



# CDM

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Decision Making

# Flow Evaluation Team

-FET-



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# Questions?



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# FET 2014-2015

SARA Altitude Capped AFPs

TFMS Flight Plans CTOP Applications

FCA Capacity Estimation CTOP Naming

IM/Tablet Use Strategic Planning

U.S./Mexican Routes Post-Op Analysis



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**S**ituational

**A**wareness of

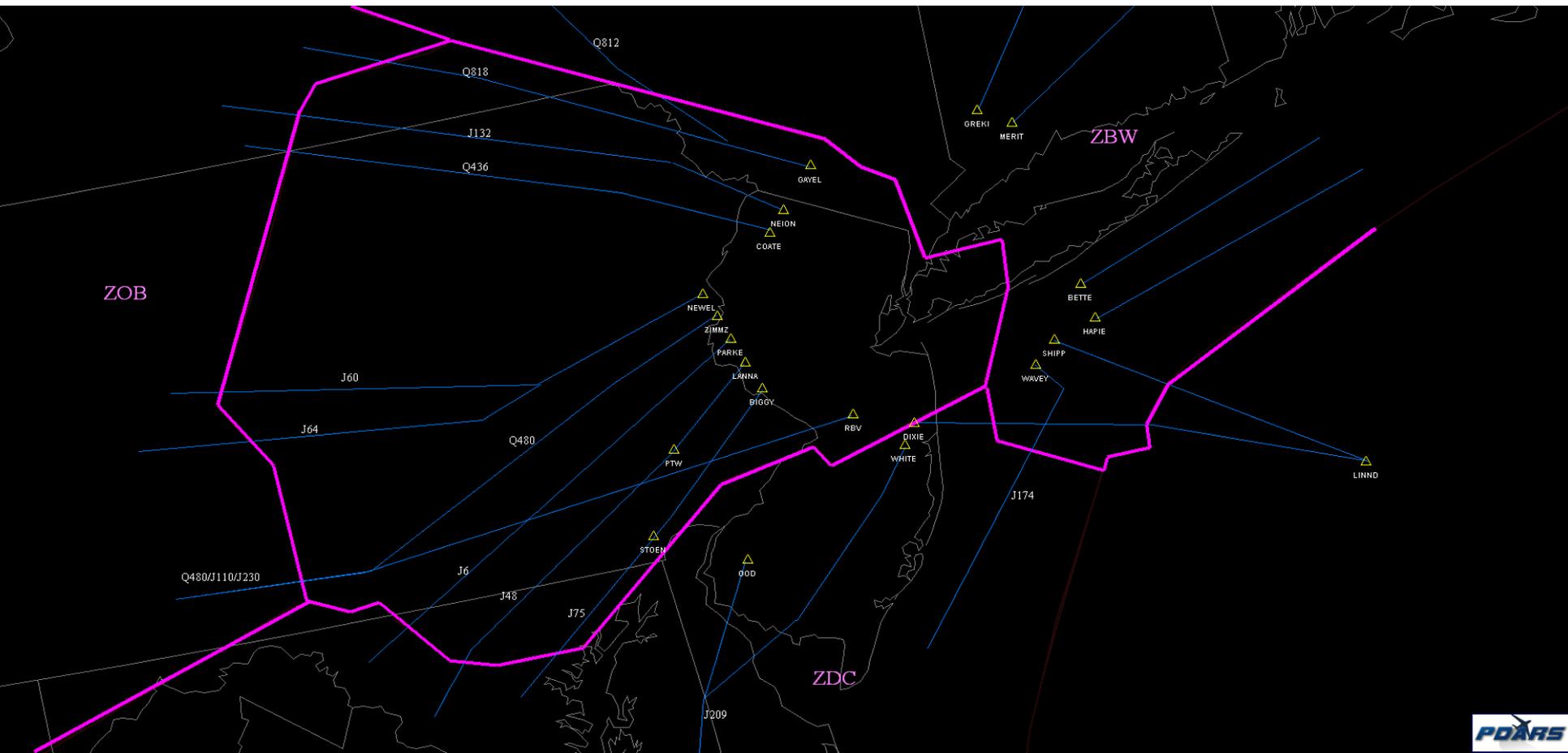
**R**oute

**A**vailability

An improved methodology for reporting/tracking/recording dynamic changes in reroute strategies/situations during Severe Weather events

