DIRECCION GENERAL DE AVIACION CIVIL
COSTA RICA

Presented by:

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Planificación ATM

Dirección General de Aviación Civil

Costa Rica

National Performance Objectives and ASBU elements Implementation in Costa Rica

Implementación del Marco de Referencia de Performance de Navegación Aérea Regional y Nacional y las Mejoras por Bloques de la Aviacion (ASBU) para las Regiones NAM/CAR
Ciudad de México, 22 a 26 de agosto

Workshop expectations

- To improve the understanding of the ASBU ~~methodology~~ method ASBU
- To learn how to properly choose ASBU blocks and elements
- To adquire practical experience that will enable the update and revision of Costa Rica'a Air Navigation Implementation Plan (CR ANIP).

Implementación del Marco de Referencia de Performance de Navegación Aérea Regional y Nacional y las Mejoras por Bloques de la Aviacion (ASBU) para las Regiones NAM/CAR Ciudad de México, 22 a 26 de agosto

Operations growth

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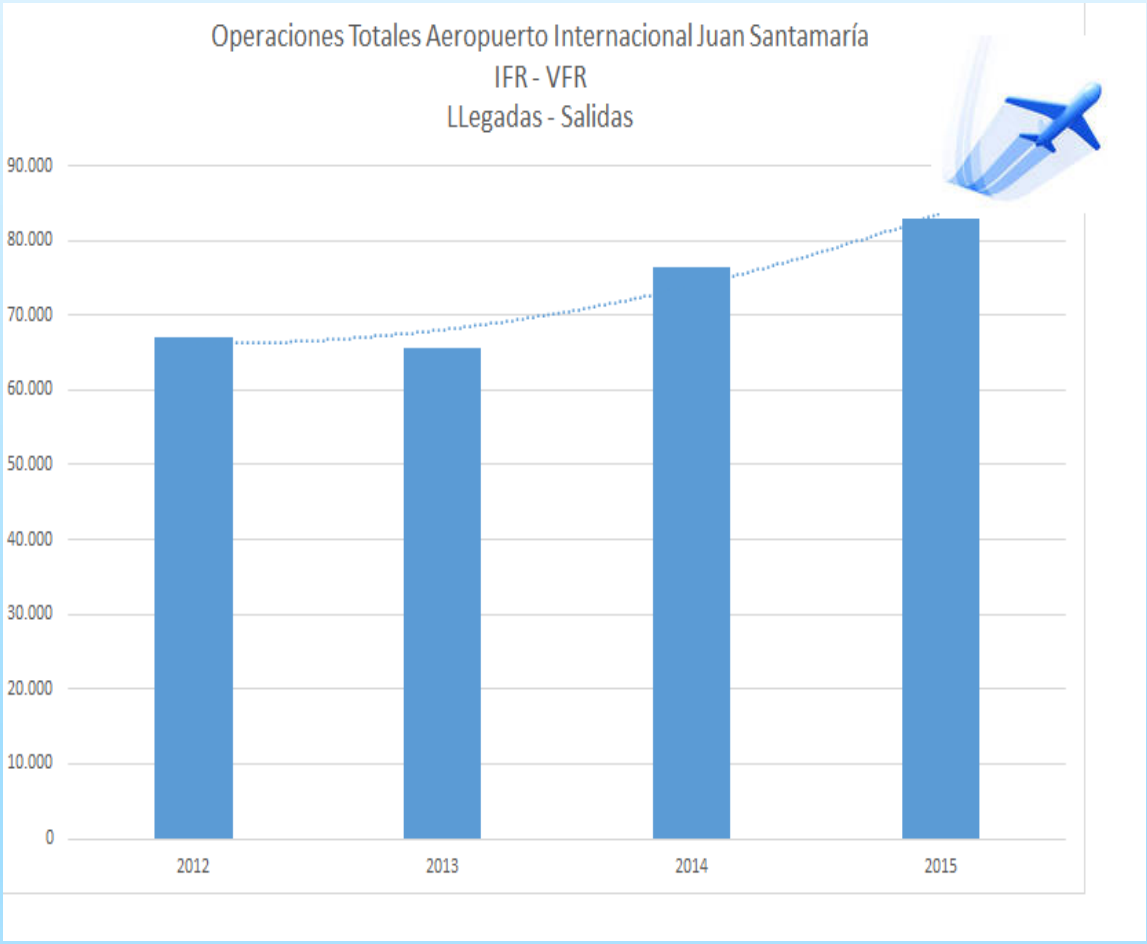
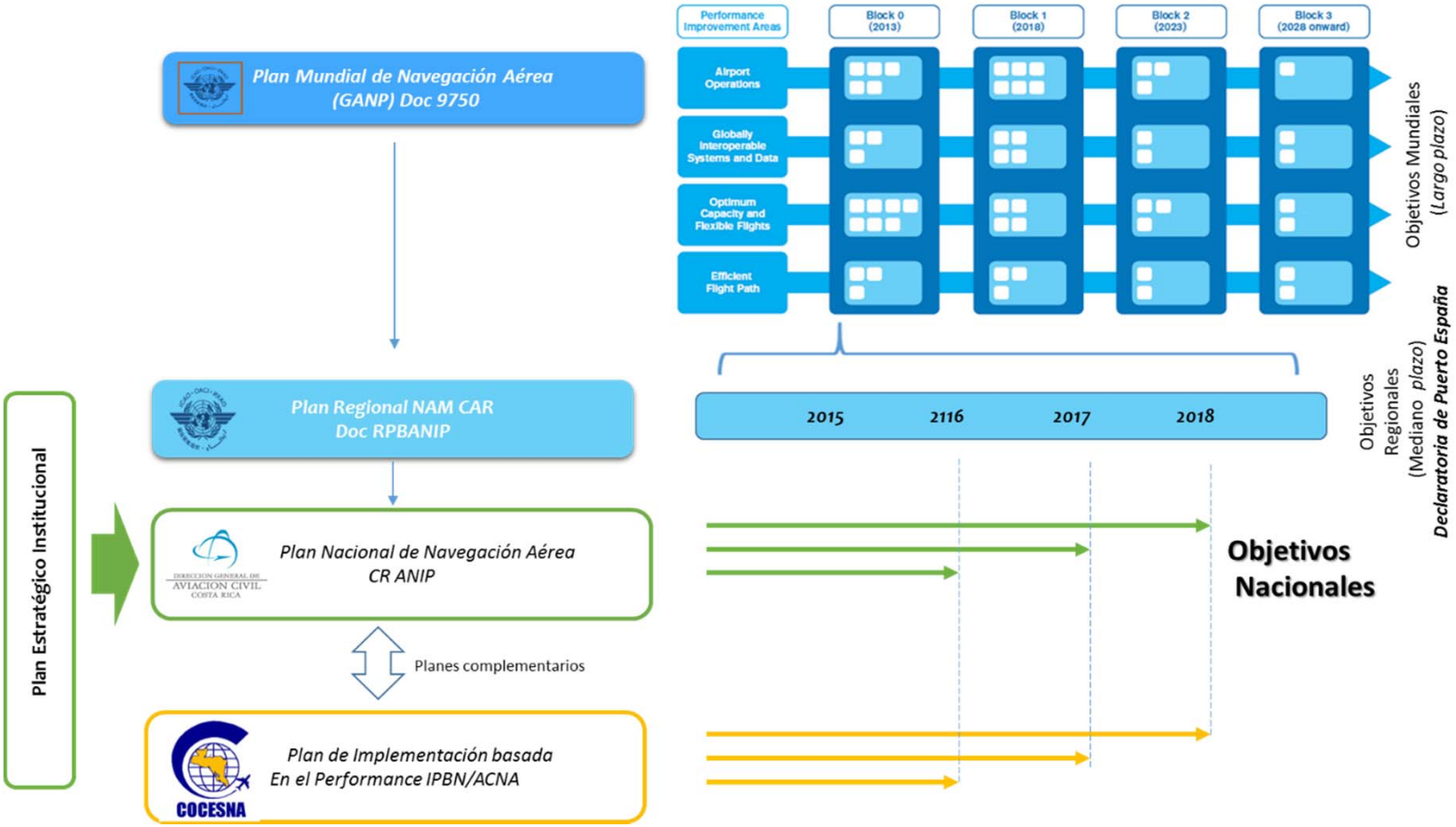


