Air Traffic

Flow Management

Presented to: MIT

By: FAA Command Center

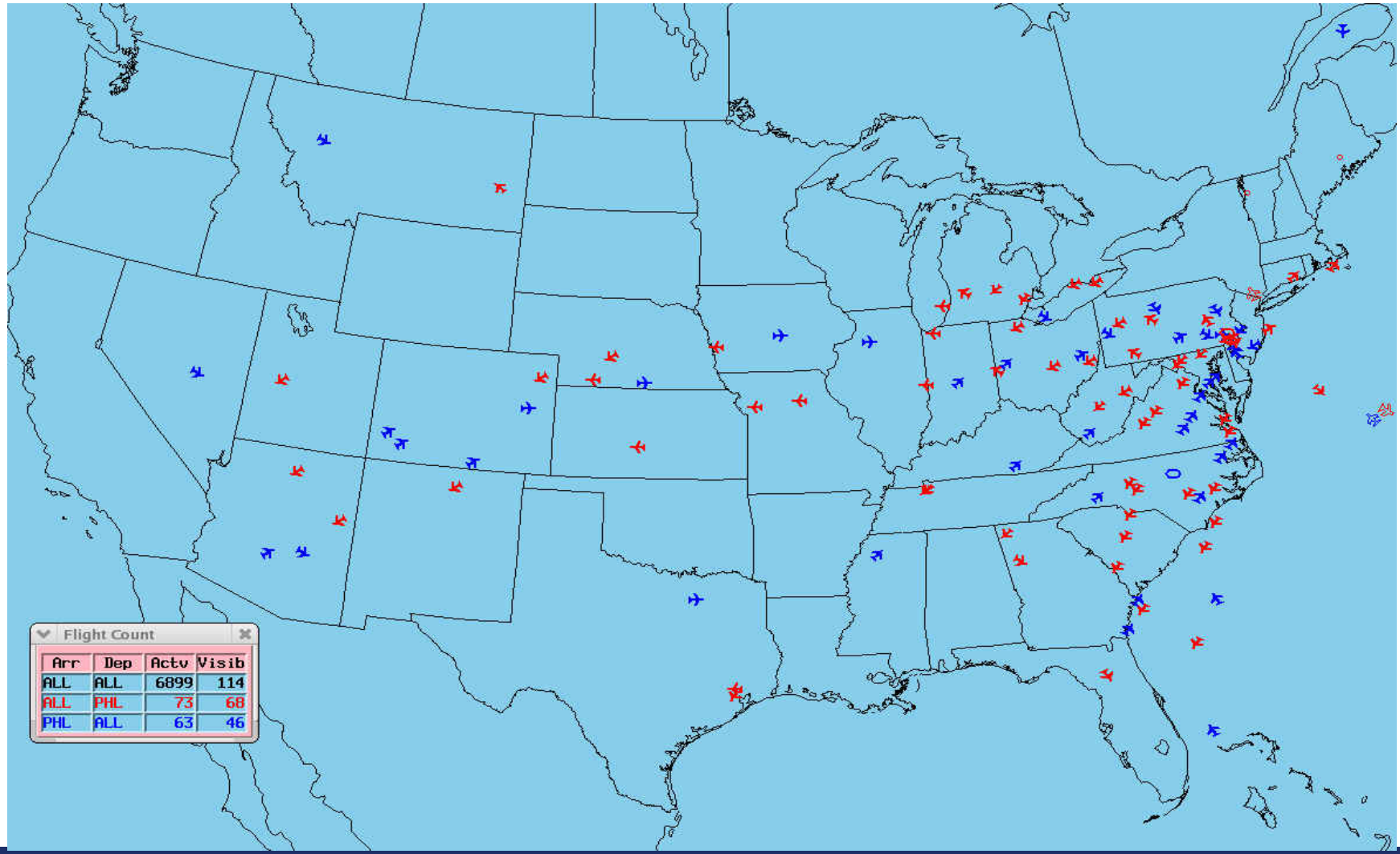
Date: October 5, 2006

Federal Aviation Administration

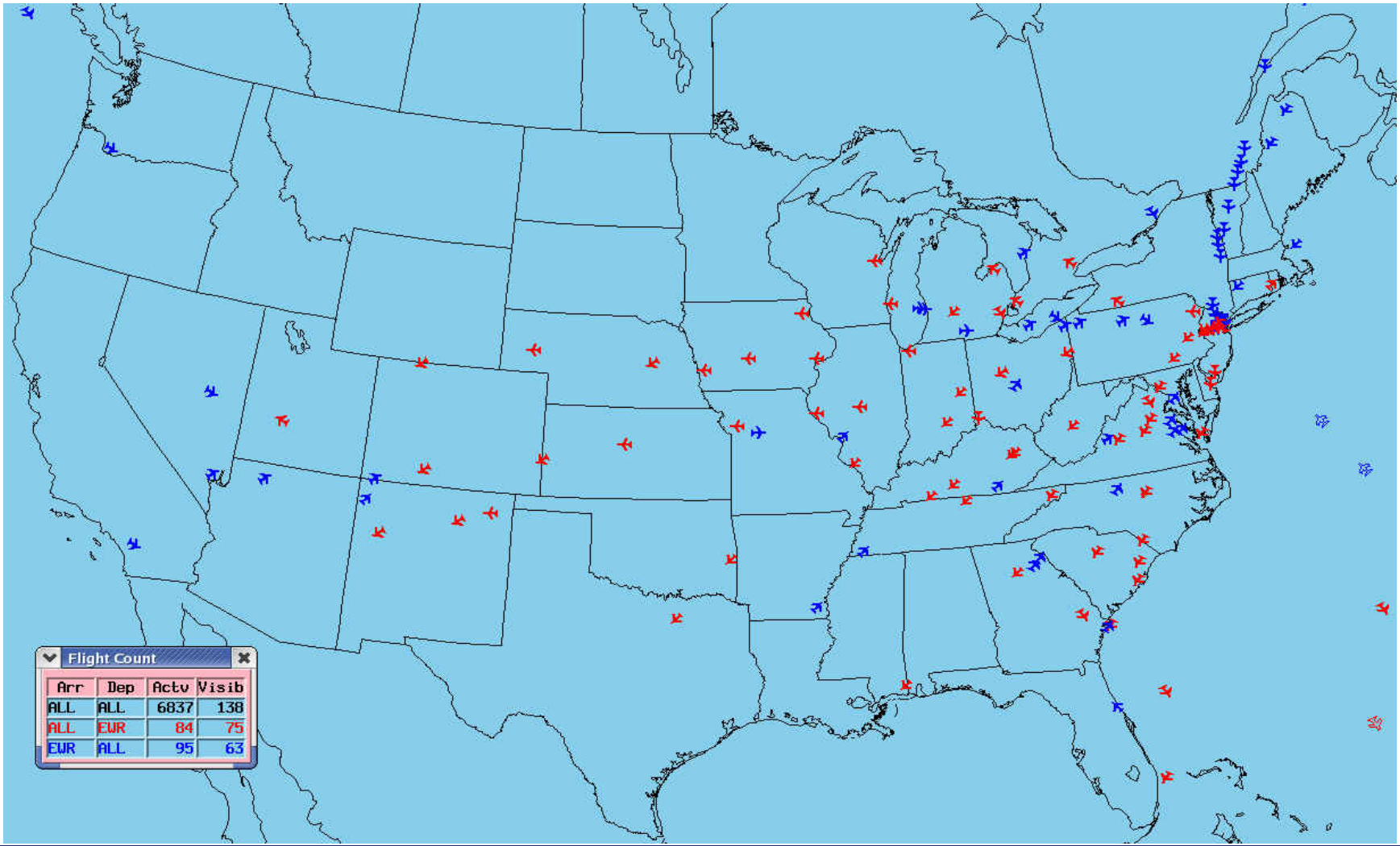
Briefing Overview

- **Why use ATFM?**
  - Benefits derived from Air Traffic Flow Management (ATFM) and the Collaborative Decision Making (CDM) process.
- **Who is involved?**
  - Air Traffic Organization
  - Customer
    - Civil
    - Military
- **How is ATFM applied?**
  - Planning and coordination
  - Automated tools and procedures

