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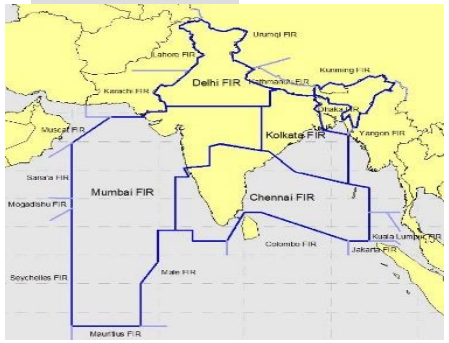
AIRPORTS AUTHORITY OF INDIA

ATFM IMPLEMENATION IN INDIA

–

PROGRESS THROUGH COLLABORATION



PRESENTED BY-

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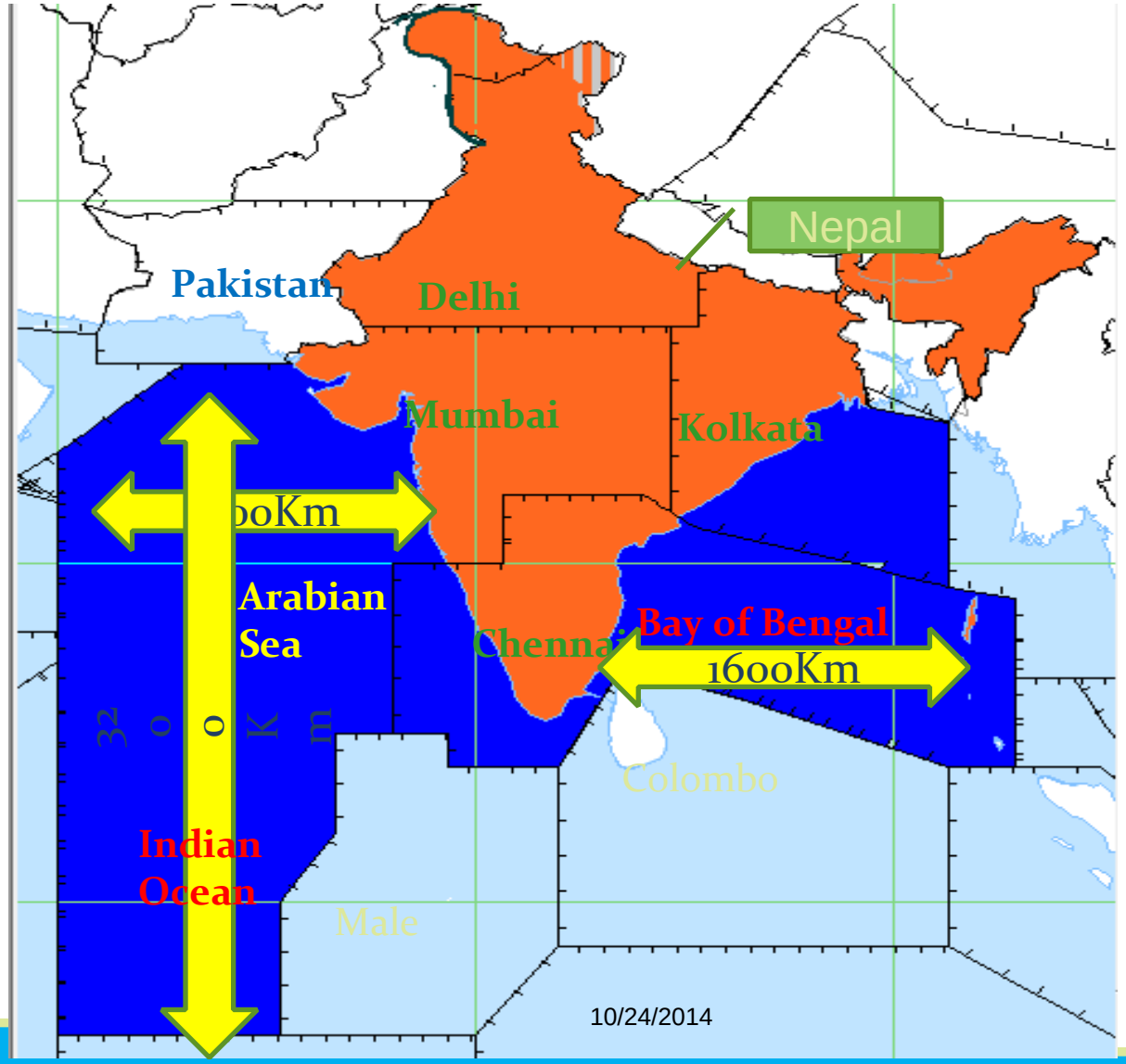
CONTENTS

INDIA – ANS RESPONSIBILITIES



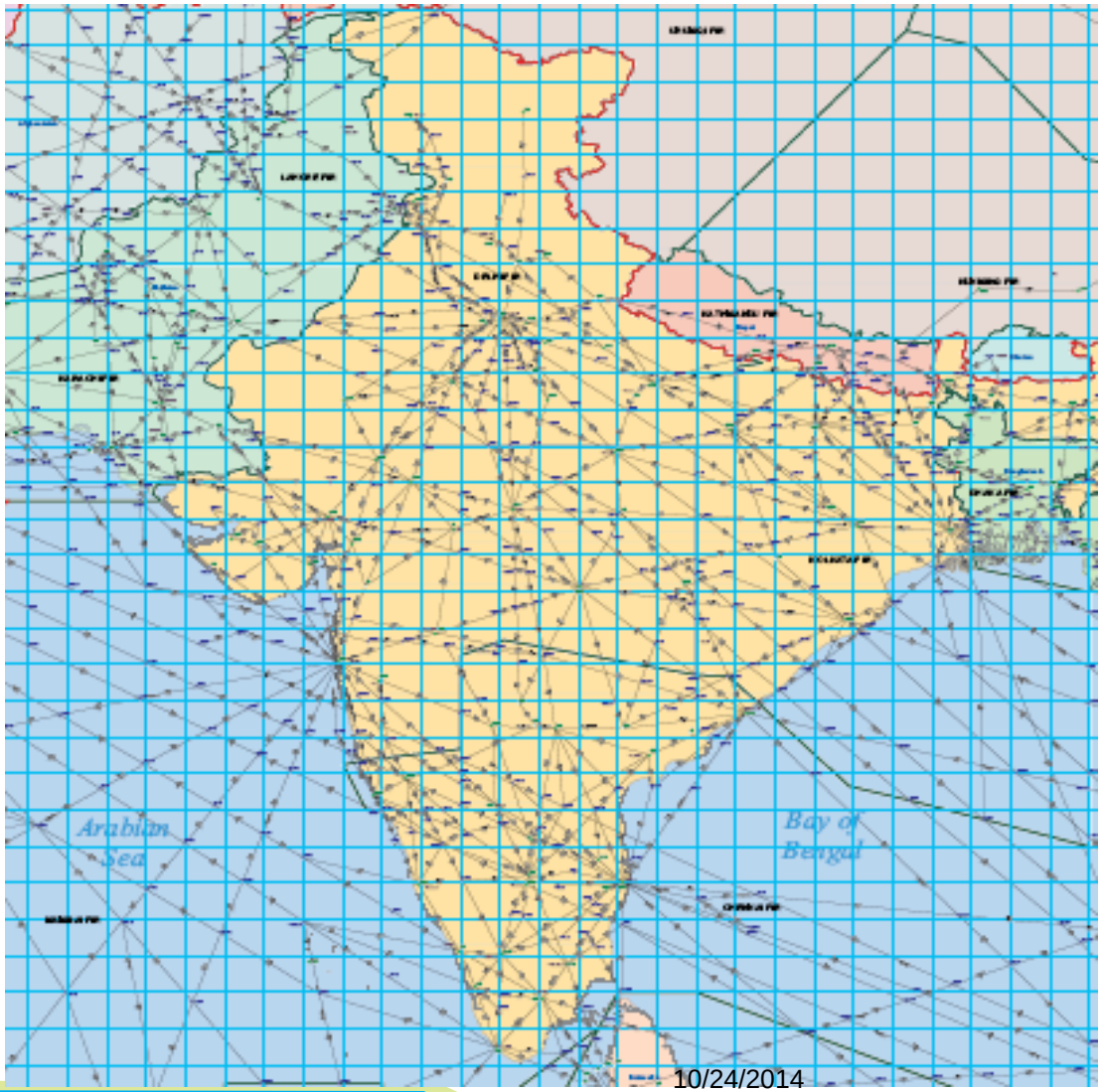
Total airspace : 2.8 million Sq.NM (9.5 M Sq.Km)