Compound annual growth rate 2012 – 2015 : 5%

Factors :

- ✓ Low – cost airlines arrival
- ✓ Positive economic outlooks for the en la región Europea y los Estados Unidos de América

CRANIP



- ✓ El CRANIP collects GANP's high level concepts and adapts them to Costa Rica's specific needs using the ASBU methodology, striving to meet the Port of Spain Declaration's targets.

Term

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- ✓ The Air Navigation Plan is designed in five years cycles and it's progress is monitored yearly, or whenever there is a significant change, like an update in the GANP or RPBANIP.

ASBU elements selection

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Bo elements selected by Costa Rica

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	ASBU	Secuenciación de pistas	Accesibilidad aeroportuaria	Separación por estela turbulenta	Operaciones en la superficie	Toma de decisiones en colaboración a nivel aeropuerto	FF/ICE	Gestión de la información aeronáutica digital	AMET Información meteorológica mejorada	Operaciones mediante rutas libres	Operaciones en red	Vigilancia alternativa	Separación de a bordo	Niveles de vuelo óptimos	Sistemas anticolisión de a bordo	Redes de seguridad terrestres	Operaciones de descenso continuo	Operaciones de ascenso continuo	Operaciones basadas en las trayectorias
	NPO	B015 RSEQ	B0 65 APTA	B070 WAKE	B075 SURF	B0 80 ACDM	B025 FICE	B030 DAIM	B0105 AMET	B010 FRTO	B035 NOPS	B084 ASUR	B085 ASEP	B086 OPFL	B0101 ACAS	B102 SNET	B005 CDO	B020 CCO	B040 TBO
	1 Implementación PBN		X							X							X	X	
	2 NAV									X									
	3 DCB	X									X								
	4 Conciencia Situacional ATM	X			X							X				X			X
	5 Mejorar SAR																		
	6 Mejorar Operaciones Aeródromos Cap/Eficiencia				X	X													
	7 COM					X	X												X
	8 AIM							X											
	9 MET								X										

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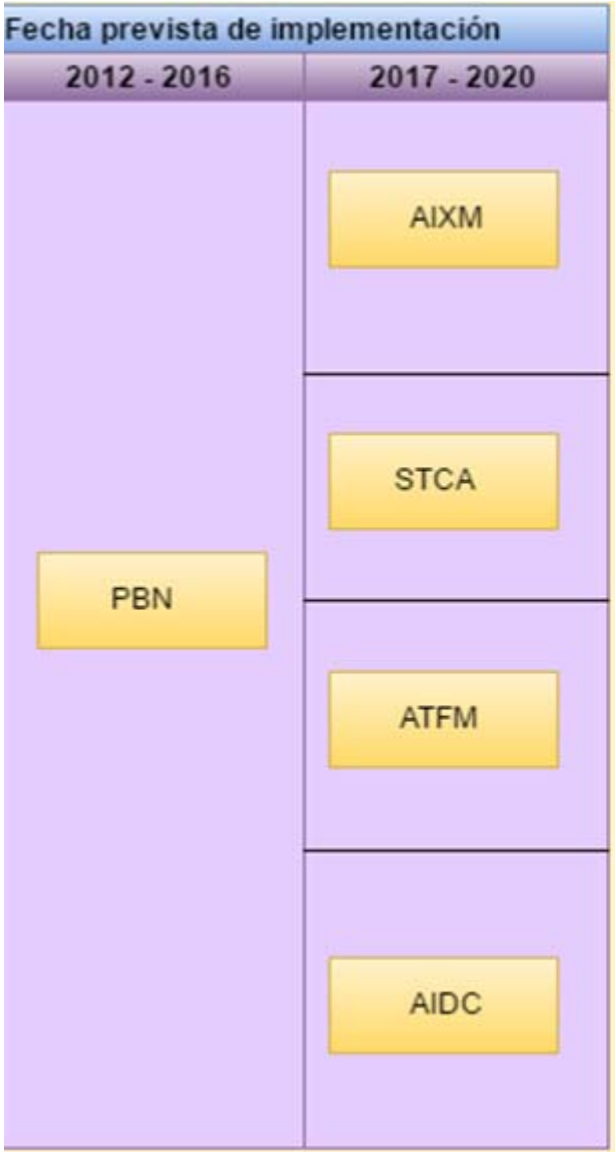
Elementos clave de ASBU seleccionados por Costa Rica



