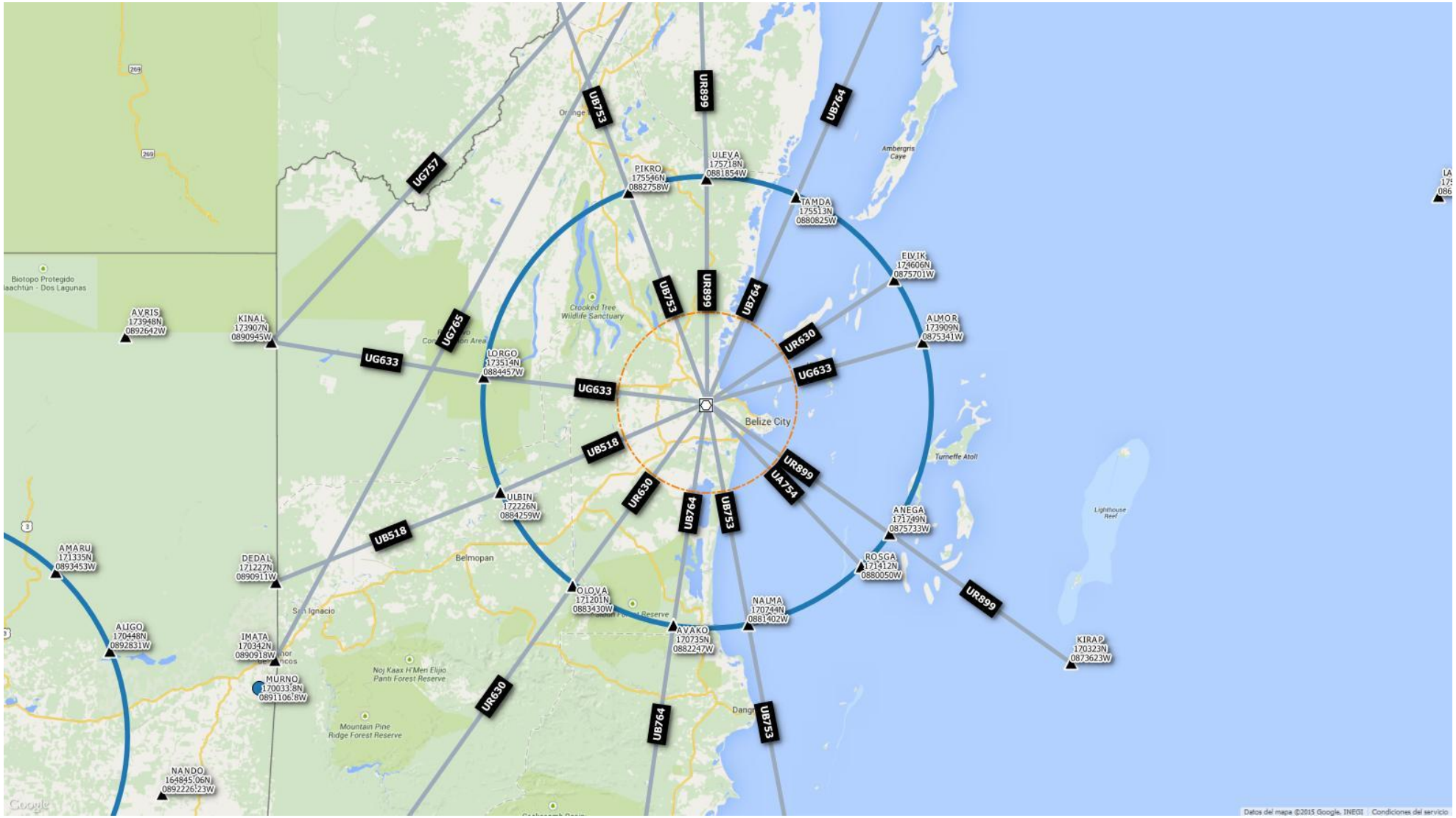
Airspace Redesign and PBN Project in Belize