Oceanic : 1.74 million Sq.Nm
(Bay of Bengal, Arabian Sea & Indian Ocean)

Continental : 1.04 million Sq.NM

4 FIRs
- **Kolkata, Delhi , Mumbai, Chennai**
- **Sub FIR : Guwahati**

INDIA – AIRSPACE SYSTEM



- **Vital link between East-South East Asia And Europe& Beyond**
- **14 neighboring FIRs**
- **Air Traffic Routes: International – 93 , Domestic – 178**
- **NEIGHBORING STATES 12**
- **AIRPORTS 125**
- **ACCS 13**
- **TOWER/APPROACH 59**
- **MOVEMENTS (ANNUAL) 1.86 MILLION**
- **ANS WORK FORCE 4700**

GROWTH OF INDIAN AVIATION

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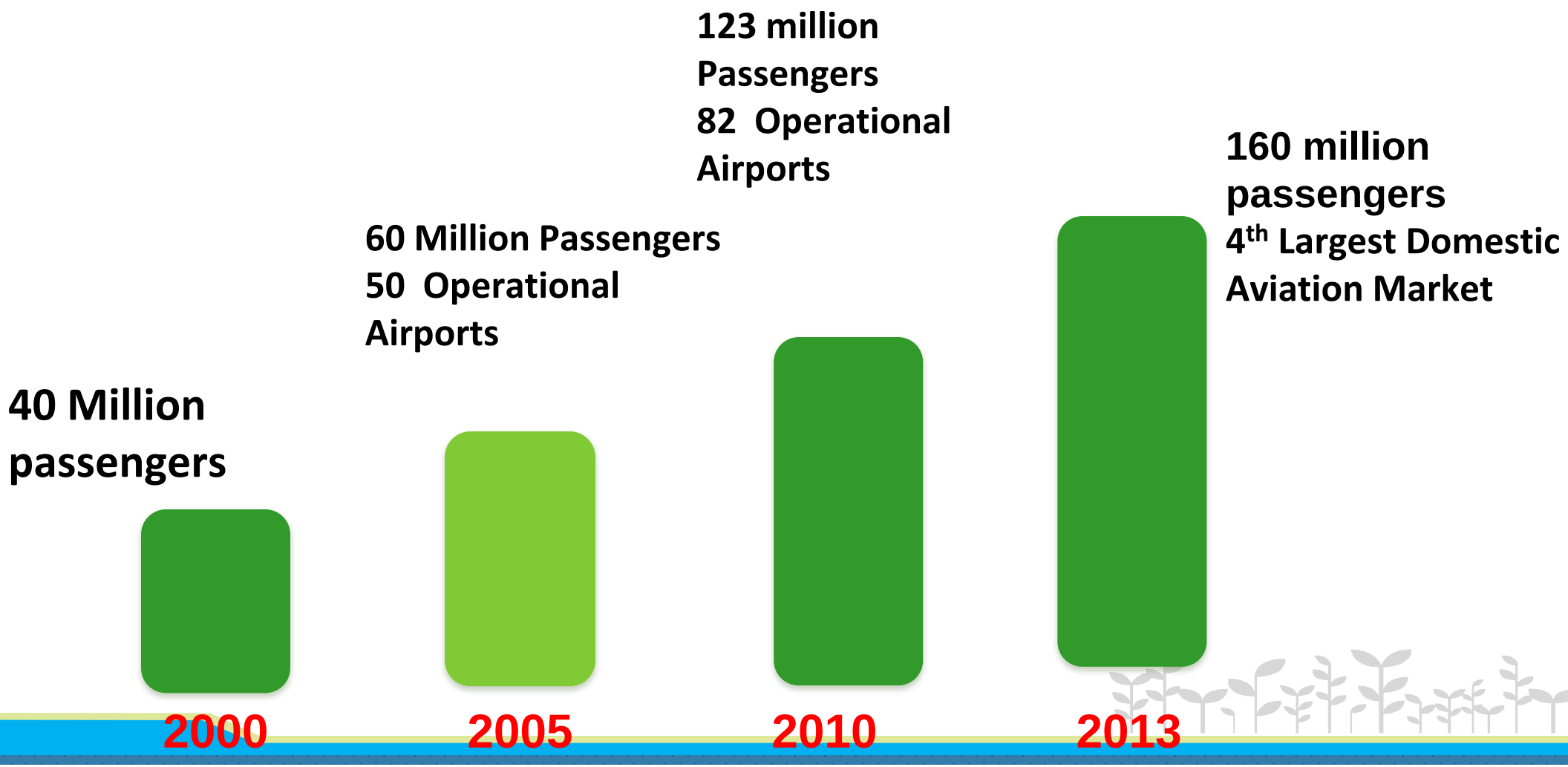