Apoyo de organizaciones externas

COCESNA

IATA

ICAO

CANSO

ANRF FORMS

Costa Rica ASBU Air Navigation Reporting Form (ANRF)					
PIA	4	**Block - Module**	B0 - CDO	**Date**	August 18, 2015

Module Description

To use Performance-based airspace and arrival procedures allowing aircraft to fly their optimum profile using continuous descent operations (CDOs). This will optimize throughput, allow fuel efficient descent profiles, and increase capacity in terminal areas.

Element Implementation Status

1	**Element Description** (Derived from Element 1) Procedure changes to facilitate CDO.	**Date Planned/Implemented** Set 15, 2016	**Status** In Progress will be completely implemented by 30/07/2017
	Status Details Every PBN STAR is a CDO procedure, there are PBN STARs with CDO. The actual procedures serve the country's main international airports (as of august 2016) and will be implemented in the secondary airport in July 2017		
2	**Element Description** (Derived from Element 1) Route changes to facilitate CDO.	**Date Planned/Implemented** Dec 15, 2013	**Status** Implemented
	Status Details Route and associated airspace changes are routinely made as part of PBN procedure design and implementation processes.		
3	**Element Description** Derived from Element 2) PBN STARs	**Date Planned/Implemented** Dec 15, 2013	**Status** Implemented
	Status Details There are 367 total PBN STARs in the NAS with some of the procedures serving multiple airports (as of June 2015). PBN STARs are implemented at 256 airports (as of June 2015).		

Achieved Benefits

Access and Equity

Element 1: Only at locations where PBN STARs can be published to deconflict traffic flows with additional/different routing options. For example, RNAV STARs with OPDs implemented at Dulles and Regan National airports are now laterally separated.

Element 3: Only at locations where PBN STARs can be published to deconflict traffic flows with additional/different routing options.

Capacity

N/A

Efficiency

Element 1: Cost savings through reduced fuel burn due to improved vertical profiles.

Reduction in the number of required radio transmissions, and therefore controller and pilot workloads; however, we do not have empirical data to evaluate this particular benefit.

Operational benefits:

- Arrivals exhibited more efficient vertical profiles.
- Average time and distance within 250 nm of the airport did not change.

		Vertical Profile Performance Outcomes					Additional Efficiency Performance Outcomes	
Weather	Proportion of Flights (%)	Number of Level Segments	Time in Level Flight (min)	Distance in Level Flight (nm)	Time-Weighted Altitude (feet)	Flights Without Level Segments (%)	Time (min)	Distance (nm)
VMC	86	2.0 (-16%)	5.4 (-13%)	31.2 (-12%)	17,300 (6%)	17 (72%)	43.4 (0%)	269.7 (0%)
Non-VMC	14	2.6 (-9%)	8.0 (-6%)	41.6 (-6%)	14,500 (6%)	9 (37%)	47.0 (0%)	280.7 (0%)
All	100	2.1 (-15%)	5.7 (-12%)	32.7 (-11%)	16,800 (6%)	16 (70%)	43.9 (0%)	271.2 (0%)

Element 3:

Only at locations where PBN STARs can be published to shorten typically flown terminal routing options, or to improve flow interaction, or improve vertical profiles.