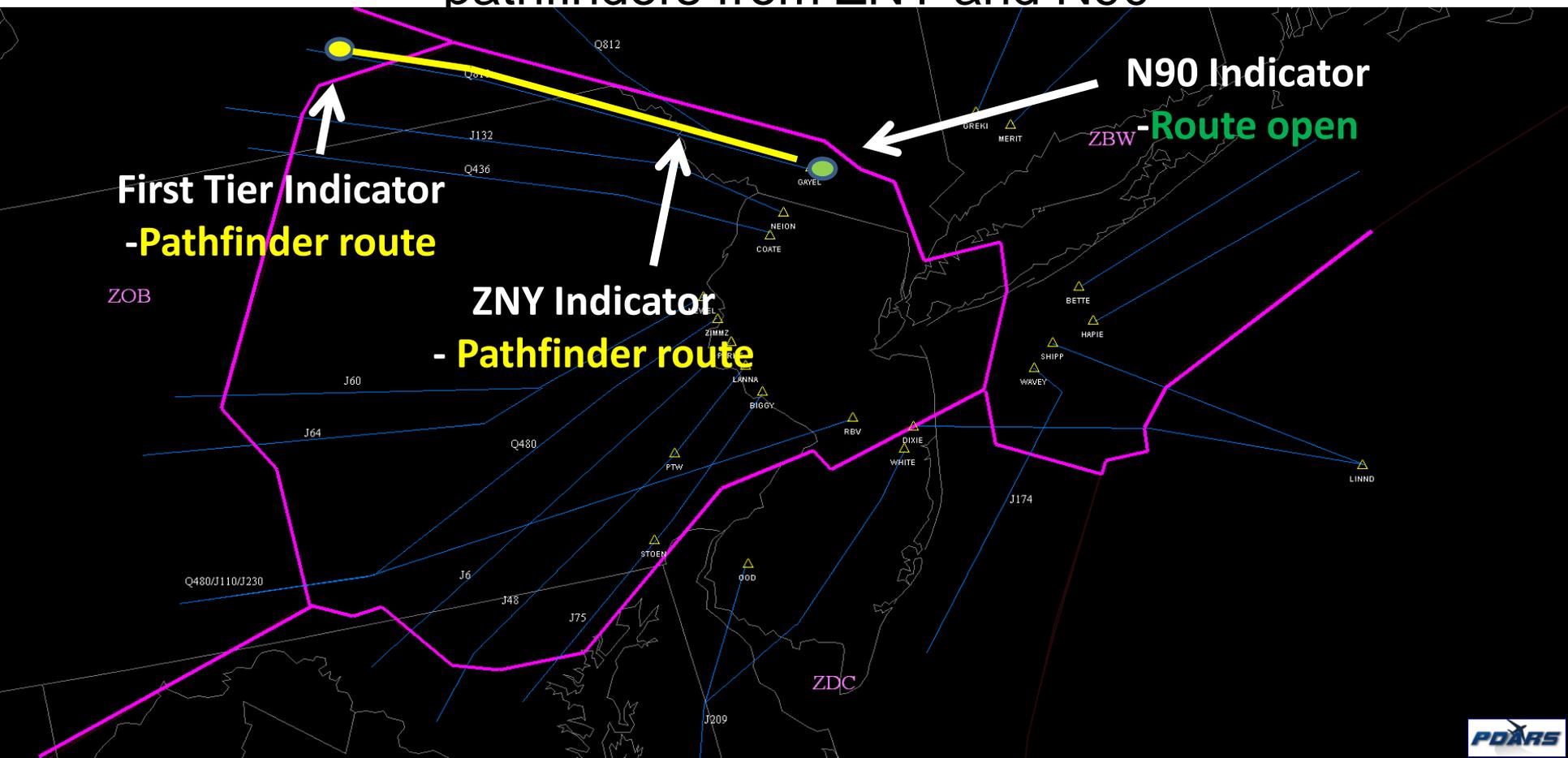


# All routes/fixes are open

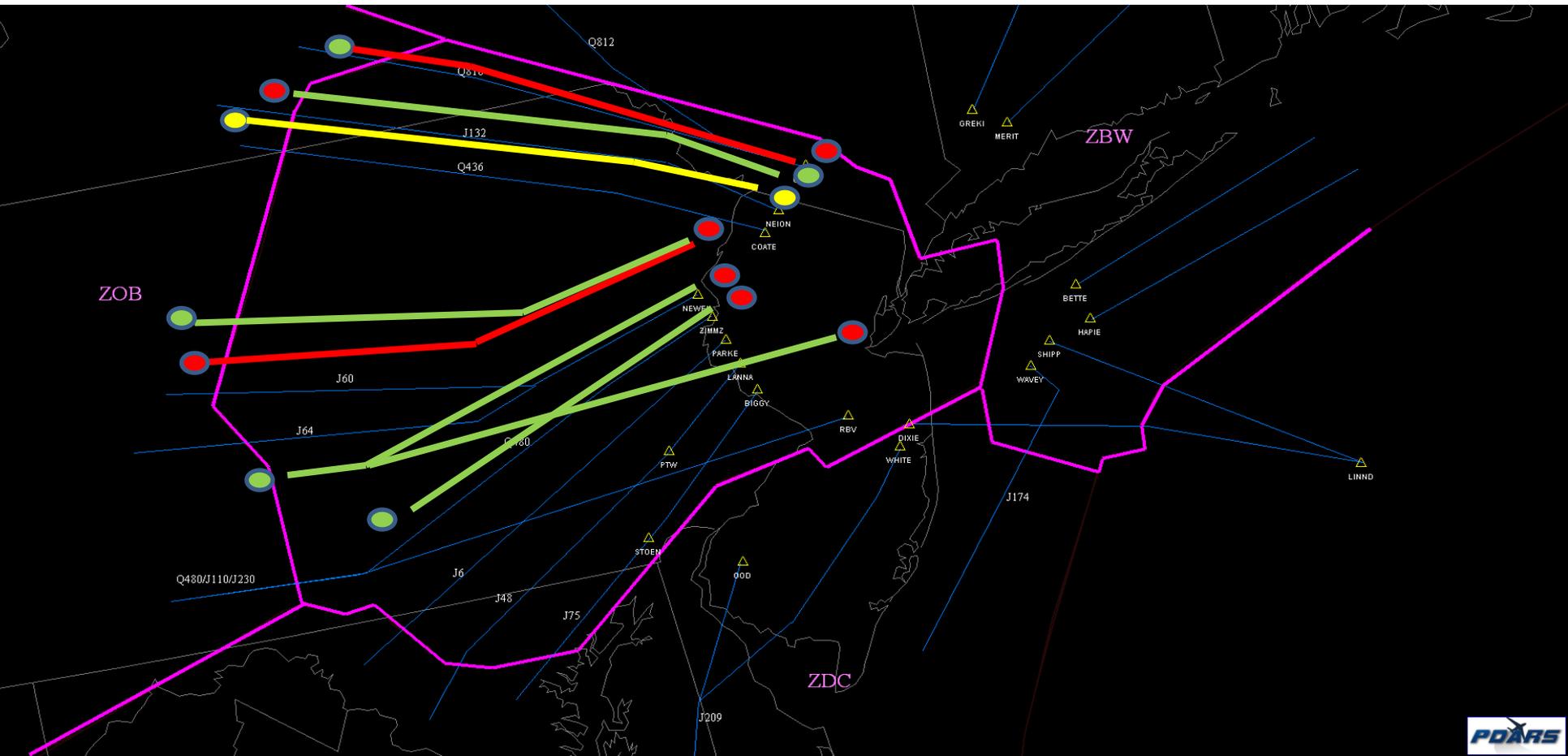




# ZOB remains constrained on Q818, but route is viable for pathfinders from ZNY and N90



# Multiple Route Closures



# Altitude Capped AFPs

- Customers requested consideration for flights that can fly at super-high sector altitudes
- Allow users that can file higher altitudes to be exempt from the AFP and/or develop 2 AFPs-one on top and another below with different throughputs
  - For example, using AFPA06 for ZDC, we could cap the AFP at flight level 390 and allow overflight traffic to continue unimpeded.
- The high altitude AFP would "incentivize" aircraft to take advantage of high altitude capacity
- Remaining flights receive an advantage of reduced delay
- Team created a recommendation that was approved by the CSG in November to look for opportunities for the cap of AFPs be lowered from the default FL600



