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WORKING PAPER

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**Seventh North American, Central American and Caribbean Working Group Meeting (NACC/WG/7)**  
ICAO NACC Regional Office, Mexico City, 29 August - 1 September 2022

**Agenda Item 3: Follow-up of the Activities of the NACC/WG Task Forces**

3.1 Progress of the NACC/WG on Aeronautical Information Management (AIM), Air Traffic Management (ATM) and Communications, Navigation and Surveillance (CNS)

**AIR SPACE OPTIMIZATION**

(Presented by the AO Task Force Rapporteur)

<b>EXECUTIVE SUMMARY</b>	
This working paper presents the progress achieved by the Airspace Optimization Task Force (AO/TF).	
<b>Action:</b>	Suggested actions are presented in Section 3.
<i>Strategic Objectives:</i>	<ul style="list-style-type: none"><li>• Safety</li><li>• Air Navigation Capacity and Efficiency</li><li>• Economic Development of Air Transport</li><li>• Environmental Protection</li></ul>
<i>References:</i>	<ul style="list-style-type: none"><li>• Fifth NAM/CAR Air Navigation Implementation Working Group Meeting (ANI/WG/5) Report, Mexico City, Mexico, 27 – 31 May 2019.</li><li>• Second NAM/CAR Air Navigation Implementation Working Group (ANI/WG) Performance-Based Navigation (PBN) Implementation Task Force Meeting ANI/WG/PBN/TF/02, Online, 10 - 12 August 2021.</li><li>• First Meeting of the Airspace Optimization Task Force of the North American, Central American and Caribbean Working Group (NACC/WG)</li><li>• 5th Meeting of the CIIFRA Team Hybrid, Miami, United States and on-line, 2 to 4 August 2022</li></ul>

**1. Introduction**

1.1 As the global pandemic began to wind down, the Performance Based Navigation Taskforce met and considered a name change to reflect the priority of optimizing the region's airspace. In August of 2021, the task force formally changed its name to Airspace Optimization Task force. In early 2022, the Task force absorbed the Airspace Optimization Team in order to prevent duplicate work and effort in a common goal.

1.2 During the pandemic, the CANSO Air Traffic Flow Management Data Exchange Network for the Americas (CADENA) was asked by airlines carrying vital pandemic relief items such as vaccines for more efficient routes. CADENA developed a process, **PASA** (Planned Airways System Alternative) **E2E**, in which the airline would submit a request to CADENA and CADENA would then run this request through the States and Air Navigation Service Providers (ANSPs) for approval. IATA and ICAO have joined CADENA resulting in **CIIFRA** (CADENA, IATA, ICAO, Free Route Airspace). The process has expanded to the permanent optimization of end-to-end routes.

1.3 The resumption of air traffic offered an opportunity in the optimization of older routes (legacy routes). The implementation of these optimized routes on trial basis as the traffic was rebounding worked well. The Airspace Optimization Team had been working collaboratively with the International Air Transport Association (IATA) as well as the CANSO ATFM Data Exchange Network (CADENA) while working with the States to achieve optimization. This collaborative group is known as CIIFRA (CADENA IATA ICAO Free Route Airspace).

## 2. AO/TF Progress and Results

2.1 CIIFRA chose a “two-pronged” attack to complete its mission.

**Track A**—In this track, the concept is to realize quick, easy and achievable gains in efficiency. Utilizing the PASA E2E process, airlines submit potential routes to CIIFRA offering information on the advantage of the proposed route. That route is then coordinated with the affected States and any state may offer an alternate route. The “ask” is that the states do the best they can. Once a route is approved, a 30 day trial is scheduled. Upon completion and success of the 30 day trial, it is extended to 90 days then 1 year. There are 6 routes currently in the 1 year status and several that are in the earlier stages. CIIFRA is currently working on getting the 6 completed routes published in the States Aeronautical Information Circular (AIC) enabling carriers to file the routes and realize more efficiencies. This process will continue along side of Track B work.

**Track B**—Once we saw the success of the PASA E2E route optimization we began the process of moving towards Free Route Airspace. It was decided to use a similar strategy to track A. Delta Airlines volunteered and the Atlanta-Lima route was chosen. The initial trial was a one day test that was pre-coordinated, this was followed by a one day test that was not pre-coordinated. Then a three day trial and most recently a seven day trial. The advantage of these routes is that the airline is able to take full advantage of the winds. These initial trials are truly more of a User Preferred Route (UPR) than true Free route Airspace (FRA) but the concept is similar. We see this as a logical step toward the ultimate FRA goal.