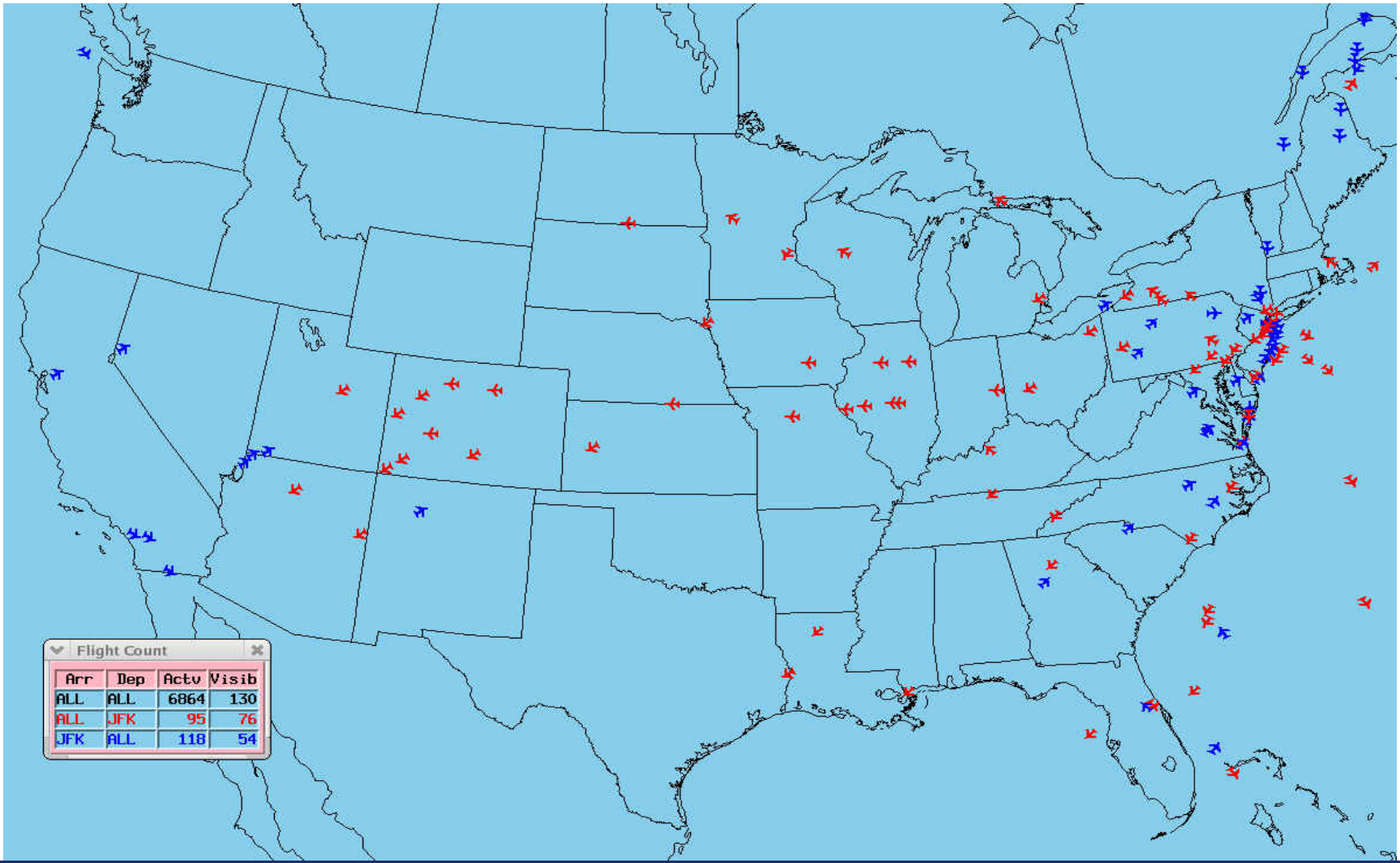
PHL Arrivals and Departures



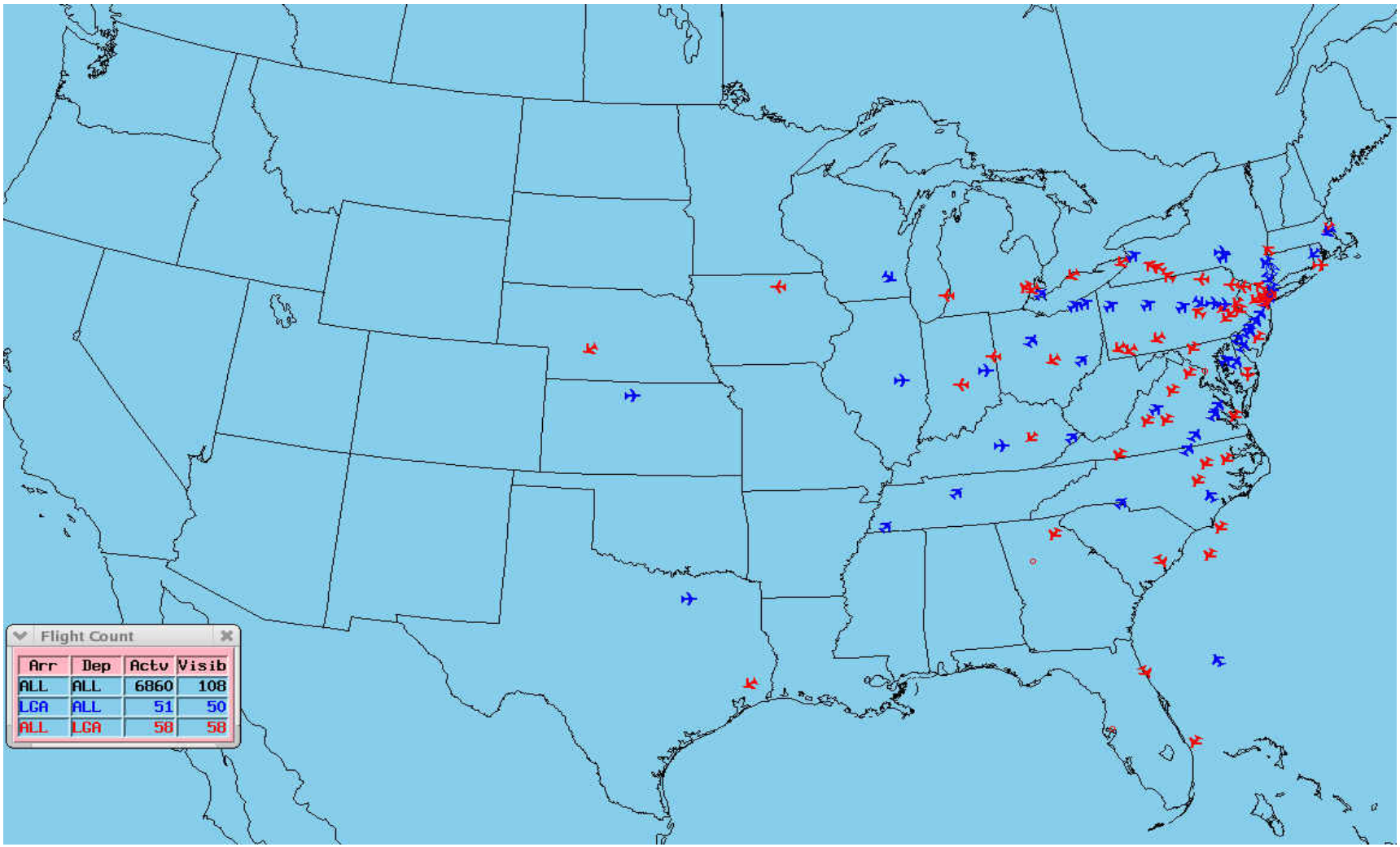
EWR Arrivals and Departures



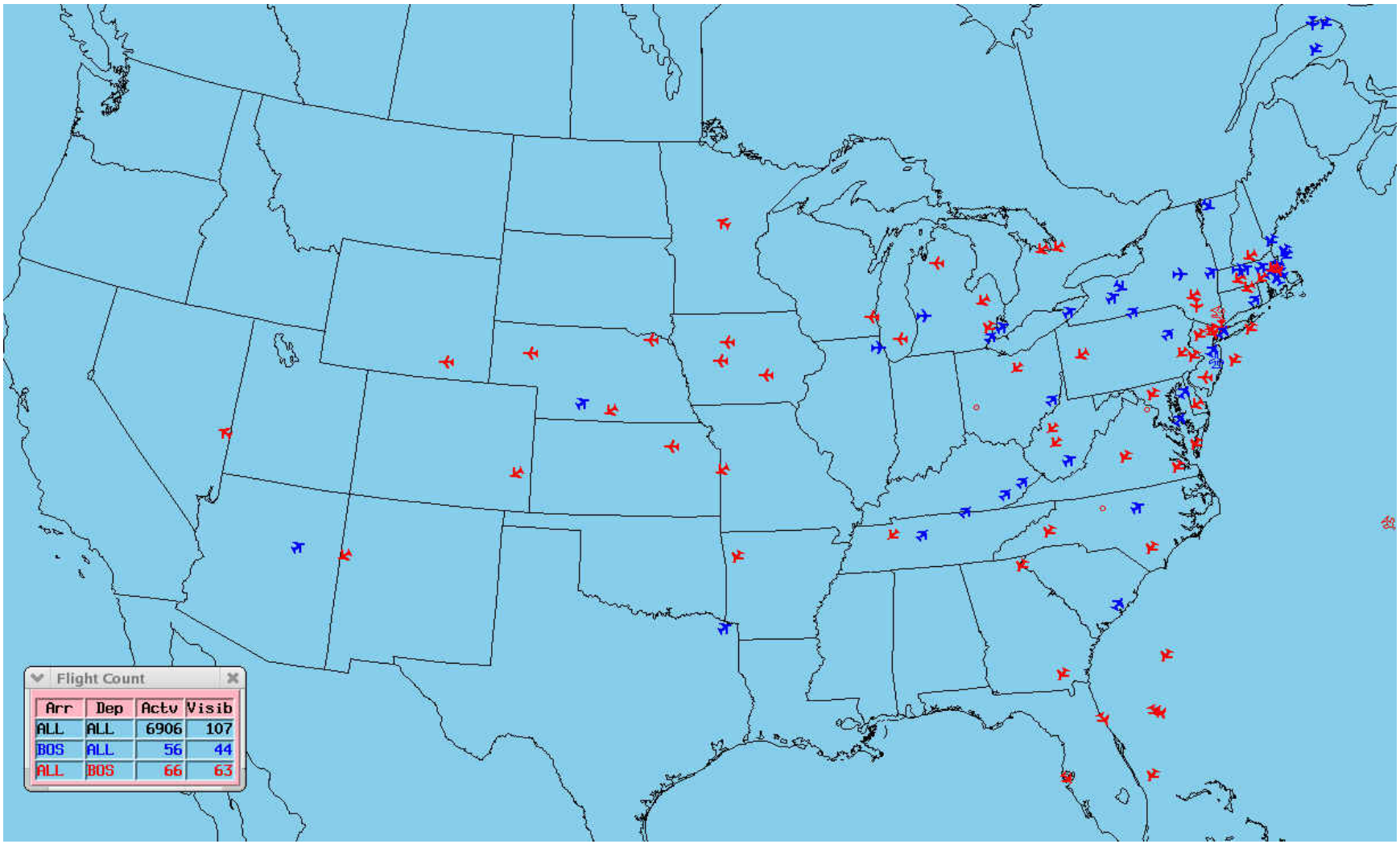
JFK Arrivals and Departures



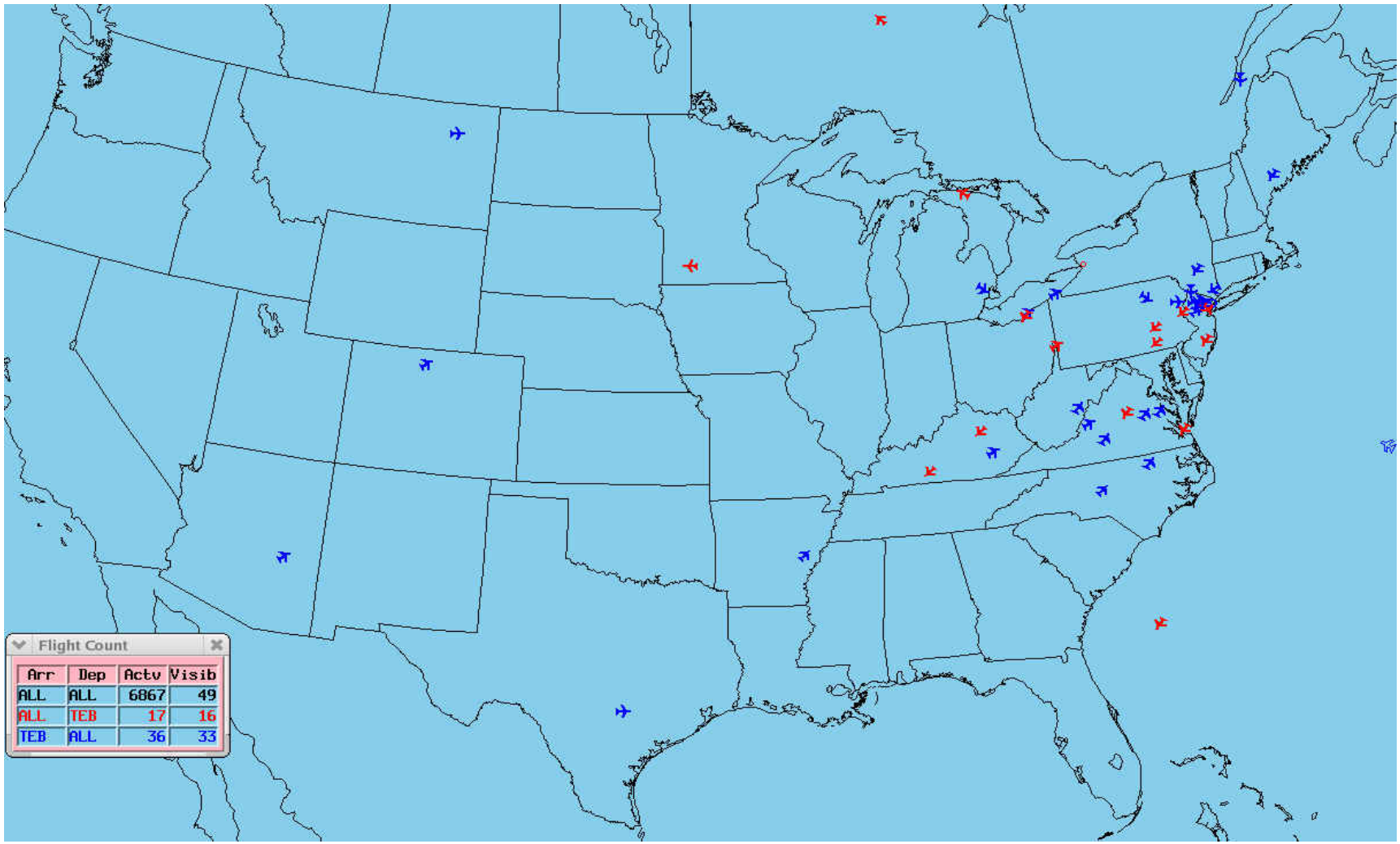
LGA Arrivals and Departures



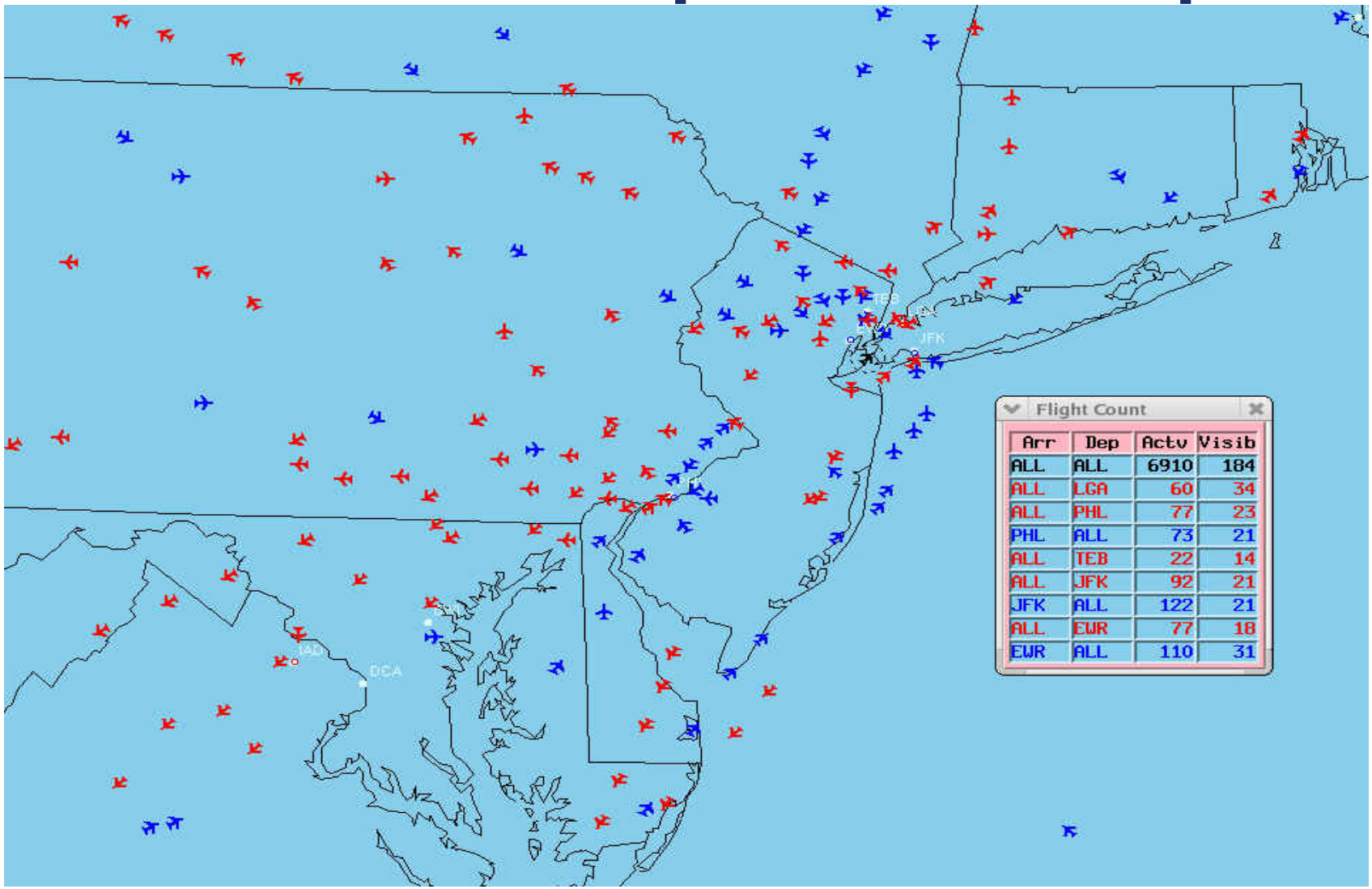
BOS Arrival and Departures



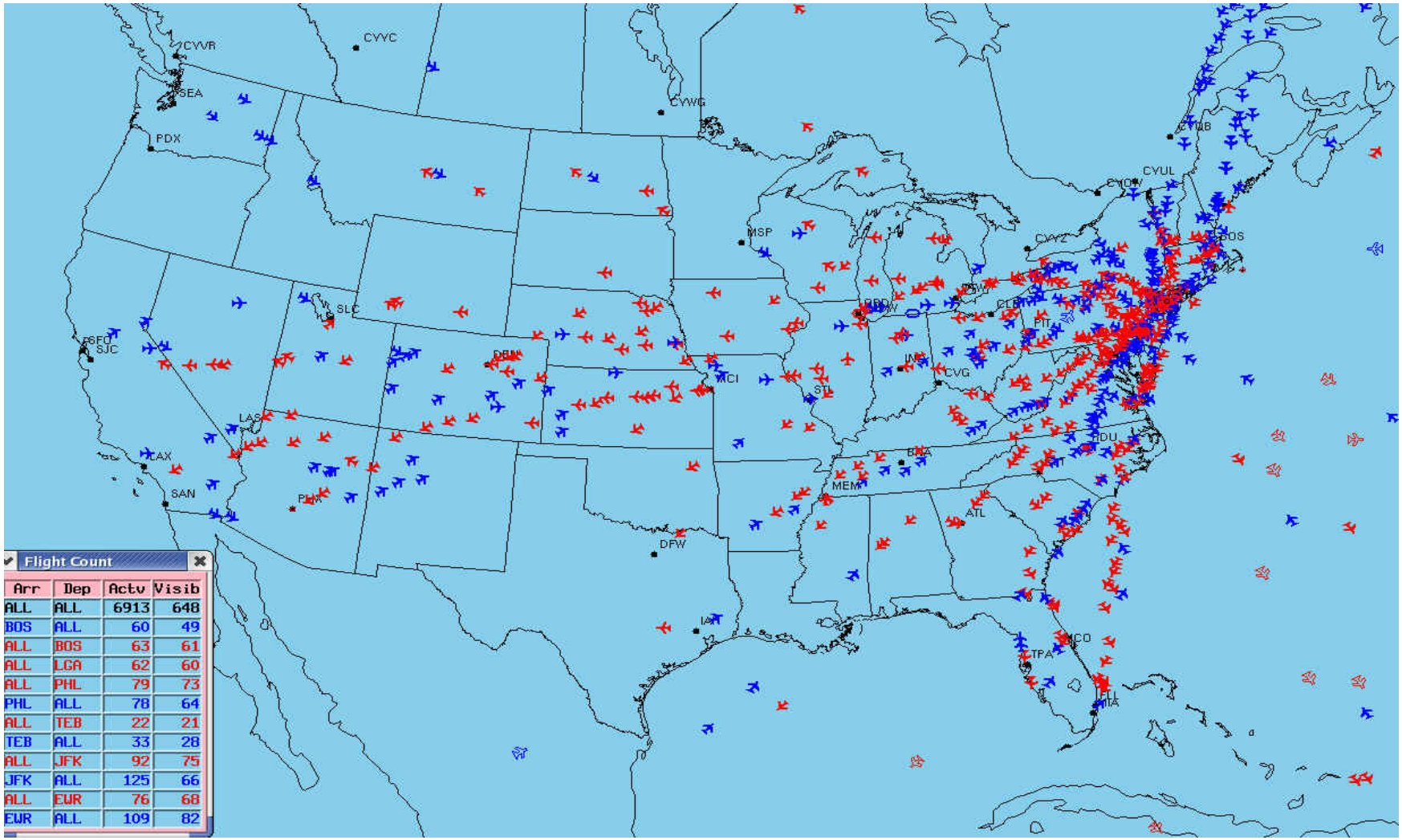
TEB Arrival and Departures



Northeast Airports Close Up

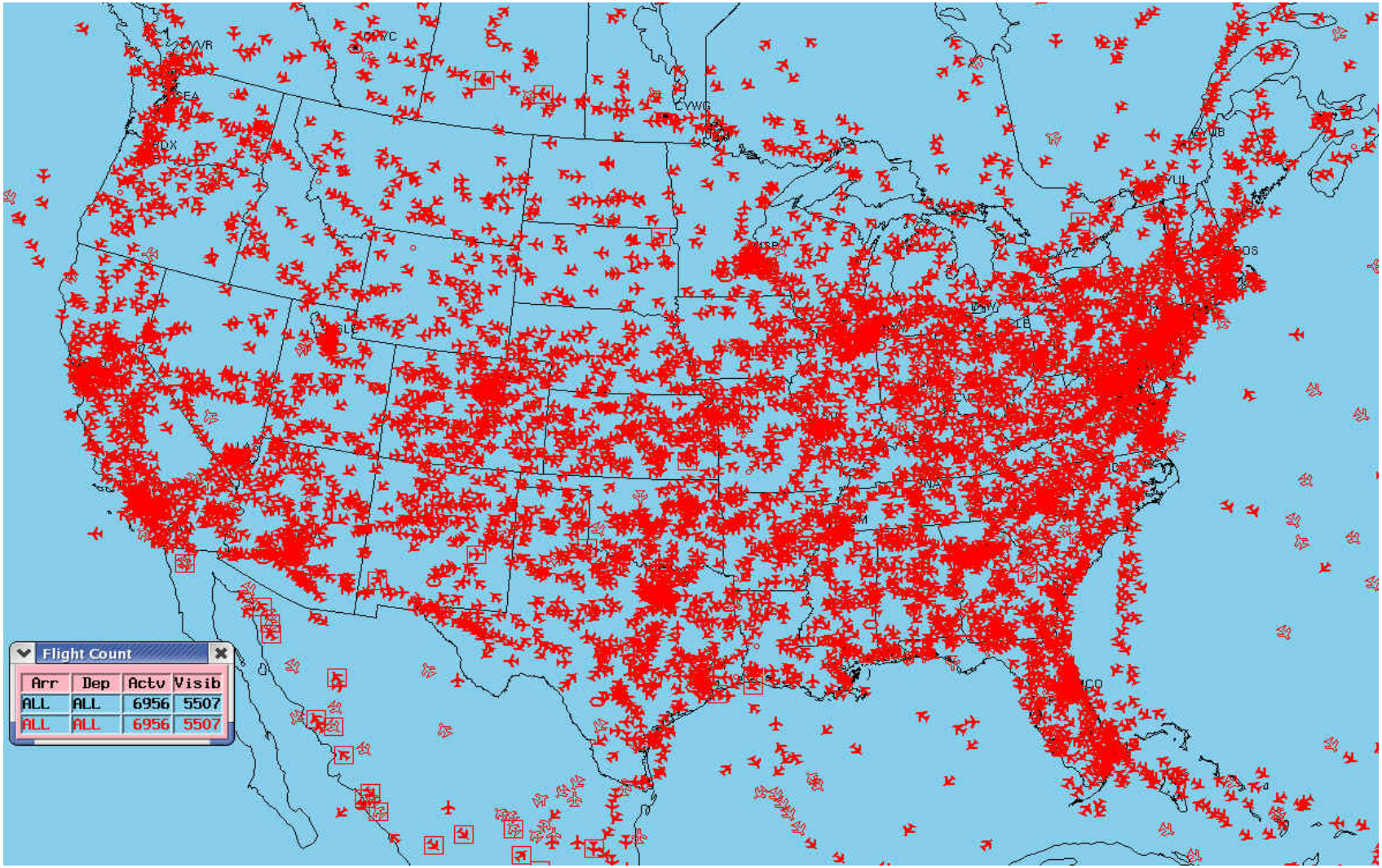


Northeast Airports Arrivals and Departures

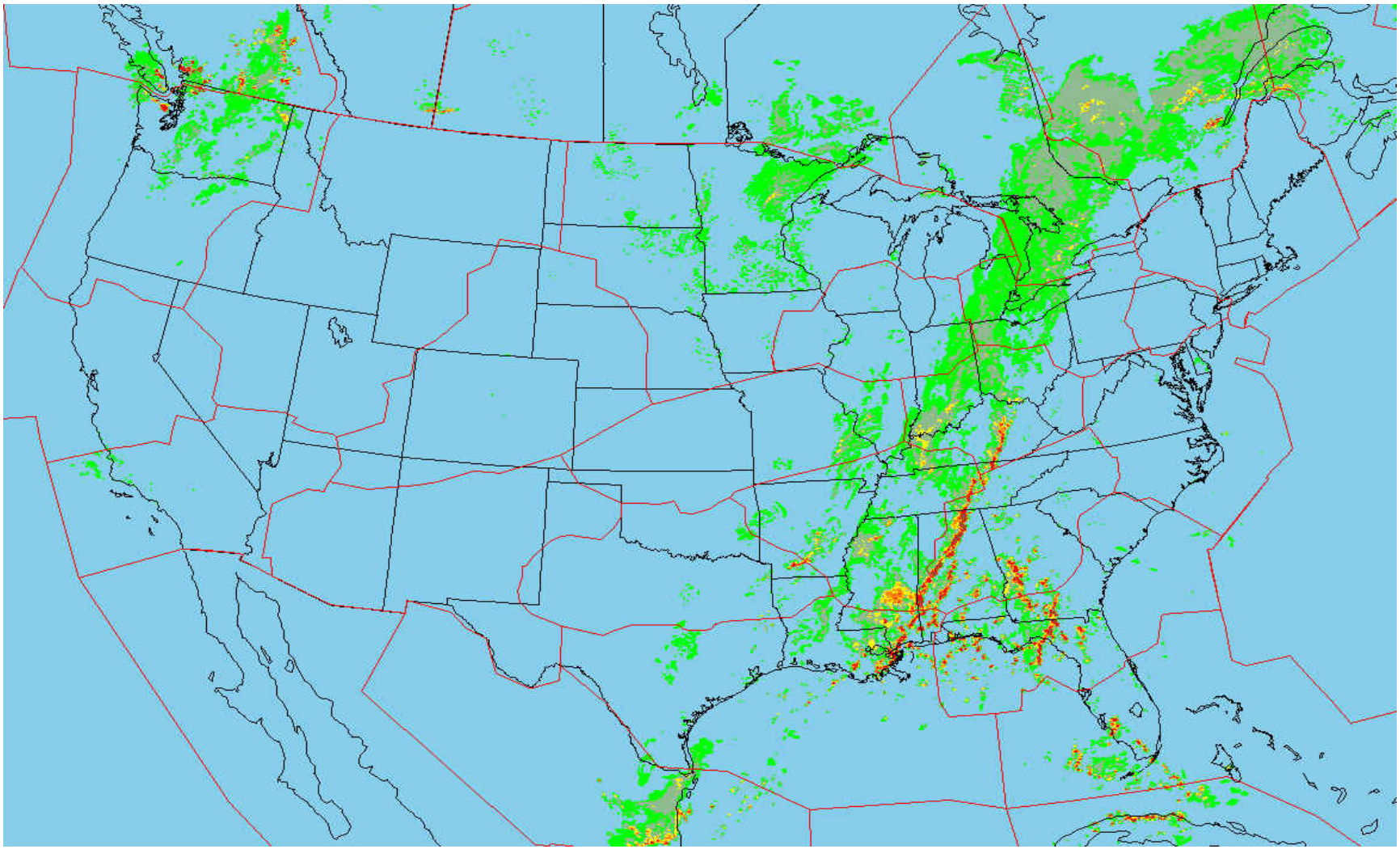


Arr	Dep	Actv	Visib
ALL	ALL	6913	648
BOS	ALL	60	49
ALL	BOS	63	61
ALL	LGA	62	60
ALL	PHL	79	73
PHL	ALL	78	64
ALL	TEB	22	21
TEB	ALL	33	28
ALL	JFK	92	75
JFK	ALL	125	66
ALL	EWR	76	68
EWR	ALL	109	82

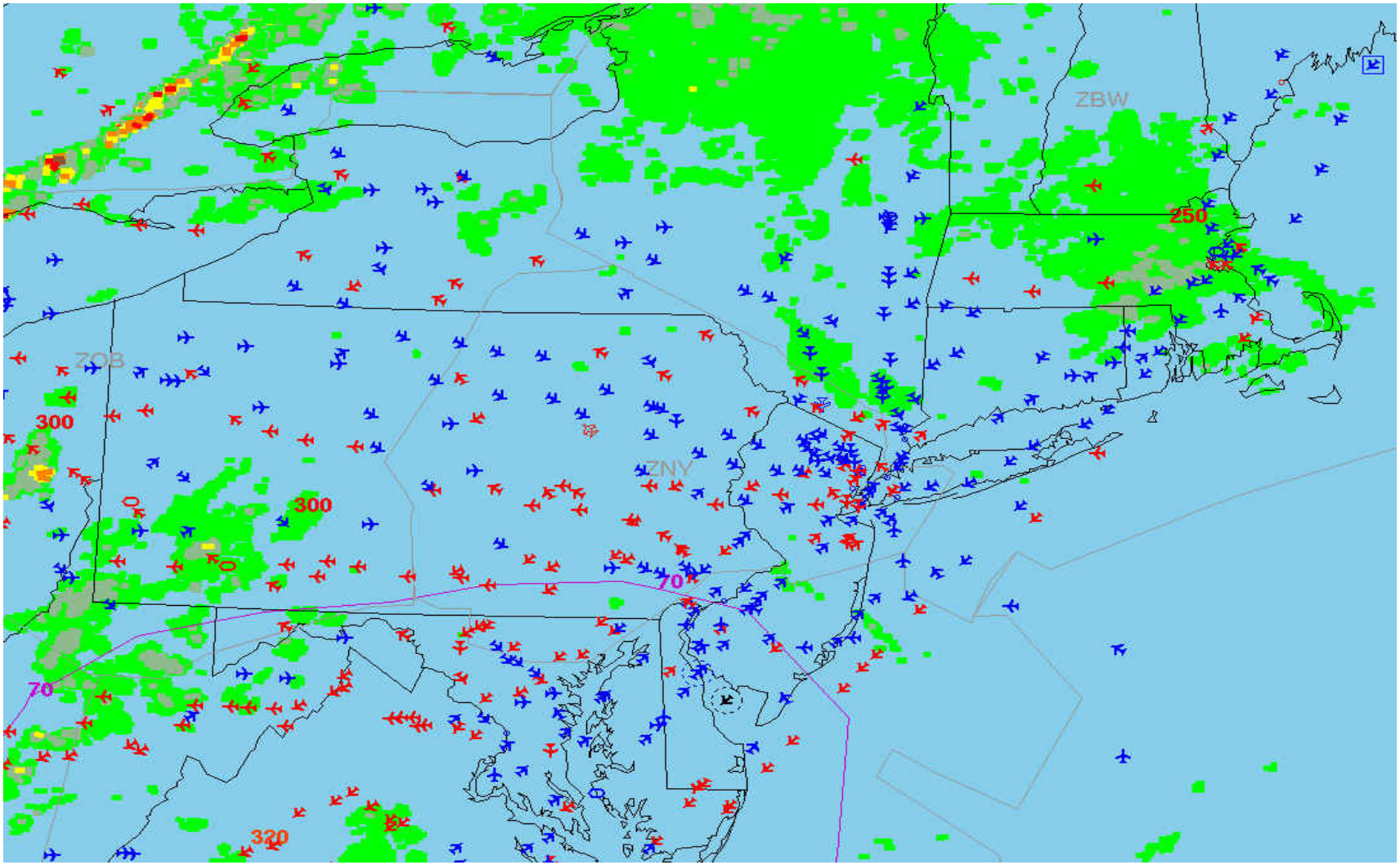
All Traffic


Flight Count
Arr Dep Actv Visib
ALL ALL 6956 5507
ALL ALL 6956 5507

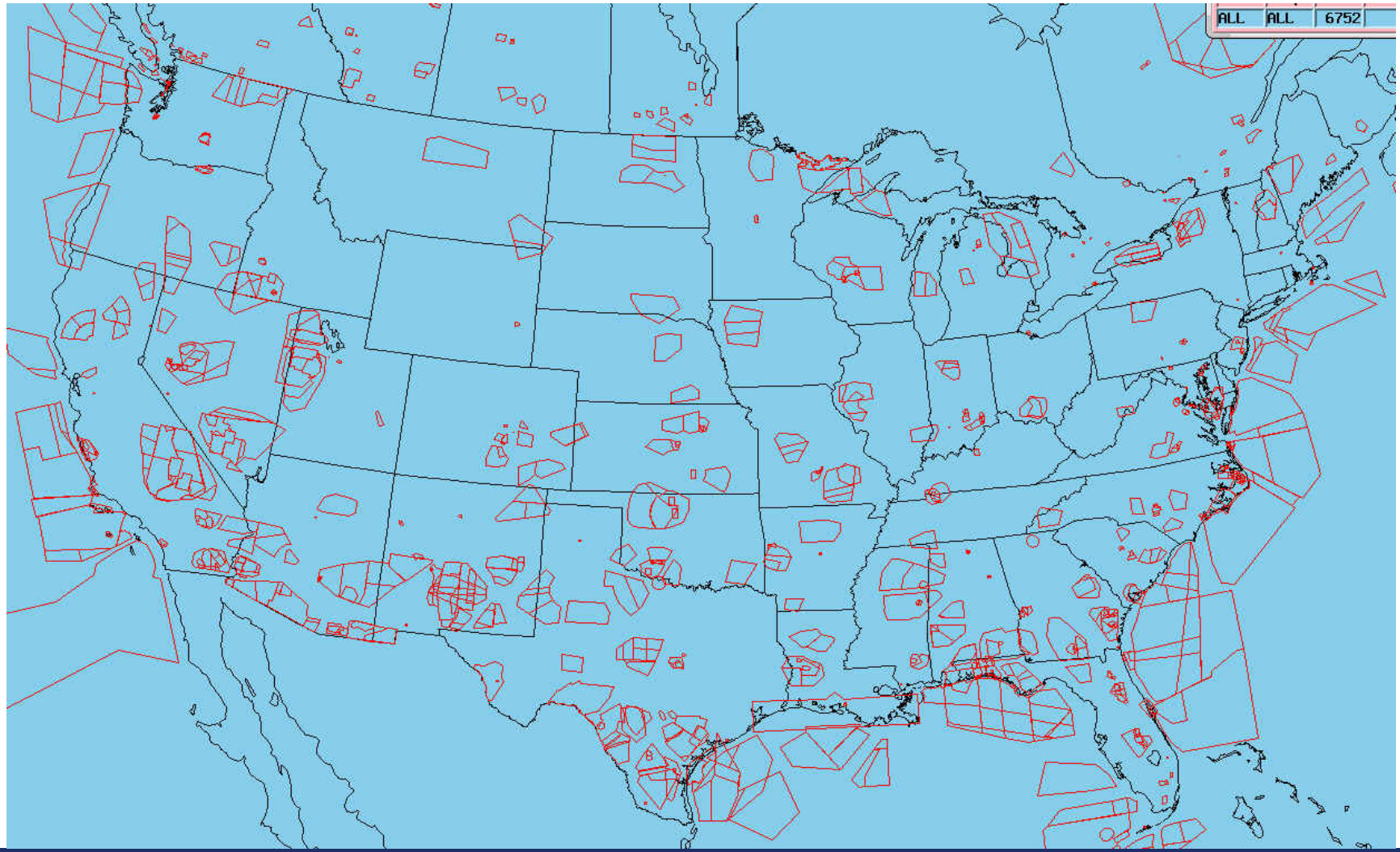
Convective Weather



All Northeast Airports with Weather



Military Airspace



Air Traffic Flow Management

- **Mission** - balance air traffic demand with system capacity to ensure a safe, efficient utilization of the National Airspace System.

- Appropriate application of traffic management initiatives provides operational benefits:
  - Minimizes delay and congestion