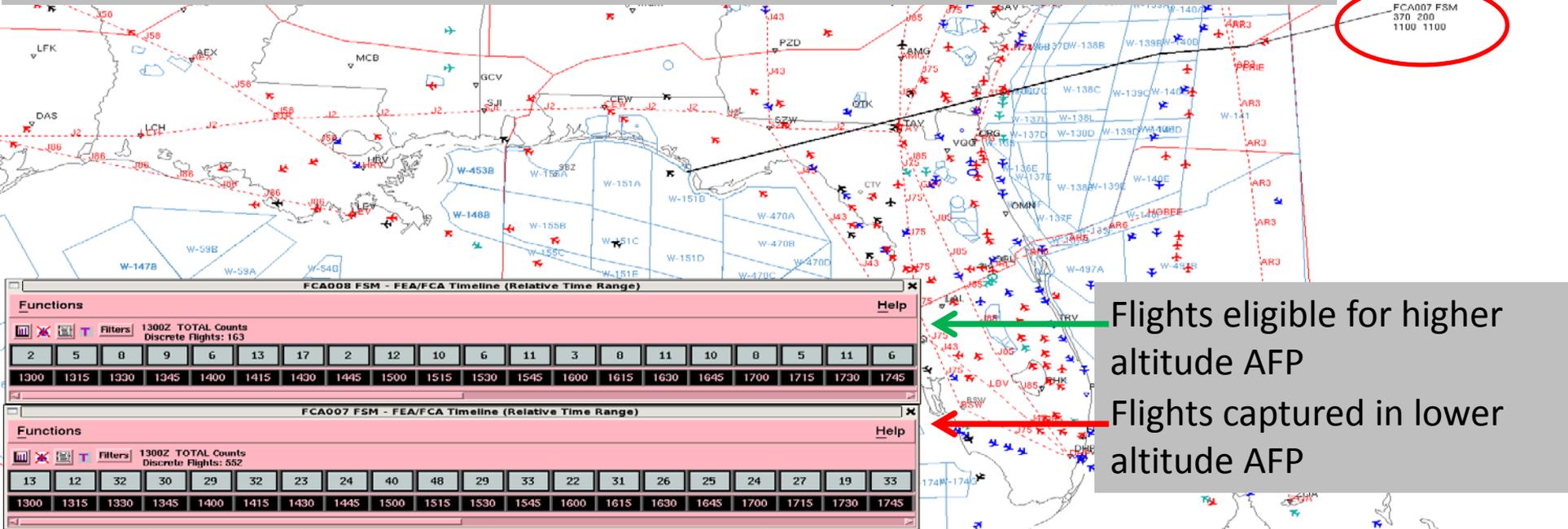
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# Dual AFP Use

1. Flights could be exempted in the high altitude AFP or a single AFP with an altitude cap could be used
2. Flights could be controlled at a different rate in a second high altitude AFP

*Either approach could provide incentive to customers to file a higher altitude*



# Altitude Capped AFPs

## Operational Efficiencies:

- Exempting aircraft operating above the AFP takes a portion of traffic, thus creating less demand for the constraint
- By doing so, you create less delay for the other operators that are operating within the constrained area, thus creating less systemic delay overall for everyone. Fewer EDCTs could be issued
- This high altitude traffic would be operating above the areas of impacted weather. They would have more room for deviations because of the lack of competing traffic



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# TFMS Flight Plans

The FET discussed the recent problem that occurred with ZAU and the fire that disrupted this facility. One of the major issues was that with ZAU ERAM offline, the processing of flight plans and flight data became a major component of overall situation.

FET discussed the possibility of using TFMS as a back-up flight planning and flight data processing system

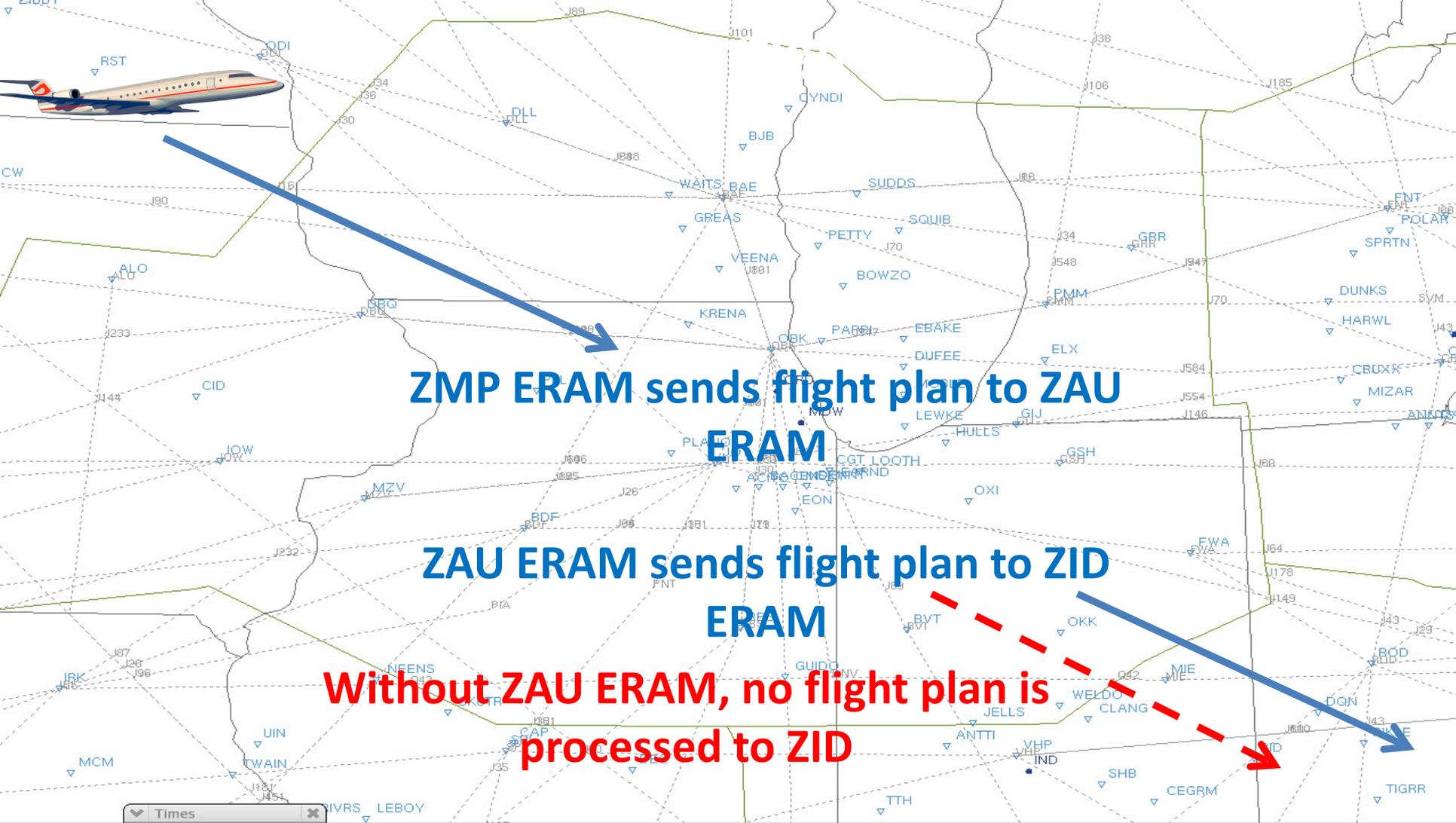
Flight plans already exist in TFMS for active and proposed flights. This could provide a very simple alternative to developing a completely new back-up system

