Regional-to-Global Air Traffic Modernization Program

North America Pilot - Prepared for the People

This document presents the technical implementation playbook for the Regional-to-Global Air Traffic Modernization Program - North America Pilot.

It includes the architecture, schema definitions, and AI-assisted modules for trajectory-based operations (TBO), demand-capacity balancing (DCB), contrail mitigation, and resilience corridor management.

System Architecture Overview:

The North American Interoperability Stack (NAIS) integrates cross-border ATC data, ensuring safety, efficiency, and sustainability.

Layers:

1. L1 - Surveillance & Comms (ADS-B, CPDLC)
2. L2 - Data Schema (NADS)
3. L3 - Interoperability Layer (NAIS)
4. L4 - Decision & AI Layer (TBO, DCB, Contrail, Resilience)
5. L5 - Human Ops Interface
6. L6 - Security & Governance

AI-Assisted Modules Overview:

- Predictive Routing Engine (Random Forest trajectory optimization)

- DCB Optimizer (Linear programming for demand balancing)

- Contrail-Aware Routing (Climatological model)

- Resilience Forecasting (Logistic regression predicting corridor risk)

Security & Governance:

Zero-trust architecture with mutual TLS authentication and federated PKI.

ICAO-managed oversight of humanitarian and diplomatic corridors (HDACs).

KPI Dashboard:

Delay Reduction (<5 min avg delay per flight)

CO2 Reduction (15% vs 2019 baseline)

HDAC Uptime (99.999%)

Data Compliance (100%)

Prepared for the People:

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to advance global aviation modernization for safety, sustainability, and peace.