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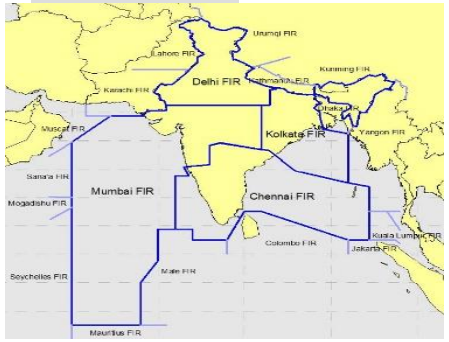
AIRPORTS AUTHORITY OF INDIA

ATFM IMPLEMENATION IN INDIA

–

PROGRESS THROUGH COLLABORATION



PRESENTED BY-

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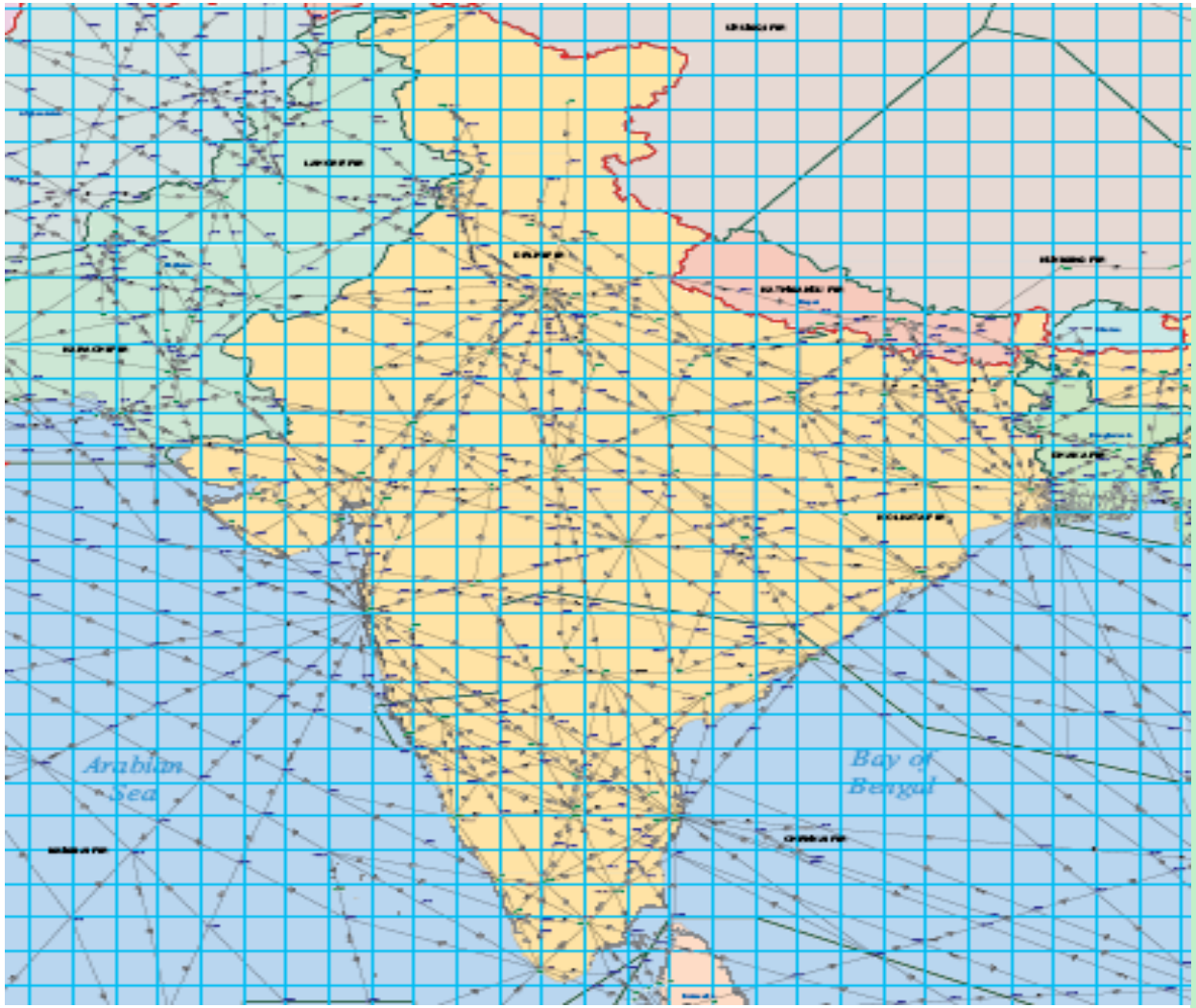
CONTENTS

INDIA – AIRSPACE SYSTEM



- 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
- 14 neighboring FIRs
- Air Traffic Routes: International – 93 , Domestic – 178
- NEIGHBORING STATES 12
- ANS WORK FORCE 4700

Indian ATM Environment

- FOUR Upper ACC (Proposed); 2 Functional Upper Airspace Centers at Chennai and Kolkata
- 12 ACC / 55+ Sectors (including 7 OCC Sectors)
- 125 Airports (17 International ; 62 Domestic)
- 13 Scheduled (Domestic) Airlines / 70 International Airlines
- 1.7 Million ATM + 0.3 Million Overflights (Approx.)
- One CCC + 36 FMP (Proposed ATFM Structure)