TFMS may not be well configured for the processing of flight data, but it may be an option that could be accomplished in the short-term and provide an effective solution



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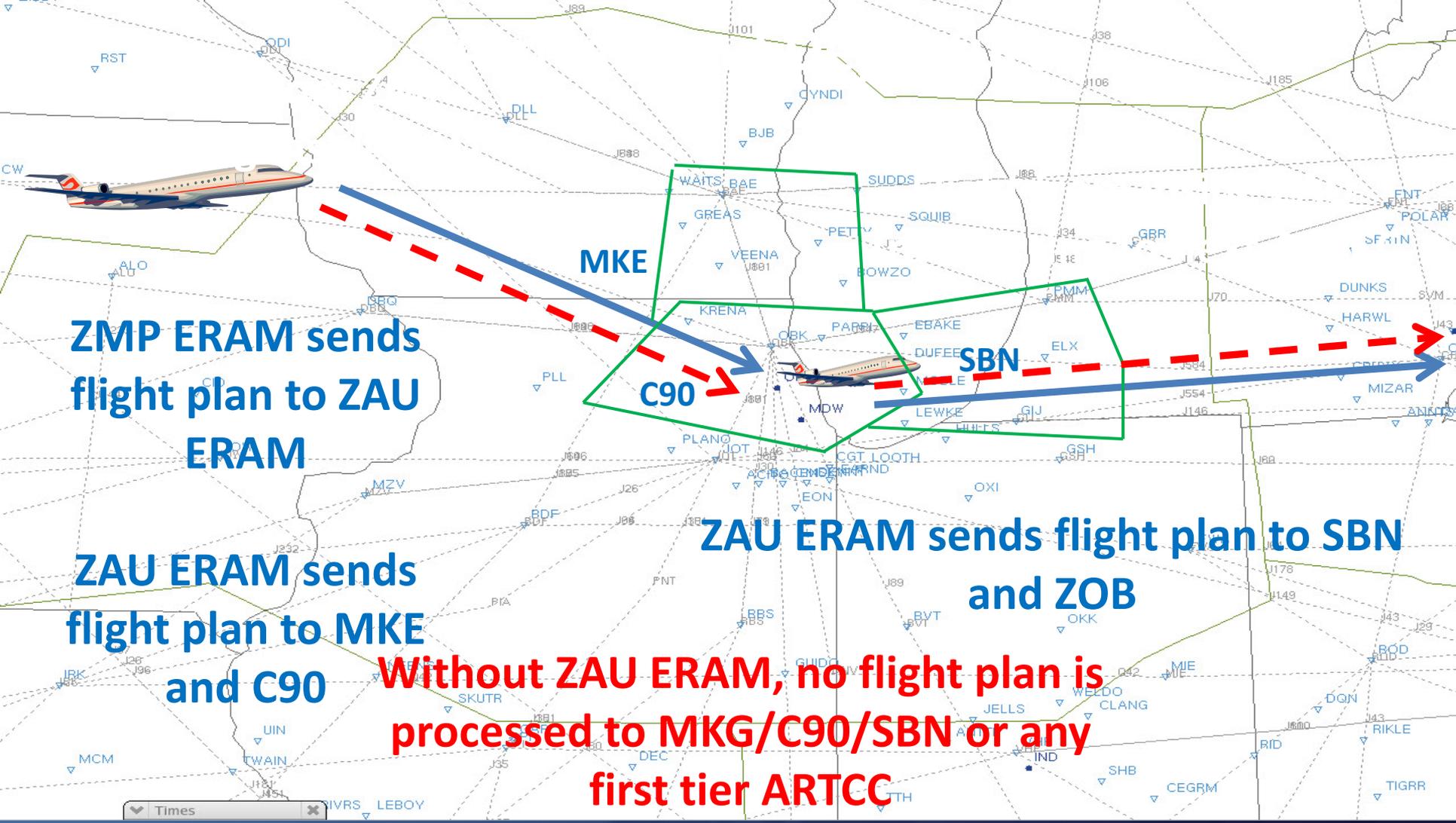
**ZMP ERAM sends flight plan to ZAU ERAM**

**ERAM**

**ZAU ERAM sends flight plan to ZID ERAM**

**ERAM**

**Without ZAU ERAM, no flight plan is processed to ZID**



**ZMP ERAM sends flight plan to ZAU ERAM**

**ZAU ERAM sends flight plan to MKE and C90**

**ZAU ERAM sends flight plan to SBN and ZOB**

**Without ZAU ERAM, no flight plan is processed to MKG/C90/SBN or any first tier ARTCC**

# TFMS FLIGHT PLANS

TFMS already has flight plan data

CTOP supports multiple flight plan capability (TOS)

TSD/FSM and other TFMS products already have departure, en route, and arrival times

**Action:** The group developed a recommendation for the CSG. FET does not expect we would be the best source of defining this development or what technology issues may exist in achieving this goal. However the importance of providing a recommendation was meaningful to the group



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# CTOP APPLICATIONS

- CTOP (Collaborative Trajectory Options Program)
- Used successfully during implementations for OAPM procedures
- Current use at Ski Country airports
- Future use possible for the 2015 Masters Golf Tournament