INDIA-ANS STRATEGIES

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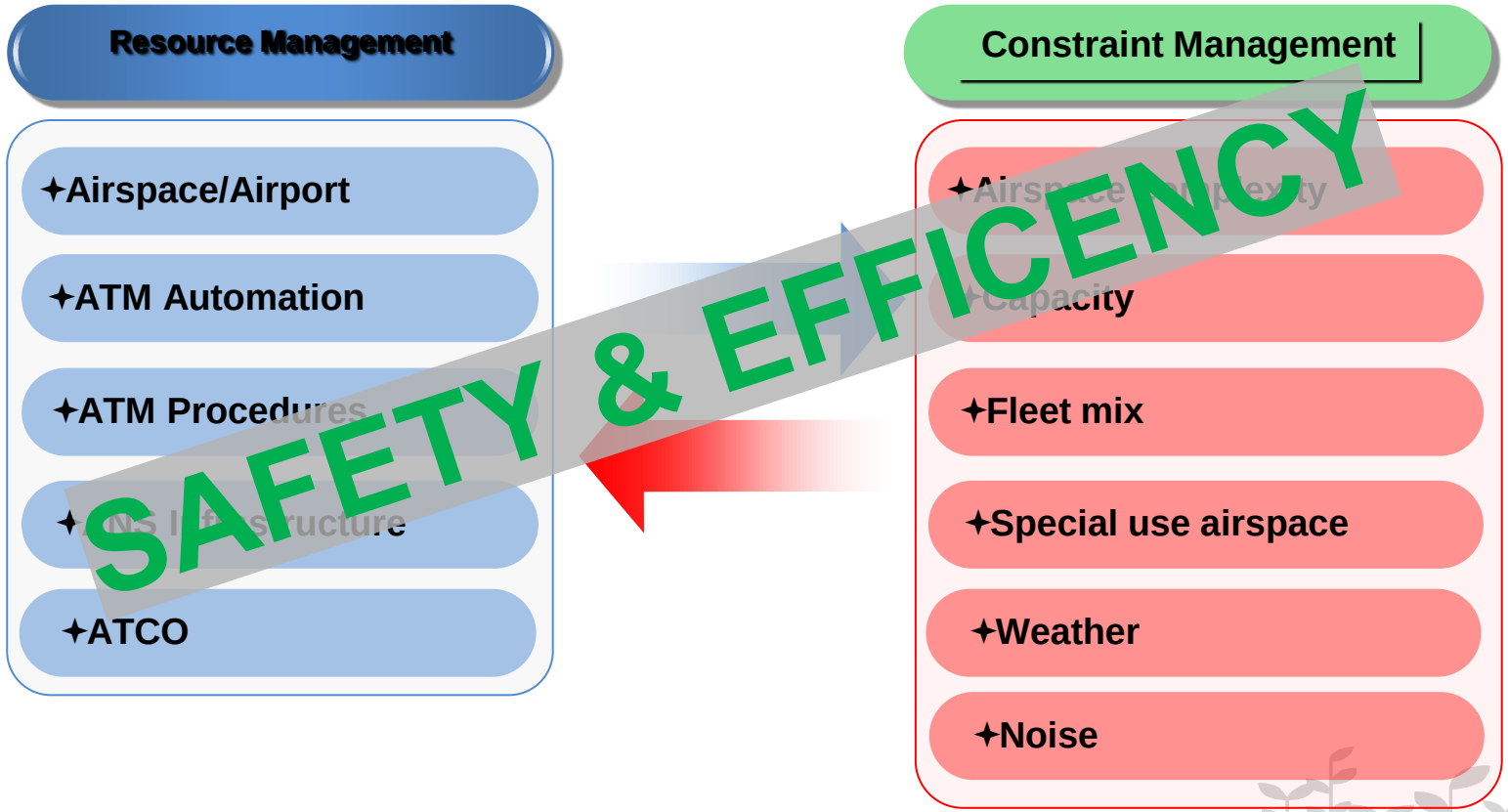
- To ensure safety and efficiency of air traffic through airspace with least average delay to users.
- Achieved through Capacity and Efficiency enhancements Initiatives



KEY ANS SOLUTIONS

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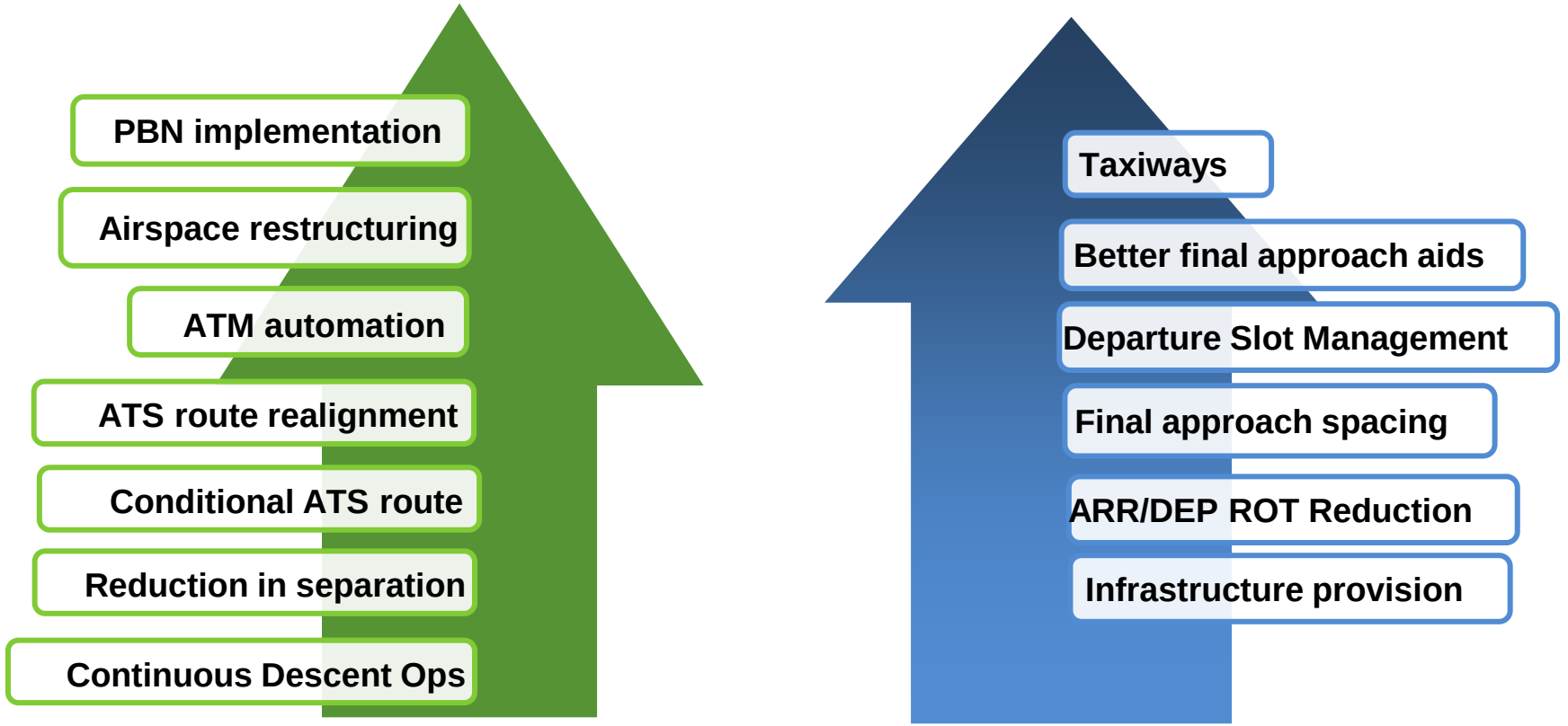
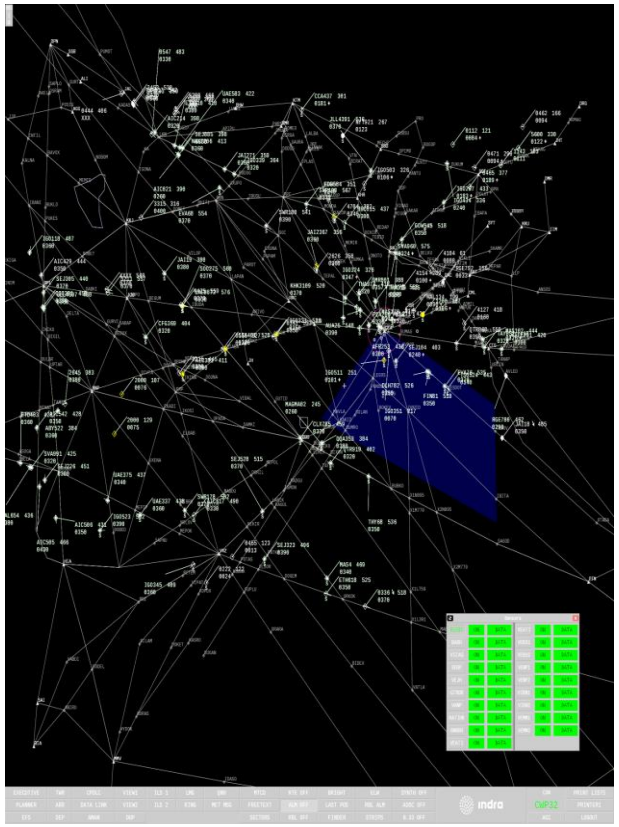