GROWTH OF INDIAN AVIATION

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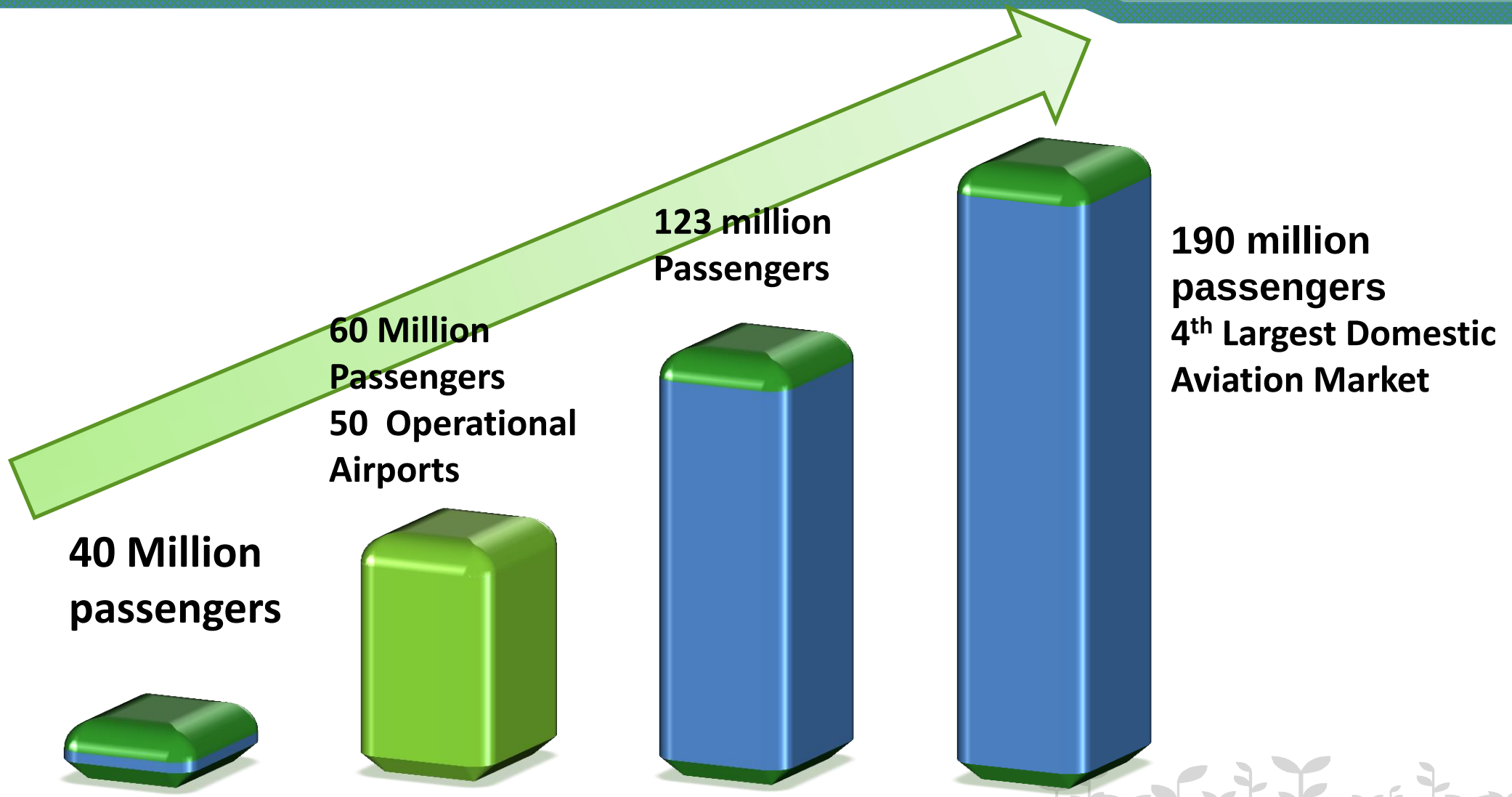
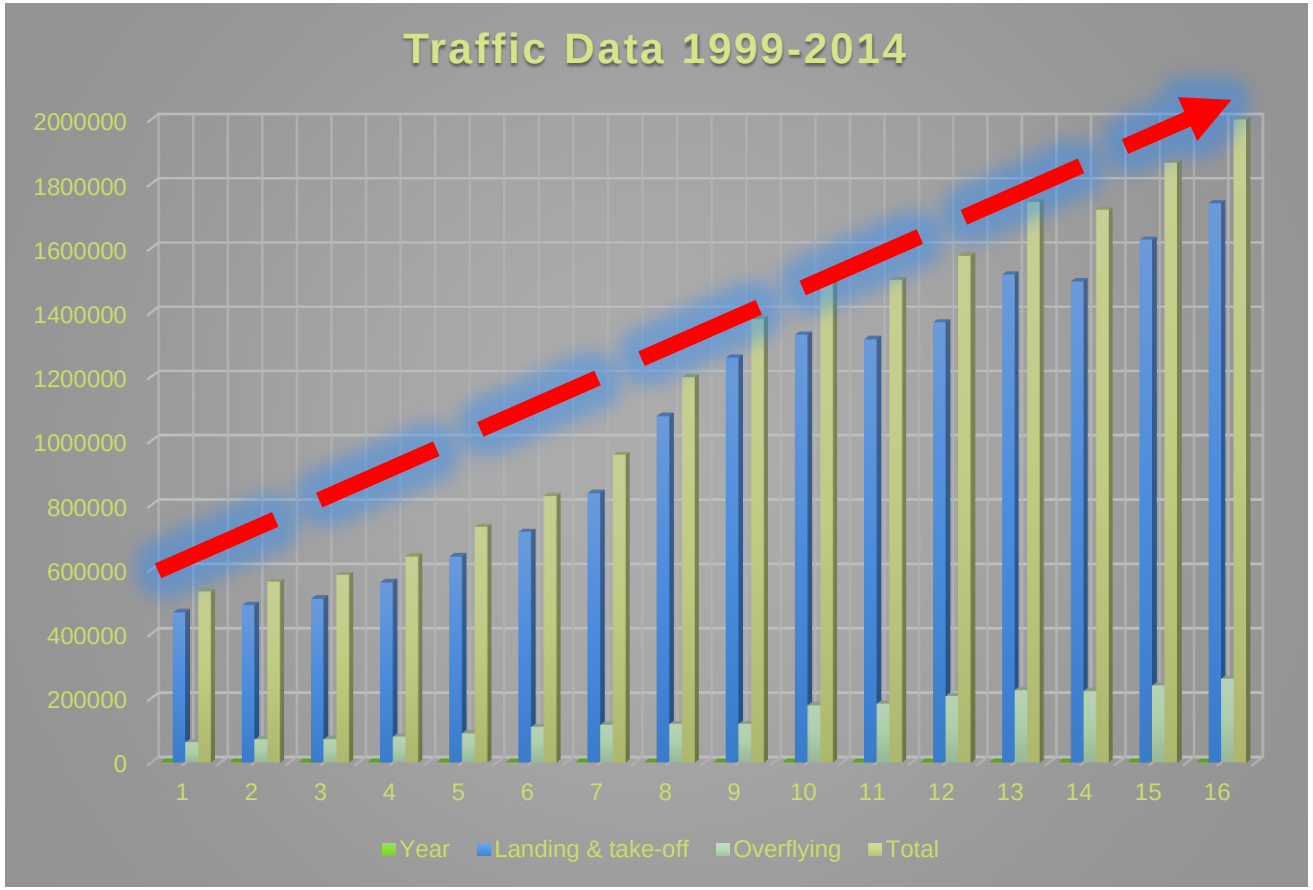