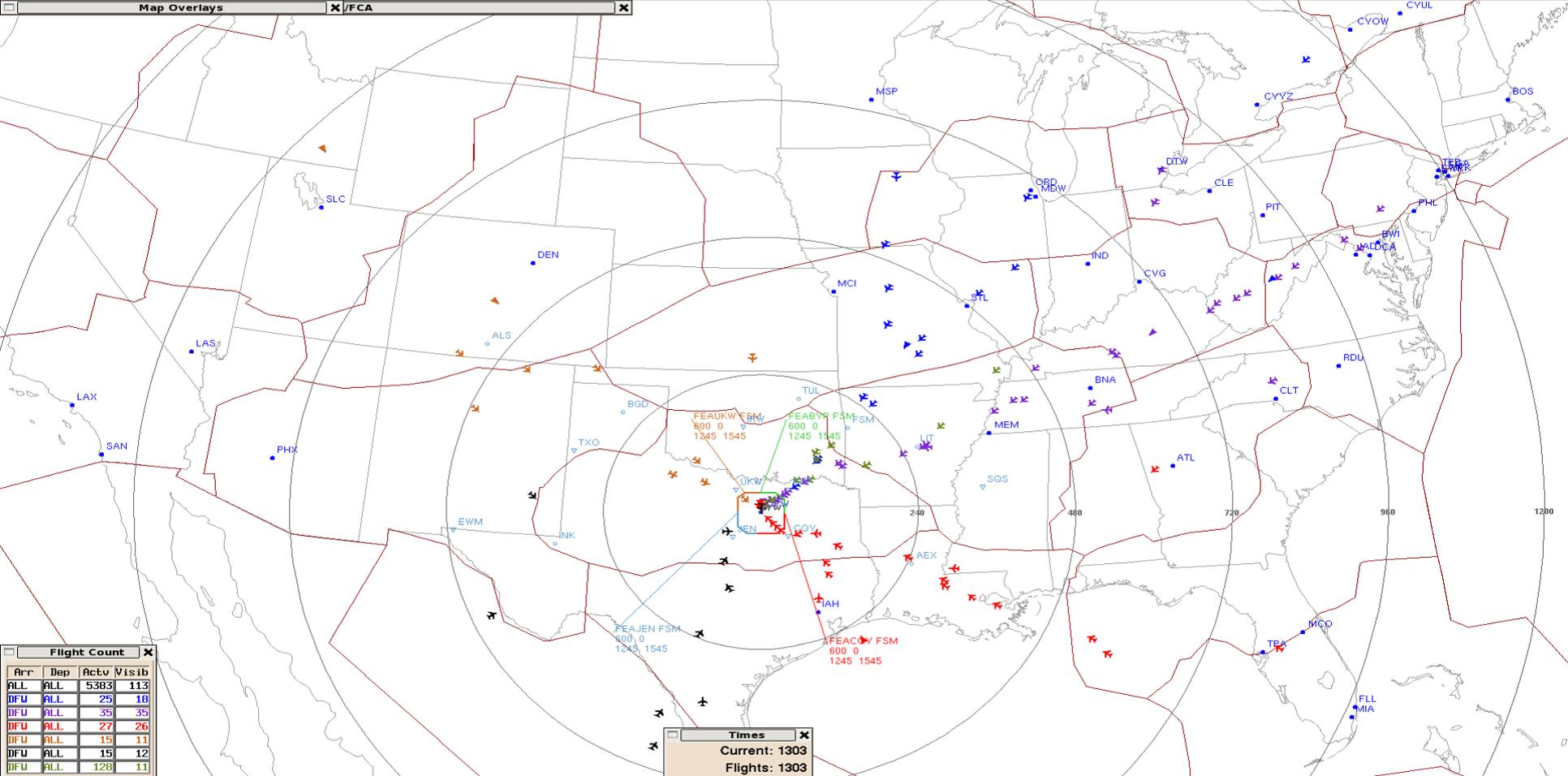
**Focus of Breakout Session**



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# DFW OAPM

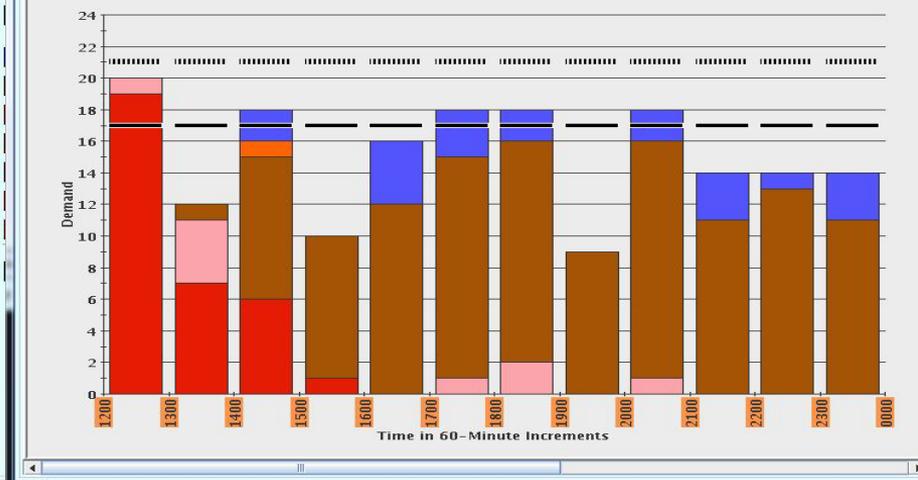
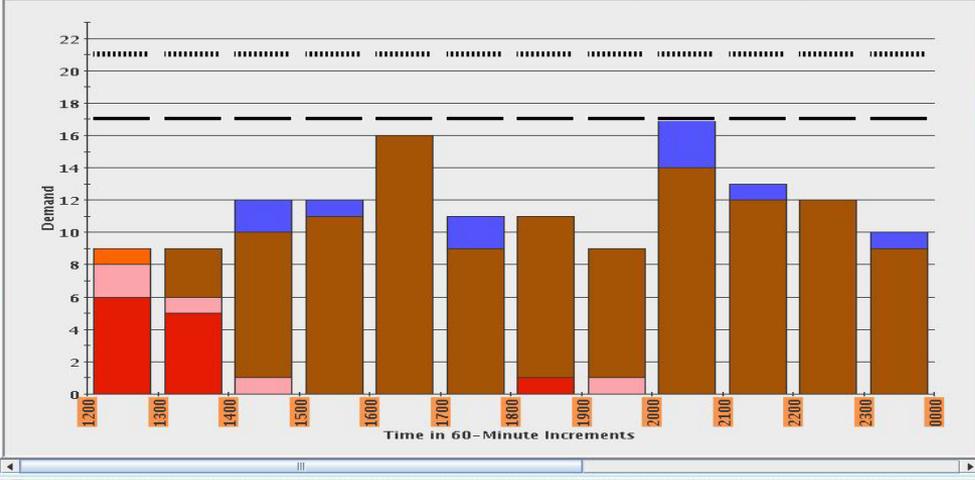
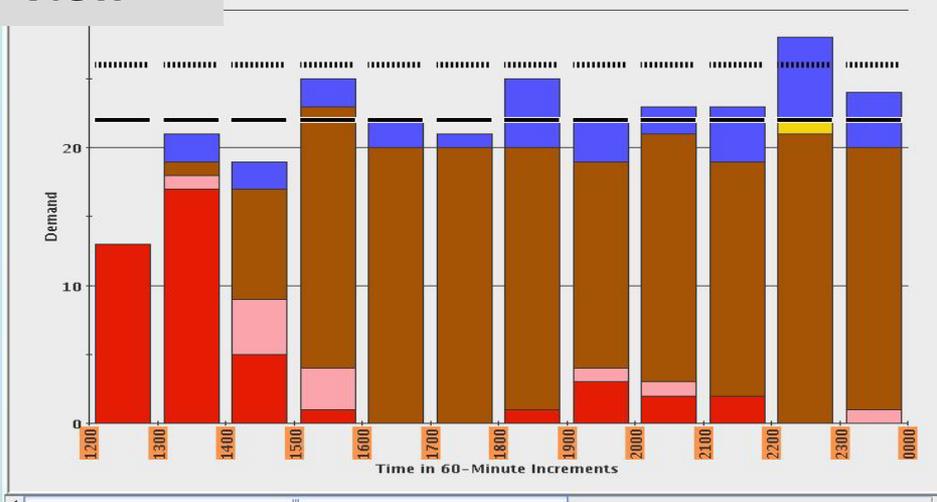
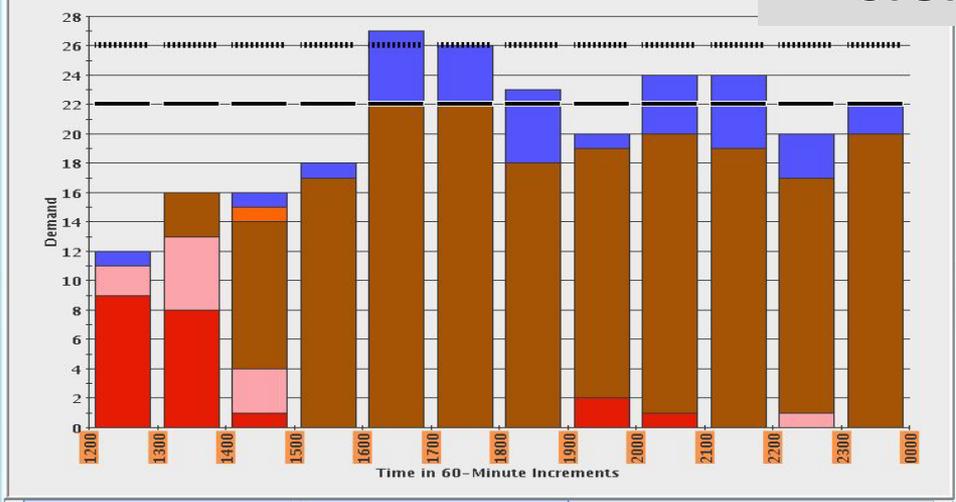