FOCUSSED ANS INITIATIVES

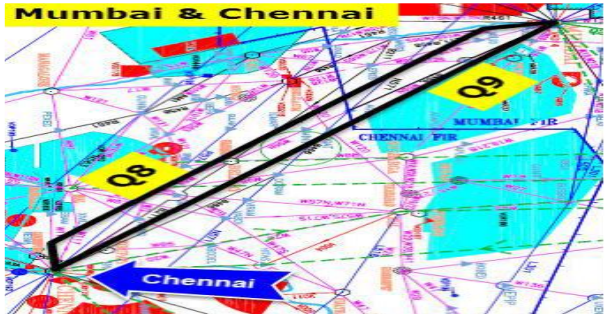
- PBN
- Airspace and Route optimization
- Nationwide Surveillance Coverage
- Upper Airspace harmonization
- ATM Automation
- FUA
- GAGAN (SBAS), GBAS
- FTI
- ATFM

MAJOR DEVELOPMENTS

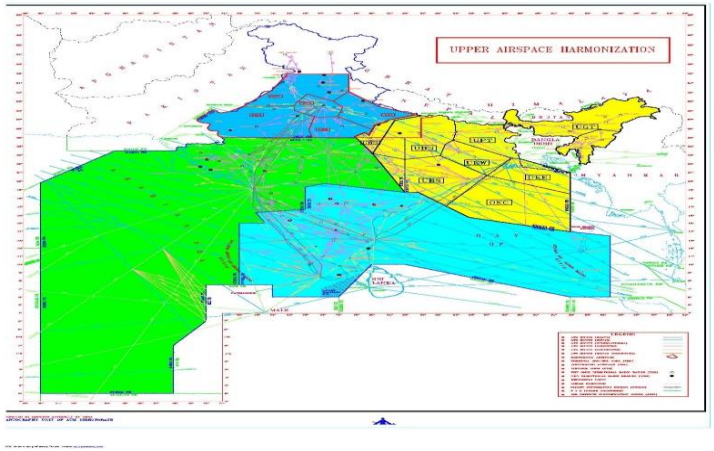


Overlapping and redundant Surveillance

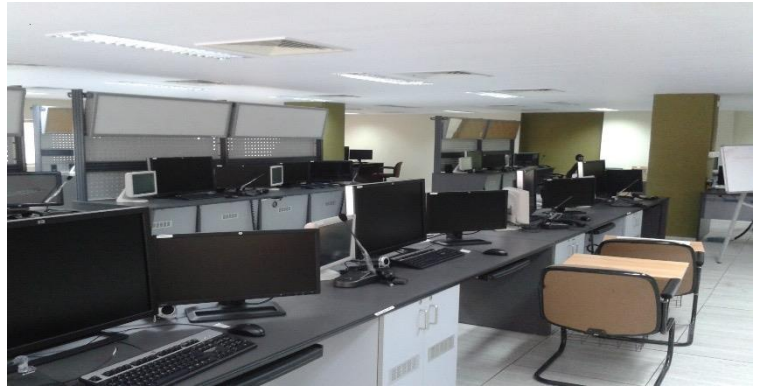
ATC Automation :
at all Major/ Medium-density Airports



PBN –Enroute/Terminal



Harmonized Upper Airspace



Integrated ATS Simulators at Delhi, Mumbai, Chennai and Kolkata

NEED FOR ATFM

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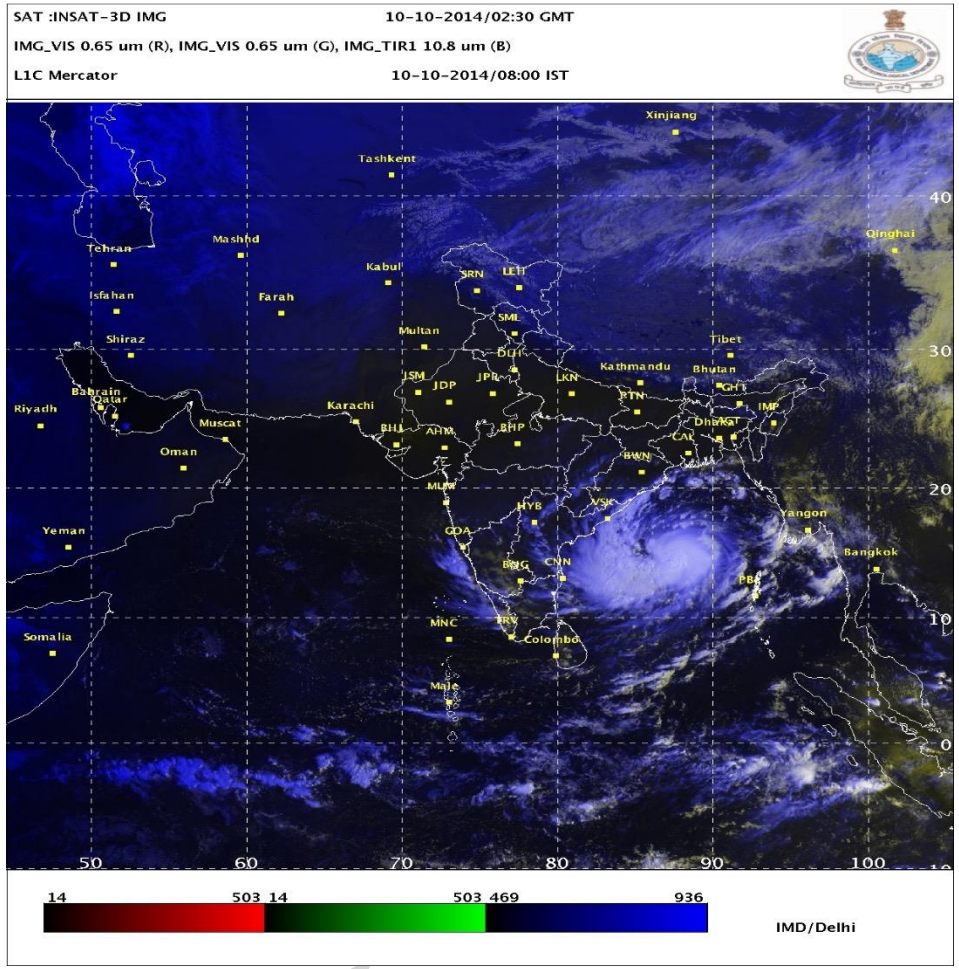
WHY DO WE NEED ATFM ?