2.2 Once this route is shown successful we will work on other routes in this UPR-FRA concept. After several routes are in place, we will start the process of true FRA implementation. This will be a slow and deliberate process utilizing the tools of time, location and altitude. The initial FRA trial will most likely be a small section of airspace during established timeframe at or above a selected altitude. Something along these lines *XXX airspace will be FRA between the hours of 0500Z and 1000Z on xx date at or above FL390*. Once this test has been proven successful (knowing that there may be issues to resolve), we will follow the pattern in previous tests and go for a longer period, then longer timeframe and lower altitude.

### Two Pronged Attack

- End to End route Optimization
- User Preferred Route/Free Route Airspace



2.3 **Track A results.** There are currently 12 routes that have been approved of which 6 we have good metrics on.

### Results Track A

Estimated 1-year savings of the 6 completed PASA Optimized Routes

KATL↔SPJC	<b>Savings</b>	
KATL↔SBGR	<b>Flight min:</b>	<b>13,126</b>
TTPP↔KMIA	<b>Fuel (lb):</b>	<b>2,583,088</b>
KIAH↔MMPR	<b>CO2 (kg):</b>	<b>3,702,477</b>
SAEZ ↔KATL	<b>Cost (\$):</b>	<b>2,107,410</b>
KATL ↔SAEZ		

2.4 To highlight the success of the team, projected yearly savings in flight minutes on the six flights is 13,126 minutes...the flying time between Atlanta and Lima is about 6.5 hours. That is the equivalent of 33 flights saved between Atlanta and Lima! The 3,702,477 CO2 emissions saved is the equivalent of greenhouse emissions of 9,184,161 miles driven by an average passenger car. There are additional 10 or so routes in the process of coordination.

2.5 Tracking the optimized routes. In order to keep track of the routes in progress and requested, a catalogue has been developed.

