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CAR/SAM Regional Planning and Implementation Group (GREPECAS)

WORKING PAPER

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Salvador, Brazil, 16 – 18 November 2022

Agenda Item 2: Global and Regional Developments

DIRECT ROUTING (DCT) STRATEGY FOR CAR/SAM REGIONS

(Presented by IATA)

EXECUTIVE SUMMARY	
This working paper presents a proposal for a Direct Routing (DCT) Strategy for CAR/SAM Regions, based on the development of a common DCT Routing Guidance Material for CAR/SAM Regions, as well as the implementation of Strategic Direct Routings (SDR) and/or User Preferred Routes (UPR).	
Action:	Suggested actions are presented in Section 3.
Strategic Objectives:	• Air Navigation Capacity and Efficiency • Economic Development of Air Transport • Environmental Protection
References:	• Global Air Navigation Plan • Reports of SAM/IG meetings • Reports of NACC/WG meetings

1. Introduction

1.1 The implementation of Strategic Direct Routing (SDR) should be based on Global Air Navigation Plan – ASBU FRTO B0/1, with the following objectives:

- Provide airspace users with additional flight planning, with route options on a larger scale across FIRs, so that planned distances can be generally reduced compared to the fixed route network.
- SDR will be established at national and regional level and is made available for flight planning (with published terms of use). **The SDR shall be considered as a transition to the implementation of the free route airspace (FRA) concept.** SDR enable airspace users to optimise flight and fuel planning.

1.2 The SDR could be implemented in a limited manner, for example:

a) Time restriction (fixed or subject to traffic/availability);
b) Traffic restriction (based on traffic flow and/or level);
c) Flight level;
d) Lateral restrictions; and
e) Entry/exit points.

1.3 The following procedures and processes may need to be considered:

a) Identify SDR airspace volume (lateral y vertical) and applicable time;
b) Direct routes may coexist with the ATS route structure;
c) Adapt airspace design to ensure horizontal and vertical connectivity with SDR.
d) ATFM procedures for SDR;
e) Review the LoAs with adjacent ATS units;
f) Publish data relevant to SDR in the AIP;
g) Airspace management procedure for the implementation of direct routes; and
h) ATC procedures for SDR coordination, including handover, path changes in direct routing, conflict detection.

1.4 Operational and dependent relationship with other ASBU elements:

a) NOPS-B0/1 Initial integration of collaborative airspace management with air traffic flow management - The integration of airspace management and air traffic flow management is a desirable requirement, with a view to optimising SDR implementation.
b) FRTO-B0/2 -Airspace planning and Flexible Use of Airspace (FUA) - The application of FUA could optimise SDR implementation considering that DCT routes could enter special use airspace, in accordance with pre-established procedures.
c) FRTO-B0/4 -Basic conflict detection and conformance monitoring - Medium-Term Conflict Detection (MTCD) and Conformance Monitoring tools are considered as requirements to reduce the workload of air traffic controllers in high air traffic volume settings. Accordingly, they can be considered as desirable requirements and should be considered when upgrading ATM systems.
d) FICE-B0/1 - Automated basic interfacility data exchange (AIDC) - Similarly, AIDC is considered a desirable tool for SDR implementation, with a view to reducing ATCO workload, especially in high air traffic volume operational environments, particularly when there is handover of SDR flights in both FIRs.

1.5 Enablers

1.5.1 Regarding the enablers, the Global Air Navigation Plan in FRTO BO/1 lists a series of EUROCONTROL documents, which could be used as guidance material. However, it is necessary that the implementation of the SDR in the CAR/SAM Region consider the characteristics of the airspace and the demand for air traffic, which is significantly lower than in Europe.

2. Analysis

2.1 SDR was implemented in some extent in 6 South American States (Brazil, Chile, Ecuador, Guyana, Peru, and Venezuela), applying procedures published via AIP amendment or AIC, based on an aeronautical publication model developed by South American Airspace Study and Implementation Group (GESEA).