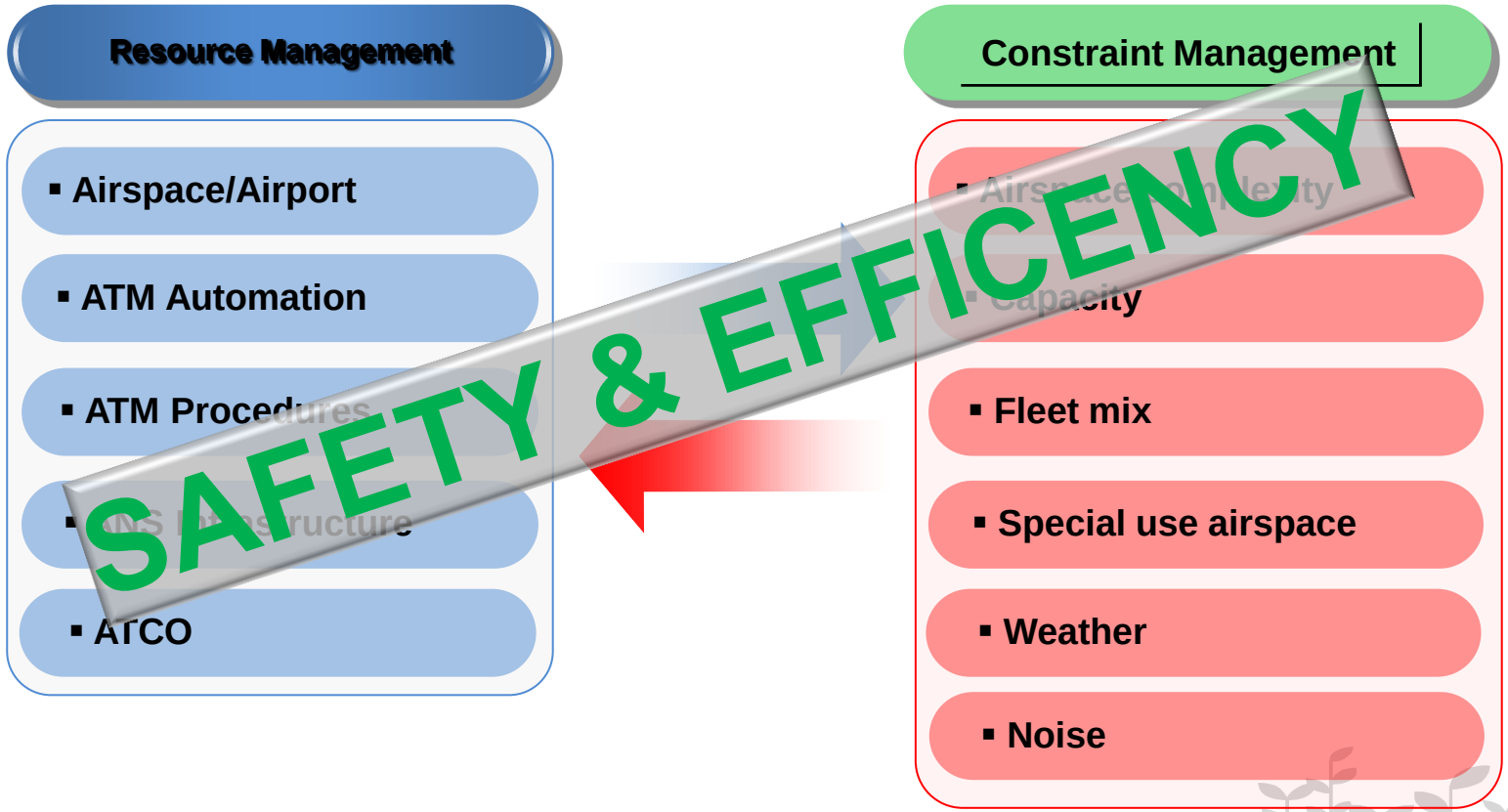
TRAFFIC DATA

- **Can Indian ATC cope with this?**
- **Maybe..**
- **<u>Can we efficiently cope with this?</u>**