Map Overlays X/FCA X

Arr	Dep	Actv	Visib
ALL	ALL	5363	113
DFW	ALL	25	18
DFW	ALL	35	35
DFW	ALL	27	26
DFW	ALL	15	11
DFW	ALL	15	12
DFW	ALL	128	11

Times X  
Current: 1303  
Flights: 1303

# CTOP View



# Customer observations

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- AAL loaded almost 8000 new routes on the night of 17<sup>th</sup> – similar updates made to TFMS – ensuring the integrity of the TOS submissions challenging
- Initial CTOP delays were significantly less than the AFP's (on average about 1000 minutes/day) due to TOS options
- The nature of the resultant CTOP delays were minimal enough such that swapping really wasn't necessary
- Issues with TFMS occasionally updating EDCT's due to single flight trajectory reassignments incorrectly being triggered by FM messages
- Extremely good cooperation and response from ZFW, Command Center, and TPC
- Revisions were our friend!
- The Dispatcher interface will probably be the most complex piece of CTOP to complete (technical/process)

# Customer preparation for DFW OAPM

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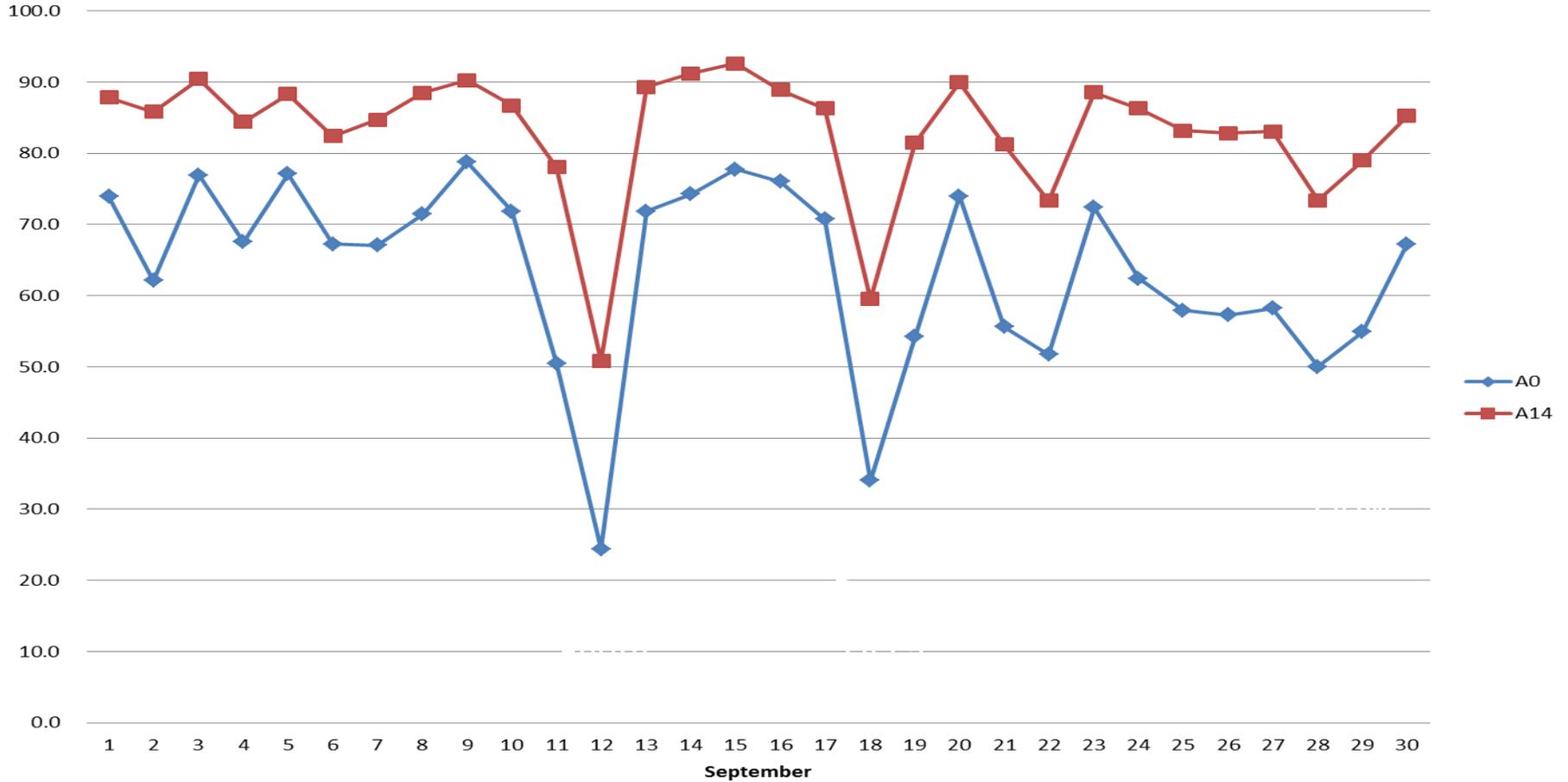
- Participated in FET's tasking to develop scenario, processes, procedures, recommendations for the use of CTOP to manage the DFW OAPM implementation
- Participated in weekly meetings with ZFW and internal personnel from Flight Planning, Air Traffic, Ops Planning, and Dispatch
- Worked with Flight Planning to identify 80+ markets with reasonable arrival fix alternatives (both AA and AE)
- Pre-built 2 alternative trajectories (i.e. TOS's) for these identified markets based on the new STARs
- Worked with ATC Coordinators and Dispatch core team to develop targeted procedures and training
- Modified internal CTOP prototype for DFW OAPM
- Ensured additional ATC Coord staffing to handle Dispatch coordination, CTOP management, and issue resolution