COCESNA

Corporación Centroamericana de Servicios de Navegación Aérea

ATS Routes



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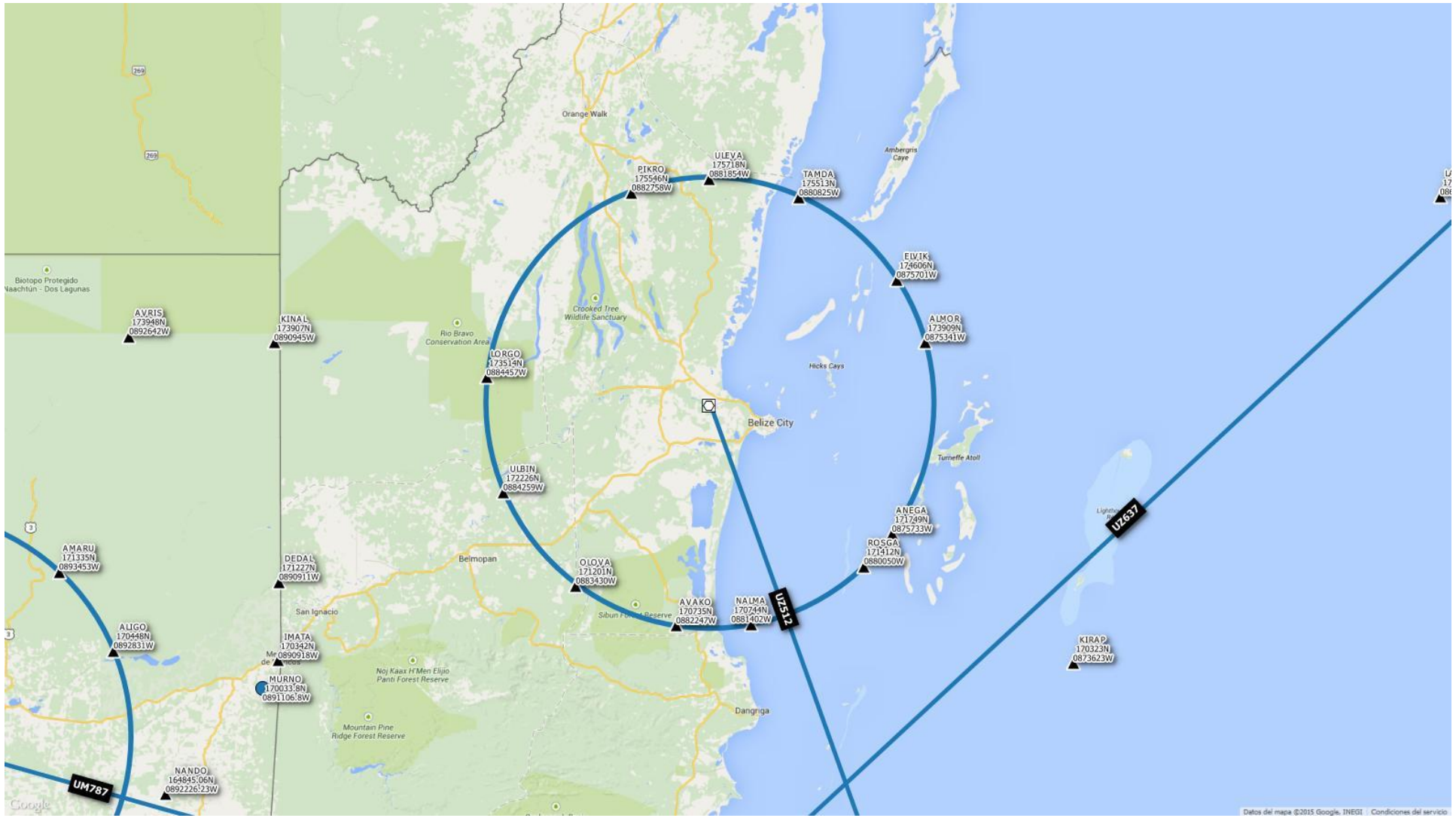
RNAV Routes - Current



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Philip S.W. Goldson Satellite Imagery

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Before making the conceptual design

- Meetings were made with ATC Staff
- Aircraft flows were analyzed
- Radar tracks for Philip S.W. Goldson was reviewed
- Conventional routes ATS structure were analyzed

Ejemplo Radar Tracks Analizados

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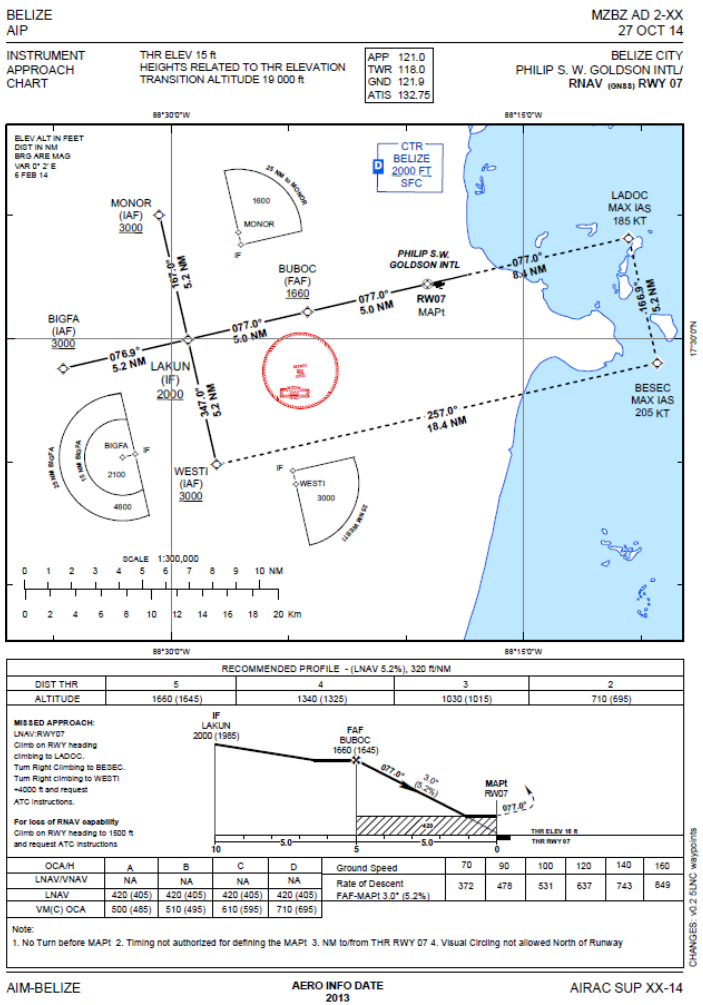
Proposal IAP RNAV(GNSS)RWY 07