Environment

Element 1: Reduced emissions as a result of reduced fuel burn (IFSET)
Element 3: Reduced emissions as a result of reduced fuel burn (IFSET)

Safety

Element 1: RNAV STARs facilitate executing stabilized approaches.
Element 3: More consistent flight paths and stabilized approach paths.

Implementation Challenges

Ground system Implementation

None

Avionics Implementation

None

Procedures Availability

None

Operational Approvals

None

Notes

None

EXAMPLE: COSTA RICA ASBU ANRF CDO

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Capacity N/A					

Key elements:

- ✓ Foreseen implementation date: September 15th 2016
- ✓ Procedures already available and in unse for the main international airport.

NACC Report Form

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NAM/CAR RPBANIP AIR NAVIGATION TARGETS FOLLOW-UP

(1) Element	(2) Targets	(3) Costa Rican Progress	(4) Observations
1. Airspace Planning	100% of States to have completed a PBN plan by Dec. 2018	100%	Costa Rica is working on the implementation of a PBN Plan called ARESAR and ARELIB for Juan Santamaria International Airport and Daniel Oduber Quiros International Airport respectively. It is also leading ARESAC the regional plan to redesign the Central American airspace.
2. Flexible Use Airspace	50% of selected segregated airspaces available for civil operations by Dec. 2016	N/A	Costa Rica has no military forces, therefore no segregated airspaces
3. AMAN And Time-Based Metering	10% of selected aerodromes with AMAN and time based metering by Dec. 2016	N/A	Currently Costa Rica has not selected any aerodrome for AMAN and time based metering implementation. (Costa Rica has hired a consultancy company to assess the capacity of the airport and AMAN implementation is expected in the near future)
4. Departure Management (DMAN)	10% of selected aerodromes with DMAN by Dec. 2016	N/A	Costa Rica has not selected any aerodromes for DMAN implementation. (Costa Rica has hired a consultancy company to assess the capacity of the airport and DMAN implementation is expected in the near future)
5. Movement Area Capacity Optimization	20% of selected aerodromes with Airport-capacity calculated by Dec. 2016	30%	Costa Rica doesn't have an airport capacity number yet but it has hired a consultancy firm to calculate the figure of Juan Santamaria International Airport (MROC)
6. ADS-C Over Oceanic and Remote Areas	80% of selected FIRs with ADS-C implemented by December 2016	38%	The organization in charge of this topic is COCESNA the ANSP for the Central America FIR, who has reported to the Regional ICAO Office NAM/CAR that it has not been implemented. The regional implementation rate is of 38%.
7. CPDLC	80% of selected FIRs with CPDLC implemented by June 2018	N/A	The organization in charge of this topic is COCESNA the ANSP for the Central America FIR, who has reported to the Regional ICAO Office NAM/CAR that it has not been implemented. The regional implementation rate is of 75%.
8. APV with Baro VNAV	80% of instrument runways to have APV with Baro VNAV implemented by December 2016 – Service Providers and users	100%	Costa Rica has selected runway 07 of airport (Aeropuerto Internacional Juan Santamaría) for Baro VNAV implementation which was completed on December 2015.
9. APV with SBAS (WAAS)	20% of instrument runways to have APV with SBAS/WAAS implemented by December 2018– Service Providers and users	N/A	No runways have been selected for APV with SBAS/WAAS by Costa Rica
10. APV with GBAS	20% of instrument runways to have APV with GBAS by December 2018 – Initial implementation at some States (services providers)	N/A	No runways selected for this target
11. LNAV	60% of instrument runways to have LNAV procedure implemented by December 2016 – Service Providers and users as per Assembly Resolution A37-11	100%	Costa Rica has an airport (Aeropuerto Internacional Juan Santamaría) with one runway ith a LNAV procedure implemented since December 2015.