  - Increases throughput
  - Increases system safety
  - Lowers cost through fuel savings
  - Provides scheduling predictability

Air Traffic Flow Management

- ATFM supports the implementation of new technology and procedures that enhance airspace capacity such as:
  - RNAV
  - RNP
  - RVSM
  - CAATS
  - Shanwick System
  - A-380 construction
  - ERAM

Collaborative Decision Making

- The Traffic Flow Management operational philosophy, technologies, and procedures that enable the Federal Aviation Administration and the aviation industry to collaboratively manage operational constraints in a manner that balances operational efficiency with aviation safety.

- Collaborative decision making has become an integral part of our ATFM process. The success of our system relies on this collaboration

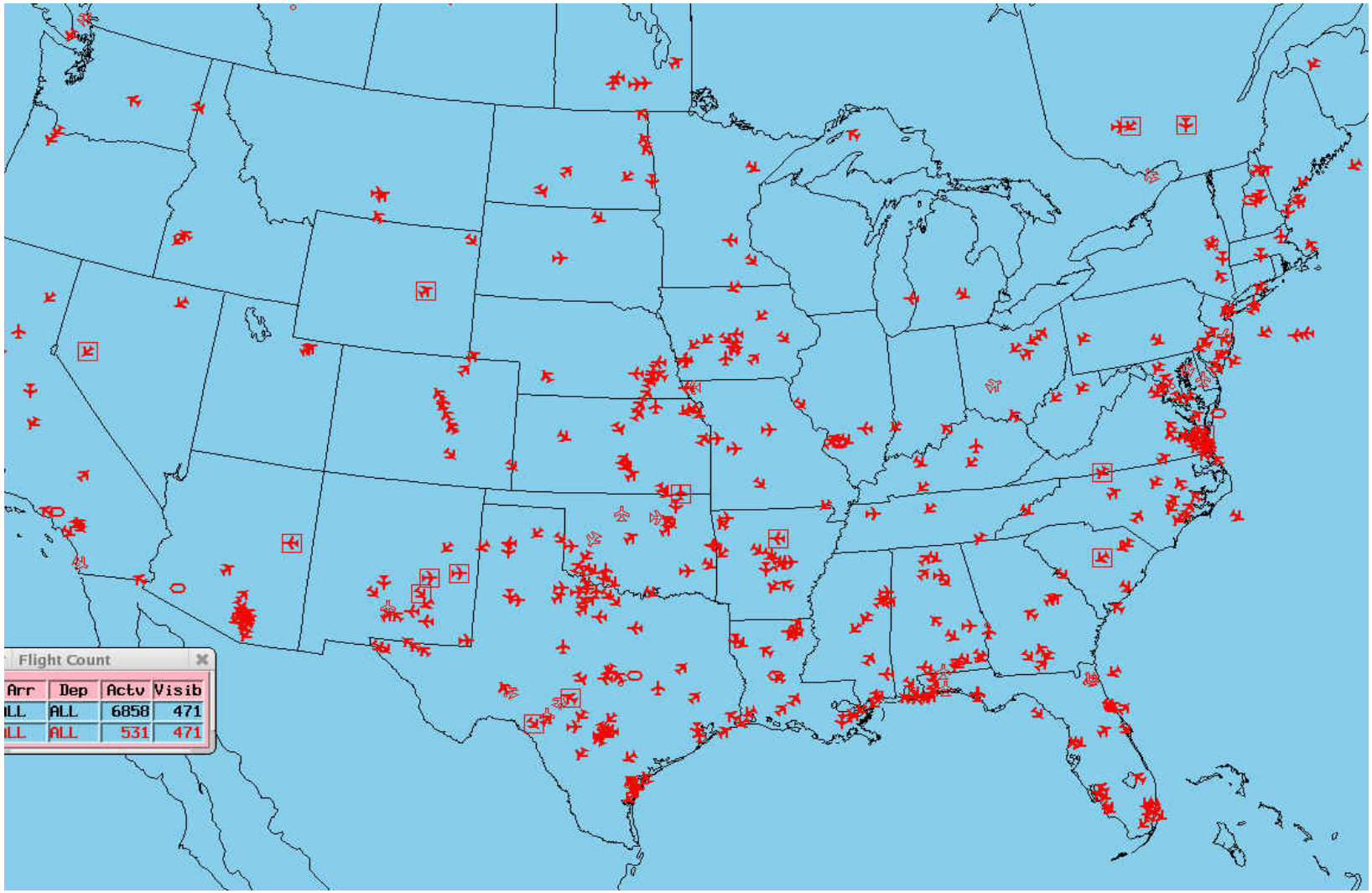
Benefit to the Customers

- Customers participate in the daily management of the NAS through
  - Daily weather assessment
  - Common situation display
  - Planning Telcons – conducted every two hours
  - Representatives located at the System Command Center [ATA, NBAA, Military Cell]
  - Direct access to the Tactical Customer Advocate
  - Access to FAA management through daily customer telecon
  - Participate in regular system improvement meetings