MZBZ



BELIZE
AIP

MZBZ AD 2-XX
27 OCT 14

INSTRUMENT
APPROACH
CHART

THR ELEV 15 ft
HEIGHTS RELATED TO THR ELEVATION
TRANSITION ALTITUDE 19 000 ft

APP 121.0
TWR 118.0
GND 121.9
ATIS 132.75

BELIZE CITY
PHILIP S. W. GOLDSON INTL/
RNAV (GNSS) RWY 07

88°30'0"W 88°15'0"W

ELEV ALT IN FEET
DIST IN NM
BRG ARE MAG
VAR 0° 2' E
6 FEB 14

CTR
BELIZE
2000 FT
SFC

MONOR
(IAF)
3000

BUBOC
(FAF)
1660

BIGFA
(IAF)
3000

LAKUN
(IF)
2000

WESTI
(IAF)
3000

PHILIP S.W.
GOLDSON INTL

RW07
MAPt

LADOC
MAX IAS
185 KT

BESEC
MAX IAS
205 KT

076.9° 5.2 NM
077.0° 5.0 NM
077.0° 8.4 NM
257.0° 5.2 NM
257.0° 18.4 NM
167.6° 5.2 NM

SCALE 1:300,000
0 1 2 3 4 5 6 7 8 9 10 NM
0 2 4 6 8 10 12 14 16 18 20 Km

17°30'0"N

RECOMMENDED PROFILE - (LNAV 5.2%), 320 ft/NM				
DIST THR	5	4	3	2
ALTITUDE	1660 (1645)	1340 (1325)	1030 (1015)	710 (695)

MISSED APPROACH:
LNAV:RWY07
Climb on RWY heading
climbing to LADOC.
Turn Right Climbing to BESEC.
Turn Right climbing to WESTI
+4000 ft and request
ATC instructions.

For loss of RNAV capability
Climb on RWY heading to 1500 ft
and request ATC instructions

IF
LAKUN
2000 (1985)

FAF
BUBOC
1660 (1645)

077.0°
3.0°
(5.2%)

MAPt
RW07

077.0°

THR ELEV 15 ft
THR RWY 07

10 5 0
5.0 5.0

OCA/H	A	B	C	D
LNAV/VNAV	NA	NA	NA	NA
LNAV	420 (405)	420 (405)	420 (405)	420 (405)
VM(C) OCA	500 (485)	510 (495)	610 (595)	710 (695)

Ground Speed	70	90	100	120	140	160
Rate of Descent FAF-MAPt 3.0° (5.2%)	372	478	531	637	743	849

Note:
1. No Turn before MAPt 2. Timing not authorized for defining the MAPt 3. NM to/from THR RWY 07 4. Visual Circling not allowed North of Runway

CHANGES: v0.2 SUNC waypoints

AIM-BELIZE

AERO INFO DATE
2013

AIRAC SUP XX-14

BELIZE
AIP

MZBZ AD 2-XX
27 OCT 14

INSTRUMENT
APPROACH
CHART

THR ELEV 15 ft
HEIGHTS RELATED TO THR ELEVATION
TRANSITION ALTITUDE 19 000 ft

APP 121.0
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BELIZE CITY
PHILIP S. W. GOLDSON INTL/
RNAV (GNSS) RWY 07

IAF MONOR

Designator	Path Descriptor	Waypoint Identifier	Latitude	Longitude	Flyover	Course °M (°T)	Turn Direction	Altitude (ft)	Distance (Nm)	Speed Limit (Kt)	Magnetic Variation	VPA(°)/ TCH (ft)	Navigation Specification
RNAV (GNSS) RWY07	IF	MONOR	173503.1099N	0883030.2719W	-	-	-	+ 3 000	-	-	0°04' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	LAKUN	172957.8146N	0882917.1358W	-	0.167 (0.167)	L	+ 2 000	5.2	-	0°04' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	BUBOC	173105.3284N	0882411.2080W	-	0.077 (0.077)	-	+ 1 660	5.0	-	0°01' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	RW07	173212.8422N	0881905.2488W	Y	0.077 (0.077)	-	-	5.0	-	0°02' E	-3°/52'	RNP APCH
RNAV (GNSS) RWY07	TF	LADOC	173406.0398N	0881031.1127W	-	0.077 (0.077)	R	+ 1 500	8.4	185	0°07' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	BESEC	172900.7465N	0880917.9717W	-	0.167 (0.167)	R	+ 2 140	5.2	205	0°07' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	WESTI	172452.5092N	0882804.0675W	-	0.257 (0.257)	-	+ 4 000	18.4	250	-	-	RNP APCH