# Customer execution for DFW OAPM

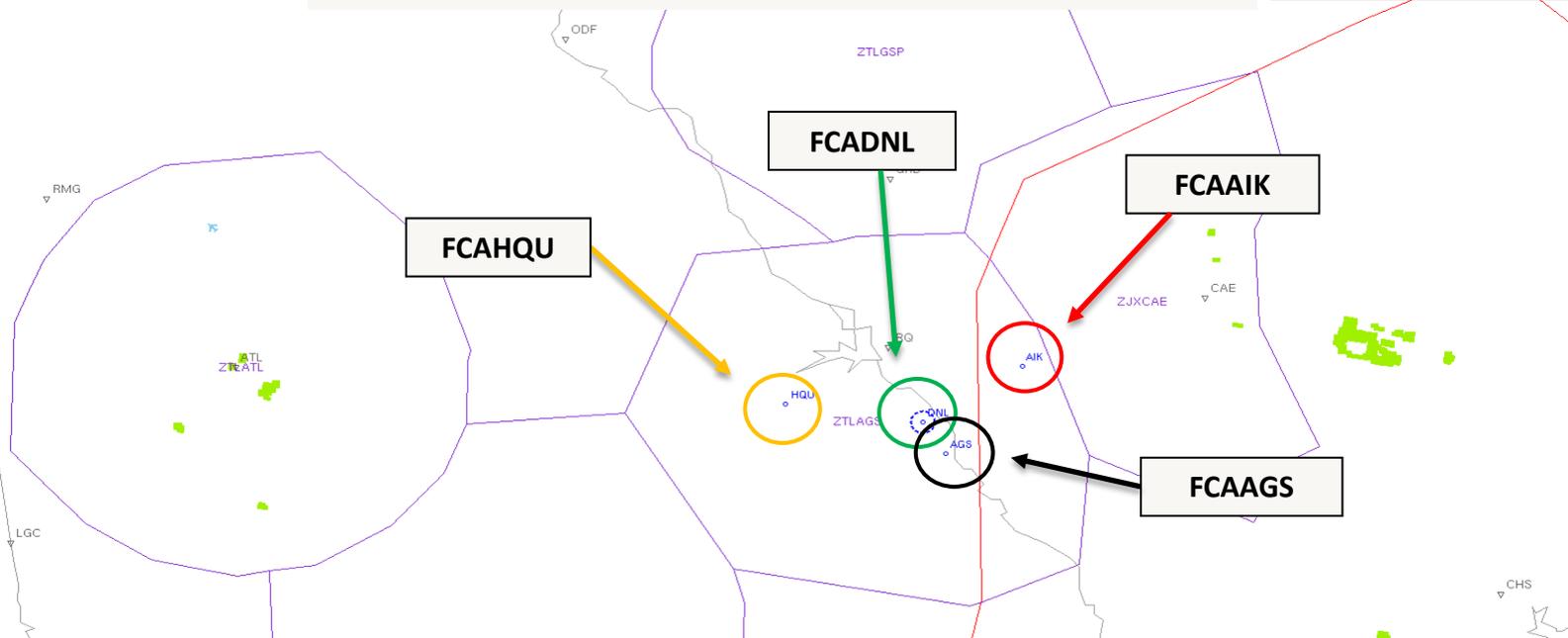
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- 0400-0900z: Midnight shift ATC Coordinator would manually fix balance flights for the first few arrival hours
- Prior to 0900z: Assess flow configuration, weather potential, and arrival fix capacities/rates
- 0900z: CTOP proposal modeled and issued by ATCSCC
- 0930z: Submit batch TOS (approximately 300)
- 1000z: CTOP issued by ATCSCC
- 1000z-0000z
  - Communicate/publish routes/slots to both AA/AE Dispatchers
  - Monitor, swap, and manually revise CTOP as needed
  - Monitor flights for route compliance, work with Dispatcher/TCA on route amendments
  - Monitor flights for anomalous delays
  - Coordinate with ATCSCC, ZFW, and TPC as needed

# DFW September Dependability



# Masters CTOP USE



Each airport could have an individual single FCA CTOP filtered for that airport

# FCA CAPACITY

- MIT Lincoln Laboratory has developed a CoSPA forecast capability geared toward forecasting capacity reduction for Flow Constrained Areas (FCAs) oriented along major flows in the NAS.
- A 0-8 hour forecast of the most likely capacity impact (in percent of fair weather capacity) within an FCA.
- The uncertainty of the percentage capacity impact forecast is given by the “spread” of expected percentage capacity loss values.
  - Narrower spread indicates a higher confident forecast.
  - The confidence in the most likely flow impact category within the FCA (low, medium, and high) is also provided.

**Action:** The FET supports operational testing of the concept for 2015



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# FCA CAPACITY

- Forecast is provided by static FCAs based on the AFPs issued frequently
- CoSpa weather and historical data provides results on capacity
- Low-Medium-High impact provided
- Timeline provided



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# CTOP NAMING

- The convention currently in use is to start with 001 and proceed in a sequential, numerical process. This would look like: CTP001, CTP002, CTP003, etc.
- The objective should be to allow a user to quickly identify what the CTOP is attempting to manage or resolve, and provide the user easy access to identifying where they can find their flight information. This is especially important in CTOP since we want the customers to manage multiple TOS's and delay scenarios.