The Military as a Customer

- Military Air Traffic Services Cell
  - Housed within the System Command Center
  - Mission - To coordinate all priority military aircraft movement and airspace issues during times of tension, warfare, natural disasters or civil unrest.
  - Warfare Support
  - Deployment of forces
  - Sensitive, specialized, or classified mission coordination
  - Military training exercise support
  - Natural or environmental disaster assistance
  - Civil exercise collaboration involving military participation

Military Aircraft



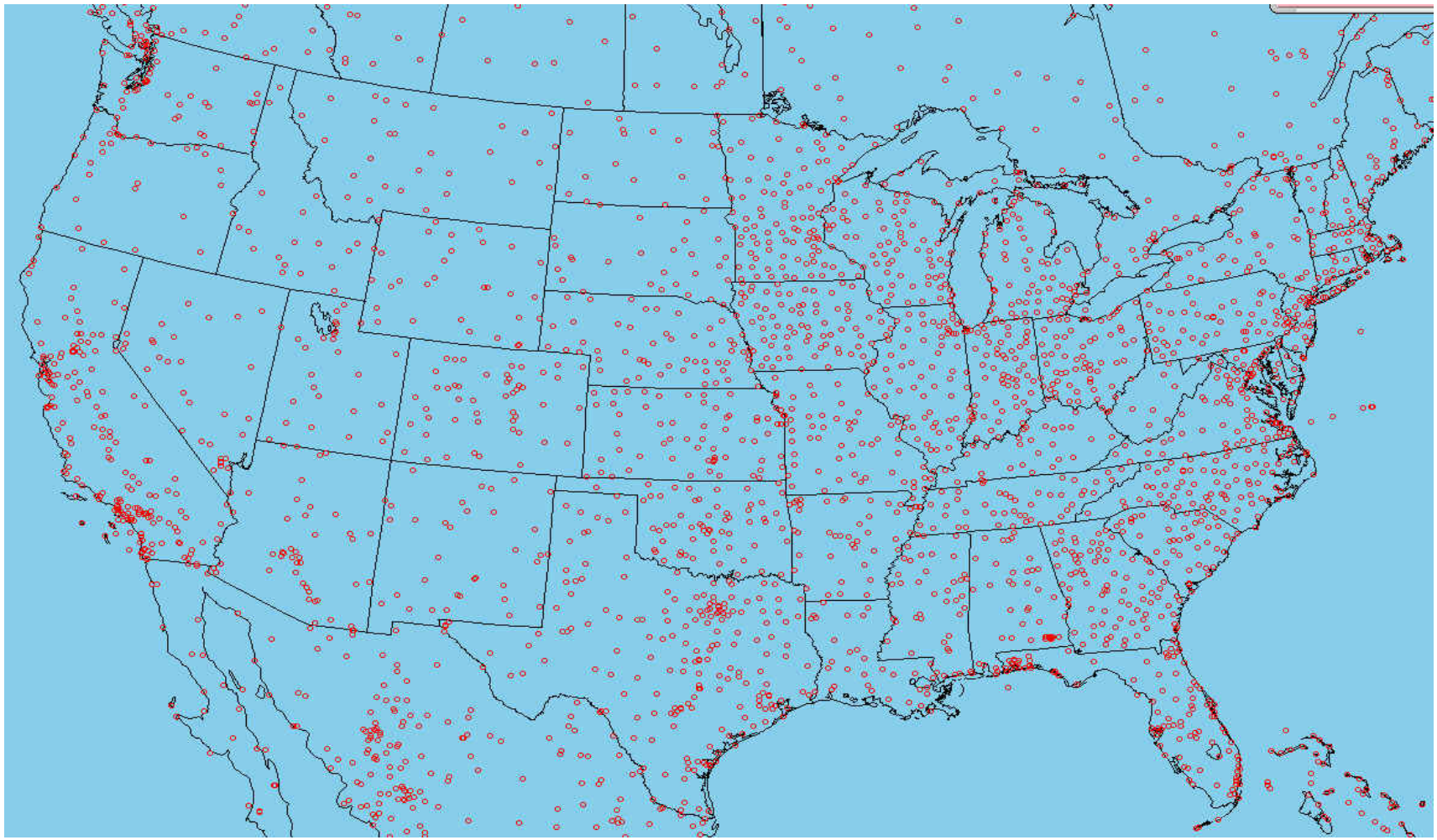
The Customer's Role

- Customer participation through direct representation within the System Command Center via
  - National Business Aviation Association
  - Air transport Association
  - Military Cell
- Airline Operations Center participation in Planning Teleconferences conducted every 2 hours
- Participate in localized teleconferences directly with Tower, TRACON, Centers, and Command Center during establishment of traffic management initiatives
- Direct access to Tactical Customer Advocate for extraordinary issues
- Common shared situational data for planning purposes

Who's Involved

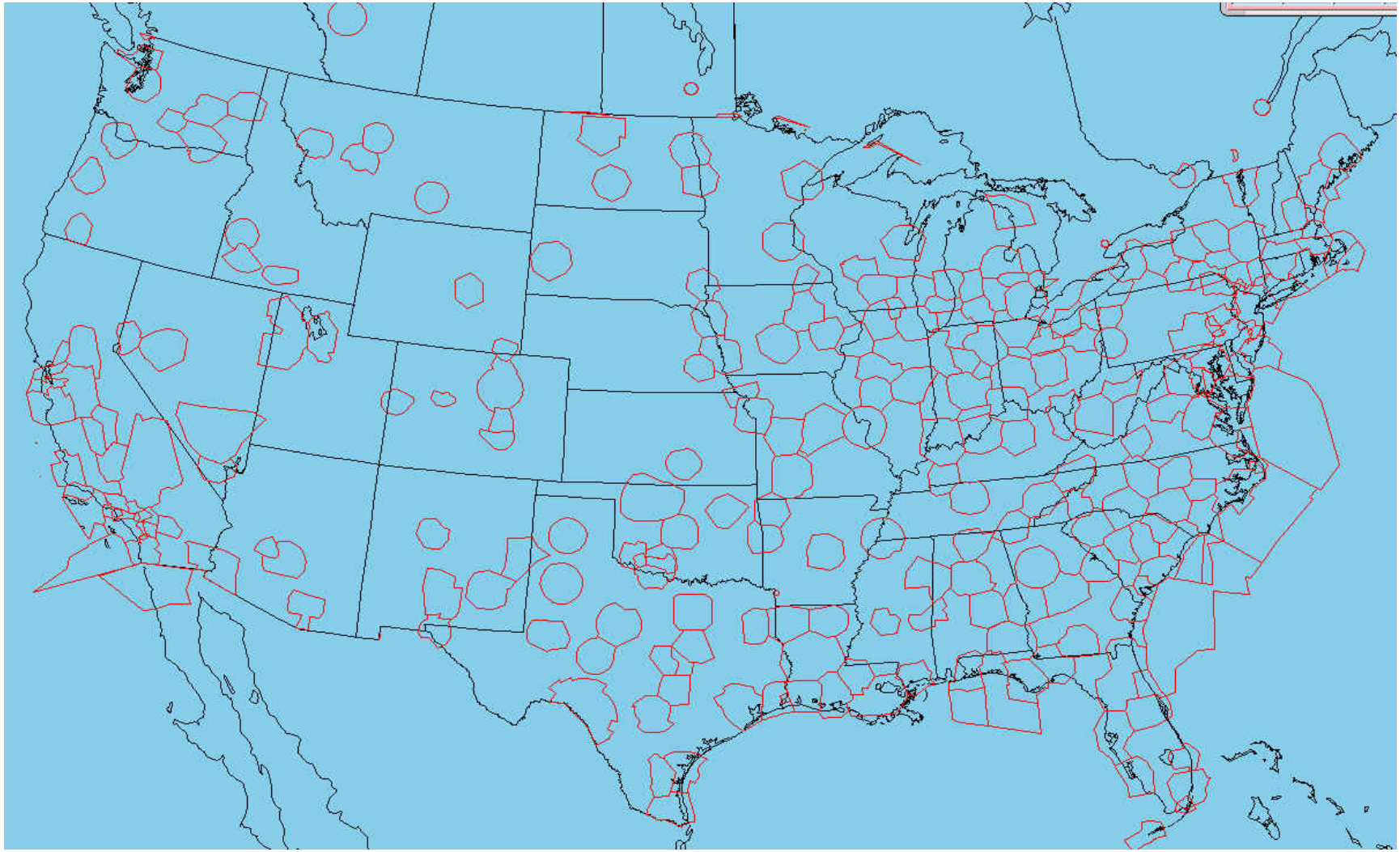
- **Terminal/TRACON**
- **Enroute**
- **Command Center**
- **Director Tactical Operations**
- **Customers**
  - Civil
  - Military