IAF BIGFA

Designator	Path Descriptor	Waypoint Identifier	Latitude	Longitude	Flyover	Course °M (°T)	Turn Direction	Altitude (ft)	Distance (Nm)	Speed Limit (Kt)	Magnetic Variation	VPA(°)/ TCH (ft)	Navigation Specification
RNAV (GNSS) RWY07	IF	BIGFA	172847.5974N	0883435.2668W	-	-	-	+ 3 000	-	-	0°07' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	LAKUN	172957.8146N	0882917.1358W	-	0.077 (0.077)	-	+ 2 000	5.2	-	0°04' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	BUBOC	173105.3284N	0882411.2080W	-	0.077 (0.077)	-	+ 1 660	5.0	-	0°01' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	RW07	173212.8422N	0881905.2488W	Y	0.077 (0.077)	-	-	5.0	-	0°02' E	-3°/52'	RNP APCH
RNAV (GNSS) RWY07	TF	LADOC	173406.0398N	0881031.1127W	-	0.077 (0.077)	R	+ 1 500	8.4	185	0°07' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	BESEC	172900.7465N	0880917.9717W	-	0.167 (0.167)	R	+ 2 140	5.2	205	0°07' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	WESTI	172452.5092N	0882804.0675W	-	0.257 (0.257)	-	+ 4 000	18.4	250	-	-	RNP APCH

IAF WESTI

Designator	Path Descriptor	Waypoint Identifier	Latitude	Longitude	Flyover	Course °M (°T)	Turn Direction	Altitude (ft)	Distance (Nm)	Speed Limit (Kt)	Magnetic Variation	VPA(°)/ TCH (ft)	Navigation Specification
RNAV (GNSS) RWY07	IF	WESTI	172452.5092N	0882804.0675W	-	-	-	+ 3 000	-	-	0°04' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	LAKUN	172957.8146N	0882917.1358W	-	0.347 (0.347)	R	+ 2 000	5.2	-	0°04' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	BUBOC	173105.3284N	0882411.2080W	-	0.077 (0.077)	-	+ 1 660	5.0	-	0°01' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	RW07	173212.8422N	0881905.2488W	Y	0.077 (0.077)	-	-	5.0	-	0°02' E	-3°/52'	RNP APCH
RNAV (GNSS) RWY07	TF	LADOC	173406.0398N	0881031.1127W	-	0.077 (0.077)	R	+ 1 500	8.4	185	0°07' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	BESEC	172900.7465N	0880917.9717W	-	0.167 (0.167)	R	+ 2 140	5.2	205	0°07' E	-	RNP APCH
RNAV (GNSS) RWY07	TF	WESTI	172452.5092N	0882804.0675W	-	0.257 (0.257)	-	+ 4 000	18.4	250	-	-	RNP APCH