- Finite Resources – Airport, Airspace
- Ever increasing growth – Increasing Demand for access
- Contingencies – Unexpected decrease in capacity (weather , emergencies)
- Saturation of Capacity
- Need for balancing Demand and Capacity for “ PLANNED” optimum utilization of resources



ATFM IMPLEMENTATION - TRIGGERS

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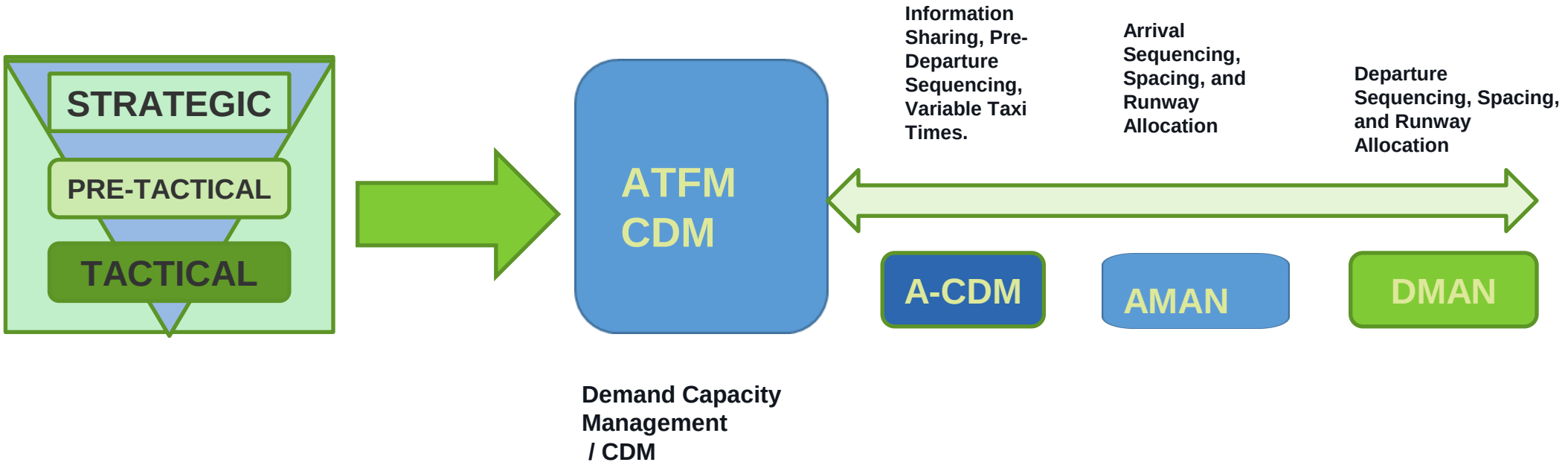
- Mature ANS Environment – Automation, PBN
- Mature Civil – Military Coordination - FUA
- Developing Modern Airport Systems – Infrastructure, A-CDM
- Planning for a major event
- Stakeholders realization of the benefits of ATFM –Optimum Resource Management
- Progressive Regulatory Environment – Enabler

ATFM AND TACTICAL DECISION TOOLS

- ATFM operates over the full spectrum of operational time phases
- As the operation approaches, the accuracy of flight data improves
- Tactical Decision Support Tools (e.g., A-CDM, DMAN, AMAN) operate in a time horizon closer to the operation