Approx. 5,000 Airports
125 FAA staffed 235 Federal Contract



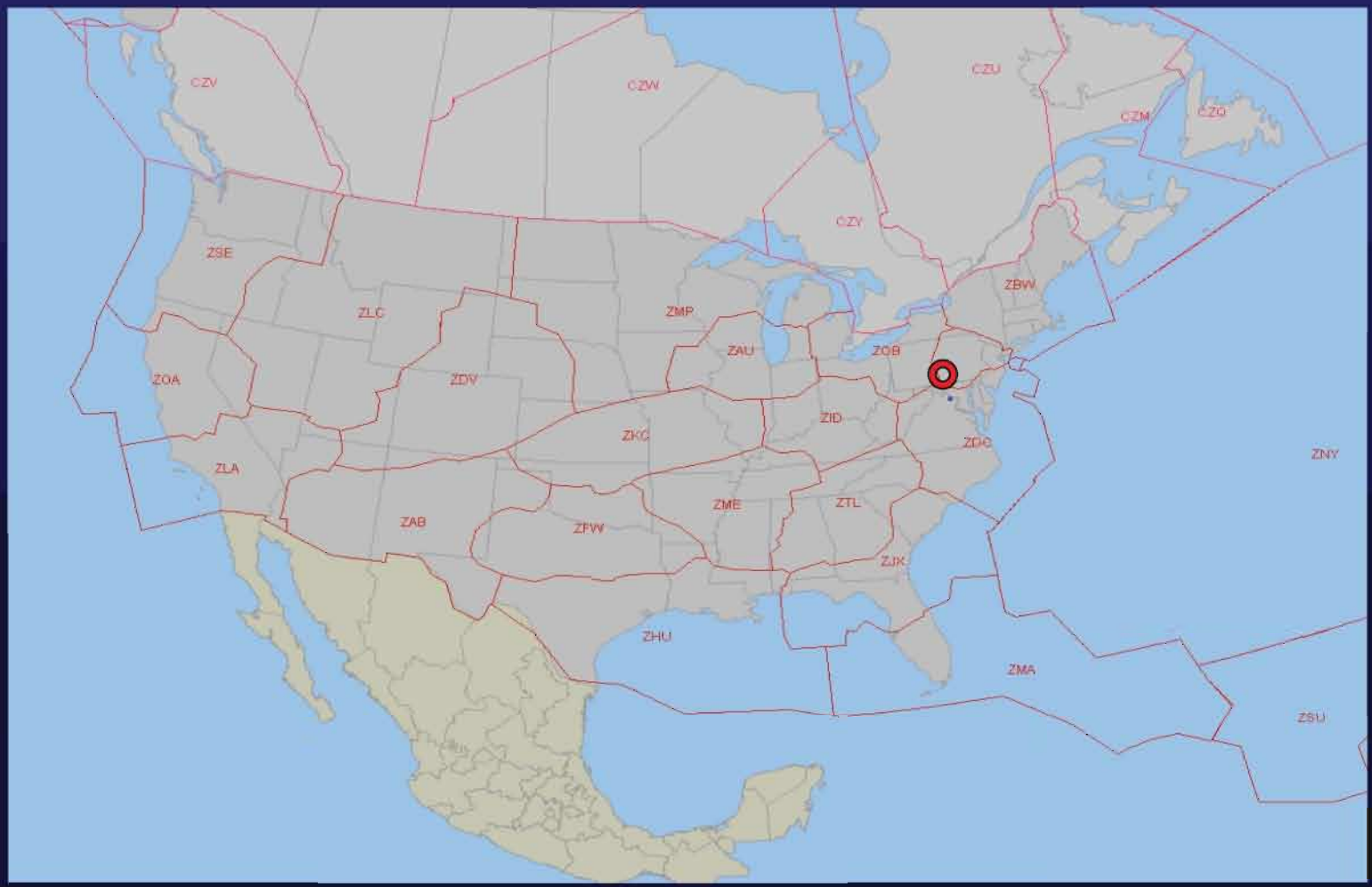
35 Primary Airports

Approx. 170 TRACONs



Air Traffic Hierarchy

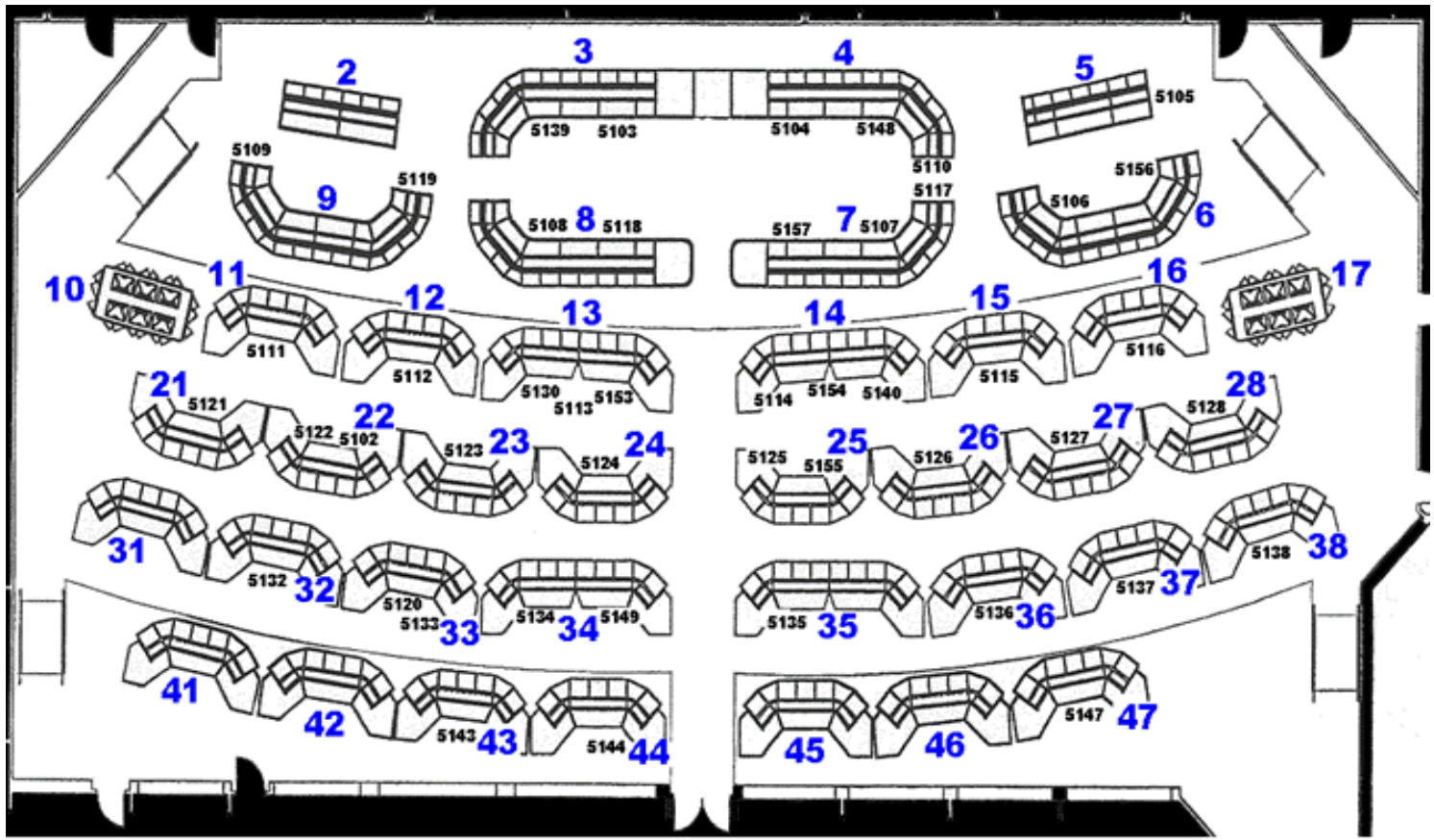
Tower – TRACON – Center – ATCSCC - DTO



Air Traffic Organizational Structure

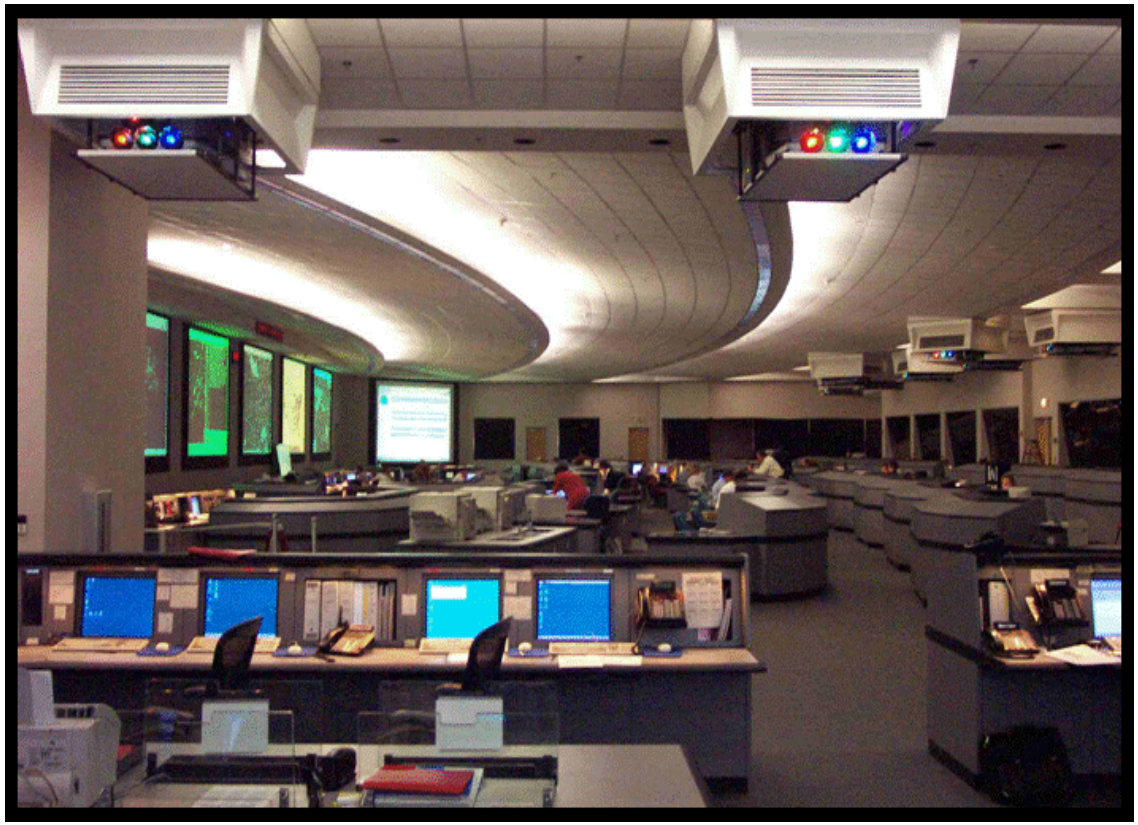
- Air Traffic Control System Command Center
  - National Operations Manager
  - Operations Planning Team
  - Traffic Management Coordinators/Severe Weather Specialists
  - Tactical Customer Advocate
  - Central Altitude Reservation Facility
- All 21 Air Route Traffic Control Centers have Traffic Management Units
- All major TRACONs and Towers have Traffic Management Units
- Manager, Tactical Operations – 5 regional representatives.

Air Traffic Control System Command Center (ATCSCC)



Applying ATFM

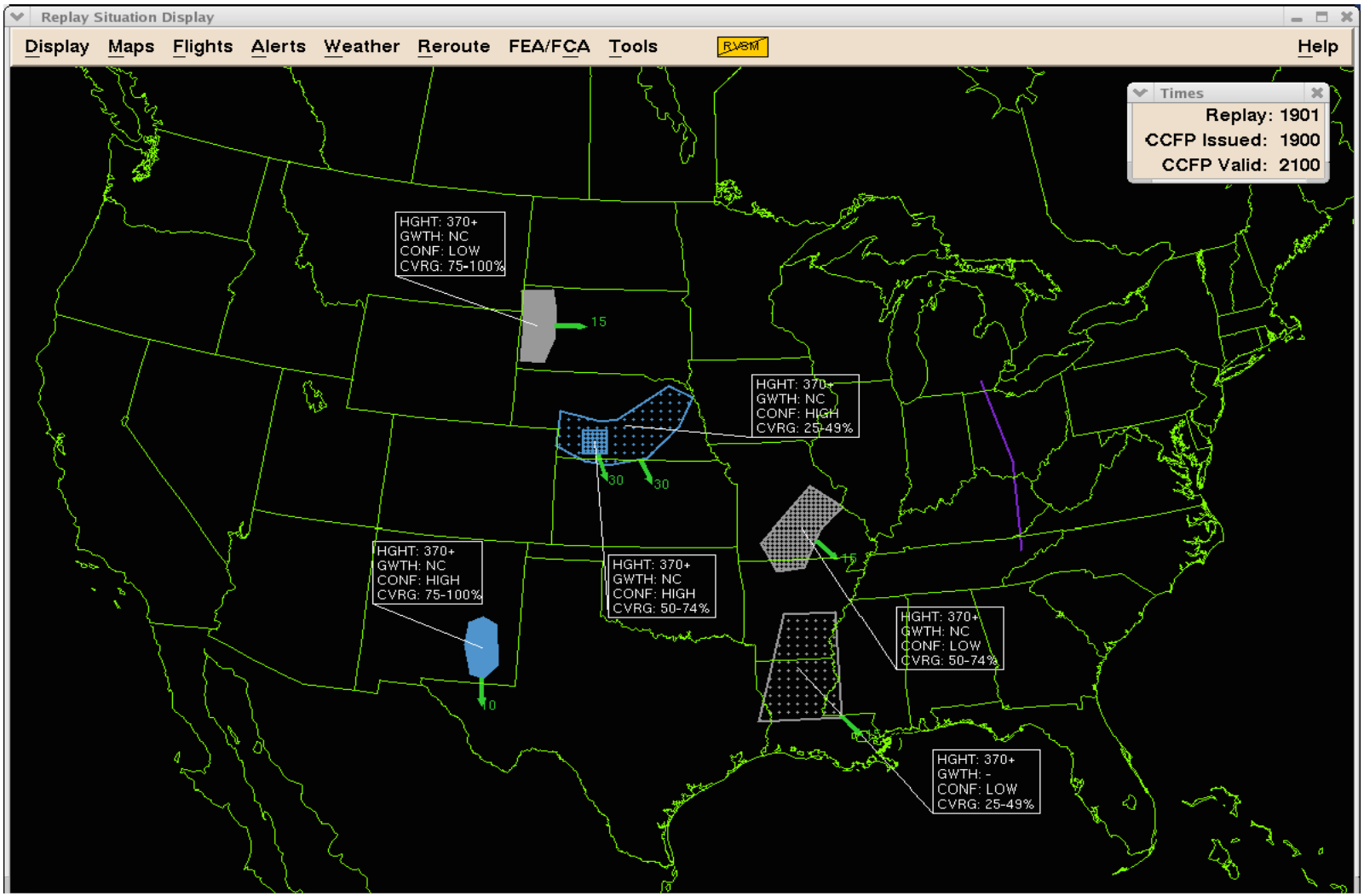
- **Planning**
- **Coordination**
- **Tools**



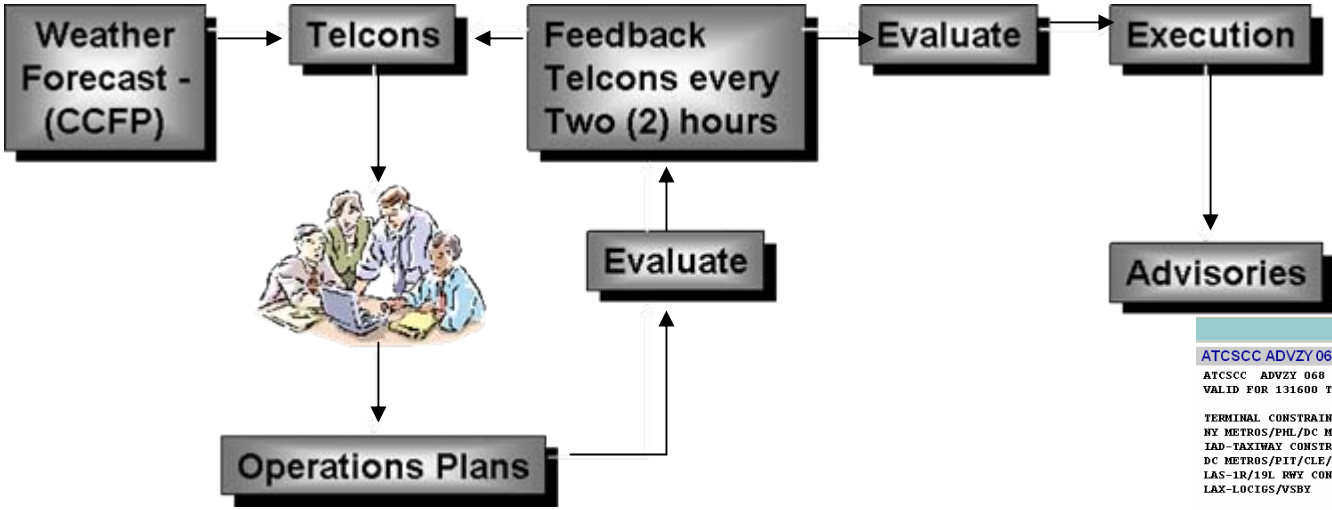
Applying ATFM Planning and Coordination

- Day begins with collaborative discussion on forecasted weather impacts to the system, with continuous review throughout the day.
- Operations Plan is developed with customers, field facilities and the System Command Center.
- Plan is revisited and updated every 2 hours throughout the day.
- Specific airport and regional initiatives are managed by Traffic Management Coordinators and field facility experts in collaboration with the customers
- Capacity and constraint data is shared via automated means with all parties

Collaborative Convective Forecast Product



Planning Process



ATCSCC Advisory

ATCSCC ADVZY 068 DCC 07/13/2005 OPERATIONS PLAN

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ATCSCC  ADVZY 068 DCC 07/13/05 OPERATIONS PLAN
VALID FOR 131600 THRU 132200

TERMINAL CONSTRAINTS:
NY METROS/PHL/DC METROS/ATL/PHL/CVG-LOCIGS
IAD-TAXIWAY CONSTRUCTION
DC METROS/PIT/CLE/DTW/ATL/MCO/IAH/DFW-TSTMS
LAS-1R/19L RWY CONSTRUCTION
LAX-LOCIGS/VSBY

ENROUTE CONSTRAINTS:
ZBW/ZNY/ZDC/ZJX/ZMA/ZTL/ZME/ZFW/ZHU/ZLC/ZAB-TSTMS
A761-TSTMS
R763-CLSD TILL 1900 DUE TO TSTMS
ZJX/ZMA-SPACE SHUTTLE LAUNCH

1. ROUTES
1800-0000       -CHOKEPOINT ROUTES TO EWR/JFK (FCA)
AFTER 1800      -SNOWBIRD 6 PLAYBOOK ROUTES PSBL
AFTER 1600      -NRP SUSPENDED VIA J29 ZFW/ZHU/ZME TO NORTHEAST
AFTER 1700      -POSSIBLE PLAYBOOK ROUTES, INCLUDING MGM AND/OR
                 CANADIAN ROUTES TO THE NORTHEAST POSSIBLE

2. ZNY
UNTIL 0300      -LGA/EWR/PHL GROUND DELAY PROGRAMS
UNTIL 0200      -NY METROS/PHL CDRS/SWAP, GROUND STOPS PSBL
AFTER 1700      -JFK GROUND DELAY PROGRAM PSBL
UNTIL 0000      -TEB GAAP GROUND DELAY PROGRAM EXPECTED

3. ZOB
AFTER 1900      -DTW/CLE/PIT CDRS/SWAP, TACTICAL REROUTES, CAPPING/
                 TUNNELING, GROUND STOPS PSBL

4. ZTL
UNTIL 0400      -ATL GROUND DELAY PROGRAM
UNTIL 0000      -ATL CDRS/SWAP, GROUND STOPS PROBABLE
AFTER 1800      -CLT CDRS/SWAP, TACTICAL REROUTES