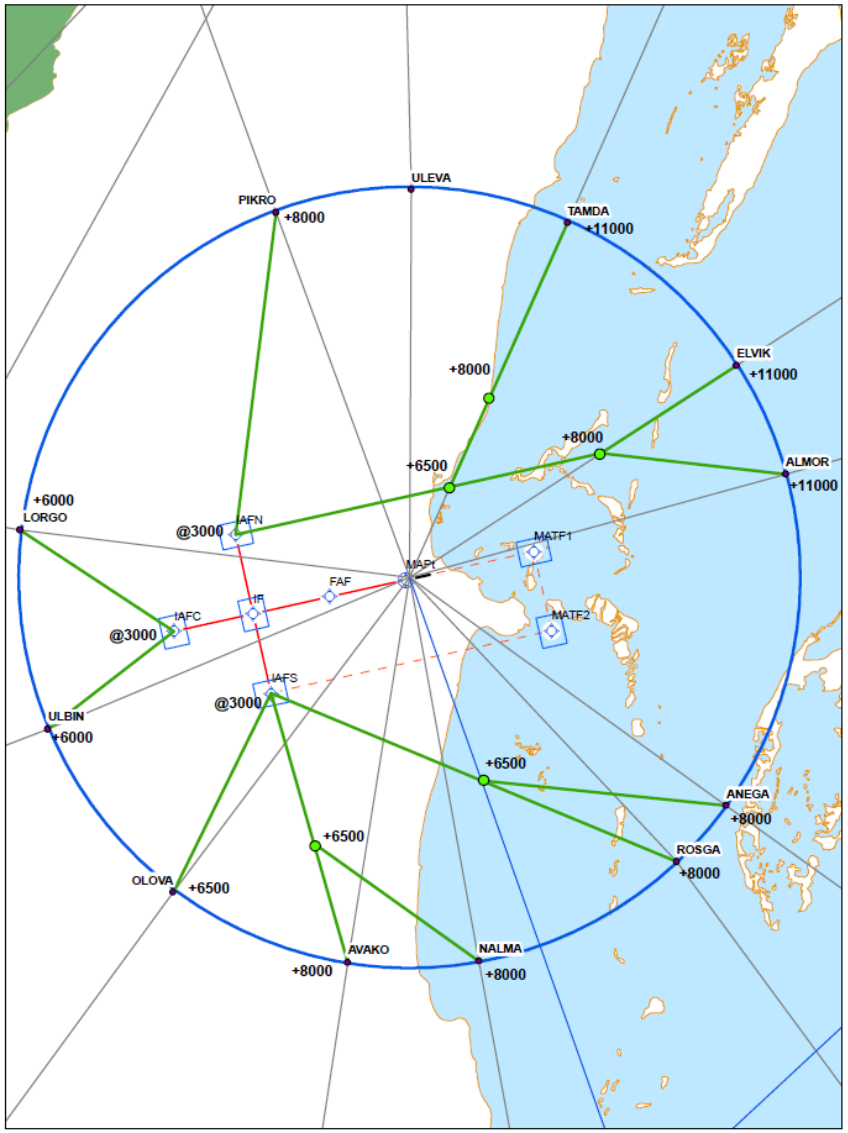
CHANGES: v0.2 SUNC added

AIM-BELIZE

AERO INFO DATE
2013

AIRAC SUP XX-14

Proposal STAR RNAV 1 RWY 07



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Before implementation Stakeholders are briefed for feedback

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BELIZE CITY
BELIZE, C.A.

AIC
Series A

AIC 006/15
16 JUNE 2015

Introduction of Performance Based Navigation (PBN) in Belize Terminal Control Area (TMA)

1. Purpose

1.1 The purpose of this Circular is to provide information concerning the introduction of Performance Based Navigation (PBN) operations at Belize's Philip S. W. Goldson International Airport (MZBZ) Terminal Control Area (TMA).

1.2 The aim is to provide aircraft operators information on Belize's plans for the implementation of PBN and a means to provide feedback on this proposal.

2. Background

2.1 PBN aims to ensure global standardization of Area Navigation (RNAV) and Required Navigation Performance (RNP) specifications. Air traffic is increasing every day and as such airspace needs to be optimized for it to be used in a more efficient manner.

2.2 The Belize Department of Civil Aviation is promoting PBN implementation in an effort to reap its benefits and in so doing comply with the Global Air Navigation Plan implementation dates for our region.

3. Need for PBN in the Belize TMA

3.1 PBN will be introduced in the Belize TMA in order to obtain the following benefits:

3.1.1 Increase operational safety
3.1.2 Fuel Savings
3.1.3 Direct Routes
3.1.4 Reduce Air Traffic Service controller workload
3.1.5 Reduce Carbon Dioxide (CO_2) emissions

4. PBN Implementation plans and expected changes

4.1 PBN implementation in Belize will be gradually done in phases and will commence in September of 2015.

4.2 PBN specifications planned to be used initially are:

4.2.1 Standard Instrument Departures (SID) - RNAV 1
4.2.2 Standard Terminal Arrival Route (STAR) - RNAV 1
4.2.3 Instrument Approach Procedures:
4.2.3.1 RNAV (GNSS) procedures – RNP APCH (LNAV/VNAV and LNAV)
4.2.3.2 ILS procedure – ILS procedure in which initial and intermediate segments will be based on RNP APCH. Use of this procedures will required approval for RNP APCH.

4.3 PBN operations within Belizean Airspace will only be done by the Global Navigation Satellite System (GNSS) as no Distance Measuring Equipment (DME) or Very High Frequency Omni-directional Radio Range (VOR)/DME infrastructure is in place nor is it envisioned to be commissioned in the future to support DME/DME and/or VOR/DME.

4.4 Instrument approach procedures in place may suffer minor changes to align as close as possible to new PBN procedures and/or be removed if they are deemed no longer necessary.

4.5 Procedures will be promulgated by AIRAC AIP Amendments with two (2) AIRAC cycles of anticipation of its effective date.

5. Information for operators not able to meet PBN specification

5.1 Aircraft operators unable to meet PBN specifications will be able to continue to operate within the Belize TMA through the use of procedures based on navigational aids (navaids) and/or surveillance radar via vectoring. These aircraft however, may need to navigate longer distances or be subjected to altitude restrictions.

5.2 Depending on the air traffic density and increase of aircraft operations in and out of the Philip S. W. Goldson International Airport, priority may have to be given to aircraft that comply with PBN specification above those aircraft that do not comply.

6. Flight Planning

6.1 Aircraft operators shall strictly follow ICAO Flight Plan requirements in force, especially those regarding Performance Based Navigation (PBN) specifications.

6.2 This aircraft that have approval to perform RNAV and/or RNP navigation specifications, shall be indicated in Item 10 of the Flight Plan Format by inserting the letter 'R'.

6.3 Item 18 on the ICAO Flight Plan Format, shall be detailed according to the RNAV/RNP specifications capacity on board the aircraft.