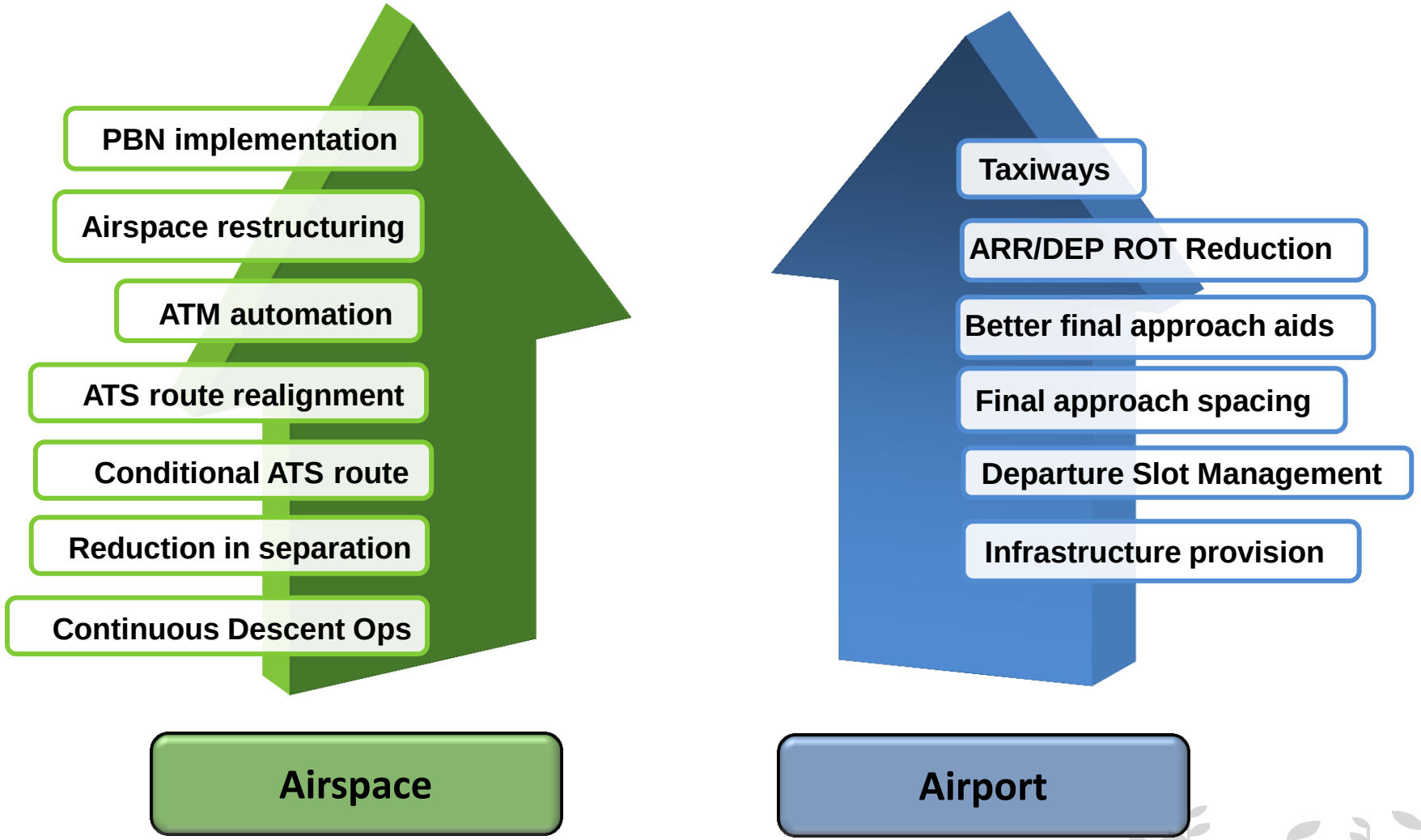


INDIA-ANS STRATEGIES

- 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



FOCUSSED ANS INITIATIVES

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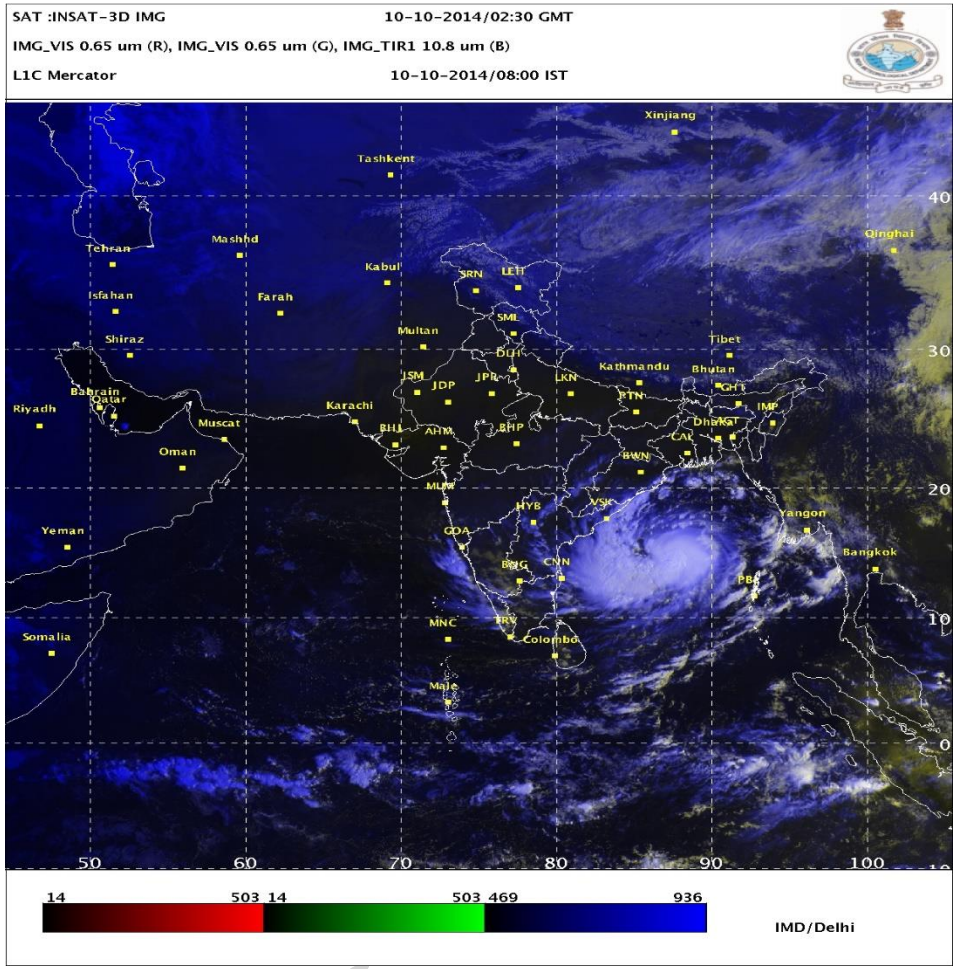
- PBN
- Airspace and Route optimization
- Nationwide Surveillance Coverage
- Upper Airspace harmonization
- ATM Automation
- FUA
- GAGAN (SBAS), GBAS
- FTI
- ATFM

NEED FOR ATFM

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 integral to ATM

ATM Environment Today

ATM Environment with ATFM

ATFM OBJECTIVES

- Ensure safety
- Maximize throughput;
- Make efficient use of available capacity;
- Manage controller workload;
- Provide equitable service;
- Achieve environmental efficiencies.
- Improved on-time arrivals;
- Minimizing delays;
- Optimizing passenger/crew/aircraft connections;
- Optimize flight profiles and routes during adverse weather conditions; and
- Optimize recovery solutions during and after disruptive events.

ATFM IMPLEMENTATION - TRIGGERS

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

C-ATFM PROJECT PROGRESS

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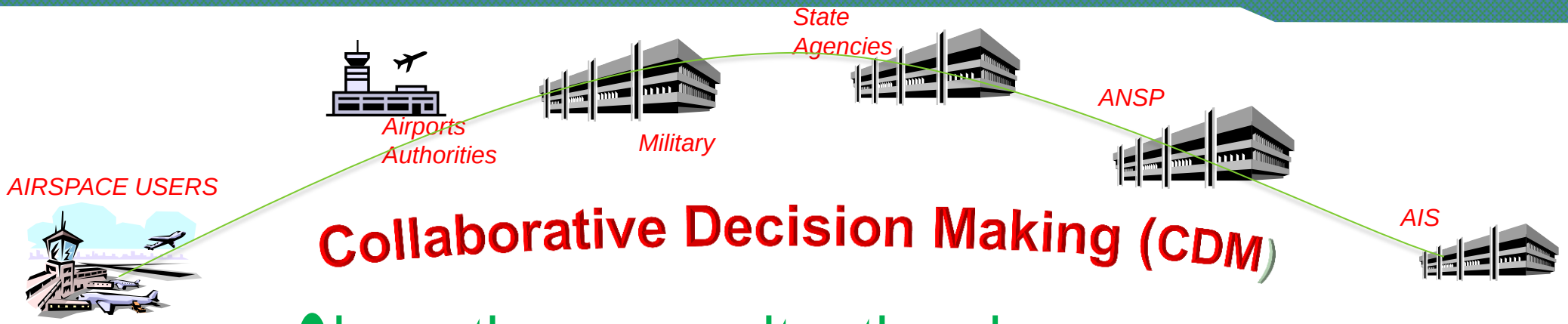
- AAI and FAA Consultancy -2009-2011
- AAI ATFM Core Group Deliberations 2011-2013
- Global Tender for C-ATFM 2013
- C-ATFM Tender awarded to M/s ATECH, Brazil – June 2014
- C-ATFM System Installation , testing and Training in progress

ATFM WITH CDM

- Collaboration with all Stakeholders is key to a successful ATFM.
- Each Partner has a holistic system wide view.
- A Sensitivity to each others' needs
- A recognition of relative benefits of system decision vis-à-vis local decision
- Objective to create more efficient and responsive Airspace System with equal or improved safety parameters.
- **CDM is now an integral part of ATFM**