la Aviacion (ASBU) para las Regiones NAM/CAR Ciudad de México,
22 a 26 de agosto

Implementation Challenges
Costa Rica

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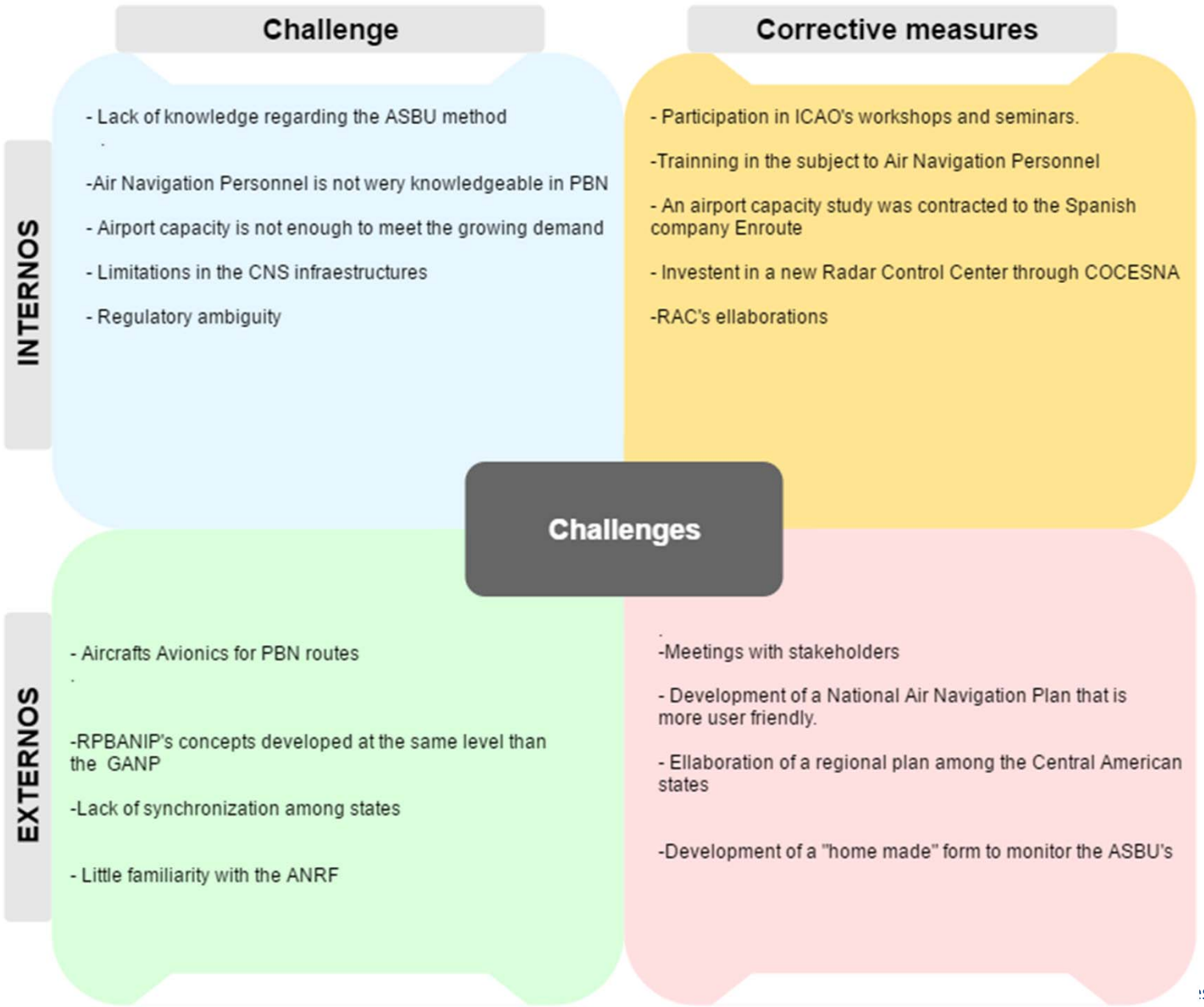