7. Additional Information or feedback

7.1 The Belize Department of Civil Aviation is hereby providing the following email address in our Department's website as a communication channel for and queries, suggestions or comments.

belize.pbn@civilaviation.gov.bz

**** END ****

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Before implementation Stakeholders are briefed for

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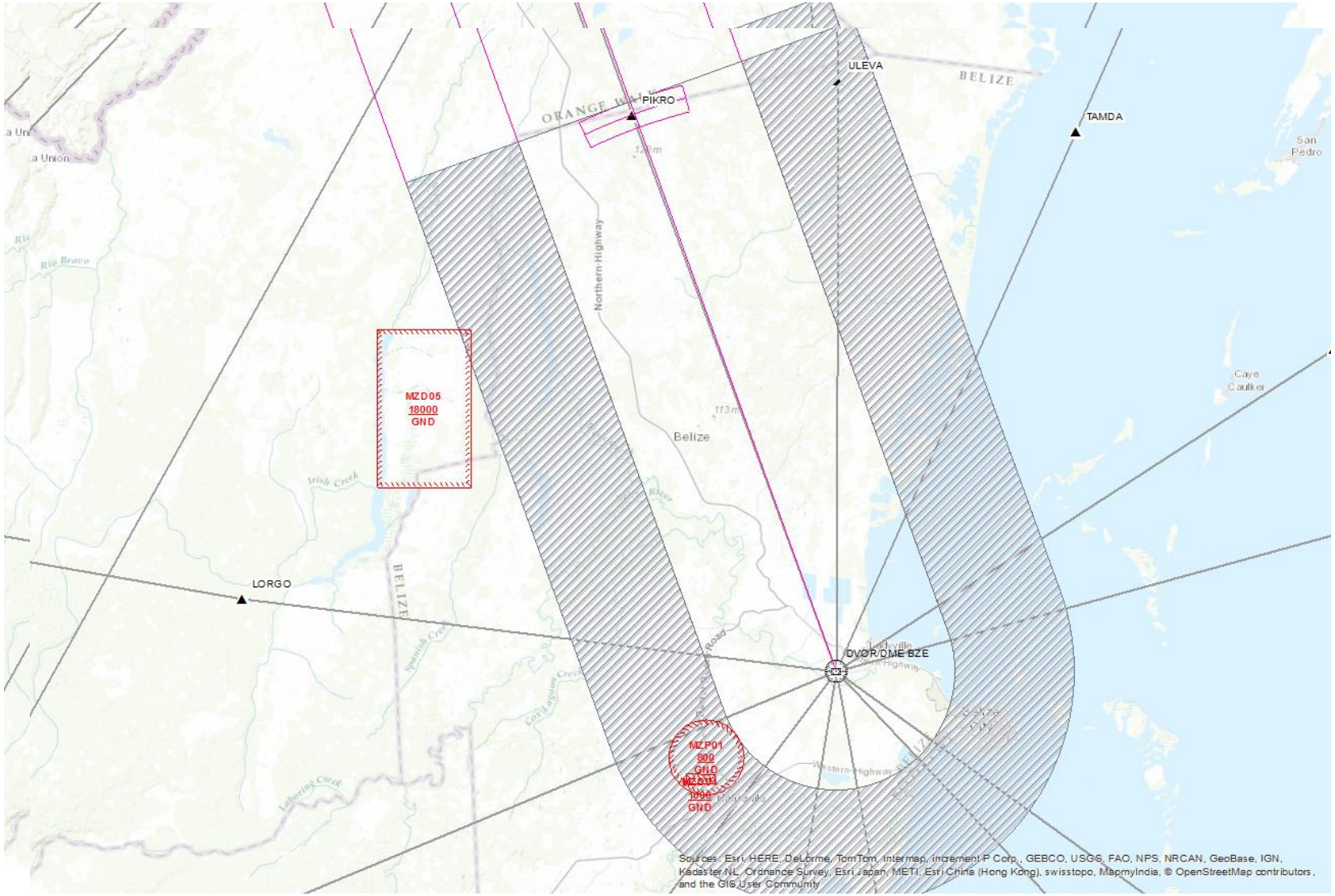
COCESNA