		CIIFRA Route Catalog							
		UPDATED: August 19, 2022							
Airline	City Pair	Southbound Route	Northbound Route	Status	Start Date	End Date	Comments		
Aerolíneas Argentinas (ARG)	SAEZ - JFK - SAEZ	Not requested	SAEZ PTAGA KUKEN UL324 MGGT UM402 BV1 UM423 KKRZ DCT DONCOU L654 ONCOU DCT WALE 9895 CAMRN DCT KJK	Approved	7/15/2022	10/13/2022			
Aerolíneas Argentinas (ARG)	SAEZ - KMA - SAEZ	KMA GWA0A1 URSU UP0G BLS1 UL795 LORBA DCT EMAGU UPS25 SJE 8839 LET UPS25 RCD UL437 LONOK UM79H BOLET UL404 ISOPO UTE72 MUXTA UW04 SNT SNTGA SAEZ	SAEZ BWANDA BWAM UWB PAR UL417 PABON EA KLER UM779 ZEJUS VICE1 KMA	Approved		3/5/2023	Aerolíneas Argentinas has requested a route modification		
Aerolíneas Argentinas (ARG)	KMA - SAEZ	KMA GWA0A1 URSU UP0G BLS1 UL795 LORBA DCT EMAGU UPS25 SJE UM89 PABON SARA PUBUM SNT SNTGA SAEZ	Not requested	To be coordinated			No northbound route requested		
Aerolíneas Argentinas (ARG)	MJUN - SAEZ	MJUN CNYLA CMI UM883 ANND DCT URAG UL288 ARNEL UM542 TAL VV3 ICL UL550 RGS UTE72 MUXTA UW04 SNT SNTTU SAEZ	Not requested	In coordination			Waiting on COCESNA response		
American (AA)	KMA - SJC - KMA	KMA MAMN1 FUNDI DCT LEFON DCT ANVAL DCT TINPA DCT VAMOS DCT GIV DCT VNKUD DCT ARU1 ADATU SJC	SJC SREJF SREN DCT VAKUD UL780 GIV DCT VAMOS DCT TINPA DCT LEVOR UPS36 GCM UG448 ATUJI DCT W8X SDB83 KMA	Approved	6/15/2022	10/7/2022			
American (AA)	KDFW - SJC	KDFW RT28 TNV MUDY L207 PSEV UL207 CPE 105 SRPOS LKAS UL303 ATEN D LMS432 TAL LV1 ATATU ATATU SJC	Not requested	To be coordinated					
American (AA)	KMA - SCL - KMA	KMA MAMN1 FUNDI LEFON ANVAL TINPA VAMOS GIV VAKUD ATUTU EMAR UL303 SMOX SAKOD SCL	SCL DONT48 DONT1 UL780 SREN VAKUD UL780 GIV VAMOS TINPA LEVOR UPS36 GCM UG448 ATUJI W8X SDB83 KMA	Approved	TBD	TBD	Waiting for airline input on start date		
Caribbean (BWA)	TTFF - KMA - TTFF	KMA S6PS S6PS Y590 HAGIT Y421 HARBG L652 ANADA UG448 PERGA TEAW MAFND LONK TALLS TTFF	TTFF DCT ANADA DCT MUNDZ DCT HARBG Y330 FODED DCT MADZ DCT FODD DCT LUPR FUD3 KMA	Approved		11/4/2022			
Caribbean (BWA)	TTFF - KFK - TTFF	KFK JFK S18P SPOY DGG5 NULUJ ZUMAP ULES SQUAD DANUK ENAP1 S18L DDUCA GEEZ BEGA TEAK NAPIO ENOR TALLS TTFF	TTFF POS GEEZ DDUCA L459 S18L ENAP DANUK L458 SAUV VALE YETI MOUNO GWENF PREP L653 CAMRN KFK	Unable			TNT denied request due to operational conflicts. Further coordination required		
Copa (CMP)	MPTO - SBOG - MPTO	MPTO DCT ORDZ DCT DAKND UWS6 VAGL DCT DBKL DCT GAVT DCT LKOD DCT 081505957M DCT PALP DCT 340605339W DCT NAKIV DCT SAKSA DCT OSANAK UTOBOKA SBOG	SBOG EVRAD1A ENODZ DCT VJLER DCT GZLB DCT NAKIV DCT SAKAR DCT ESAG DCT 081505957M DCT MMLUM DCT 042300649W DCT SAKT DCT DBKL UWS6 DAKND DCT 6290 SBOG1 MPTO	Approved	5/9/2022	No end date			
Copa (CMP)	MPTO - KLAX - MPTO	KLM PND40D TCATE DCT PRE DCT ALGUN DCT CROSD DCT PSAG DCT QTTI DCT ENDB DCT EMADA DCT JDS DCT ANSON DCT VUMAN VUMANJA MPTO	MPTO SIMANJA SIMAN DCT AMAB DCT VOKAS DCT ATUJO DCT ANDAU DCT RAULS DCT CVN DCT AUAPA DCT AGUA DCT AVAMOR OLAAG KLAX	In coordination			(1) Joe initiated coordination with Panama, SENIAM and COCESNA in April 2022 (2) COCESNA approved - waiting on SENIAM and Panama (3) Joe sent follow up email to Mario Hernandez on August 15, 2022 (4) Mario Hernandez said MNTV will be testing route to ensure operational feasibility		