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Internal Challenges - ASBU

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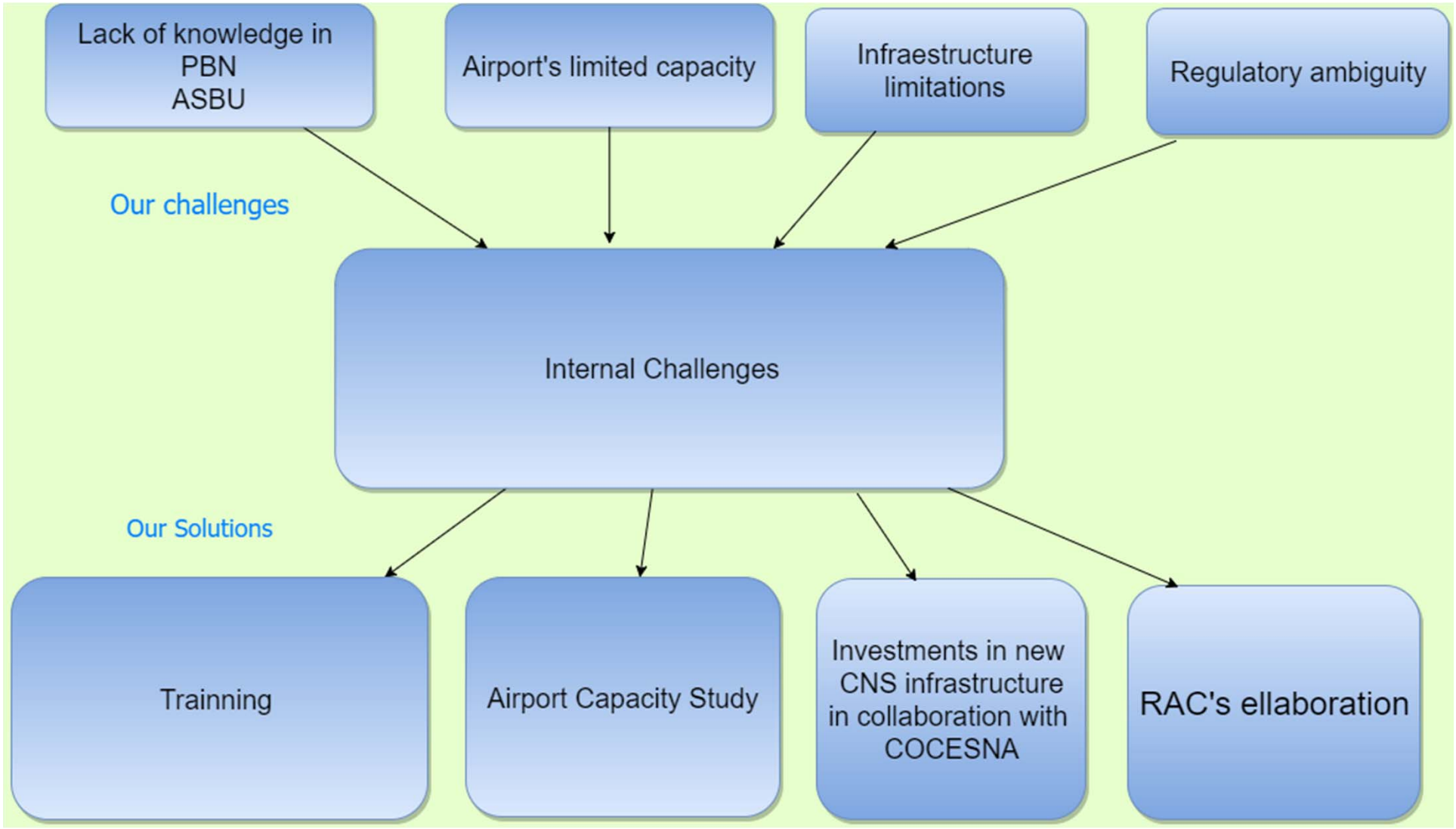