AAI CENTRAL ATFM STRUCTURE

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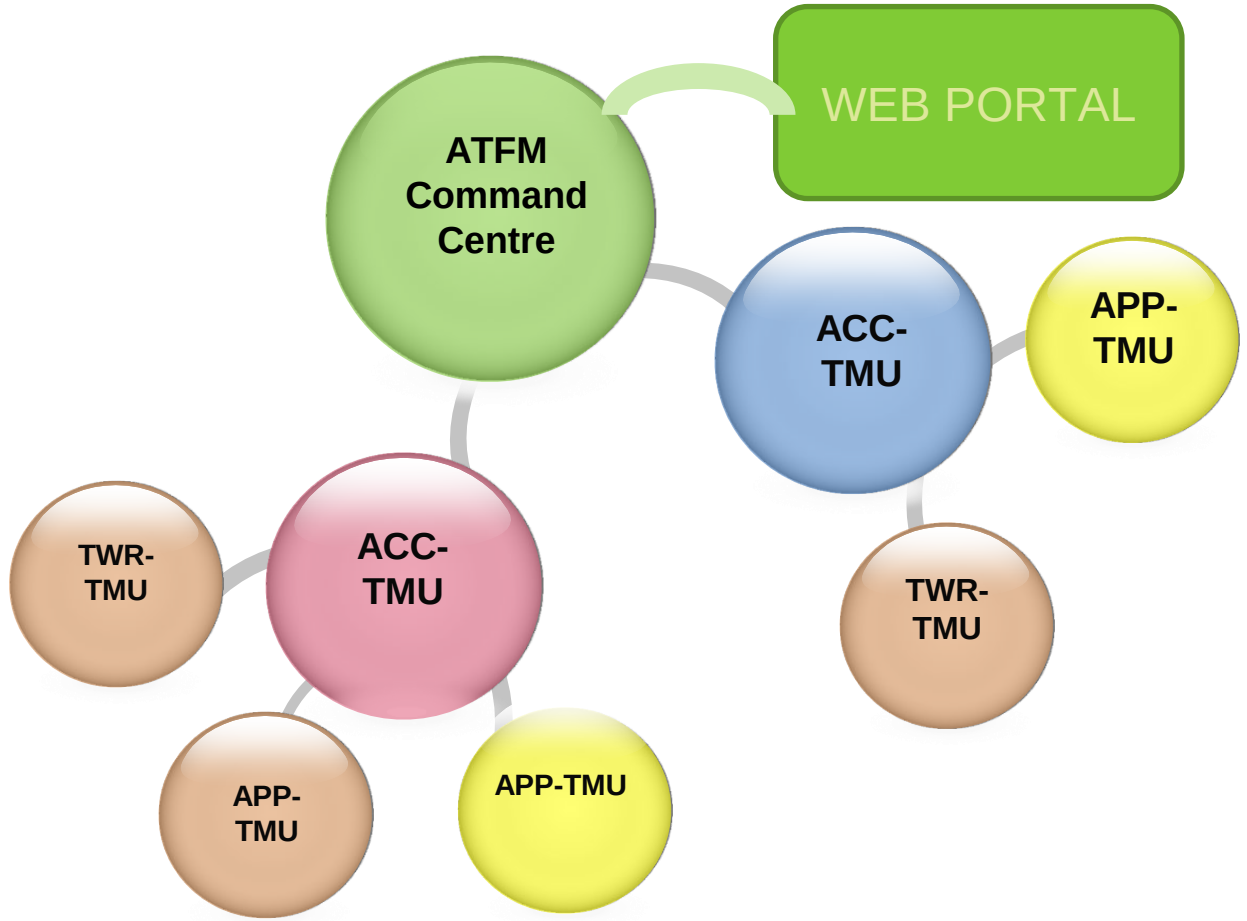
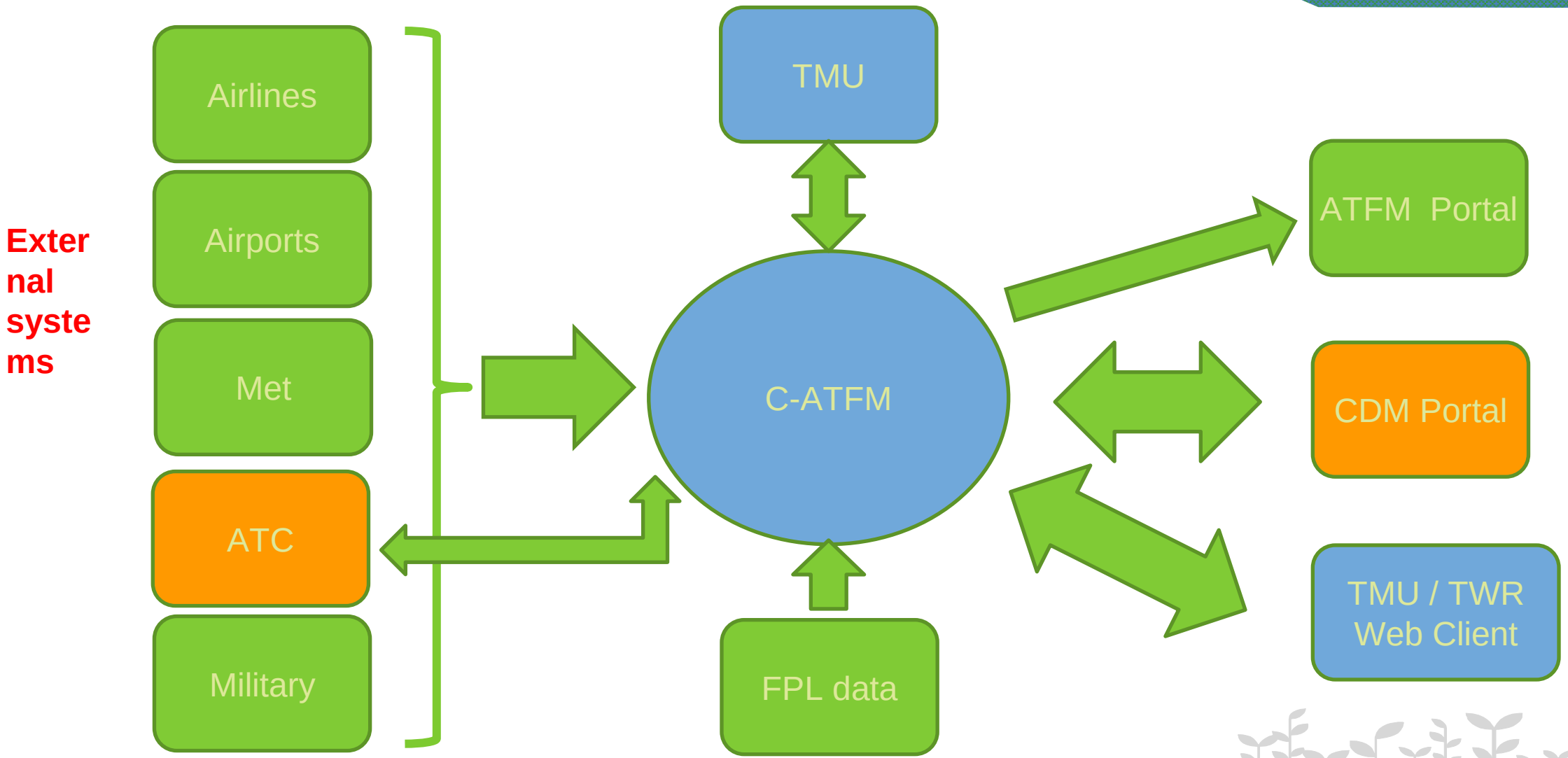
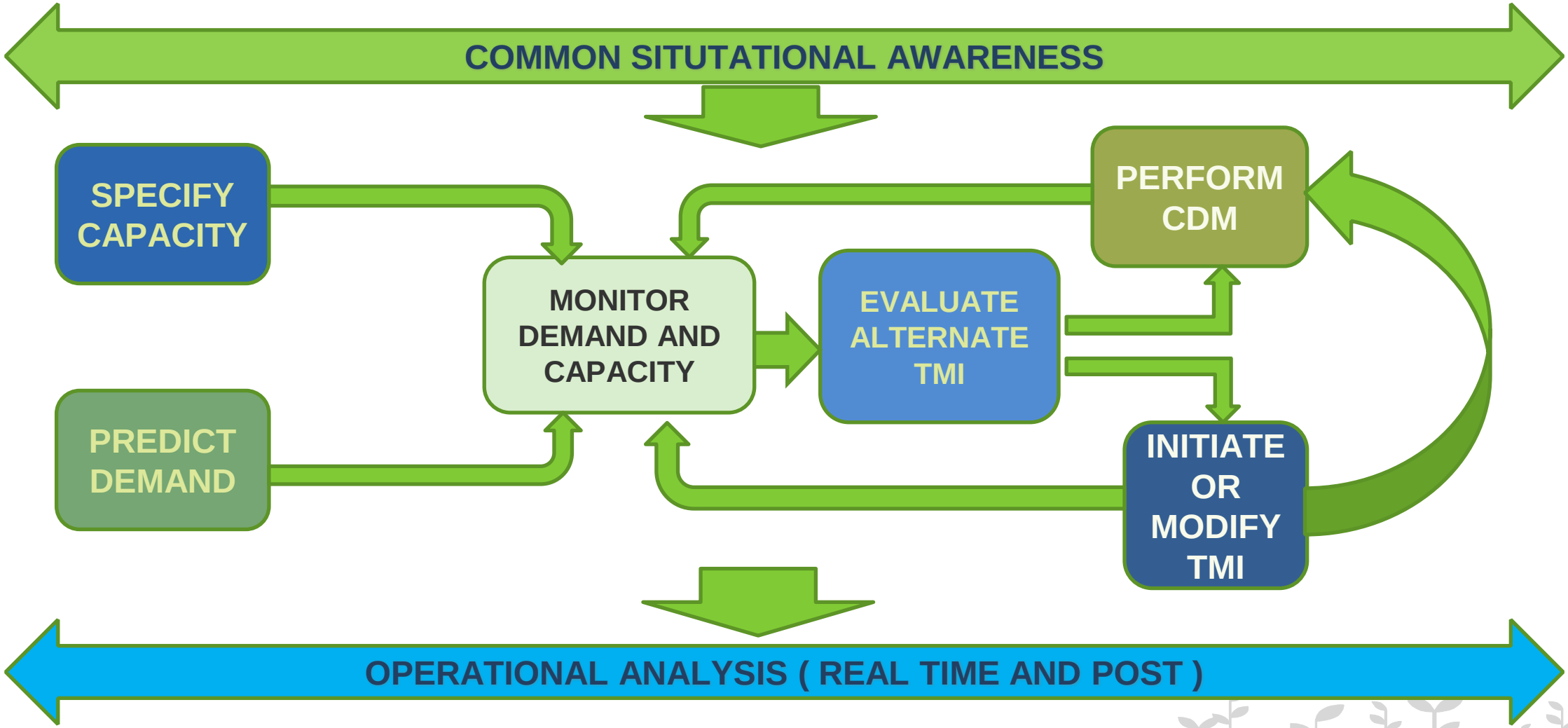
- Objective is to manage and optimize traffic flows by actively collaborating with airlines, airport, defense and other stakeholders on daily basis.
- The Central Command Center (CCC) will receive strategic and tactical FPL , Weather, Airspace ,Traffic, Airport information for accurate Situational Awareness
- Traffic Management Unit (TMU) will be the unit implementing ATFM program