Delta (DAL)	KATL - SJC - KATL	KATL SMTZ2 WALET DCT FUESS D79 MCLAW V442 FUNDI DCT LEFON DCT ANVAL DCT TINPA DCT GIV DCT VAKUD DCT ADATU JXDUJ SJC	SJC SRENJF SREN DCT VAKUD UL780 GIV DCT VAMOS DCT TINPA DCT LEVOR UPS36 GCM UG448 ATUJI DCT W8X Y383 PEARY Q87 MATUK Q77 SURE5 DCT LAIR DCT LARZZ JEDD KATL	Approved		10/14/2022			
Delta (DAL)	KATL - SGR - KATL	KATL V8Y72 MGN DCT HANT Q88 SHRS Y383 KENAI Y355 FIREX Y294 G2590 LACT ANADA DCT KORTO DCT SUMA - SGR	SGR - SUMA DCT KORTO DCT ANADA L652 HARBG Y621 UAGT Y336 WEND Y385 MANL Q88 SHRS DCT LAIR DCT LARZZ JEDD KATL	Approved		10/25/2022			
Delta (DAL)	KATL - SAEZ - KATL (Option 1)	KATL SMTZ2 WALET DCT FUESS D79 FEMD DCT DHP A558 URSU UP0G BLS1 EMAGU UPS25 RCD UL417 TOPOG UL404 ISOPO UTE72 MUXTA UW04 SNT SNTGA SAEZ	SAEZ BWANDA BWAM UWB PAR UL417 BORDO Y258 OCTA Q77 SHRS DCT LAIR DCT LARZZ JEDD KATL	Approved		10/7/2022			
Delta (DAL)	KATL - SAEZ - KATL (Option 2)	KATL V8Y72 MGN DCT HANT Q88 SHRS DCT DBRL Q87 EBAY DCT DMV DCT URSU UP0G BLS1 UL795 LORBA DCT EMAGU DCT BOBA DCT VULND DCT LONAK DCT PURAS DCT LET DCT ARNUB DCT SARA DCT PUBUM UL417 TOPOG UL454 ISOPO UTE72 MUXTA UW04 SNT SNTGA SAEZ	SAEZ BWANDA BWAM UWB PAR UL417 PUBUM DCT CITRA DCT PUBEJ DCT ARUNA DCT LONAK DCT RDT DCT NEVA UL417 LEMK DCT AITR UM779 ZEJUS DCT OCTA Q77 SHRS DCT LAIR DCT LARZZ JEDD KATL	Approved	6/24/2022	10/7/2022			
Delta (DAL)	KATL - SCL - KATL	KATL V8Y72 MGN DCT HANT Q88 SHRS DCT DBRL Q87 EBAY DCT DHP A558 URSU UP0G BLS1 UL795 LORBA DCT TOV UTOBOKA SMOX SAKOD SCL	Not requested	To be coordinated			Awaiting airline input on northbound route		
Go Linkas Airlines (GOL)	SBR - MJUN - SBR	MJUN L26 BOTOPOA BOTOPO UM782 ANVAL DCT BOWAN DCT RDTI DCT TME DCT KODS DCT AKPEP DCT M848 DCT ISRA DCT RAVL DCT XINGU DCT MALM UL213 PAFES OBDG02A SBR811L	SBR811R KOTVU38 PAFES U233 MALAW DCT TELOS DCT PUMTU DCT D8MT UM656 ENOU DCT M848 DCT AKPEP DCT KODS DCT TME DCT B8AM ULW30 MGN DCT ALPON DCT LEVOR DCT BRUD DCT ANKO DCT PALLE PALLE (3 MNRUN23)	To be coordinated					
Go Linkas Airlines (GOL)	SBR - MOPC - SBR	Not requested	SGR09R ULW30 UWEV U235 KENT U746 RONAK DCT OPLUX DCT UNAS DCT VUREZ DCT DARLD DCT UTMID DCT EDPET DCT BLUP DCT LDF DCT ANAG UM423 MTA DCT U7G5 DCT ARMUJ DCT SATOC RN4V M3PC86	To be coordinated					
United (UAL)	KAAH - MSLP - KAAH	KAAH BTRAG WWRN KANA KEKR TADT SASG VSA ASOKU OLSU MSLP	MSLP DLGU UG436 AUR UWS3 ASOKU VSA BAKG TADT KEKR MANJ JS CRPH02N2 KAAH	Approved		Ad Hoc Basis	Gen requested these routes for ferry flights that need to comply with overwater regulations on an ad hoc basis. Approved by Mario Hernandez with one condition - UAL must send flight plan into 30 hours before each flight. Gen Schwaes notified		
United (UAL)	KAAH - MAMP - KAAH	KAAH CRP M7V OTTEA PTODMA MAMP	MAMP - M7OD OTT48 OTTEA M7V CRP KAAH	Approved		11/30/2022			
United (UAL)	KAAH-MING-KAAH	KAAH PND DCT CROSD DCT TELAV MING	MING DCT URSU DCT CROSD DCT GIL UWS S4W D9 CRP KAAH	To be coordinated					
United (UAL)	KAAH-MING-KAAH	KAAH DVOE AXDQ UVRV MING	MING - DONS ALDVE DVOE CRP - KAAH	To be coordinated					
Emirates (UAE)	MAMAK - SCOM (Option 1)	TEYOS U7113 OAK DCT PSUM UL318 PALAD	Not requested	To be coordinated					
Emirates (UAE)	MAMAK - SCOM (Option 2)	TEYOS U7113 OAK DCT ALSA UL318 PALAD	Not requested	To be coordinated					
Emirates (UAE)	KORD-SCDM	BACIN DCT BLOH DCT BEKO DCT ENL DCT S25 135 MCB DCT HRV L333 P5AD UL328 SU08A UNW30 CRP DCT RUT DCT TOKUJ UM423 MEGAL DCT	Not requested	To be coordinated					
Emirates (UAE)	MNGL-KAAH	Not requested	OTOKO DCT UNIK DCT M7V 125 CRP DCT UMEIDA	To be coordinated					