5. ZJX/ZMA
UNTIL 2300      -TACTICAL REROUTES, CAPPING/TUNNELING

*** SUBMIT NEW OPERATIONS PLAN AGENDA ITEMS VIA OIS PAGE ***

NEXT PLANNING TELCON: 131715Z
PARTICIPATION REQUIRED BY: ALL CENTERS/N90
131545-131759
05/07/13 15:45  FSA.//lxstn08a
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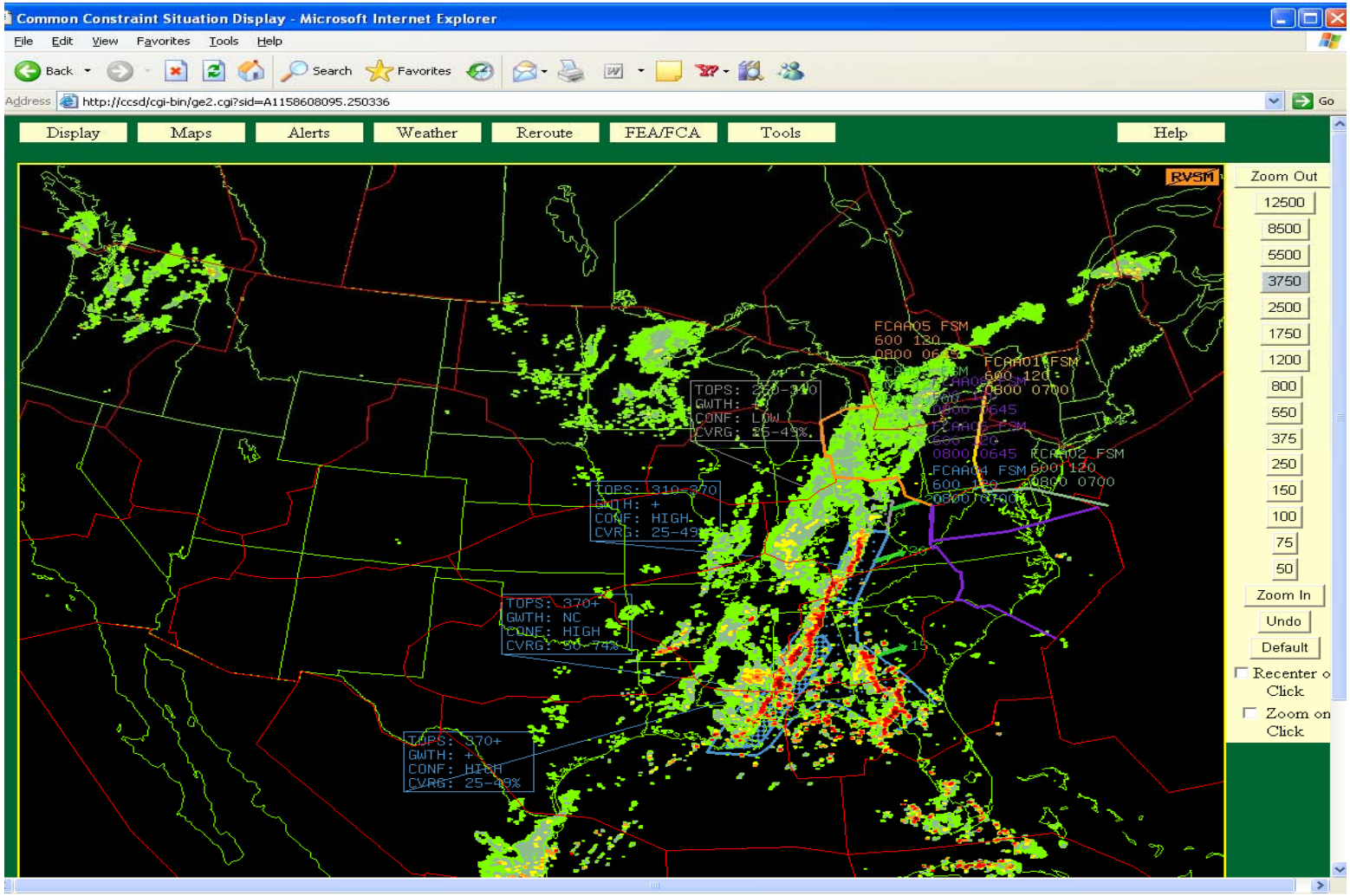
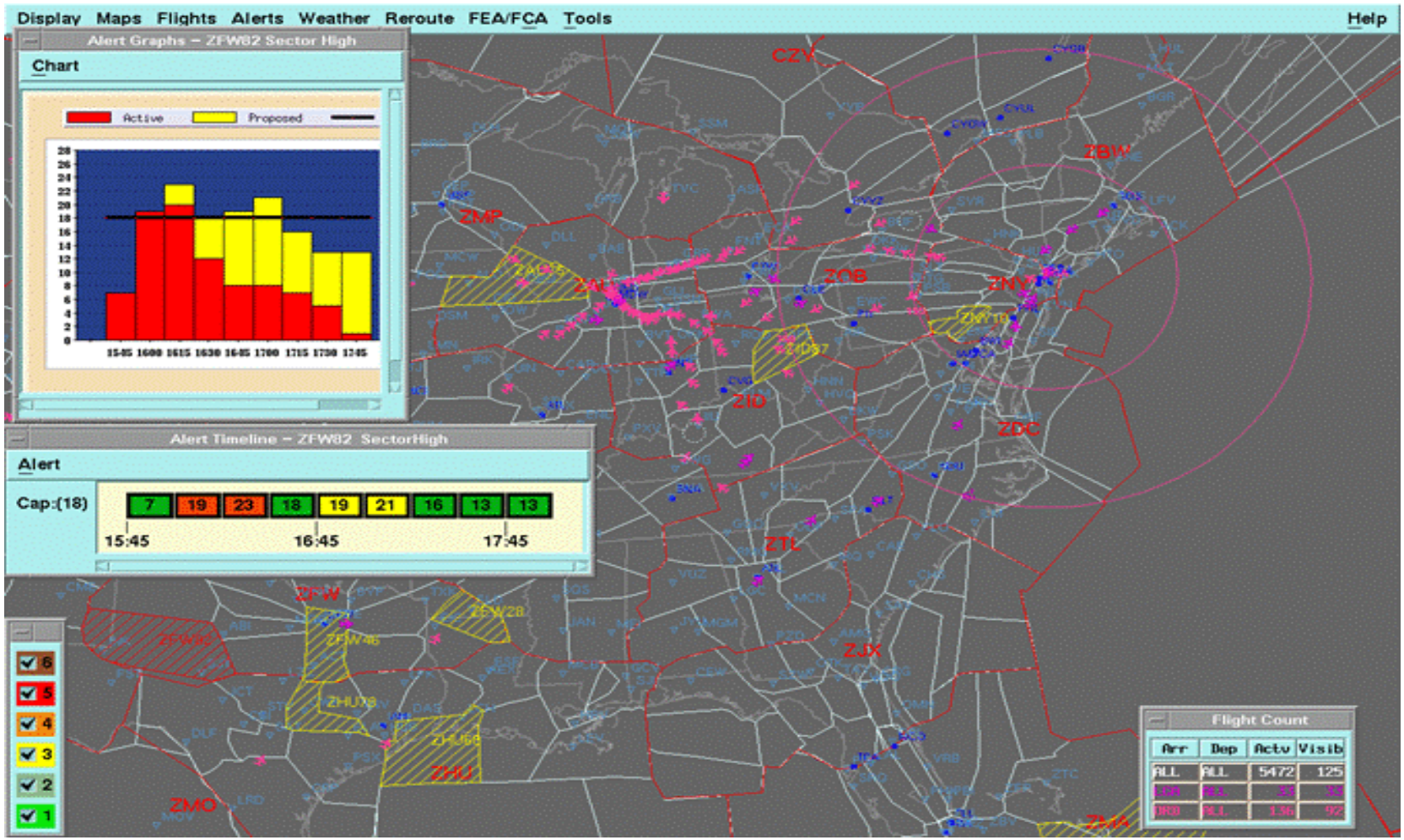
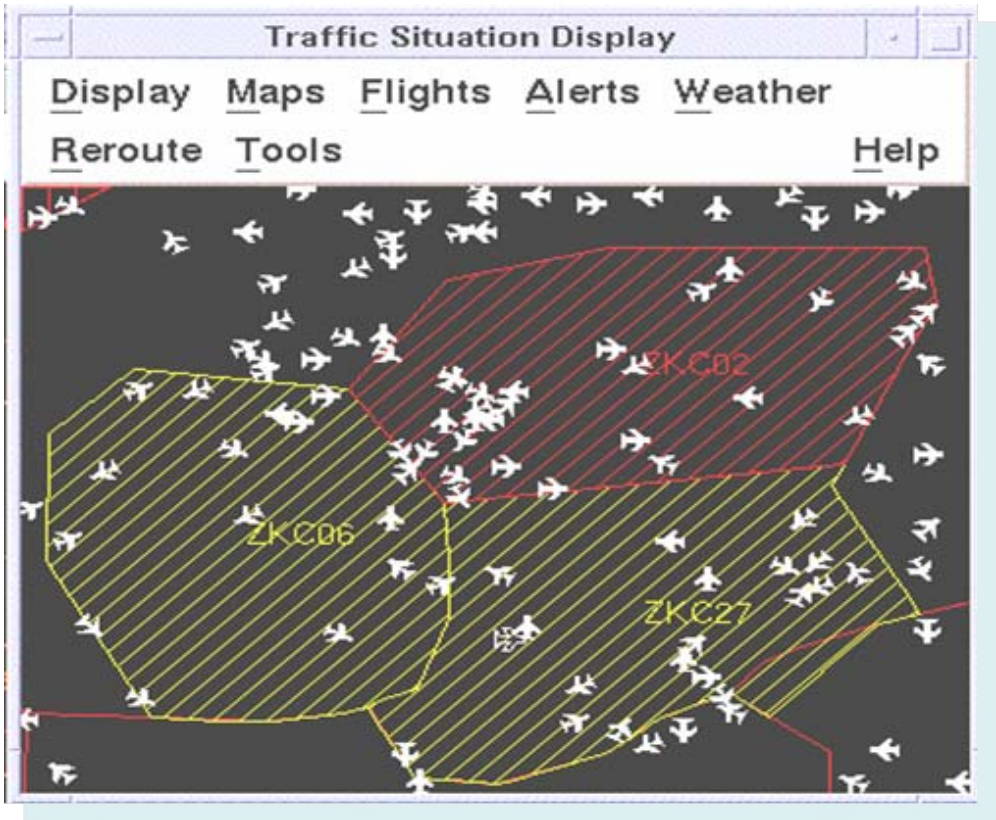
Common Situation Display



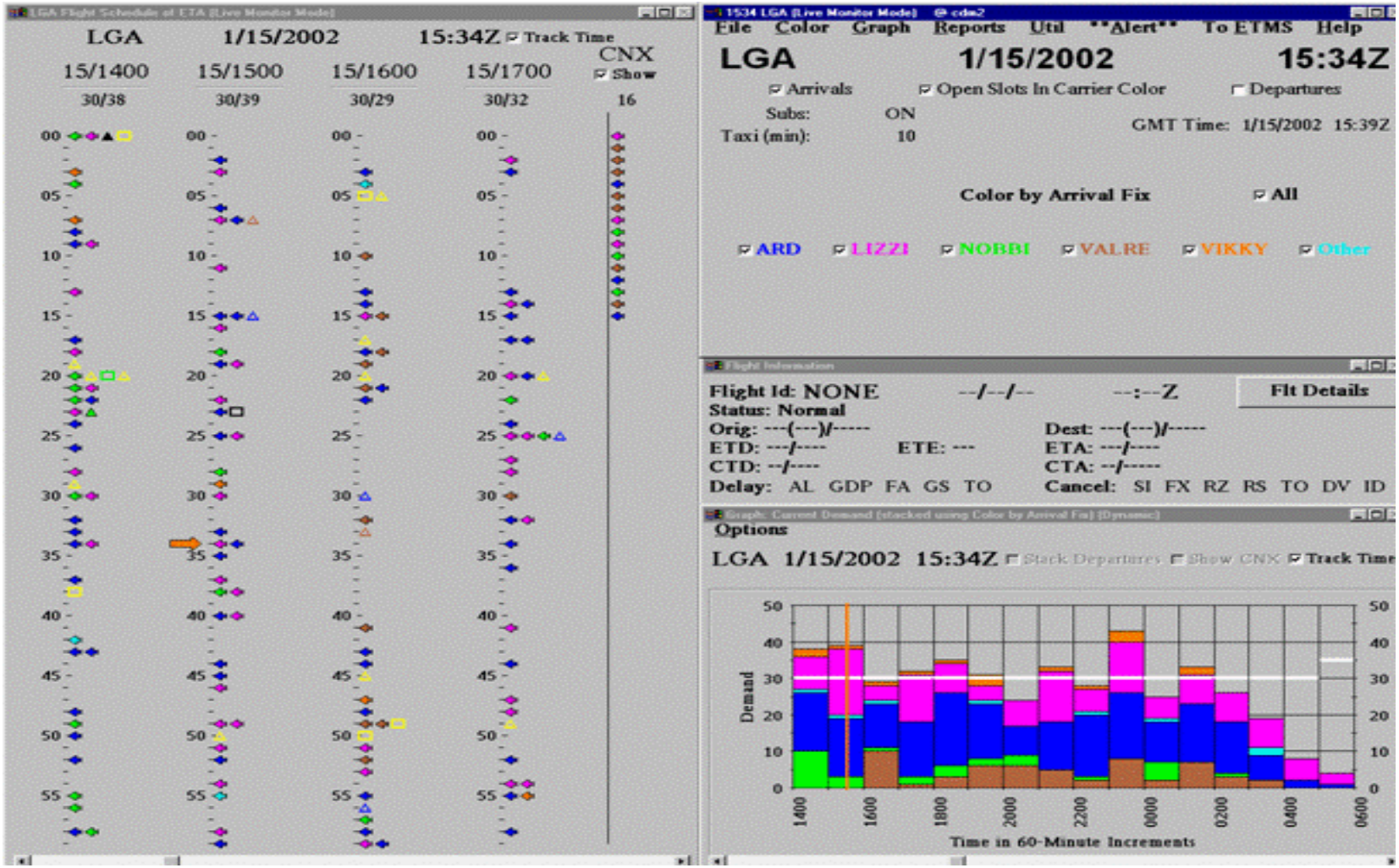
Enhanced Traffic Management System (ETMS)



Enhanced Traffic Management System (ETMS)



Flight Schedule Monitor

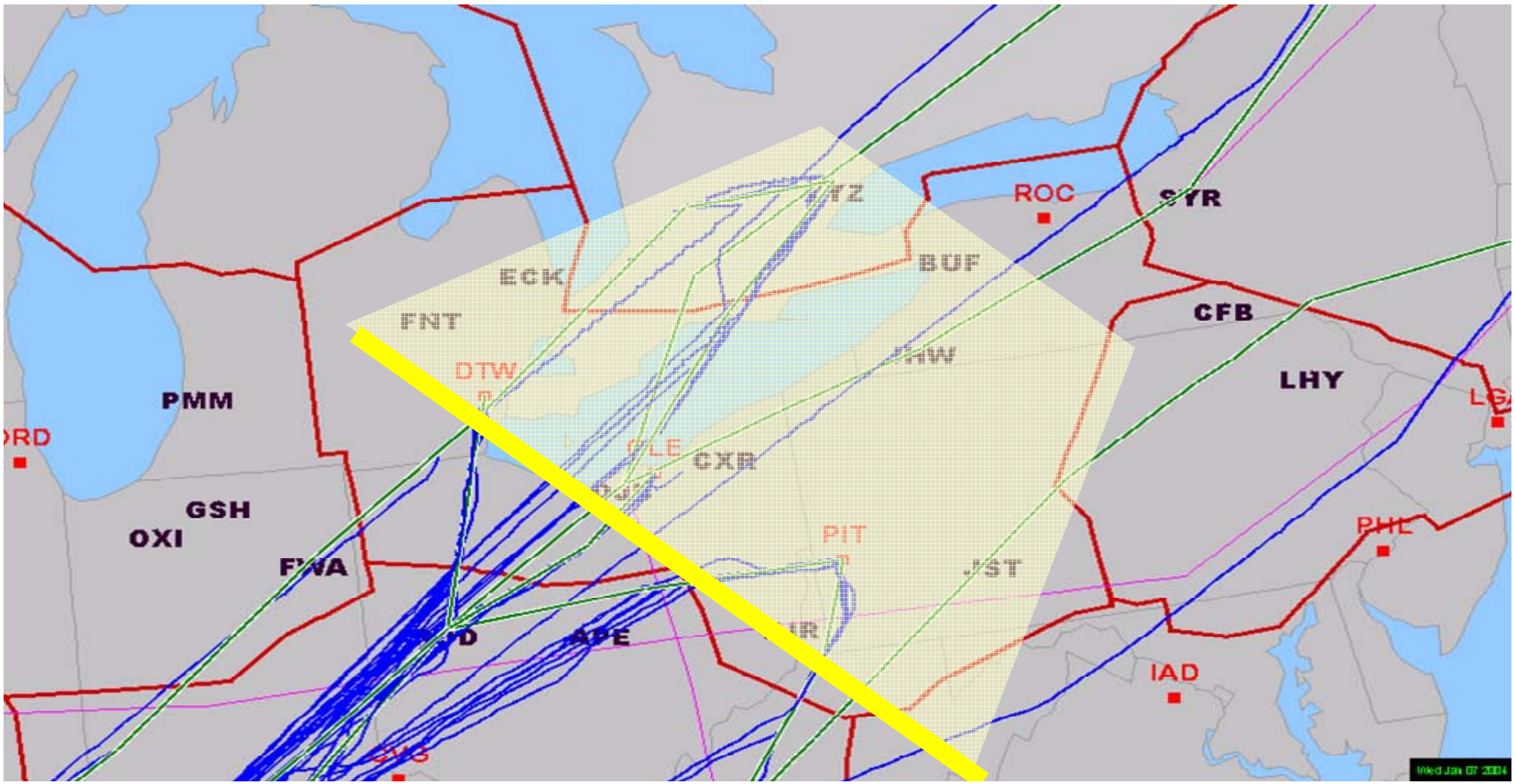


Flow Evaluation Area/Flow Constrained Area

- FEA – Geographic area identified as being impacted by weather or other constraint, is shared with customers and FAA facilities to allow voluntary rerouting away from impacted area.
- FCA – A formalized FEA which requires positive traffic management initiatives to meter traffic through constrained area

- Initiatives applied may be
  - **Miles-in-trail or minutes-in-trail.**
  - **Capping altitude below impacted area**
  - **Tunneling through designated corridors**
  - **Ground delay programs and/or ground stops**

Flow Evaluation Area



National Playbook

Playbook
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National PlayBook Menu
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    - ATL HONIE-LGC
    - BOS ORW
    - BOS ORW-SCUPP
    - CVG CINCE 1
    - CVG CINCE 2
    - CVG EAST
    - CVG MOSEY
    - CVG SWEED 1
    - CVG SWEED 2
    - CVG TARNE
    - DEN OBH
    - DEN ONL
    - DFW BYP 1
    - DFW BYP 2
    - DFW CQY
    - DFW EAST 1
    - DFW EAST 2
    - DFW JEN
    - DFW UKW
    - DFW WEST
    - DTW CETUS
    - DTW EAST
    - DTW MIZAR
    - DTW SPICA
    - IAD MULRR 1
    - IAD MULRR 2
    - IAD MULRR 3