2.2 As an example of SDR implementation, the most recent data collection (July 2022) and considering only the flights benefited from the implementation of the SDR in the Brazilian Airspace, GOL airline computed a reduction of 1,285 NM, generating a reduction of 5.5 tons of fuel (equivalent to a reduction of 17.38 Tons of CO2). AZUL Airlines reported that the SDR concept in two months of analysis (April 21 to June 20, 2022) allowed a reduction in flying distances of more than 1,935 NM, saving around 8.7 tons of fuel (equivalent to a reduction of 27.49 Tons of CO2).

2.3 To fulfil the need of obtaining early benefits where States are not able to implement SDR, a joint working group formed by CANSO, IATA, and ICAO, named as CIIFRA, was created in 2021 to support the implementation of UPRs, which are routes requested by the airlines that optimize the route between a specific city-pair. UPRs must be approved by all ANSPs, through their Flow Management Units, Area Control Centre managers, or Civil Aviation Authorities, as applicable, in which any segment of the route occurs. Once an UPR is approved for the trial, it will be available for a specified period of time (i.e., trial period) and a specific airline. The purpose of the route trials is to determine the operational feasibility of the routes and once the operational feasibility of the routes is verified, to have them published via AIC/AIP. After the States publish the route segments within their AIC/AIPs, those segments may be used by all airlines for any city pair until further notice. Typically, UPRs are based on published waypoints and do not apply necessarily formal ATS Routes published by States.

2.4 It is important to note that although the present CIIFRA´s strategy is focus on the implementation of Optimized End-to-End Routes to obtain early benefits, SDR is also part of the group´s strategy as a transition to FRA.

2.5 As an example, 4 Optimized End-to-End routes trials performed so far provided an estimation of the following savings/per year:

a. Flight Time: 6,565 minutes
b. Fuel: 1,303,973 pounds
c. CO2: 1,869,052 Kg

2.6 CIIFRA developed a catalogue of UPRs, which contains 35 airline proposals, 26 involving the CAR and SAM Regions and 9 in the SAM Region only. Currently 13 UPRs are being used, in a trials system, with a view to verifying safety and efficiency, as well as obtaining early benefits, before full publication. 4 States have already published the UPRs that are being tested in their airspaces: Ecuador, Panama, Peru and Trinidad and Tobago. The publication of the 35 routes of the route catalogue and other proposals that will be made by users, have the potential to significantly increase savings and contribute to the evolution towards Strategic Direct Routing (SDR) and Free Route Airspace (FRA). The UPRs catalogue is attached as **Appendix** to this working paper.

2.7 A close collaboration between Airspace Optimization Task Force from NACC/WG and Airspace Study and Implementation Group from SAM/IG are essential to harmonize and expedite the implementation of DCT routing in Latin America and Caribbean, to provide flight efficiency and enhance aviation in the Regions. To this end, the development of a common guidance material for the CAR/SAM

regions would be important. This work has already started in both regions and harmonization between them should start as soon as possible.

2.8 Active participation of States, ANSPs and Airlines are essential to the implementation of Strategic Direct Routing and Optimized End-to-End routes as initial steps to reach the goal of implementing Free Route Airspace (FRA). It is important to note that Strategic Direct Routing is the more suitable way to progress into the FRA, in accordance with the GANP, and its implementation by some States in the Region has already demonstrated its feasibility and corresponding benefits.

3. Suggested Actions

3.1 The Meeting is invited to:

a) take note of the information presented in this working paper;

b) evaluate the feasibility of developing a common DCT Routing Guidance Material for CAR/SAM Regions; and

c) Urge States to implement Strategic Direct Routing to improve aviation efficiency and sustainability in the CAR/SAM Regions, as an important step into Free Route Airspace. Alternatively, for States not ready to implement SDR yet, to implement UPRs, as described in item 2,3, as a transition to Strategic Direct Routing.