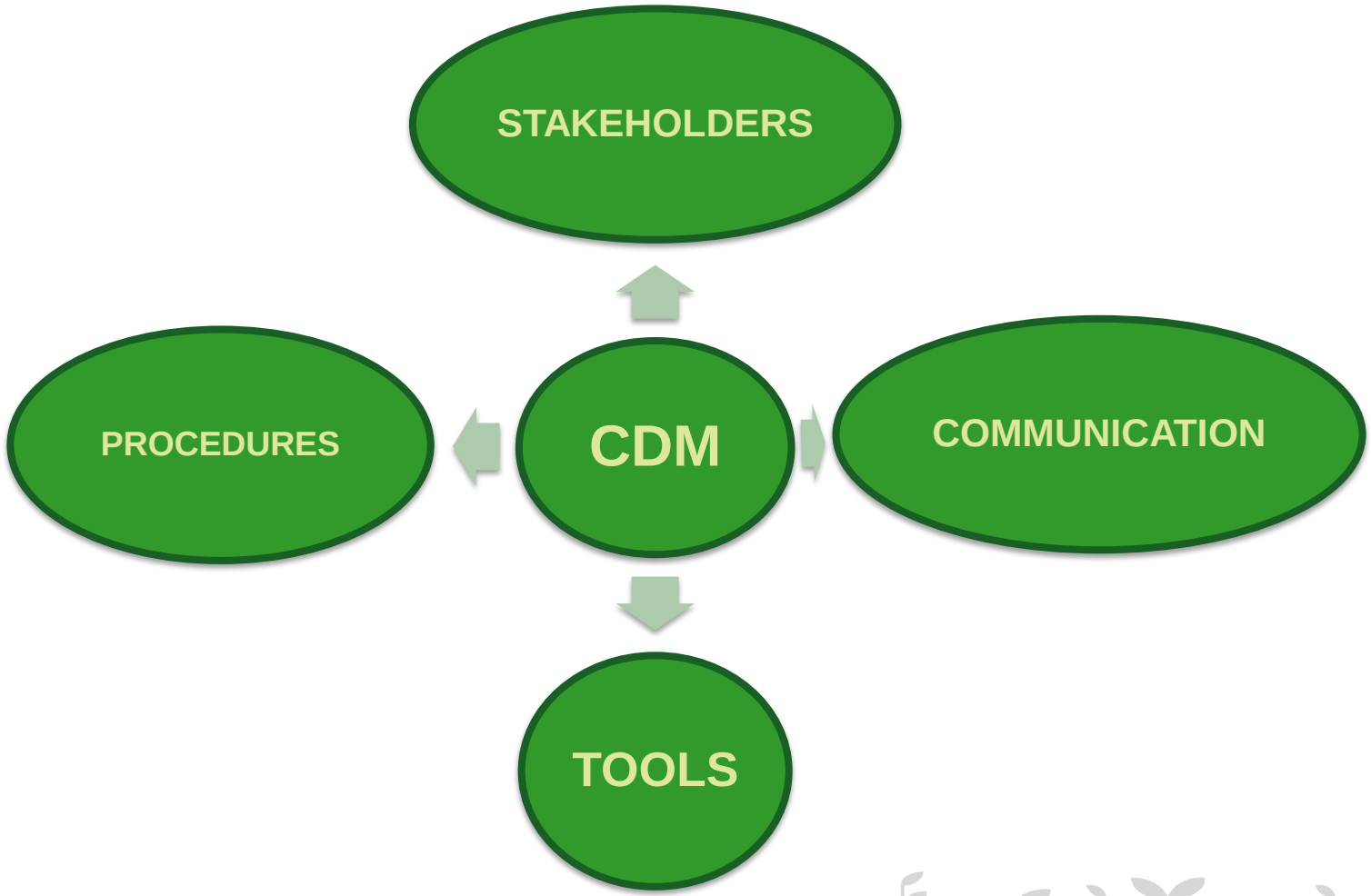
ATFM STAKEHOLDERS



Share the same situational awareness

Use of common Flow Planning Tools

THE CDM PROCESS

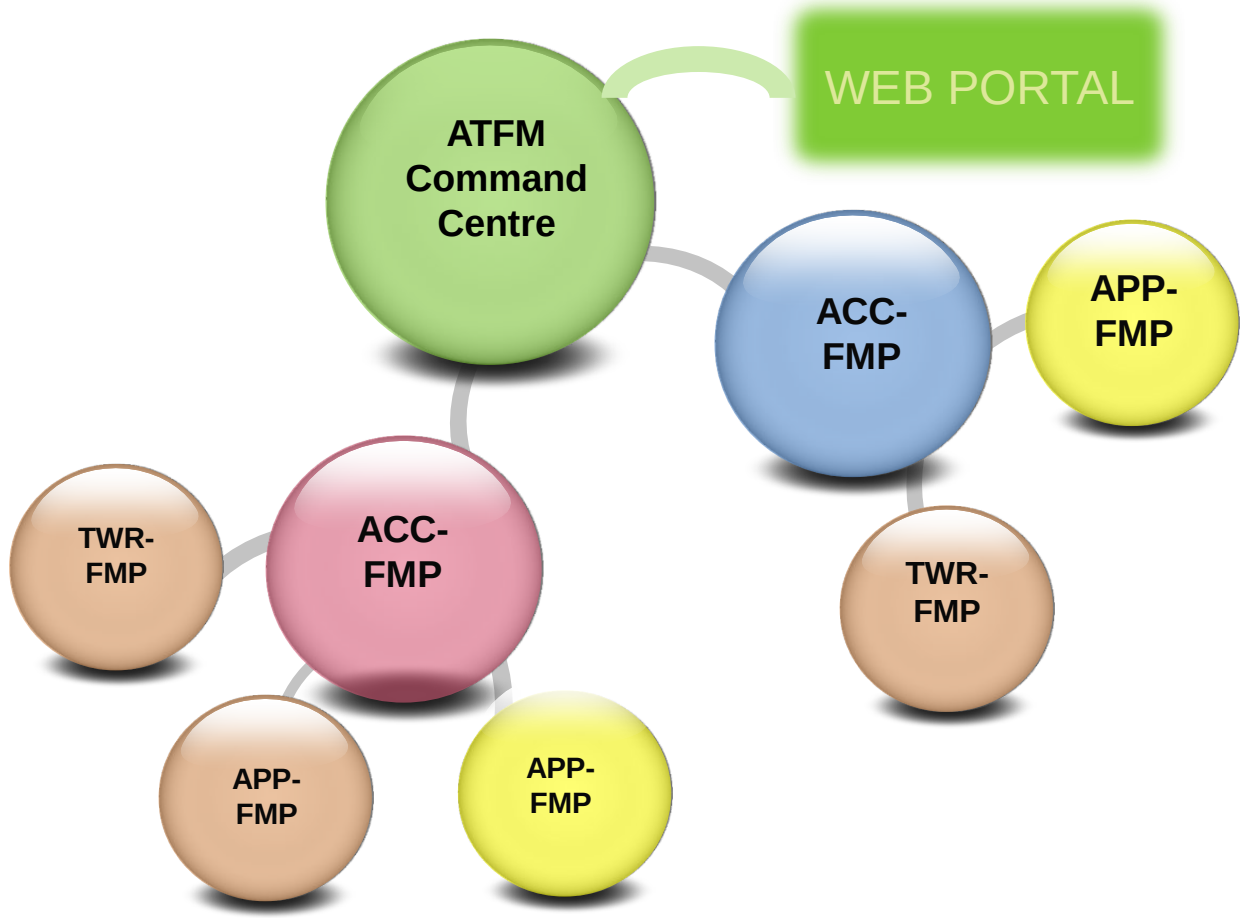


AAI C-ATFM CONCEPT

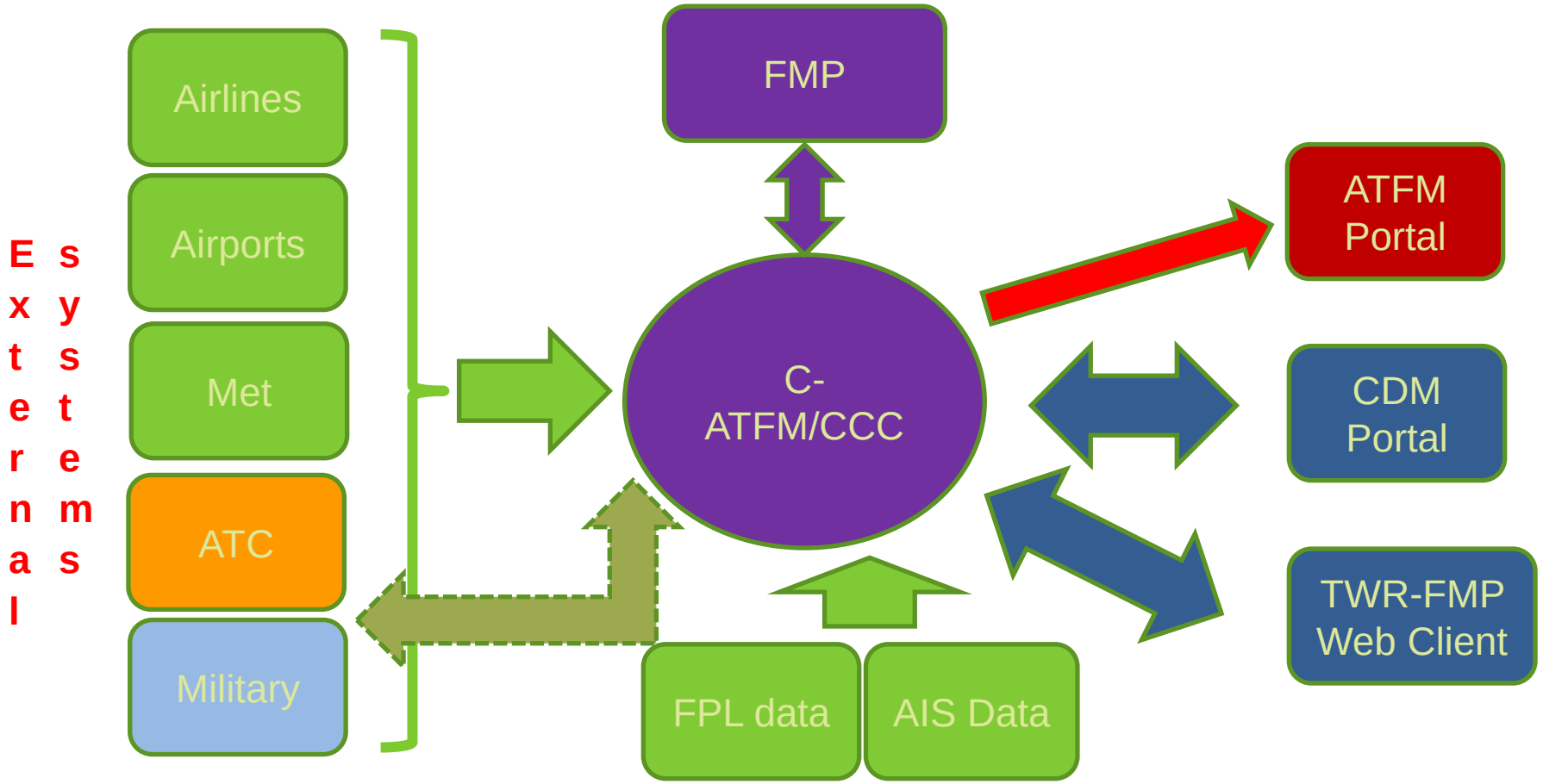
- Integrated ATFM/CDM (connectivity and data exchange between all participating systems)
- Strategic to Tactical ATFM by focusing on
  - Weather
  - Airspace management
  - Airline operational requirements
  - Airport constraints – departure and arrival airport