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# CTOP NAMING

Examples of possible naming for CTOP:

**Airport Departure/Arrival use:** DFW-D-01, D10-A-01

*Facility where the FCA(s) are drawn– A or D for Arrival or Departure – Up-number*

**En Route use:** ZFW-ZID-O-01, ZMP\*ZFW-ZFW-O-01

*En Route facility where the FCA(s) are drawn(if the line is drawn through multiple facilities, then a “\*” will indicate start and stop points, ex. ZJX\*ZDC – Facility with constraint – O for Overflights - Up-number*



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# REGIONAL STRATEGIC PLANNING

By developing a planning flow based on the 5 current regions (NE, SE, MW, W, SW) it will be much easier to identify all the concerns that must be dealt with regarding any system constraint specific to that regional area.

All parties will know when in the plan they are expected to be available to participate. This allows participants time to prepare and ensure they are ready to discuss the issues with the right people available.

All issues particular to that region can be worked through with all the appropriate parties that are within the area of concern being discussed, resulting in an enhanced and more organized approach.

All stakeholders are concerned with the staffing and time needed for planning. Limiting the amount of time someone needs to be separated from their operational responsibilities could be reduced.

This format is similar to what we use for the National System Review except the NSR starts west and moves east. For operational planning, we believe that an east to west flow would be more beneficial

The result will be better structure to the planning flow and streamlined collaborative discussions.



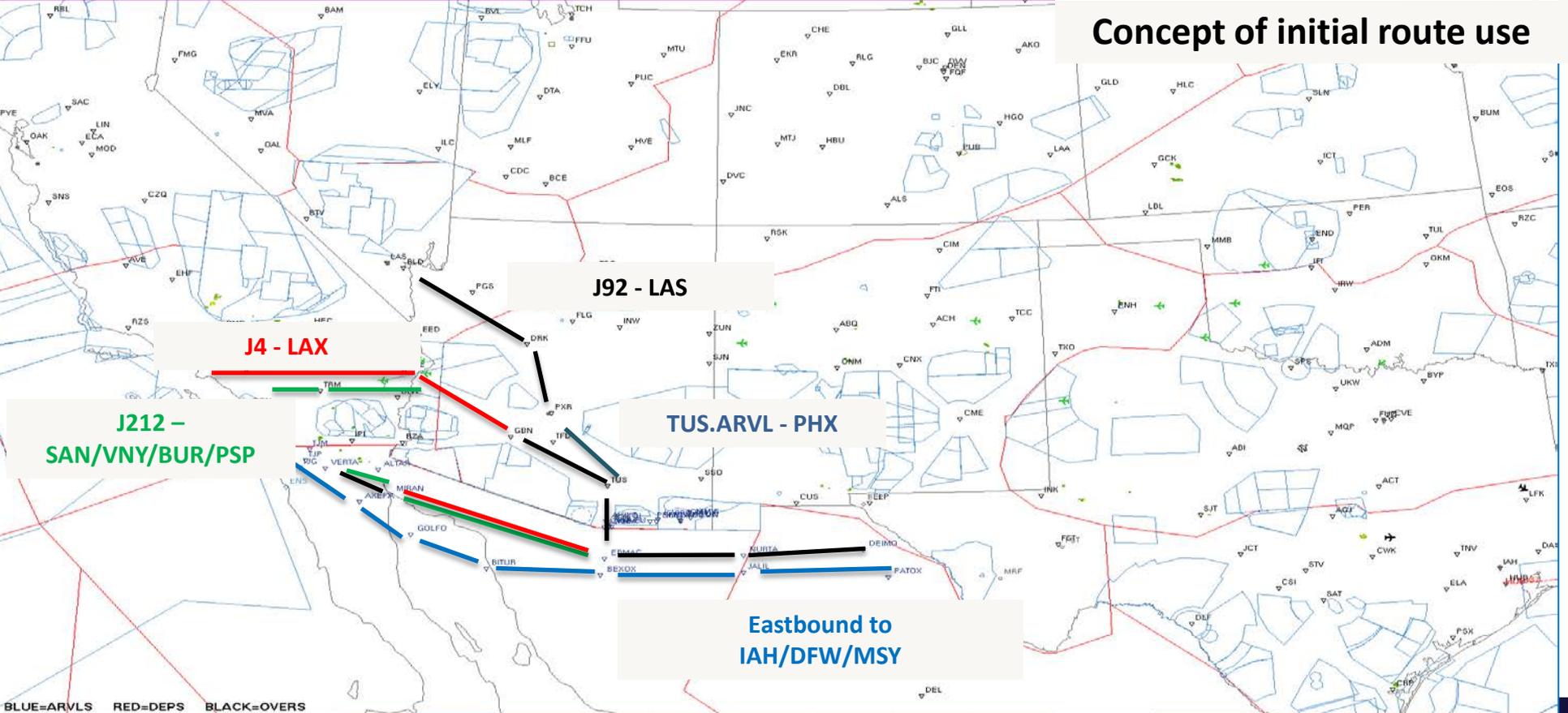
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# Mexican/U.S. Routes

- Shared route use through Canadian airspace has been in development and use for more than 10 years. This has proven to be very beneficial for all parties and greatly enhances route availability during constraints.
- Development of shared routes with Mexico could provide similar strategic advantages we have seen with Canada
- Initial use objectives would focus on providing offload route capability through Mexican airspace for traffic flows between Louisiana and Texas to California, Nevada, and Arizona. This will be especially valuable to manage system constraints due to weather and SAA

# Concept of initial route use



BLUE=ARVLS RED=DEPS BLACK=OVERS

LOG/EMAIL/OIS
FLORIDA
NY ARRV
TEXAS
NY DEPTS
ORD
ZOB
EAST COAST
ZID
GULF
ATL
BLANK
FSM
OTHER
DC METROS
ALERTS
TRANSCON
ROUTES
tsd
Starting Take Screenshot
Thu Jan 29 11:46:31

# IM/TABLET

## POST-OP ANALYSIS

- Imagine the possibilities of transporting Traffic Management into the NextGen of communication. The ability to have a small, mobile, electronic device that would provide enhanced communication, allow mobility across a control facility, access to webinars and providing a foundation for back-up communication. - **CLOSED**
- This specific document provides information to the group on the need for improved post-operations analysis and also requests that the FET be tasked with identifying recommendations for such capabilities from a traffic flow management and flight operations control perspective.  
- **CLOSED**



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