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APPENDIX
User Preferred Routes – Route Catalogue
Status on 17 October 2022

UPRs CAR/SAM Regions

Airline	City Pair	Southbound Route	Northbound Route	Status	Start Date	End Date	Comments
Aerolinas Argentinas (ARG)	SAEZ - KJFK - SAEZ	Not requested	SAEZ PTA6A KUKEN UL324 MIGOT UM402 BVI UM423 KIKER DCT DONQU L454 OKONU DCT YAALE Y495 CAMRN DCT KJFK	Approved **(Extension)**	7/15/2022	07 15 2023	Extension to be coordinated with San Juan. Request through 7/15/23
Aerolinas Argentinas (ARG)	SAEZ - KMIA - SAEZ	KMIA GWAVA1 URSUS UP406 BILSI UL795 LORBA DCT EMABU UP525 SJE UB689 LET UP525 RCO UL417 LOKOX UM784 BOLET UL404 ISOPO UT672 MULTA UW24 SNT SNT6A SAEZ	SAEZ BIVAM2A BIVAM UW8 PAR UL417 PABON EJA KILER UM779 ZEUSS VIICE1 KMIA	Approved		3/5/2023	Aerolinas Argentinas has requested a route modification
Aerolinas Argentinas (ARG)	KMIA - SAEZ	KMIA GWAVA1 URSUS UP406 BILSI UL795 LORBA DCT EMABU UP525 SJE **UB689 PABON** PUDBU **ISARA PUBUM SNT** SNT6A SAEZ	Not requested	In coordination			(1) No northbound route requested (2) Andres Guilhem added PUDBU to comply with Brazil's 300NM rule
Aerolinas Argentinas (ARG)	MMUN - SAEZ	MMUN CZM1A CZM **UB881 ANIKO DCT RADIM DCT LIXAS UL203** ARNEL UM542 TAL UV1 JCL UL550 ROS UT672 MULTA UW24 SNT SNT7U SAEZ	Not requested	Approved	8/29/2022	11/27/2022	(1) No northbound route requested (2) COCESNA approved on condition of accepting the additions of RADIM. (3) ARG accepted the addition of RADIM
American (AAL)	KMIA - SPJC - KMIA	KMIA MAYNR1 FUNDI DCT LEPON DCT ARNAL DCT TINPA DCT VAMOS DCT GYV DCT VAKUD DCT ATATU ATATU2 SPJC	SPJC ISRE2F ISREN DCT VAKUD UL780 GYV DCT VAMOS DCT TINPA DCT LEVOR UP536 GCM UG448 ATUVI DCT IKBIX SNDBR2 KMIA	Extension - In coordination	6/15/2022	10/7/2022	**Extension to be coordinated with ECNA, JCAA, Panama, Colombia, Ecuador, CORPAC, Chile. Request through 12/31/22**
American (AAL)	KDFW - SPJC	KDFW ARTZ8 TNV MUSYL L207 IPSEV UL207 CPE IOS URPOS LIXAS UL203 ATEN O UM542 TAL UV1 ATATU ATATU2 SPJC	Not requested	To be coordinated			
American (AAL)	KMIA - SCEL - KMIA	KMIA MAYNR1 FUNDI LEPON ARNAL TINPA VAMOS GYV VAKUD ATUTU ILMAR UL302 SIMOK SIMOSD SCL	SCEL DONT4B DONTI UL780 ISREN VAKUD UL780 GYV VAMOS TINPA LEVOR UP536 GCM UG448 ATUVI IKBIX SNDBR2 KMIA	Approved	TBD	TBD	**Waiting for airline input on start date**
Caribbean (BWA)	TTPP - KMIA - TPPP	KMIA SKIPS2 SKIPS Y290 HAGIT Y421 HARBG L452 ANADA UG449 PERGA ITRAK NAPKO LEXOR TALUS TTPP	TTPP DCT ANADA DCT MUNOZ DCT HARBG Y330 FODED DCT MADIZ DCT FOXID DCT FLIPR FLIPR7 KMIA	Approved		11/4/2022	