  - Terminal Airspace constraints (CCO 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

AAI CENTRAL ATFM STRUCTURE

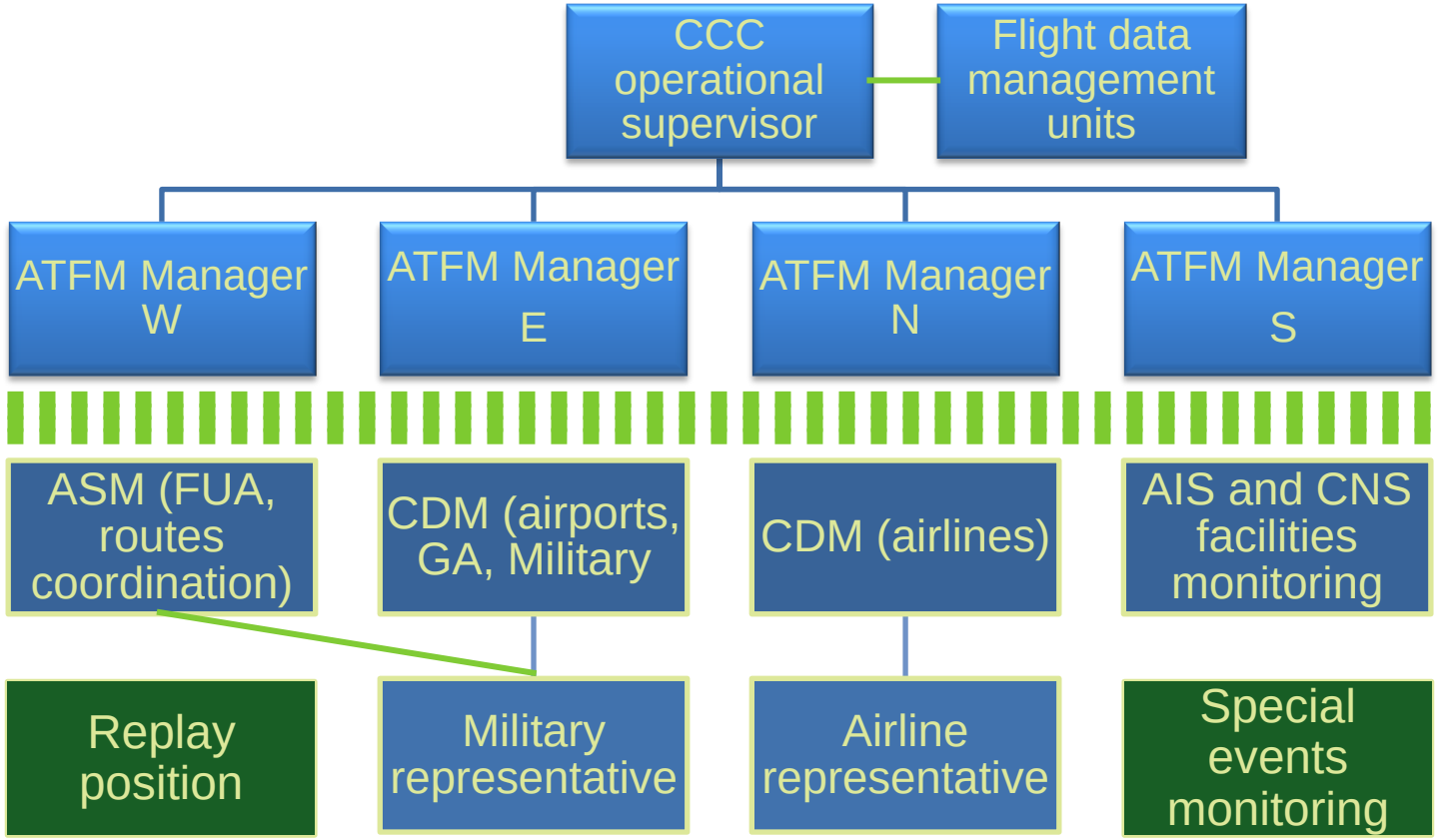
- Objective is to manage and optimize traffic flows by actively collaborating with airlines, airport, defense and other stakeholders on daily basis.
- The Central Command Center (CCC) will receive strategic and tactical FPL , Weather, Airspace ,Traffic, Airport information for accurate Situational Awareness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