Email for PBN consultation

- belize.pbn@civilaviation.gov.bz

Airspace Change Proposal – Danger area modification



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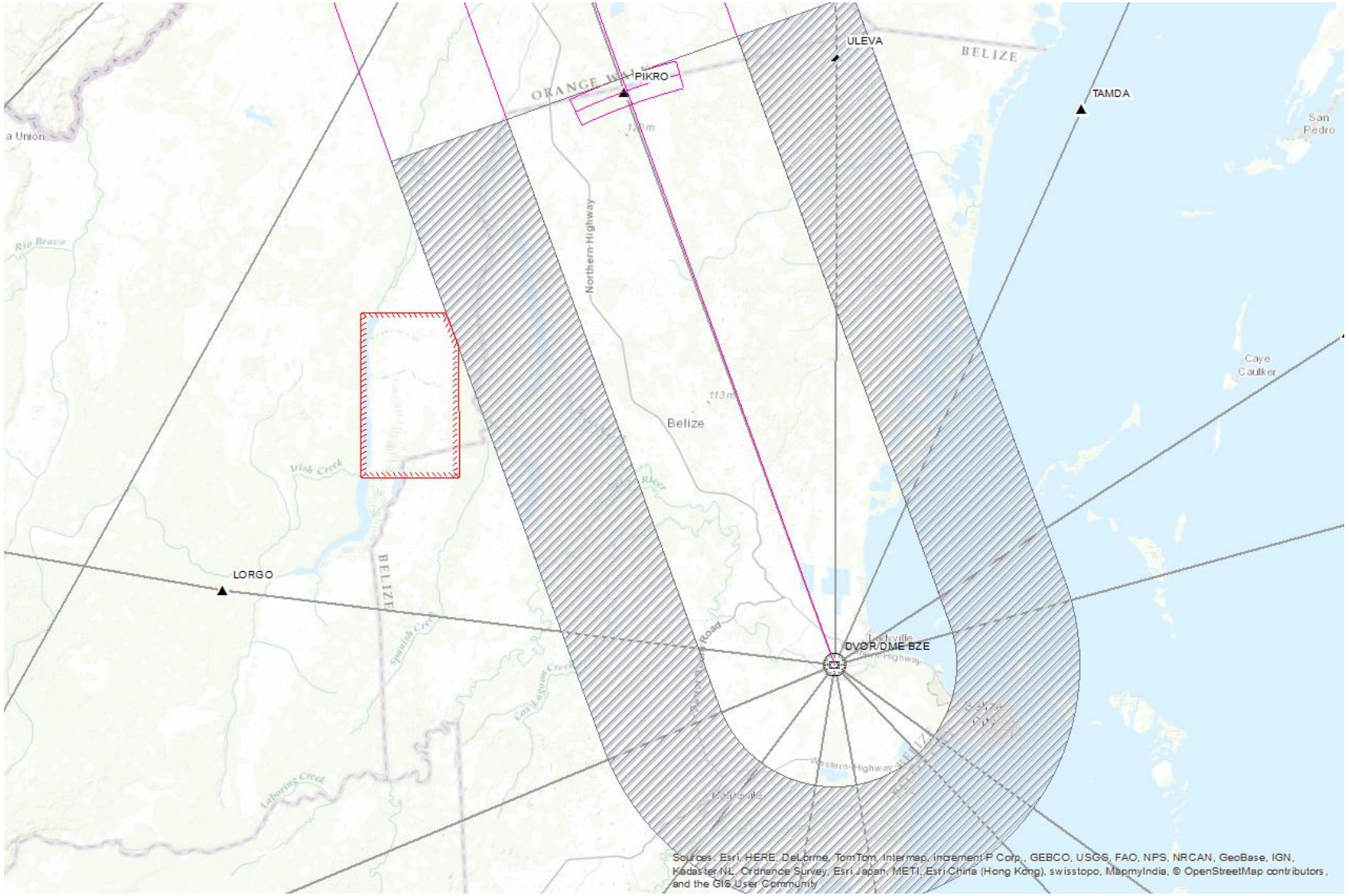
Airspace Change Proposal – Danger area modification



