ASBU ELEMENT: FRA within the Piarco FIR
PROJECT PLAN DEVELOPMENT

FRA IMPLEMENTATION		
Why? the main purpose is that it provides a summary of the essence of the element for the operational elements, and information of the direct relationship of the performance.	**What?** description of what stakeholders can do with this element that could not be done before. This section is not intended to describe performance enhancement or benefits	**How?** additional information to improve the understanding of the element.
- Improve efficiency for airspace users within the Piarco FIR by allowing optimum trajectories; - Enhance safety by improving flight path predictability; - Reduce harmful carbon emissions within the Piarco FIR.	**Stakeholders** - Aircraft Operators; Safety Regulators; ANSPs; Airports; Ministry of Environment and Passengers Discussion with aircraft operators on their needs. Identify city pairs and best trajectories. Discussion with airports on capacity. Oftentimes, efficiencies gained by en-route optimization initiatives, are hindered by poor airport infrastructure. Ensure the Safety Regulator is kept in the loop at all stages of planning and implementation. **Action plan** – Develop action plan based on analysis, consultation, CDM with stakeholders. Outline the tasks and activities required to reach the objectives. This includes assigning responsibilities and setting deadlines. **Benefits** – - Greater flexibility to airspace users so that they may file trajectories that are as close to optimum as possible. This will result in reduced fuel consumption; reduced time en-route and reduced carbon emissions. - Improved predictability to ATCOs based on advanced information on intended flight paths. This reduces coordination time between ATCOs in adjacent airspace as well as between ATCOs and pilots. The safety enhancement is greater time for monitoring. - Cost to operators should be reduced and therefore this cost may be	**Case study –** ***Conduct gap analysis*** Analyze the reference scenario – (airspace structure, traffic density and complexity, sectors, routes etc); **SEE APPENDIX A** Conduct impact assessment – compare proposed changes against reference scenario to determine the possible effect on Capacity, Efficiency, Safety and Environment; **Technical evaluation** Evaluate current CNS capabilities: Surveillance – En-route - SSR; ADS-B ground and possibly ADS-B Sat; Approach – ADS-B ground/MLAT/SSR Controller-pilot communication (VHF/HF/CPDLC) – type of comms required depends on airspace requirements (For Piarco – Continental Sector – VHF; Oceanic Sector – CPDLC with HF relay as back-up); Ground/Ground communication – Voice comm Links, Networks, AIDC Determine what upgrades or new acquisitions are required; **Risk analysis** Identify hazards ATM System failure Comms failure Surveillance failure Weather system – tropical cyclone Determine and apply mitigation measures: Back up systems/redundancy

	translated into reduced ticket costs for passengers. -	Contingency Plan – ATFM measures/ ATC Zero process **Cost benefit analysis** CDM with internal and external stakeholders (CFOs/business analyst etc.) Calculate direct and indirect costs Calculate potential direct savings Safety enhancements are not directly measurable but lowering risk may result in lower insurance costs **Business case** Document above analyses and results and provide to executives for decision making **Safety case** Document safety assessments and provide mitigation strategies to Safety Regulation Division **Schedule** Through CDM process, develop action plan with timelines and milestones **Implementation Strategy** - Define clear objectives with specific measurable goals - Action Plan - Resource Allocation - Monitoring and Evaluation: Establish metrics and processes to track progress and evaluate the effectiveness of the implementation. - Communication Plan: Develop a strategy for keeping all stakeholders informed and engaged throughout the implementation process. - Risk Management
Relationship of the performance (Key performance indicators)		
"What cannot be measured cannot be improved"		
KPI01 **Departure punctuality**	KPI09 Airport peak capacity	KPI17 Level-off during climb
KPI02 **Taxi-out additional time**	KPI10 Airport peak throughput	KPI18 Level capping during cruise
KPI03 **ATFM slot adherence**	KPI11 Airport throughput efficiency	KPI19 Level-off during descent
KPI04 **Filed flight plan en-route extension.**	KPI12 Airport/Terminal ATFM delay	KPI20 Number of aircraft accidents
KPI05 **Actual en-route extension**	KPI13 Taxi-in additional time	KPI21 Number of runway incursions

KPI06 **En-route airspace capacity** **KPI07** **En-route ATFM delay** **KPI08** **Additional time in terminal airspace**	KPI14 Arrival punctuality KPI15 Flight time variability KPI16 Additional fuel burn	KPI22 Number of runway excursions KPI23 Number of airprox/TCAS alert/loss of separation/near midair collisions/midair collisions (MAC)