Air Traffic Control System

Command Center

National Severe Weather

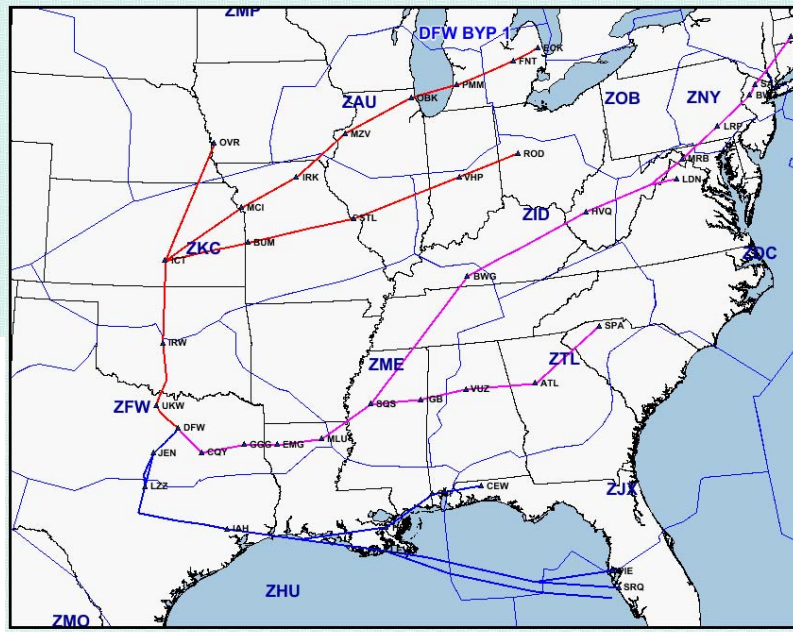
Playbook

DFW BYP 1

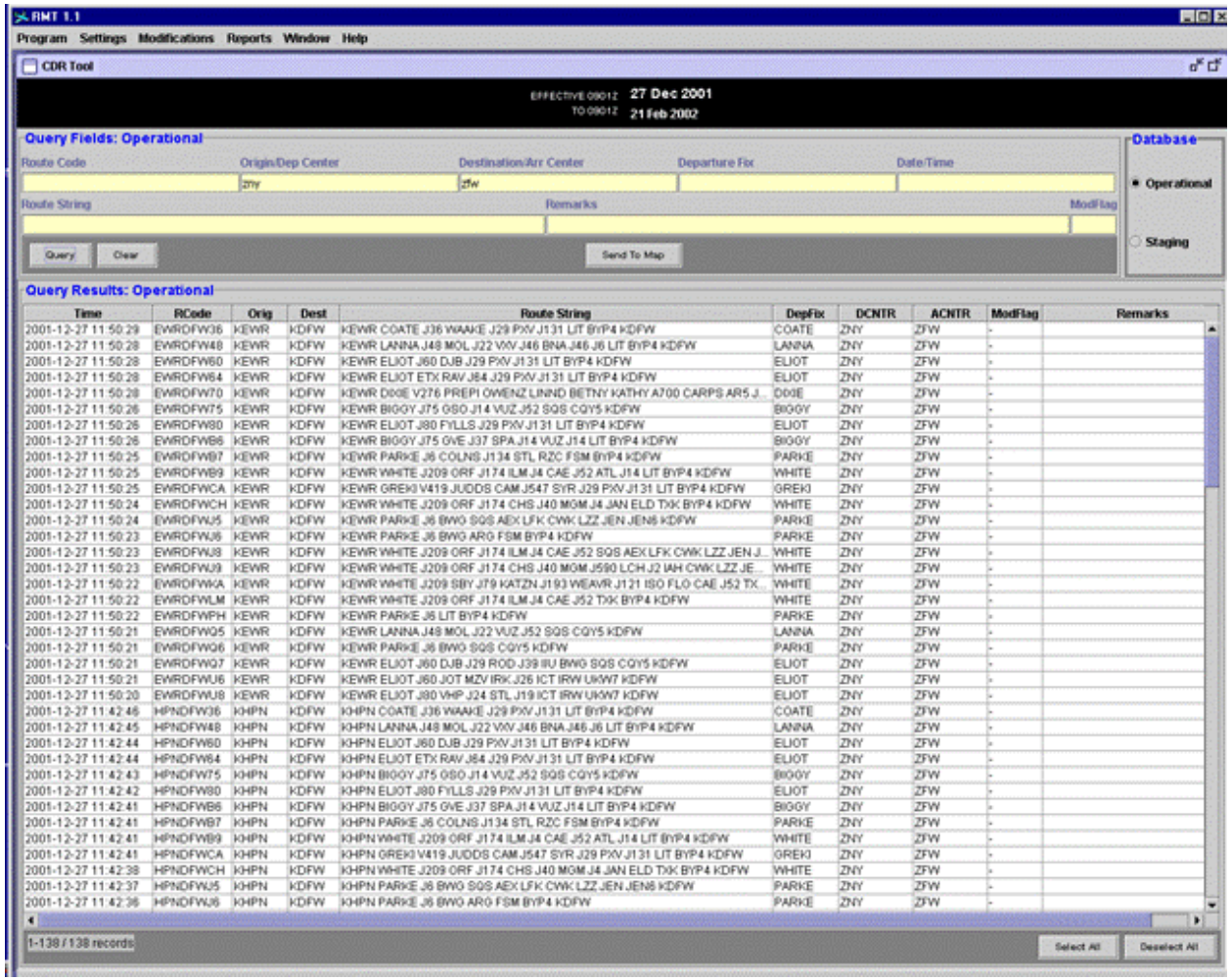
Impacted Area or Flow: DFW BYP STAR

Facilities Included: ZFW/ZME/ZID/ZDC/ZNY/ZBW/CZY/ZTL/ZHU/ZJX/ZMA/ZKC/ZAU/ZOB/ZMP

Instructions: REROUTE ANY AIRBORNE TRAFFIC AND INTERNAL DEPARTURES DESTINED THE DFW TERMINAL ARE VIA THE FOLLOWING ROUTES. SUBSTITUTE OTHER DESTINATION IN PLACE OF DFW IF APPLICABLE



Coded Departure Routes (CDRs)



Ground Stops/Ground Delay Programs

File Edit View Go Communicator Help

(Note: This page will refresh every minute. Last updated Wed, 14 Jun 2000 20:14:57 GMT.)

ATCSCC OIS SYSTEM

06 14 00

1615:33

OIS Main Menu

- Summary
- Schedules
- East Directory
- West Directory
- Planning Team
- Severe Weather
- Tier Info
- Checklists
- Airport Metrics
- GDP Coversheets
- OJT Info
- SOP (leave OIS)
- Phone List
- Comments
- Trouble Reports
- Equipment Callback

GROUND DELAY PROGRAMS [Edit]

ARPT	START	END	FACILITIES	REASON	MAX	AVG	AAR
ATL	1809	2359	ZTL2 - DFW	WX ENROUTE	74	38	80
DFW	1800	0259	ALL	THUNDERSTORMS	150	39	72
EWR	1800	0359	ALL CYYZ/CYUL/CYOW/CYHZ	SUPPORT OF SWAP	354	276	5
LGA	2030	0159	NOWEST	TSTRMS ENRTE/SWAP	301	242	-28
PHL	1600	2359	ALL CANADA	LOW CEILINGS	267	150	30
STL	1900	0159	ALL	TSTMS	197	113	32

GROUND STOPS [Edit]

ARPT	TIME	FACILITIES	REASON
BOS	2030	ZDC/ZTL/ZJX/ZMA/ZHU	THUNDERSTORMS ON RTE
BNI	2100	ZID/ZOB/ZMP/ZAU/ZKC/ZME/ZFW	WX EN RTE
CLE	2100	ZNY/ZDC/ZID/ZAU/ZBW/ZOB/ZMP	WEATHER/TSTMS
CLT	2100	ZDC/ZNY/ZBW	TSTMS
CVG	2015	ZID/ZOB/ZNY/ZBW/ZDC	TSTMS
DCA	2100	ZID/ZOB/ZMP/ZAU/ZKC/ZME/ZFW	WX EN RTE
DTW	2100	ZDC/ZJX/ZTL/ZMA/ZAU/ZBW/ZID/ZMP/ZNY/ZOB	TSTMS ENROUTE
IAD	2000	ZID/ZOB/ZMP/ZAU/ZKC/ZME/ZFW	WX EN RTE
JFK	2030	ZDC/ZJX/ZMA/ZTL/ZME/ZHU/ZFW/ZAB/ZLA	TSTRM ON RTE
LGA	2030	ZDC/ZJX/ZMA/ZTL/ZME/ZHU/ZFW/ZAB/ZLA	TSTRM ON RTE
MDW	2100	ZAU/ZID/ZME/ZTL/ZDC/ZJX/ZMA/ZOB/ZNY/ZBW	TSTMS
ORD	2100	ZAU/ZID/ZOB/ZMA/ZJX/ZTL/ZME/ZDC/ZNY/ZBW	TSTMS/NO ROUTES
STL	2100	ZNY/ZBW/ZOB/ZID/ZDC	TSTMS
TEB	2030	ZDC/ZJX/ZMA/ZTL/ZME/ZHU/ZFW/ZAB/ZLA	THUNDERSTORMS ON RTE
ZOB	2100	ZTL/ZJX/ZMA	NO ROUTES/WX

DELAY INFO [Edit]

ARPT	AD	DD	TIME	REASON
ATL		+90	1800	ORD G/S
ATL		+60	2001	WX
BOS		+135	1920	SWAP
BNI		+15	1703	LDN/AML RSTRN

DEICING [Edit]

ARPT	AAR/ADR	TIME	PLAN?

Document: Done.

ATCSCC Advisory

ATCSCC ADVZY 109 LGA/ZNY 07/14/2004 CDM PROPOSED GROUND DELAY PROGRAM

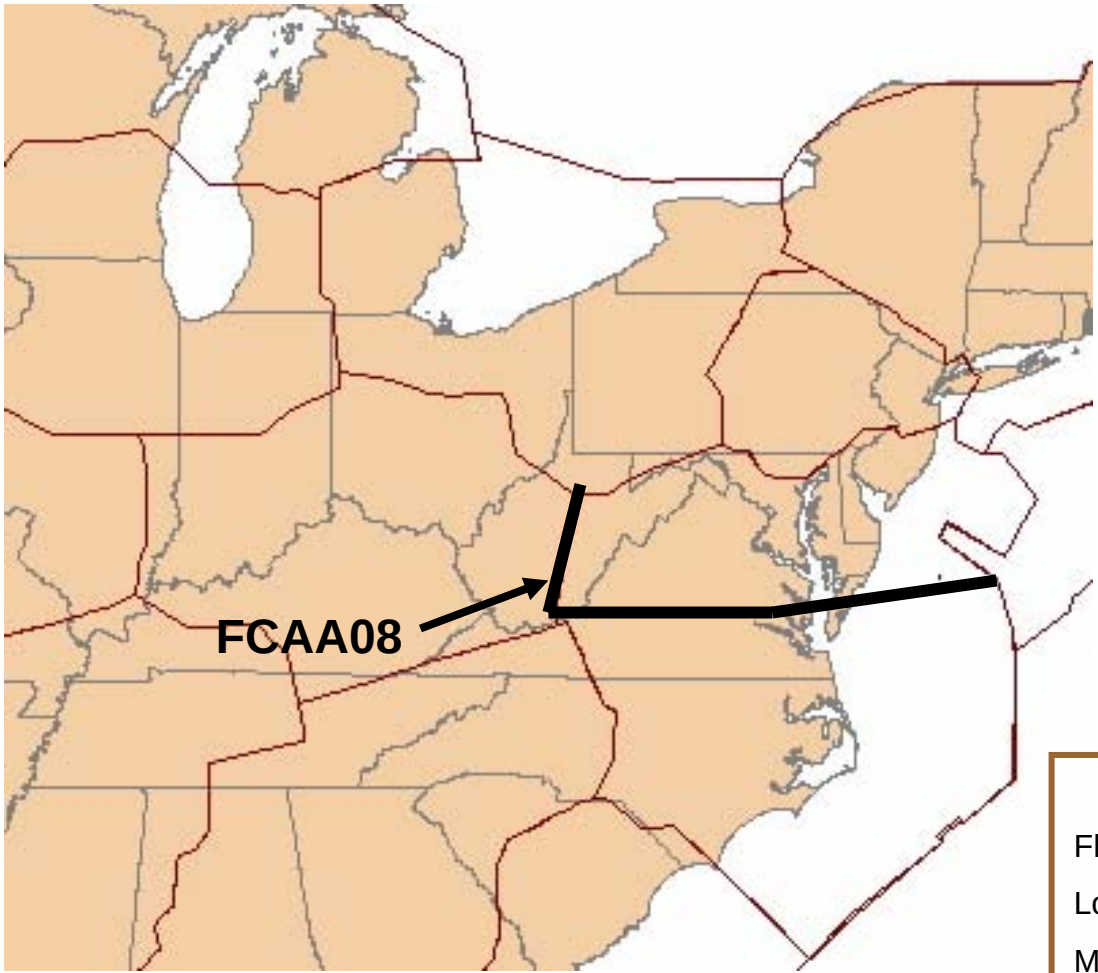
MESSAGE: AIRPORT: LGA
ADL TIME: 1637Z
ARRIVALS ESTIMATED FOR: 14/1800Z - 15/0459Z
ANTICIPATED PROGRAM RATE: 27
FLIGHTS INCLUDED: ALL CONTIGUOUS US DEPARTURES
SCOPE: (NOWEST+CZY_AP) ZAU ZBW ZDC ZFW ZHU ZID ZJX ZKC ZMA ZME ZMP ZNY ZOB ZTL CYHZ CYOW CYUL CYYZ
CANADIAN AIRPORTS INCLUDED: CYHZ CYOW CYUL CYYZ
DELAY ASSIGNMENT TABLE APPLIES TO: ZNY
ANTICIPATED MAXIMUM DELAY: 345
ANTICIPATED AVERAGE DELAY: 202
REASON: WEATHER, THUNDERSTORMS
REMARKS: REDUCED AAR TO 27 AND EXTENSION
USER UPDATES MUST BE RECEIVED BY: 1700Z

EFFECTIVE TIME: 141643 - 141759
SIGNATURE: 04/07/14 16:44

Airspace Flow Program

- New tool delivered in spring 2006
- Combines FSM flight data, Ground Delay Program algorithms, and FEA/FCA technology to target specific NAS element such as
  - Volume of enroute airspace
  - Specific airway
  - Airport
  - Specified fix
- More precisely targets impacted enroute airspace as compared to GDP technology

Airspace Flow Program



FCAA08 is defined by the western boundary of ZDC *and a line across central Virginia*.

Altitude Filters: 120 – 600

Arrival Filters: ZNY, ZBW, **ZDC**

Departure Filters: None

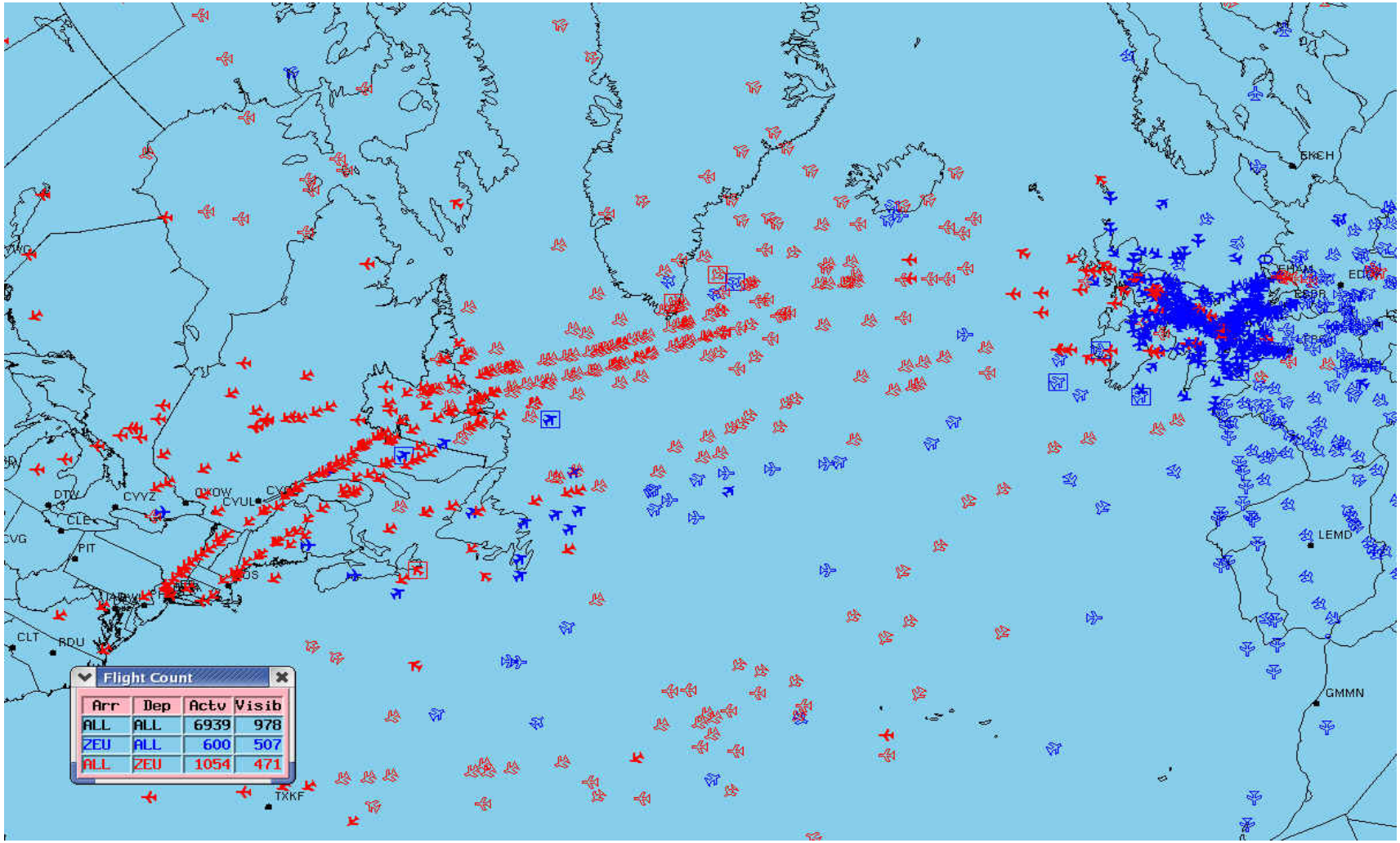
Likely weather for use: Weather in the Ohio Valley region or in ZDC airspace.