2.6 It has been determined that to maintain order, the optimized routes in trial basis will be limited to 20. Routes that have been in use for several months will be encouraged to be published in AIP/AIC's and once that is accomplished, room for other trial routes become available. A state letter was sent out with a template for the process to publish the first six routes.

2.7 **Track B** results. There is currently 1 route that has been approved and is flying a User Preferred Route (UPR). This route is between Atlanta and Lima. As mentioned in 2.1, this is the first step towards FRA. We do have good metrics on this route as shown.

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

Estimation of 1-year savings based on 12 days

2.8 We are coordinating with Aerolíneas Argentinas on the second UPR route which will fly between Miami and Buenos Aires.

2.9 As many of the routes fly into South American airspace, we have coordination through Fernando Hermoza of ICAO's SAM Regional Office and Julio De Souza Pereira of IATA. Both are participants of CIIFRA.

2.10 As the Taskforce transitioned from PBN Taskforce to Airspace Optimization Taskforce, an ad hoc group convened during the last week of July, 2022 in order to revise the taskforce terms of reference, work programme and Caribbean Region Airspace Optimization concept paper.

2.11 General meeting in Miami, from 2 to 4 August 2022. The ad hoc group presented the Terms of Reference, Work Programme and the Caribbean Region Airspace Optimization concept paper. It was decided that further revisions were required and after the core group is selected and convened will be finalized by October 2022.

2.12 The following six action items were decided during this meeting.

1. **Action Item 1:** The Secretariat to issue a letter requesting nominations for the core members of the AO/TF by 19 August 2022. It was agreed to remove "airline operator" from the list of core members as that function will be supported by IATA-**Completed**
2. **Action Item 2:** The AO/TF to analyse IATA's recommendation on harmonization in the phraseology for DCT and UPR usage and report back by the February 2023 meeting.-**To be completed**
3. **Action Item 3:** A subsequent meeting to be held with the AO/TF core members to work on finalizing the AO/TF Work Programme to be presented by October, 2022.-**to be completed**
4. **Action Item 4:** An Ad hoc Group comprising relevant stakeholders from the ANSP, Airline Operators, Airport Operators and SMEs to be developed to follow up on IATA's recommendation to add the Airport Efficiency Programme to the AO/TF work programme to continue the optimization efforts of the upper airspace and terminal area to the airport level as airport constraints affect terminal airspace optimization by November 2022 and to meet as needed in order to provide a briefing at the February 2023 meeting. The **Meeting was held on 23 August 2022 discussing the development of this group. The membership was decided on and work will presume.**
5. **Action Item 5:** The Airport Efficiency Programme to be included under the work programme of the AO/TF, as part of a holistic Airspace Concept Implementation Model at the next gathering of the AO/TF.-**in process**
6. **Action Item 6:** An Ad hoc Group to be created to work on "Terminal Airspace Concepts" to consolidate different concepts for arrivals/departures so that States may have ideas on which concept may benefit that state better by November 2022 and meet as needed in order to provide a briefing at the February 2023 meeting.- **Meeting was held on 23 August 2022 discussing the development of this group. The membership was decided on and work will presume**

2.13 The task force is also working on an Optimized Airspace concept for the CAR region, which includes harmonized separation standards, airspace restructuring, Performance Based Navigation, and Free Route Airspace. Goals are being established for the optimization of airspace to allow continuous flow in the upper and lower airspace of contiguous Flight Information Regions (FIRs) and terminal areas (TMAs). A draft was presented at the Miami general meeting and will continue to be worked on with another draft to be presented in February.

**3. Suggested actions**

3.1 The Meeting is invited to:

- a) evaluate the progress of the Airspace Optimization/TF;
- b) review and support the Airspace Optimization/TF recommendations indicated in Section 2; and
- c) propose any other actions as deemed necessary.