External Challenges – ASBU

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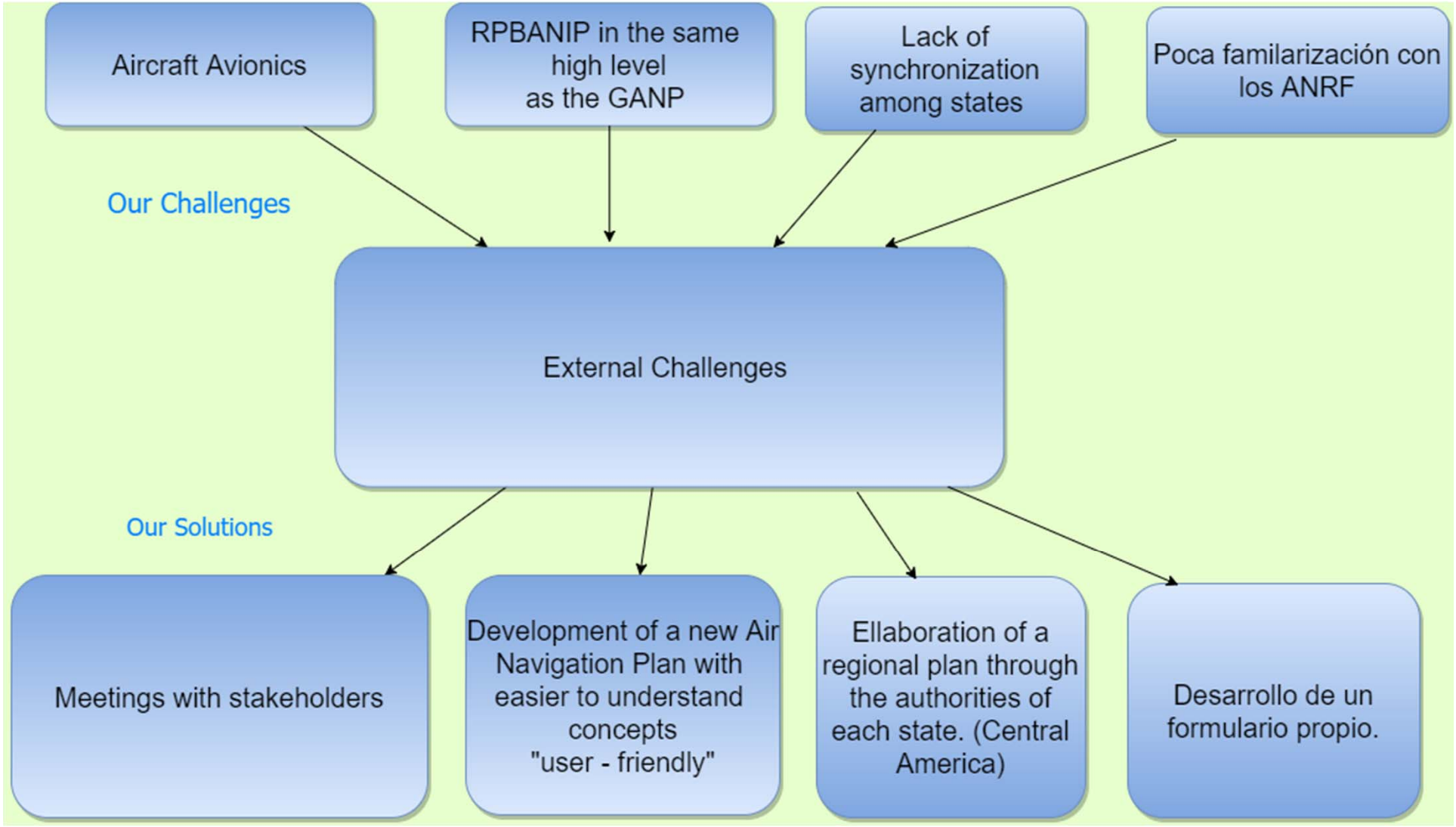

Conclusions

- ✓ Accelerated air traffic growth demands an Air Navigation Plan from States that promotes the development of aviation in a safe and expedite manner.

- ✓ ASBU's are a powerful tool in the development of Regional and Air Navigation Plans.

Conclusions

- ✓ ASBU's modules and elements most be carefully selected in order to ensure a successfull implementation.

- ✓ Costa Rica is facing external and internal challenges that must be addressed for the success of the ANIP.

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Thank you!!!

August, 2016