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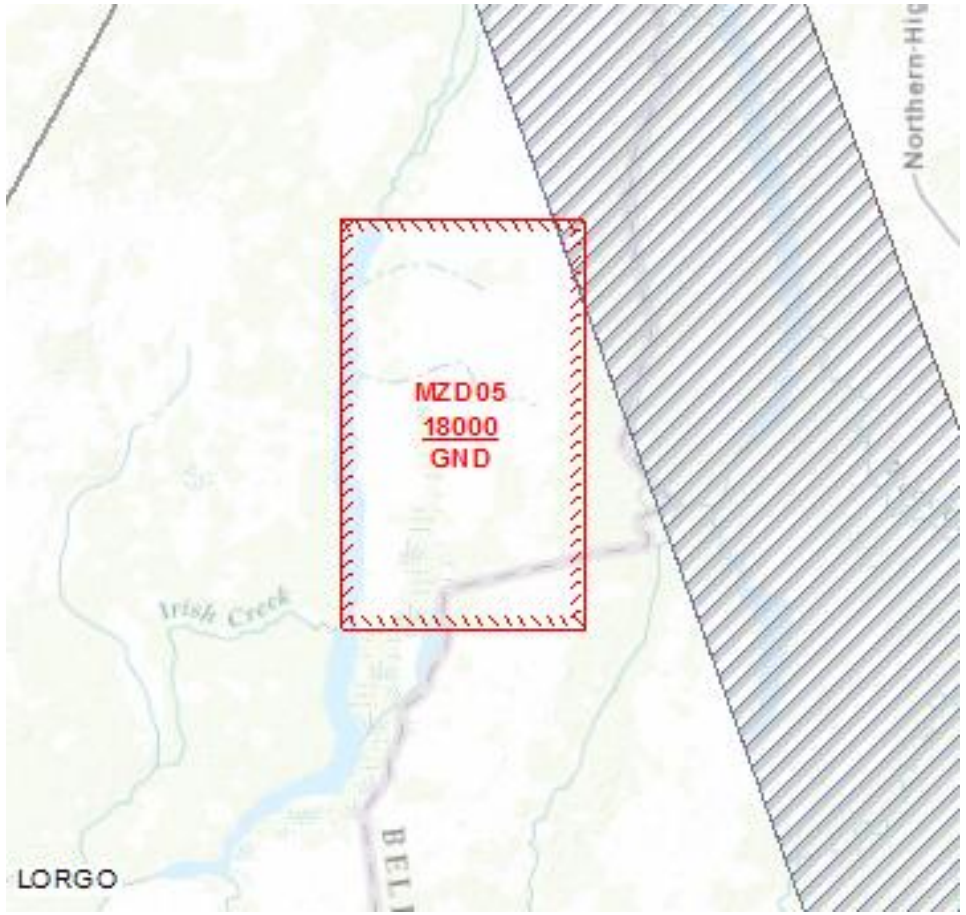
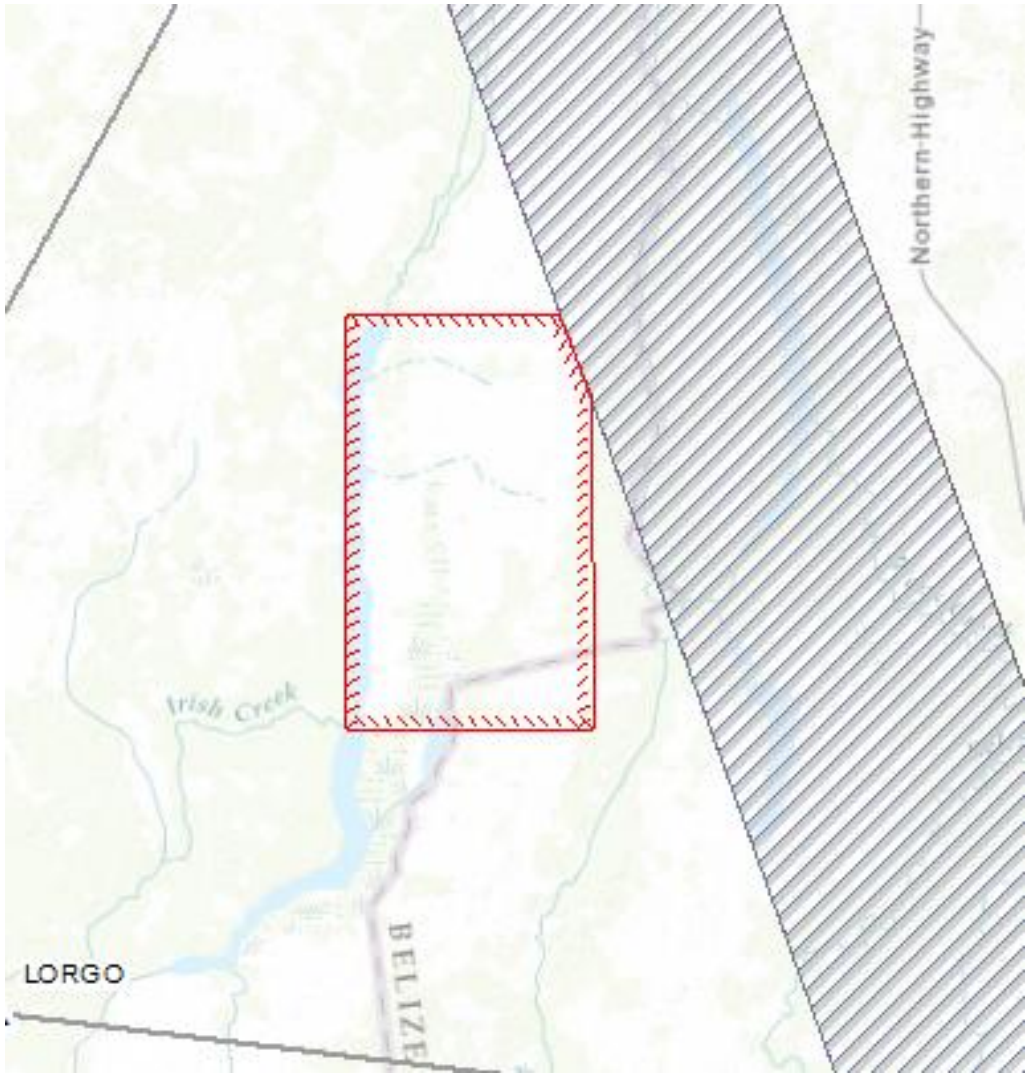
Airspace Change Proposal – Danger area modification





Tasks to be done

- Create VFR corridors
- Design segregated SID/STAR RWY 07
- STAR/SID/Procedures RWY 25
- Review conventional procedures to align as much as possible to PBN procedures
- Socialize PBN plan for local and international operators
- Ammend/Update AIP
- Train Belize Staff in PBN

Conclusions

- Belize is working on the in the PBN roadmap and its making its incorporation in phases for implementation
- Belize is taking into consideration the industry/stakeholders for the PBN project so its succesful for everyone (win-win solution)
- Belice and COCESNA are working together to undertake this project

COCESNA