Caribbean (BWA)	TTPP - KJFK - TTPP	KJFK JFK SHIPP SPDEY DOGRS BLUUU DUMPR ISLES SQUAD DARUX ENAPI SHEIL ODUCA GEECE PERGA ITRAK NAPKO LEXOR TALUS TTPP	TTPP POS GEECE ODUCA L459 SHEIL ENAPI DARUX L459 SAVIK YAALE YETTI MOUGH OWENZ PREPI LEECY CAMRN KJFK	Unable			ZNY denied request due to operational conflicts. Further coordination required
Copa (CMP)	MPTO - SBGL - MPTO	MPTO DCT OREPI DCT DAKMO UW36 VASIL DCT OBKIL DCT GAVIT DCT ILKOD DCT 0835S05957W DCT PALEP DCT 1404S05339W DCT NAXIV DCT SAMGA DCT OGMUK UTBOM2A SBGL	SBGL EVRAD1A ENSOD DCT VULER DCT GELIB DCT NAXIV DCT SAMAR DCT ESDAG DCT 0901S05939W DCT MIMUM DCT 0428S06440W DCT GAVIT DCT OBKIL UM549 DAKMO DCT ISOKO ISOKO1 MPTO	Approved	5/9/2022	No end date	
Copa (CMP)	MPTO - KLAX - MPTO	KLAX PNDAH2 TCATE DCT PPE DCT ALGUN DCT OTOSO DCT IPSAG DCT OTITI DCT EMOBI DCT EMADA DCT IOS DCT ANSON DCT VUMAN VUMAN1A MPTO	MPTO SIMAN2A SIMAN DCT AMUBI DCT VOKAS DCT ATUTO DCT AXOMU DCT RAULS DCT CVM DCT AVAPA DCT ASUTA DCT AMMOR OLAAA2 KLAX	In coordination			(1) Joe initated coordination with Panama, SENEAM and COCESNA in April 2022 (2) COCESNA approved - waiting on SENEAM and Panama (3) Joe sent follow up email to Mario Hernandez on August 15, 2022 (4) Mario Hernandez said MMTY will be testing route to ensure operational feasiblity
Delta (DAL)	KATL - SPJC - KATL	KATL SMLTZ2 WALET DCT **ZPLEN** Q79 MCLAW Y442 FUNDI DCT LEPON DCT ARNAL DCT TINPA DCT VAMOS DCT GYV DCT VAKUD DCT ATATU ATATU2 SPJC	SPJC ISREN2F ISREN DCT VAKUD UL780 GYV DCT VAMOS DCT TINPA DCT LEVOR UP536 GCM UG448 ATUVI DCT IKBIX Y183 PEAKY Q87 MATLK Q77 SHRKS DCT LAIRI DCT LARZZ JJEDI2 KATL	Approved **(Extension)**		12/31/2022	Approval was received to continue Step 4 Trial until 12 31 2022. Extension coordinated with ECNA, JCAA, Colombia. Panama and CORPAC have approved via their AICs. William Rubiano coordinated with Colombia.
Delta (DAL)	KATL - SBGR - KATL	KATL VRSTY2 MCN DCT YANTI Q89 MANLE Y185 RENAH Y355 FIPEK Y294 GESSO L467 ANADA DCT KORTO DCT SUMVA .... SBGR	SBGR ... SUMVA DCT KORTO DCT ANADA L452 HARBG Y421 HAGIT Y306 VENDS Y185 MANLE Q89 SHRKS DCT LAIRI DCT LARZZ JJEDI2 KATL	Approved		**10/25/2022**	
Delta (DAL)	KATL - SAEZ - KATL	KATL VRSTY2 MCN DCT YANTI Q89 SHRKS DCT CRG DCT DEBRL DCT OMN DCT URSUS UP406 BILSI UL795 LORBA DCT EMABU DCT BOBKA DCT VULNO DCT LONAX DCT PUPAS DCT LET DCT ARNUB DCT ISARA DCT PUBUM UL417 TOPOG UL404 ISOPO UT672 MULTA UW24 SNT SNT6A SAEZ	SAEZ BIVAM2A BIVAM UW8 PAR UL417 PUBUM DCT CITRA DCT PUDBU DCT ARUXA DCT LONAX DCT IROTI DCT NEVPA UL417 LENAX DCT ALTIB UM779 ZEUSS DCT OCTAL Q77 SHRKS DCT LAIRI DCT LARZZ JJEDI2 KATL	Approved **(Extension)**	6/24/2022	12/31/2022	Extension to be coordinated with ECNA, JCAA, Colombia. Request through 12/31/22. William Rubiano obtained approval from Colombia and Bolivia until 4/16/2023