Weather Triggers: Lines and popcorn storms. CCFP predicted intensity levels of greater than 50% with High Confidence.

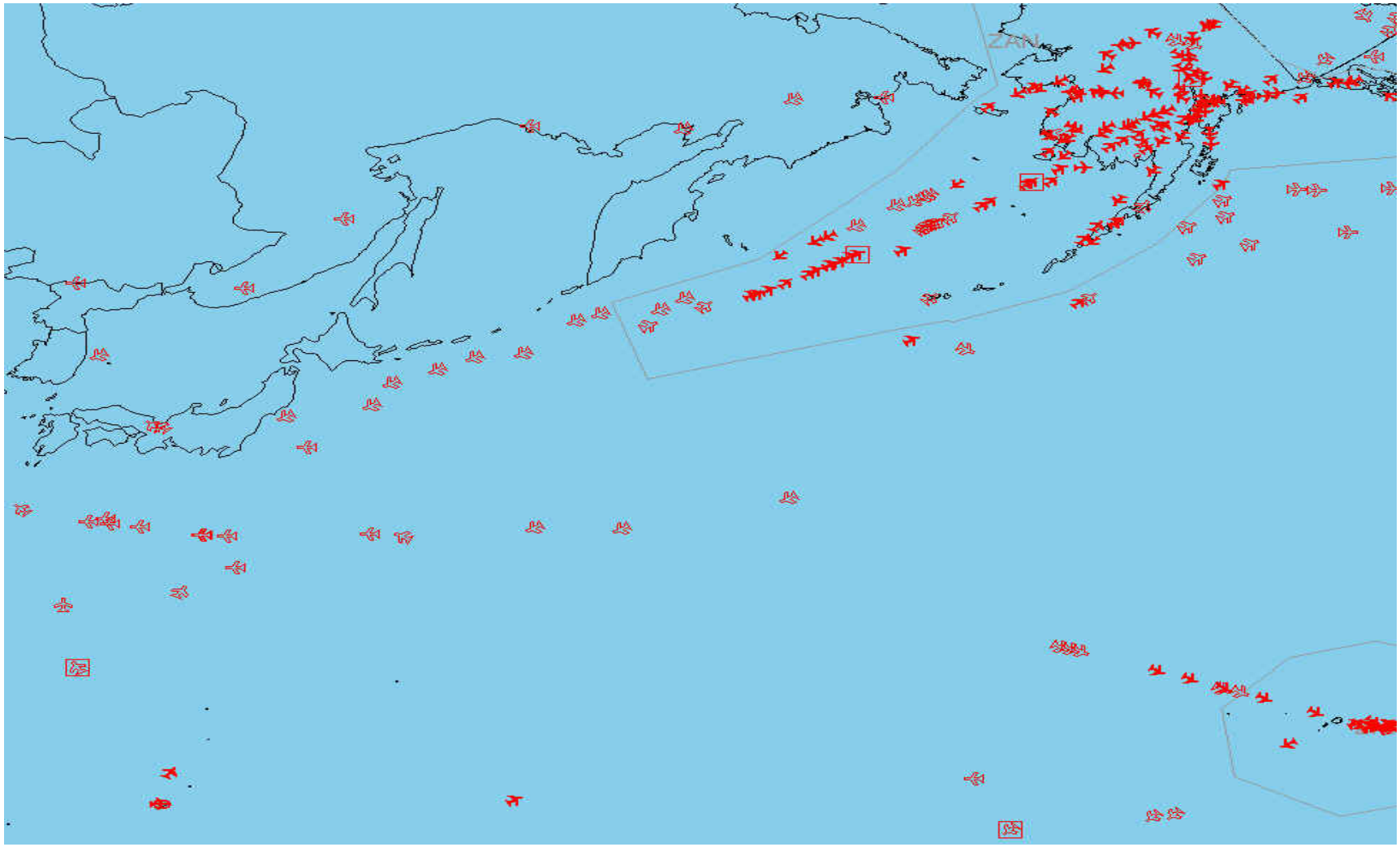
NESP Rate Guidelines

Flow through ZDC:	
Low Weather Impact:	135 – 145 Rate/Hour
Med Weather Impact	125 – 135 Rate/Hour
High Weather Impact	115 – 125 Rate/Hour

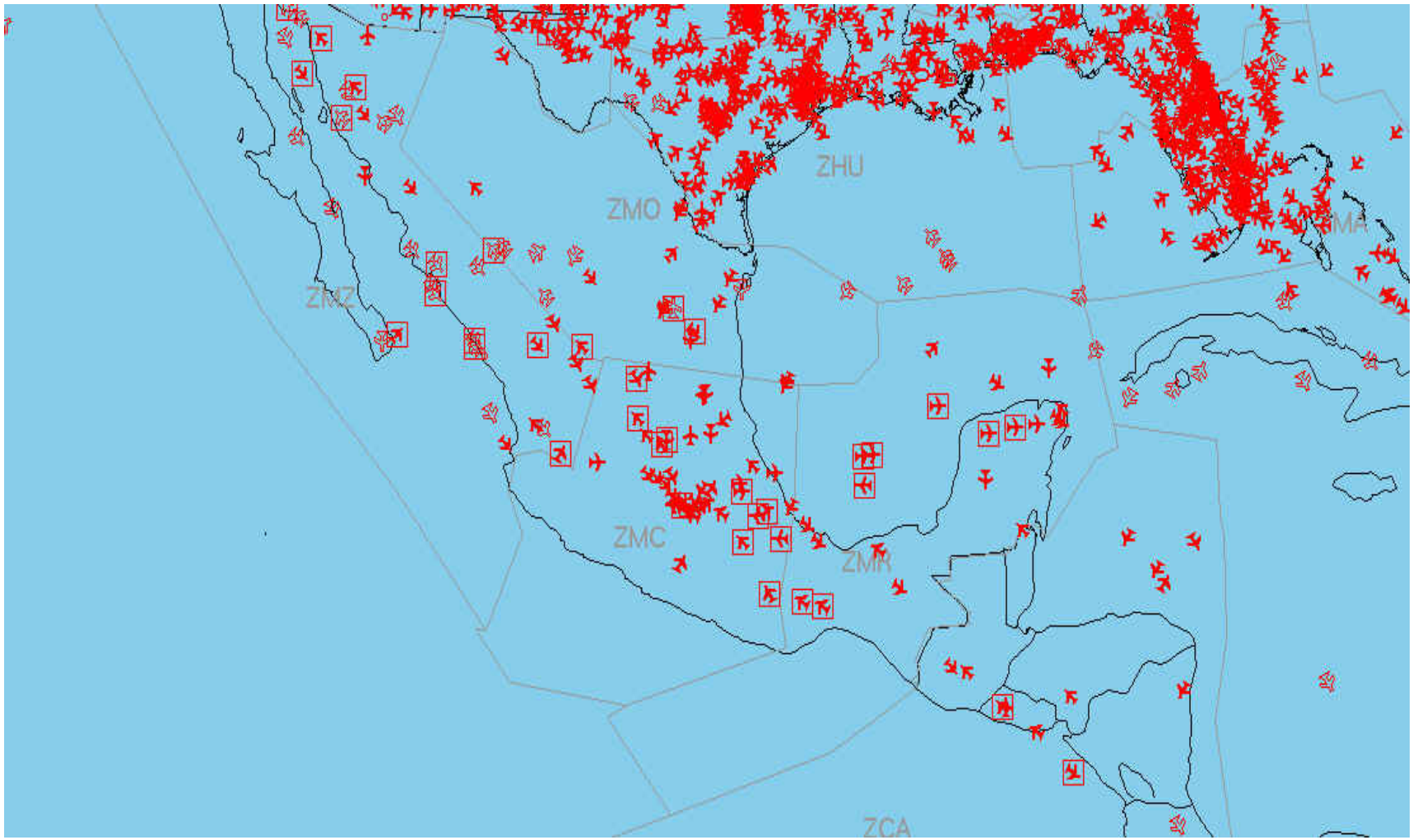
European Traffic



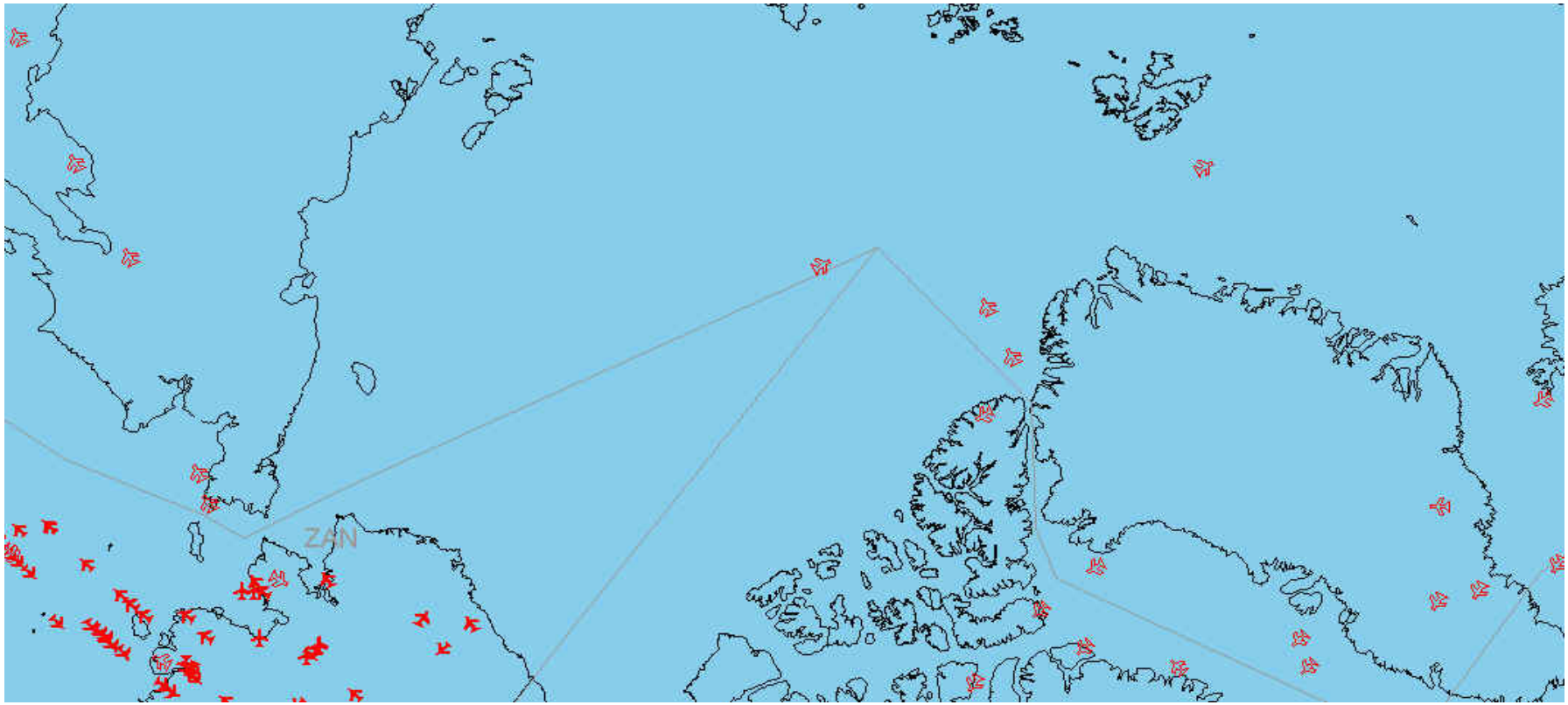
Pacific Traffic



Mexico and Caribbean Traffic



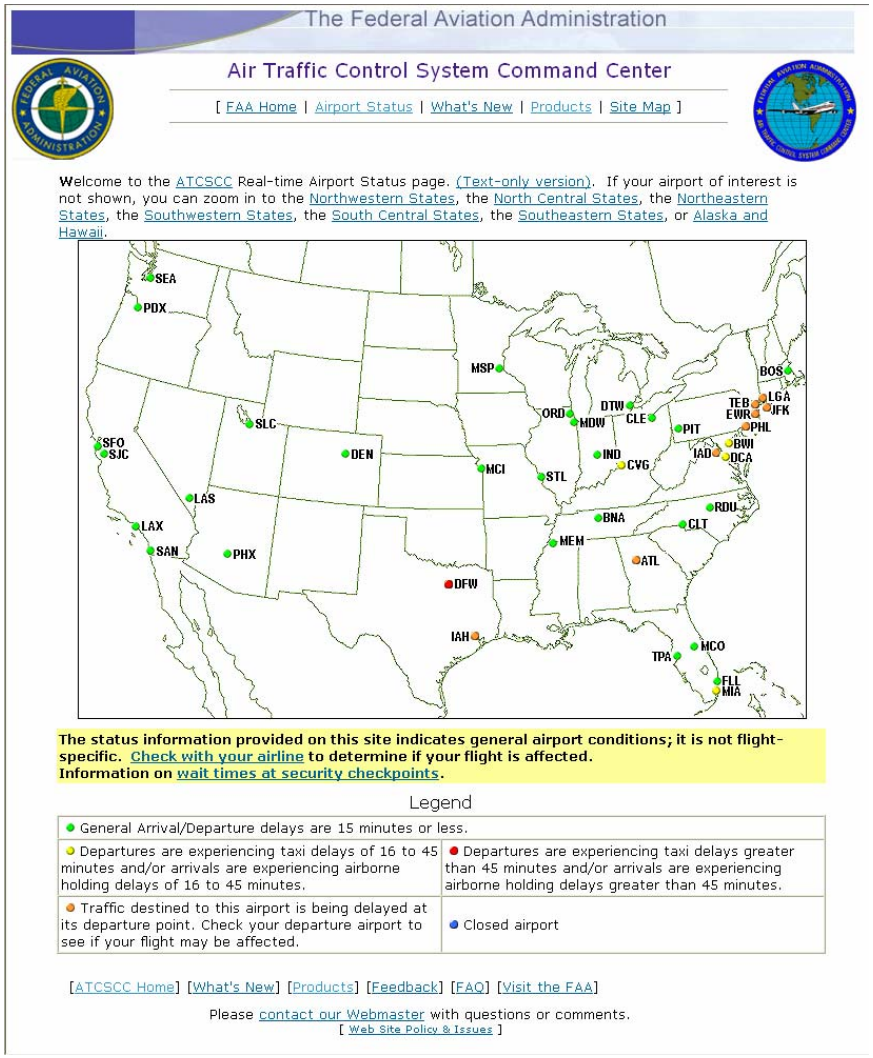
Polar Route



International ETMS Data Exchange

- Current Agreements
  - Mexico
  - Canada
  - United Kingdom
  - COCESNA
  - Chile
  - Columbia
- In Progress
  - Eurocontrol
  - Panama
  - Dominican Republic
- Future Expansion
  - Brazil
  - Japan

ATCSCC Web Site



Internet

http://www.fly.faa.gov