

Deployment Scenario Title	Advanced geometric GNSS-based procedures in TMAs
Deployment Scenario Description	Advanced geometric GNSS-based procedures in TMAs: this solution validates the use of GNSS geometric guidance from the initial approach fix or earlier, facilitating a wider variety of curved approaches to a single runway. It also addresses curved departure routes that turn shortly after take-off in order to avoid noise-sensitive areas, approach routes or missed approach routes. For airports where there is a dependency between departure and arrival runways, flexible and customised departure routes may be possible, thus allowing for an increase in capacity.
Essential Operational Change	Airport and TMA performance
Maturity	In development phase: Key R&D Activities

Applicable Operating Environment			
Airport	Terminal Airspace	En-Route	Network

Timeline																						
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	

Performance Contribution of the DS				
Capacity	Safety	Environment	Cost-efficiency	Operational efficiency

Stakeholders affected (at least one enabler to be deployed)						
ANSP		AO		AU		Network Manager
Civil	Military	Civil	Military	Civil	Military	
TWR, APP, ENR, CNS, AIS	TWR, APP, ENR, CNS, AIS			Scheduled, BA Fixed, BA Rotorcraft, GA	Transport, Fighter	Network Manager

SESAR Solutions			
Solution Code	Solution Title	Solution Description	Related Elements
PJ.01-03A	Improved Parallel Operations	Parallel Approach operations are improved through the application of RNP navigation...	PJ OI DS EOC ICAO
PJ.02-11	Enhanced Terminal Area for efficient curved operations	Enhanced Terminal Area for efficient curved operations refers to curved segments for departures...	SOL PJ OI DS EOC
PJ.02-W2-04	Advanced geometric GNSS based procedures in the TMA	This R&D activity addresses the use of GNSS geometric guidance from the initial approach fix...	PJ DS EOC

Operational Improvement Steps			
OI Step Code	OI Step Title	OI Step Description	Related Elements
AOM-0606	Enhanced Parallel Approach Operations using PBN/RNP transitions to xLS	Independent Parallel Approach operations are enhanced through the application of PBN/RNP...	SOL OI EN DS ICAO
AOM-0607	Enhanced Terminal Area for Efficient Curved Operations	Using curved segments in the approach and departure phases will optimise the environmental impact...	SOL EN DS

Enablers						
Required/Optional	New/Inherited	Develop/Use	Enabler Code	Enabler Title	Enabler Description	Related Elements
🔒			A/C-02b	Enhanced positioning using multi constellation GNSS dual frequency	Enhanced precision and availability/continuity of positioning (based on GNSS dual frequency,...	STK OI EN DS
🔒			A/C-02c	Enhanced Vertical positioning based on GNSS extended to TMA operation	Vertical navigation based on geometric reference in the TMA	STK OI EN DS
🔒			A/C-04	Flight management and guidance for improved lateral navigation in approach via RNP	Flight management and guidance to improve lateral navigation in approach e.g. 2D RNP value down...	STK OI EN DS
🔒			A/C-81	Flight management and guidance for Curved procedures	Flight management and guidance for lateral and vertical precision navigation in TMA (requiring...	STK OI EN DS
🔒			AERODROME-ATC-77	Aerodrome ATC system to support efficient curved arrival and departures operations	Aerodrome ATC system to support efficient curved operations and geometric altitude, leading to...	STK OI DS
🔒			APP ATC 119	Approach ATC System Support for Curved Arrival and Departures Operations, including the use of Geometric Altitude	Optimised three dimensional operations (used when airport GBAS or regional SBAS services are...	STK OI DS
🔒			CTE-N06	Space Based Augmentation System (SBAS)	Space Based Augmentation Systems (SBAS, i.e. EGNOS, WAAS) are civil aviation safety-critical...	STK OI EN DS ⚙️
🔒			PRO-254	ATC procedures to support curved segments for arrival and departure operations, including the use of Geometric Altitude	ATC procedures standardised at ICAO level for Flight Crews and Controllers to support curved...	STK OI EN DS
➔			CTE-N07a	GBAS Cat I based on Single-Constellation / Single-Frequency GNSS (GPS L1)	GBAS Cat I is deployed as a precursor to GBAS Cat II/III to support validation of precision...	STK OI EN ⚙️
➔			CTE-N07d	GBAS expanded service volume	Ground Based Augmentation System (GBAS) is a civil-aviation safety-critical system that supports...	STK OI EN DS