C-ATFM ARCHITECTURE



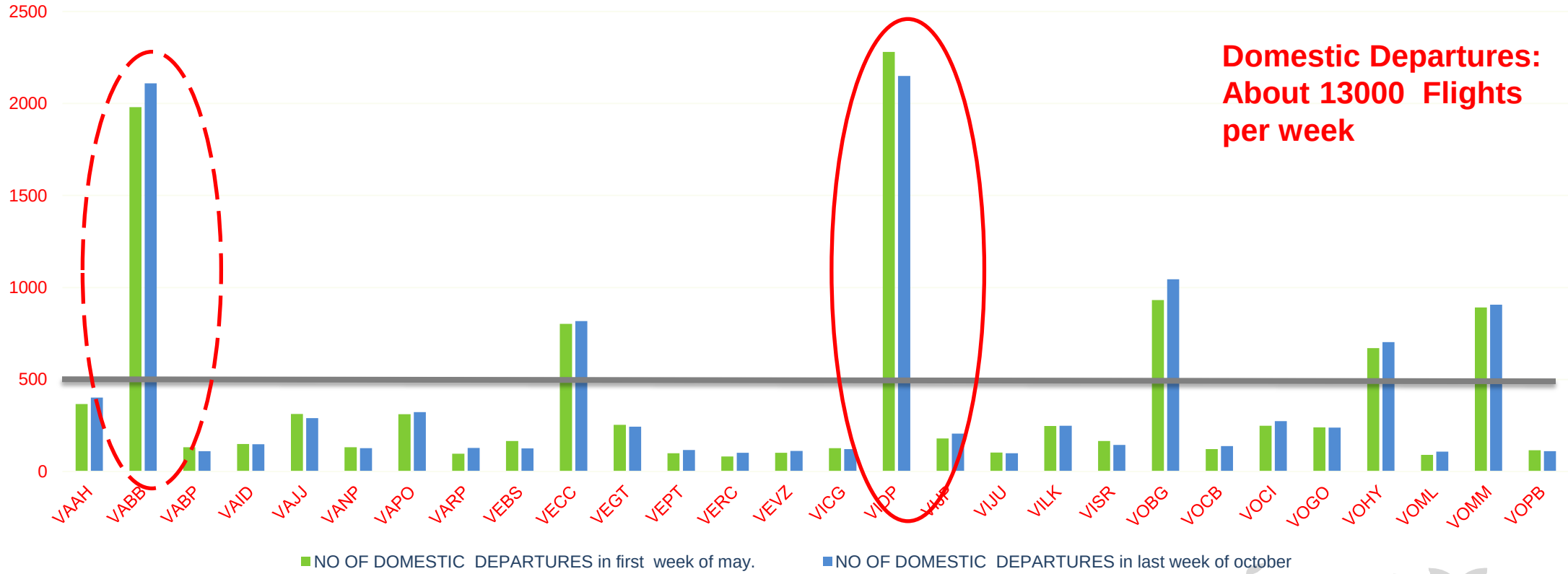
CCC POSITIONS



CCC REPRESENTATION – MAIN ROOM

DEPARTURE FLOWS (PER WEEK)

DEPARTURE FLOWS FROM MAJOR AIRPORTS

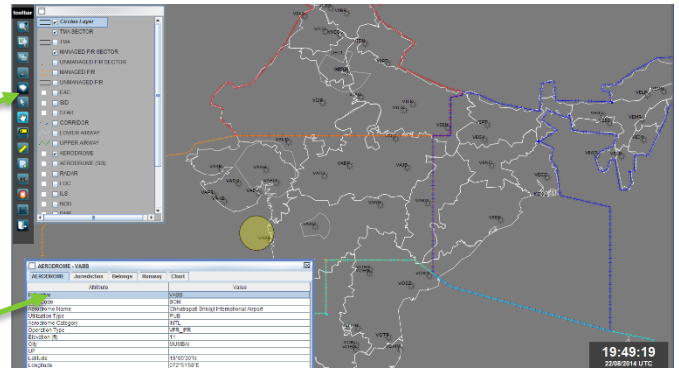


Domestic Departures: About 13000 Flights per week

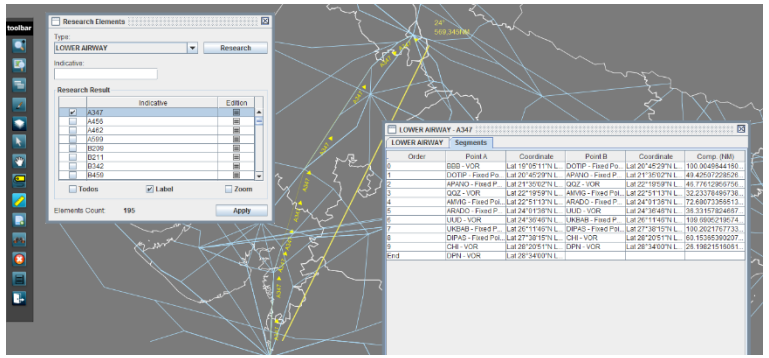
C-ATFM PHASE 1

- CCC at Delhi
- FMP(Flow Management Positions at Mumbai, Delhi, Kolkata, Chennai, Bangalore and Hyderabad
- Phase I in 2015
- FMP at other ACC and APP in 2016