Delta (DAL)	KATL - SAEZ	KATL VRSTY2 MCN DCT YANTI Q89 SHRKS DCT CRG DCT DEBRL DCT OMN DCT URSUS UP406 BILSI UL795 ALTIB DCT NEFTU DCT EMABU DCT SINID DCT GEKAR DCT LONAX PUPAS DCT LET DCT ILPOL DCT ISARA DCT PUBUM UL417 TOPOG UL404 ISOPO UT672 MULTA UW24 SNT SNT6A SAEZ.	Not requested	Approved	10/18/2022	12/31/2022	William Rubiano (DAL) has coordinated and received approval from Paraguay, Bolivia and Colombia
Delta (DAL)	KATL - SCEL - KATL	KATL VRSTY2 MCN DCT YANTI Q89 SHRKS DCT CRG DCT DEBRL DCT OMN DCT URSUS UP406 BILSI UL795 ALTIB DCT NEFTU DCT EMABU DCT SINID DCT GEKAR DCT LONAX PUPAS DCT LET DCT ILPOL DCT ISARA DCT PUBUM UL417 TOPOG UL404 ISOPO UT672 MULTA UW24 SNT SNT6A SAEZ.	Not requested	To be coordinated			Awaiting airline input on northbound route
Gol Linhas Aéreas (GOL)	SBBR - MMUN - SBBR	MMUNR12R BOTOP2A BOTOP UM782 ARNAL DCT ROKIN DCT IROTI DCT TME DCT KODSI DCT AKPEP DCT MIBAB DCT ISIPA DCT RAXIL DCT XINGU DCT MALMI UZ33 PAPES OBDOG2A SBBR11L	SBBRR11R KOTVU3B PAPES UZ33 MALMI DCT TELOS DCT PUMTU DCT DEMIT UM656 EKOXU DCT MIBAB DCT AKPEP DCT KODSI DCT TME DCT DIBAM UW10 MGN DCT ALPON DCT LEVOR DCT BIRLO DCT ANIKO DCT PAULE PAULE1H MMUNR12L	To be coordinated			
Gol Linhas Aéreas (GOL)	SBGR - MDPC - SBGR	Not requested	SBGRR09L UKBEV1D UKBEV UZ26 KEXIT UZ46 ROMIK DCT OPRUX DCT LIVAB DCT VUREB DCT DARLO DCT UTMID DCT EDPET DCT BUVIP DCT LDP DCT ANBAG UM423 MTA DCT UTGIS DCT ARMUR DCT SATOE RNAV MDPCR08	To be coordinated			
United (UAL)	KIAH - MSLP - KIAH	KIAH.RITAA6.WWREN..KANNA..KEKRI..TADET..BASKO..VSA..ASOKU..OLI SU..MSLP	MSLP..OLISU.UG436.AUR.UW3.ASOKU..VSA..BASKO..TADET..KEKRI..MA M.J25.CRP.HTOWN2.KIAH	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 info 10 hours before each flight. Gen Schnee notified
United (UAL)	KIAH - MMPR - KIAH	KIAH ... CRP MTY OTEKA KEDMA MMPR	MMPR ... XUDED UT148 OTEKA MTY CRP ... KIAH	Approved		11/30/2022	
United (UAL)	KIAH-MMSD-KIAH	KIAH ... PNG DCT CODLE DCT TENAY MMSD	MMSD DCT USBOG DCT OLESI DCT CUL UJ10 SLW J29 CRP KIAH	To be coordinated			
United (UAL)	KIAH-MMGL-KIAH	KIAH ... DEVOE AXEDO LIVRI ... MMGL	MMGL ... GOYAS ALOVO DEVOE CRP ... KIAH	To be coordinated			
Emirates (UAE)	MMMX -SEQM Option 2	TEVOS UT113 OAX DCT IPSUM UL318 PALAD	Not requested	To be coordinated			
Emirates (UAE)	MMMX -SEQM Option 1	TEVOS UT113 OAX DCT ALSAL UL318 PALAD	Not requested	To be coordinated			
Emirates (UAE)	KORD-SEQM	BACEN DCT BLOKR DCT BEKKI DCT ENL DCT SQS J35 MCB DCT HRV L333 PISAD UL333 ILUBA UN420 SPP DCT RHT DCT TOKUT UM674 NEGAL DCT	Not requested	To be coordinated			
Emirates (UAE)	MMGL-KIAH	Not requested	OTOKI DCT URVIK DCT MTY J29 CRP DCT LMEDA	To be coordinated			