C-ATFM Architecture



INTEGRATED ATFM & CDM- FUNCTIONAL FLOW



AAI C-ATFM CONCEPT

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- Integrated ATFM/CDM (connectivity and data exchange between all participating systems)
- Strategic to Tactical ATFM by focusing on
  - Weather
  - Airspace management
  - Airline operational requirements
  - Airport constraints – departure and arrival airport
  - Terminal Airspace constraints (CCO and CDO)
  - En-route constraints
- Demand and Capacity Balancing (Traffic Management Initiatives at departure and arrival airport and En-route airspace)
- Robust Post Operation Analysis

C-ATFM PHASE 1

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- CCC at Delhi
- TMU(Traffic Management Units at Mumbai, Delhi, Kolkata, Chennai, Bangalore and Hyderabad
- Phase I by 2015
- TMU at other ACC and APP by 2016

AAI C-ATFM - SNAPSHOTS

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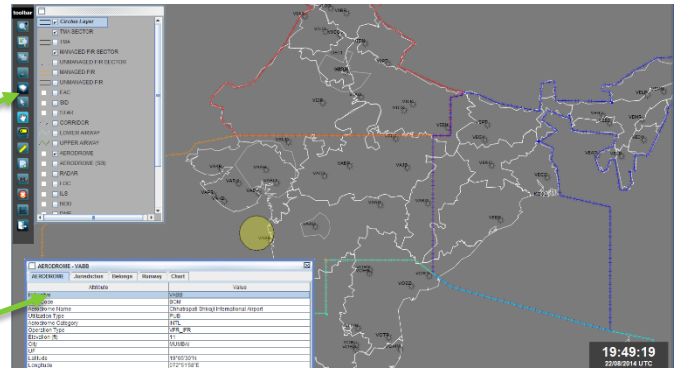
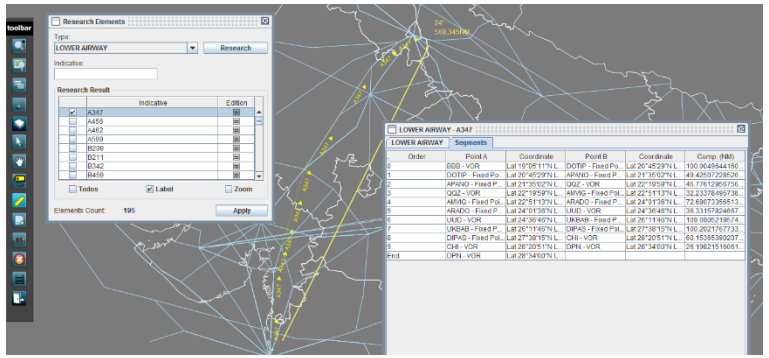
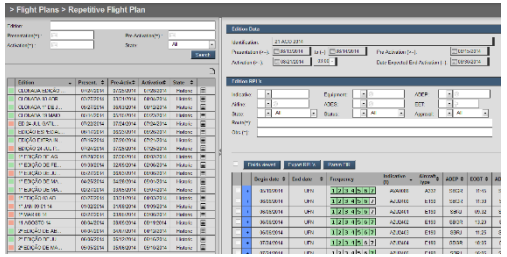