https://www4.icao.int/ganpportal/ASBU/KPI

ASBU ELEMENT ENABLES

1. Enable 1

KEY: Implemented In progress Not required based on assessment

Describe

Element	Technical Needs	Standards and technical information to incorporate in the analysis
FRTO B1/1 – Free route Airspace	-	-
The Free Route Airspace (FRA) concept brings significant flight efficiency benefits and a choice of user preferred routes to airspace users. As a step to full trajectory-based operations, the FRA concept brings increased flight predictability, reduced uncertainty for the ATM network function, which in turn can lead to potential capacity increases for ATM, which will also benefit the user.	**ASBU enablers according to GANP** NOPS-B1/5 - Full integration of airspace management with air traffic flow management FRTO-B1/4 - Dynamic sectorization FRTO-B1/3 - Advanced Flexible Use of Airspace (FUA) and management of real time airspace data FICE-B0/1 - Automated basic inter facility data exchange (AIDC) FRTO-B1/5 - Enhanced Conflict Detection Tools and Conformance Monitoring FRTO-B0/1 - Direct routing (DCT)	DAIM-B2/2 - Daily Airspace Management information to support flight and flow Evolution -
	Practical requirements based on assessment of Piarco FIR • VHF coverage in continental airspace with redundancy • Surveillance in continental airspace with redundancy • ATS procedures/LOAs/MOUs • ATCO training • Basic ATFM system including procedures/LOAs • ATM System with advanced MTCD and Dynamic Sectorization capabilities • CPDLC • AIDC • ATFM coordination with region through CADENA • RNP2/4 routes as contingency	-

— END -

Section 1 – Basic Airspace Definition

NAME OF STATE/ANSP/ORGANIZATION	TRINIDAD AND TOBAGO/PIARCO/TRINIDAD AND TOBAGO CIVIL AVATION AUTHORITY
AIRSPACE BOUNDARY DEFINITION	150000N/0650000W; 150000N/0631500W;152000N/0630000W; 172200N/0630000W; 180000N/0620000W; 180000N/0450000W; 221800N/0400000W; 170000N/0373000W; 133000N/0373000W; 100000N/0480000W; 092000N/0540000W; 085500N/0570000W; 085500N/0595700W; 095923N/0612757W; 095923N/0615540W; 100506N/0620328W; 104400N/0614700W; 110000N/0623000W 150000N/0650000W
NUMBER OF SECTORS	2 SECTORS: • CONTINENTAL (Northeast Sector, Northwest Sector, South Sector) • OCEANIC

Section 2 – Airspace Density

SECTOR	TYPE OF AIRSPACE	UTC PERIOD	DENSITY	COMPLEXITY	COMMENTS
1	CONTINENTAL	0300-0800	HIGH	MEDIUM	
		0800-1500	LOW	LOW	
		1500-0100	HIGH	MEDIUM	
		0100-0300	LOW	LOW	
2	OCEANIC	0300-0800	MEDIUM	MEDIUM	
		0800-1500	LOW	LOW	
		1500-0300	MEDIUM	MEDIUM	

Section 3 – CNS Capabilities

SECTOR	COMMUNICATIONS	SURVEILLANCE/ADS-C	AIDC WITH ADJACENT ANSP	COMMENTS
1	VHF	RADAR	NO	• VHF upgrade in progress. Currently there are issues in some portions of this sector and this is affecting the ability to allow unrestricted SDR operations and to transition to FRA. It is expected that upgrades will be completed by July 2025 and thereafter, Trinidad and Tobago expects to allow full SDR throughout the upper airspace. • Ground based ADS-B planned for South Sector Q1 2025 • Ground based ADS-B planned for North Sector Q2 2025 • MLAT for the approach sector Q1 2025 • Discussions ongoing regarding ADS-B SAT
2	CPDLC and (HF via NY ARINC)	ADS-C	Live trials with New York No AIDC with the other 4 adjacent	• Two months of live trials have shown great promise and have reduced ATCO coordination between the two units significantly. •

SECTOR	COMMUNICATIONS	SURVEILLANCE/ADS-C	AIDC WITH ADJACENT ANSP	COMMENTS
			Units in this sector	

Section 4 – ATM System Capabilities

ATM SYSTEM CAPABILITY	PROVIDE DETAILS	ADDITIONAL COMMENTS IF NECESSARY
	Fully automated (Vendor - LEONARDO)	ATM system LeadinSky
MEDIUM TERM CONFLICT DETECTION (MTCD)	Available and tested	
SHORT TERM CONFLICT ALERT (STCA)	Available and tested	
ATM SYSTEM DATABASE	Waypoints up to 250 nm in adjacent ATSUs airspace is included. Aircraft database is manually updated	Area of Interest (AOI) occupies a quadrilateral area bounded by the coordinates 27N069W, 03N069W, 03N030W and 2830N02857W. All waypoints within the AOI is contained in the database and manually updated when changes are notified

Section 5 – ATS Procedures

LETTERS OF AGREEMENTS WITH ADJACENT ATSU's	**PROVIDE DETAILS**	**ADDITIONAL COMMENTS IF NECESSARY**
	Continuous review and amendment	There is an established procedure for periodic reviews and for dealing with critical issues that may develop and require attention
SURVEILLANCE HAND-OFF	Not implemented	ATM systems with adjacent units are not interoperable
SEPARATION STANDARDS	Separation Standards are not harmonized across FIR Boundaries.	Separation Standards are not harmonized across FIR Boundaries. CDM with adjacent ATSUs on harmonizing separation standards are being undertaken

Section 6 – Data analysis and safety assessments

	PROVIDE DETAILS	ADDITIONAL COMMENTS IF NECESSARY
DATA AVAILABLE TO ANALYSE TRAFFIC SCENARIOS	Yes	Short Term and long term data available for playback analysis
SIMULATOR AVAILABLE TO TEST PROPOSED SDR OPERATIONS	Yes	
PERSONNEL AVALABLE TO CONDUCT SAFETY CASE	ATS Safety Unit trained and capable of conducting safety case	