AAI C-ATFM - SNAPSHOTS

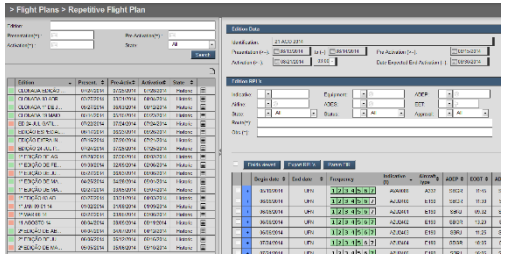


Airspace element search tool

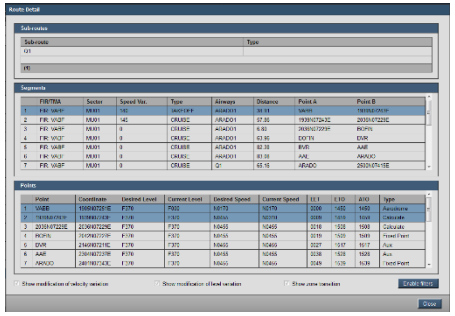


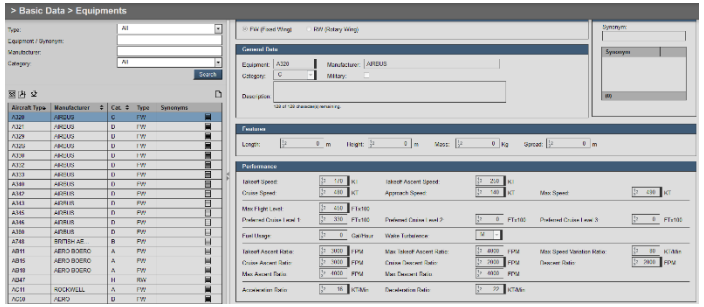
Aircraft Performance Database

RPL Database



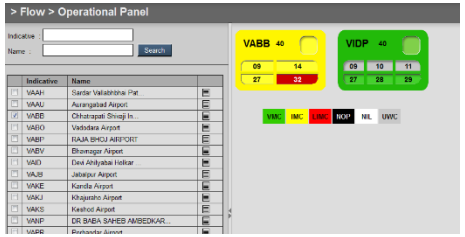
Route Detail



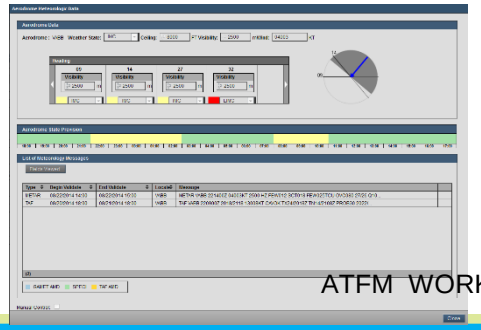


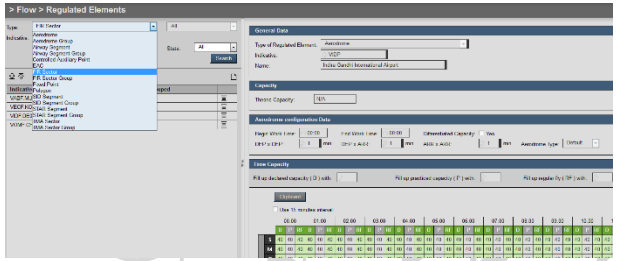
Regulated Elements Database

Status Monitor



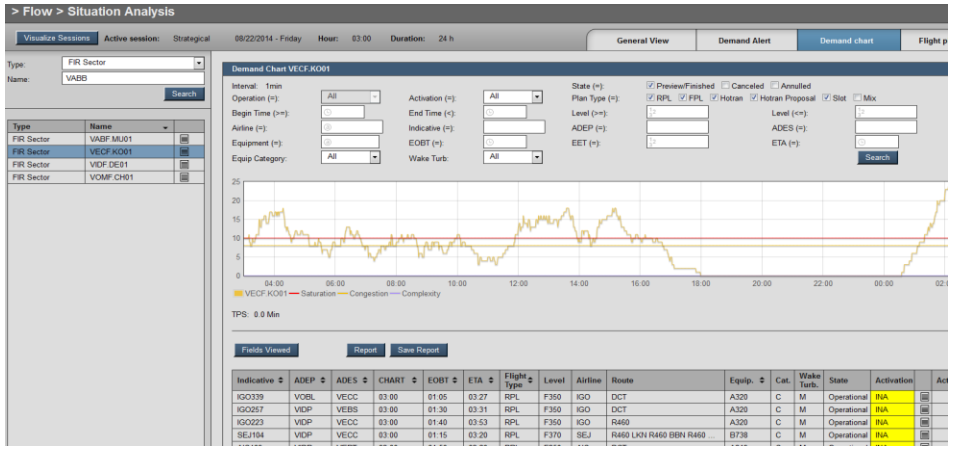
Weather Information



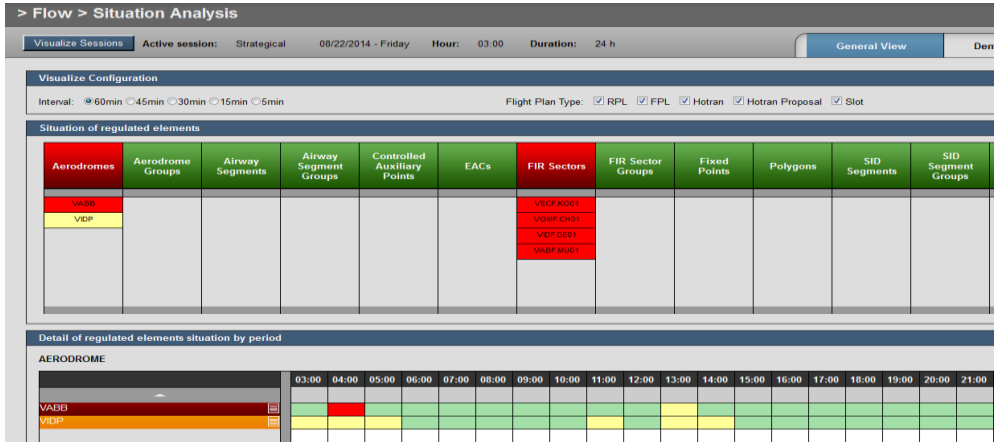


AAI C-ATFM - SNAPSHOTS

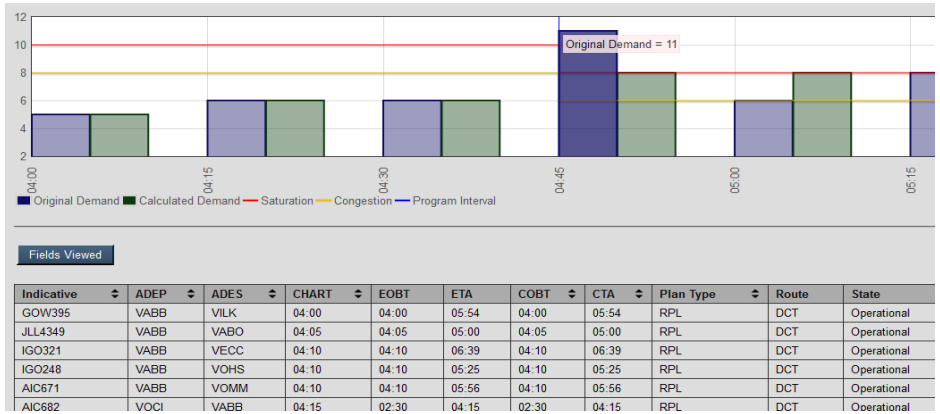
Capacity & Demand Analysis



Capacity & Demand General View

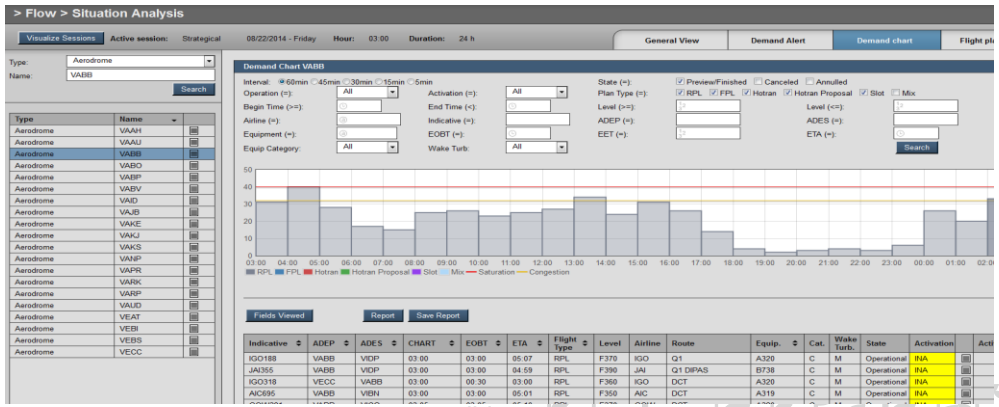


CDM Proposal (Ground Delay Program)



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



ATFM MEASURES

ATFM MEASURES ARE INITIATED IN TACTICAL PHASE TO BALACE DEMAND AND CAPACITY

IMPLEMENTATION CHALLENGES

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

ROAD AHEAD……

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- Begin Operational Trials (December 2015)
- Process of Safety Management throughout
- ATFM Letters of Agreement
- ATFM Personnel and Training
- Develop and Publish ATFM Regulations

AAI C-ATFM SYSTEM VISION

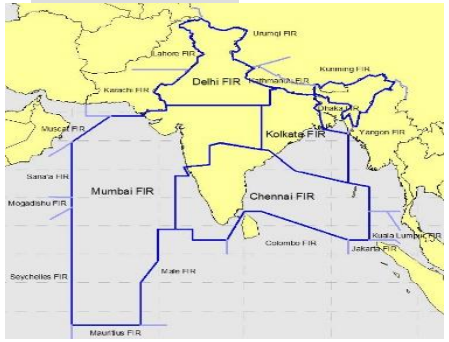
Adopt the best practices from ATFM lessons learned around the world …

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

Harmonize the INDIA C-ATFM SYSTEM with other National/Regional ATFM systems to enable “ SEAMLESS ATM”

.

AIR TRAFFIC FLOW MANAGEMENT
INDIA



THANK YOU