Airspace element search tool

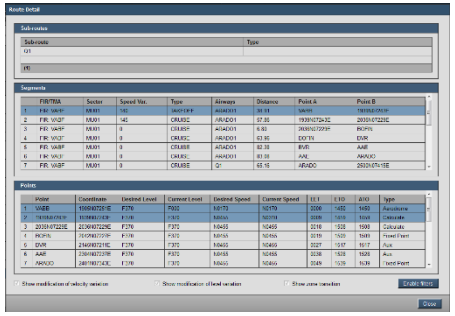


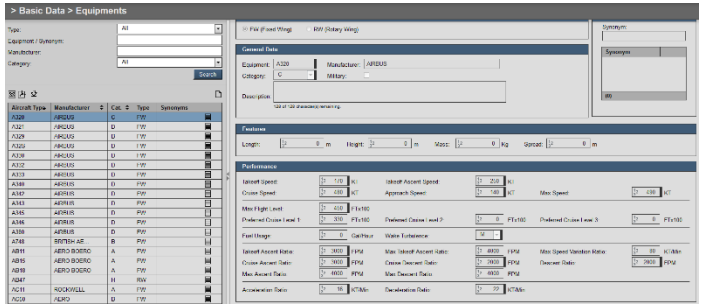
Aircraft Performance Database

RPL Database



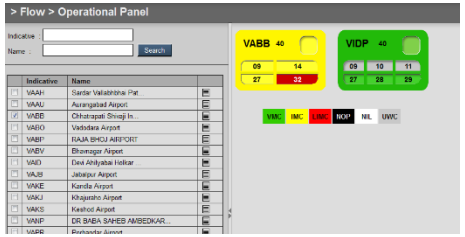
Route Detail



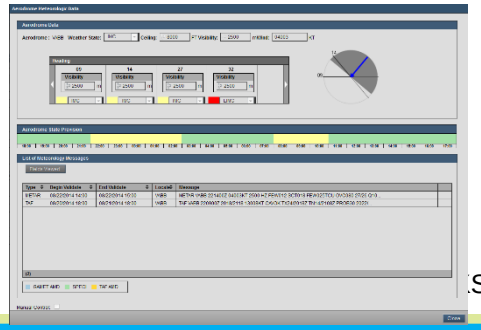


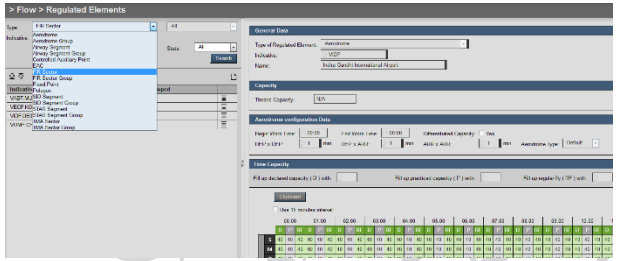
Regulated Elements Database

Status Monitor



Weather Information





AAI C-ATFM - SNAPSHOTS

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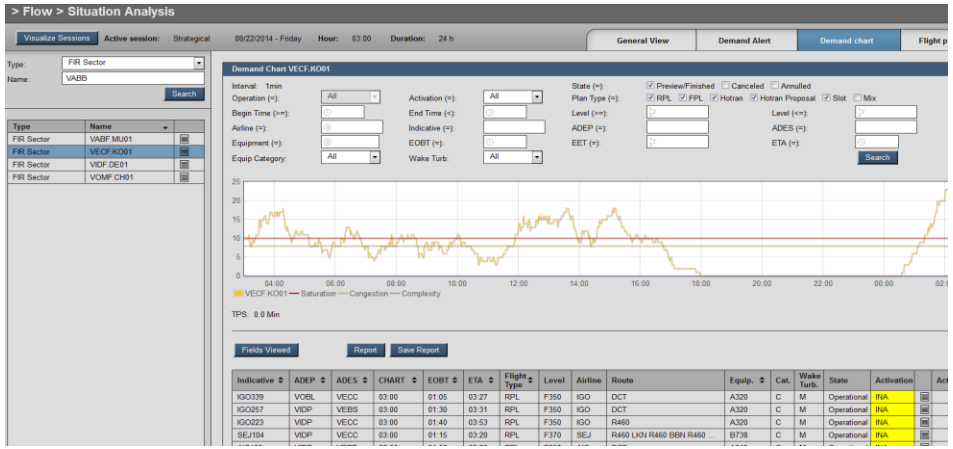
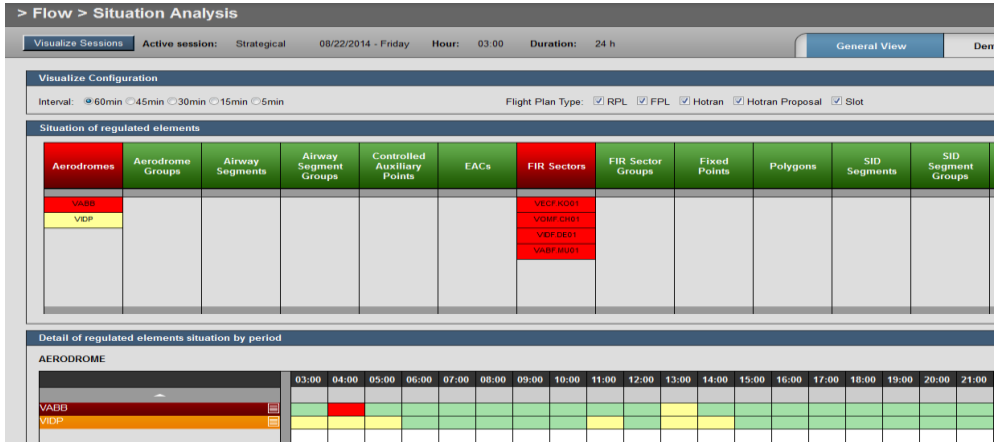
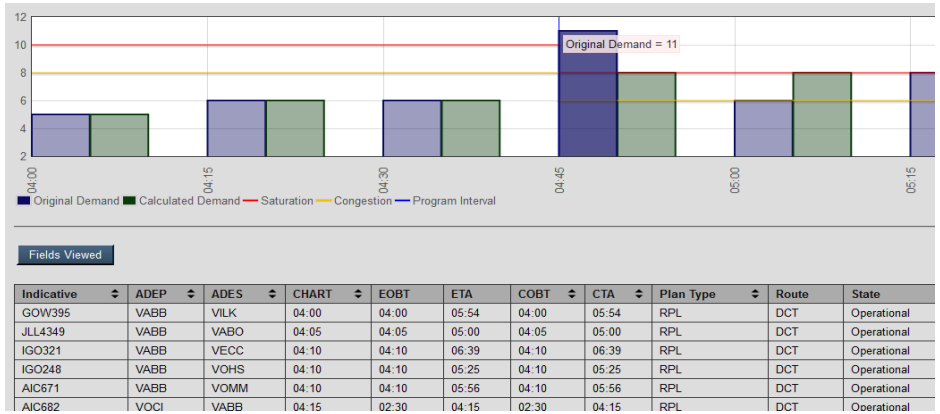
Capacity & Demand Analysis



Capacity & Demand General View

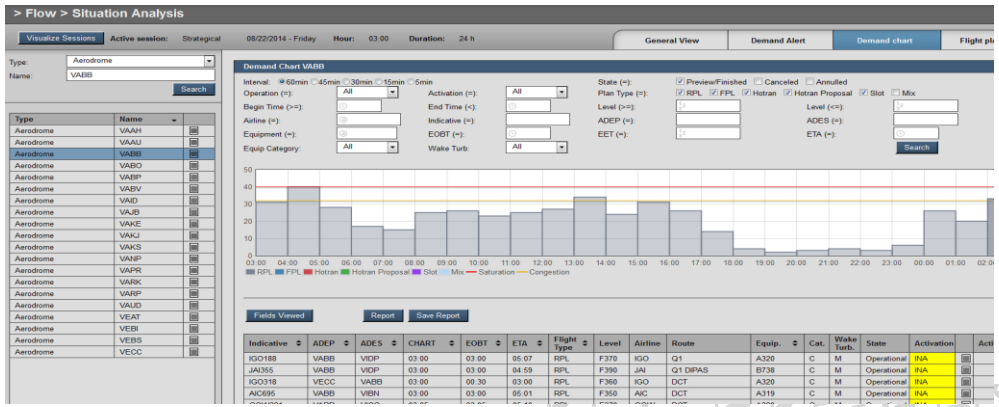


CDM Proposal (Ground Delay Program)



Indicative	ADEP	ADES	CHART	EOBT	ETA	COBT	CTA	Plan Type	Route	State
GOW395	VABB	VILK	04:00	04:00	05:54	04:00	05:54	RPL	DCT	Operational
JLL4349	VABB	VABO	04:05	04:05	05:00	04:05	05:00	RPL	DCT	Operational
IGO321	VABB	VECC	04:10	04:10	06:39	04:10	06:39	RPL	DCT	Operational
IGO248	VABB	VOHS	04:10	04:10	05:25	04:10	05:25	RPL	DCT	Operational
AIC671	VABB	VOMM	04:10	04:10	05:56	04:10	05:56	RPL	DCT	Operational
AIC682	VOCI	VABB	04:15	02:30	04:15	02:30	04:15	RPL	DCT	Operational

Capacity & Demand Analysis by timeframe



IMPLEMENTATION CHALLENGES

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- CHANGE MANAGEMENT
- TECHNOLOGY ABSORPTION
- MANPOWER
- DEFINING METRICS
- BUY IN FROM STAKEHOLDERS

ROAD AHEAD……

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- Develop methodology for determining capacity
- Process of Safety Management throughout
- ATFM Letters of Agreement
- ATFM Personnel and Training
- Develop and Publish ATFM Regulations

AAI C-ATFM SYSTEM VISION

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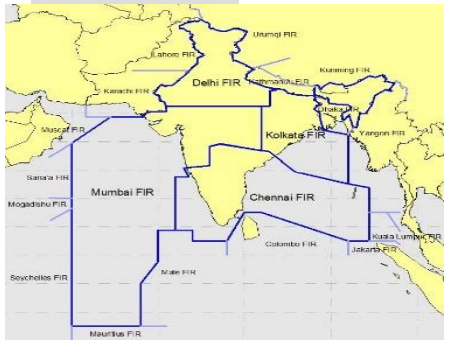
Adopt the best practices from ATFM lessons learned around the world …

Develop and Implement OUR OWN INDIAN NATIONAL ATFM SOLUTION with CDM … and

Simultaneously ensure capability to participate in the regional ATFM efforts for " SEAMLESS ATM" .



PROGRES THROUGH COLABORATION