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UPRs SAM Region only

Airline	City Pair	Southbound Route	Northbound Route	Status	Start Date	End Date	Comments
Gol Linhas Aéreas (GOL)	SBGR - SAME - SBGR	SBGRR09L ZORZA1A SOVSI UZ85 ATIMA DCT ESNOG DCT ARULA UM400 SIKOB DCT	SAMER36 SALBO1C SALBO UL531 CBA DCT IREKA UW14 UROLI DCT GEBUN DCT VUNAT				
Gol Linhas Aéreas (GOL)	SCEL - SBGR	No southbound route	SCELR17R GUVOL5B GUVOL DCT ORABA DCT ERE UW14 UROLI DCT GEBUN DCT TERER				
Gol Linhas Aéreas (GOL)	SAAR - SBGR	No southbound route	SAARR20 DABOT1G DABOT DCT RIOKA DCT GEMSU DCT VUNEG UZ71 BOLIP UZ28 XONUG				
Gol Linhas Aéreas (GOL)	SACO - SBGR	No southbound route	SACOR01 IRAVO1 GEMOP DCT SIKOB DCT TIGDI DCT ESUKA DCT SUMPO UZ28 XONUG				
Gol Linhas Aéreas (GOL)	SBFZ - SABE	SBFZR13 RODIT1A RODIT UM654 ANSOK DCT UGPIR DCT MOTGI DCT UBLAM DCT TOGAL UL324 KUKEN KUKEN2Q SABER13	No northbound route				
Gol Linhas Aéreas (GOL)	SBMO - SABE - SBMO	SBMO SBMOR12 ESBIR2A DENDO DCT MAPVU DCT VUTNO DCT OPVUK UZ21 LOKAM UZ85 BIVAR DCT VUGUP DCT MAZAR DCT URURI DCT KUKEN KUKEN2Q SABER13 SABE	SABE SABER13 KUKEN7 KUKEN DCT URURI DCT PUBED DCT DOLDI DCT XONUG DCT BIVAR DCT KONVI UZ23 BHZ DCT VUTNO DCT MAPVU DCT MCE DCT SBMOR12 SBMO				
Gol Linhas Aéreas (GOL)	SABE - SBSG - SABE	SBSG SBSGR12 AMVUK1C VACAR DCT MOSMU UZ30 ENTIT DCT DIDAB DCT DOLDI DCT PUBED DCT URURI DCT KUKEN KUKEN2Q SABER13 SABE	SABE SABER31 KUKEN7 KUKEN DCT URURI DCT EPGEP DCT UMGES DCT GELAB DCT UKBAG DCT SIGIR DCT ALGAP DCT OFITO DCT RAXIK DCT VACAR VACAR1G SBSGR12 SBSG				
Gol Linhas Aéreas (GOL)	SABE - SBRF - SABE	SBRF SBRFR18 SATMA2A MCE DCT ELEFA DCT REMIG UZ30 ENTIT DCT KIGES DCT SUMPO SABE UN741 PUBED DCT UMRUD UN741 PAPIX PAPIX1R SABER31	SABE SABER13 KUKEN7 KUKEN DCT URURI DCT PUBED DCT DOLDI DCT XONUG DCT BIVAR DCT KONVI UZ23 BHZ DCT VUTNO DCT MAPVU DCT ARU BUVAD1A SBRFR18 SBRF				
Gol Linhas Aéreas (GOL)	SABE - SBSV - SABE	SBSV SBSVR10 GEDEX2A TOLOG DCT LOMOR DCT VUKAT UZ57 OPVUK UZ21 LOKAM UZ85 BIVAR DCT VUGUP DCT MAZAR DCT URURI DCT KUKEN KUKEN2Q SABER13 SABE	SABE SABER13 KUKEN7 KUKEN DCT URURI DCT PUBED DCT CTB DCT KONVI UZ23 BHZ DCT VUTNO DCT MUMAS ASUGA1A SBSVR10 SBSV				

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