

Air Traffic Control System Command Center



Severe Weather and Route Management
2004

The ATCSCC Severe Weather Area was established to address the needs of Air Traffic Control (ATC) and the user community during the summer thunderstorm season, when convective activity creates a major disruption to the normal movement of air traffic. With the complexities involved in today's air traffic environment, the Severe Weather Area has evolved into a year-round operation, addressing: National Route Program (NRP) issues, offload routings, National Airspace Redesign (NAR) initiatives and various route tests, among others. The strategic planning function was established to foster collaboration with the FAA field facilities and user community to develop a Strategic Plan of Operations (SPO) for known and anticipated system constraints.

During periods of convective activity or other significant system constraints, air traffic facilities will be called upon to favor and accept traffic that is not normally routed through their area. All ATC facilities and system users are expected to participate in and cooperate with the SPO to minimize system delays and balance traffic flows.

I. Operating Positions

Severe Weather National Traffic Management Officer (NTMO)

1. Responsible for severe weather operations.
2. Prioritize work within the Severe Weather Area.
3. Ensure coordination is completed to develop severe weather strategies.
4. Monitor hotlines when appropriate.
5. Suspend NRP operations as conditions warrant.

Severe Weather Specialist

1. Determine the potential impact of severe weather or other operational concerns and coordinate with all affected facilities to develop alternate routes.
2. Serve as the focal point for the implementation and coordination of reroutes.
3. Coordinate use of Canadian airspace.
4. Transmit advisories defining severe weather areas and alternate routes.
5. Transmit Anchorage ARTCC gateway release list for the Russian Far East tracks.
6. Serve as the focal point for all coordination and resolution of NRP concerns.
7. Coordinate and retransmit North Atlantic Track (NAT) transitions.

Severe Weather Coordinator Position

1. Coordinate operational plan, routes, and miles-in-trail restrictions (MIT) implemented by severe weather with the appropriate ATCSCC areas.
2. Ensure that specialists are informed of all reroutes being implemented to eliminate duplicate or conflicting efforts.
3. Monitor reroutes to determine need for revision, extension, or cancellation.
4. Monitor hotlines to the extent possible.

II. Tools

National Playbook

Originating from a Collaborative Routing workgroup recommendation to enhance common situational awareness, the Playbook is comprised of prevalidated routes for a variety of weather scenarios. The Playbook is well suited to addressing arrival and enroute impacts. Updated on the same 56-day charting cycle for aviation charts, the Playbook is a living document that experiences continual updates and revisions.

Route Management Tool/Coded Departure Routes (CDRs)

CDRs are designed to enhance common situational awareness and decrease controller workload in implementing reroutes. Departure scenarios require more flexibility than the Playbook can usually provide, making them better addressed by CDRs. For use in the Severe Weather Unit, CDRs are located within the Route Management Tool (RMT). Also included in the RMT are location identifiers, preferential arrival routes (PAR) and a graphical depiction tool for reroutes.

Collaborative Convective Forecast Product (CCFP)

Collaborative weather product from the ARTCC Weather Service Units, Aviation Weather Center of the National Weather Service, ATCSCC weather unit and airline meteorologists. The CCFP is the primary weather product for the SPO.

FEA / FCA

A Flow Evaluation Area (FEA) is a four-dimensional volume of airspace, along with flight filters and a time interval, used to evaluate potential system constraints. A Flow Constraint Area (FCA) is a four-dimensional volume of airspace, along with flight filters and a time interval, used to identify areas of system constraints. System users must take action to mitigate the constraint identified by the FCA.

NRP and Severe Weather

NRP routes are an important consideration for the Severe Weather Area and a valuable tool for the user community, providing route flexibility for flights filed at or above FL290. With enough foresight, system users may be encouraged to file NRP routings or user preferred trajectories (UPTs) away from an area of current or forecast impact during the SPT, making reroutes unnecessary. Alternatively, NRP routings may exasperate operational concerns, requiring reroutes for delay mitigation or flow integrity. Finally, NRP may be suspended through constrained areas to reduce complexity, however this must be coordinated with the NTMO for approval prior to the suspension.

Canadian Airspace

Utilizing routes through Canadian airspace is an excellent alternative when domestic routes are impacted. Toronto and Montreal Centers must coordinate with their operational areas prior to accepting additional traffic, so allot extra time when implementing a swap through their airspace.

Tunneling/Capping

Tunneling refers to the early descent of arriving traffic to avoid saturated sectors. This may be accomplished by descending from the super-high to high stratum, or the high to low stratum. Capping refers to restricting departures to the low altitude stratum, avoiding saturated high altitude sectors.

Eastern Region Hotline

The Eastern Region hotline is used during severe weather events to facilitate coordination among field facilities and the ATCSCC. Select users are invited to monitor the telcon as well, but may not participate. When a Severe Weather Avoidance Plan (SWAP) is anticipated, the hotline will be activated and the participants will dial-up through the Eastern Region bridge. All major eastern region facilities, ZOB, ZBW, ZAU, the ATCSCC and users (listen only) are invited to participate. Remember that reroutes are not to be coordinated via the hotline.

Departure Spacing Program (DSP)

DSP is a traffic management prototype currently in operation in the New York and Philadelphia metropolitan areas. It is designed to provide traffic management specialists and controllers with tools to allow them to maximize the utilization of available airspace capacity and reduce departure delays. DSP coordinates the release of departures from multiple airports to produce a level of demand that can be efficiently managed as departure traffic converges on common departure fixes. DSP has also automated the operation of the New York Departure Complex, resulting in less time and workload needed to coordinate departure route changes, especially during severe weather situations. Additionally, DSP has automated the flow of departure information and the release coordination process between the towers, TRACON, and the traffic management unit in the ARTCC. For the Severe Weather specialist, DSP is primarily used to monitor flights for "No Route Available."

Strategic Planning

Strategic planning is the process by which FAA facilities and the user community collaboratively develop initiatives to manage the NAS. The goal of this collaboration is to reach a consensus among the participants for the best initiatives to manage the NAS. Users and facilities are required to take action on the planned initiatives, making the system as predictable as possible.

High Altitude Redesign (HAR)

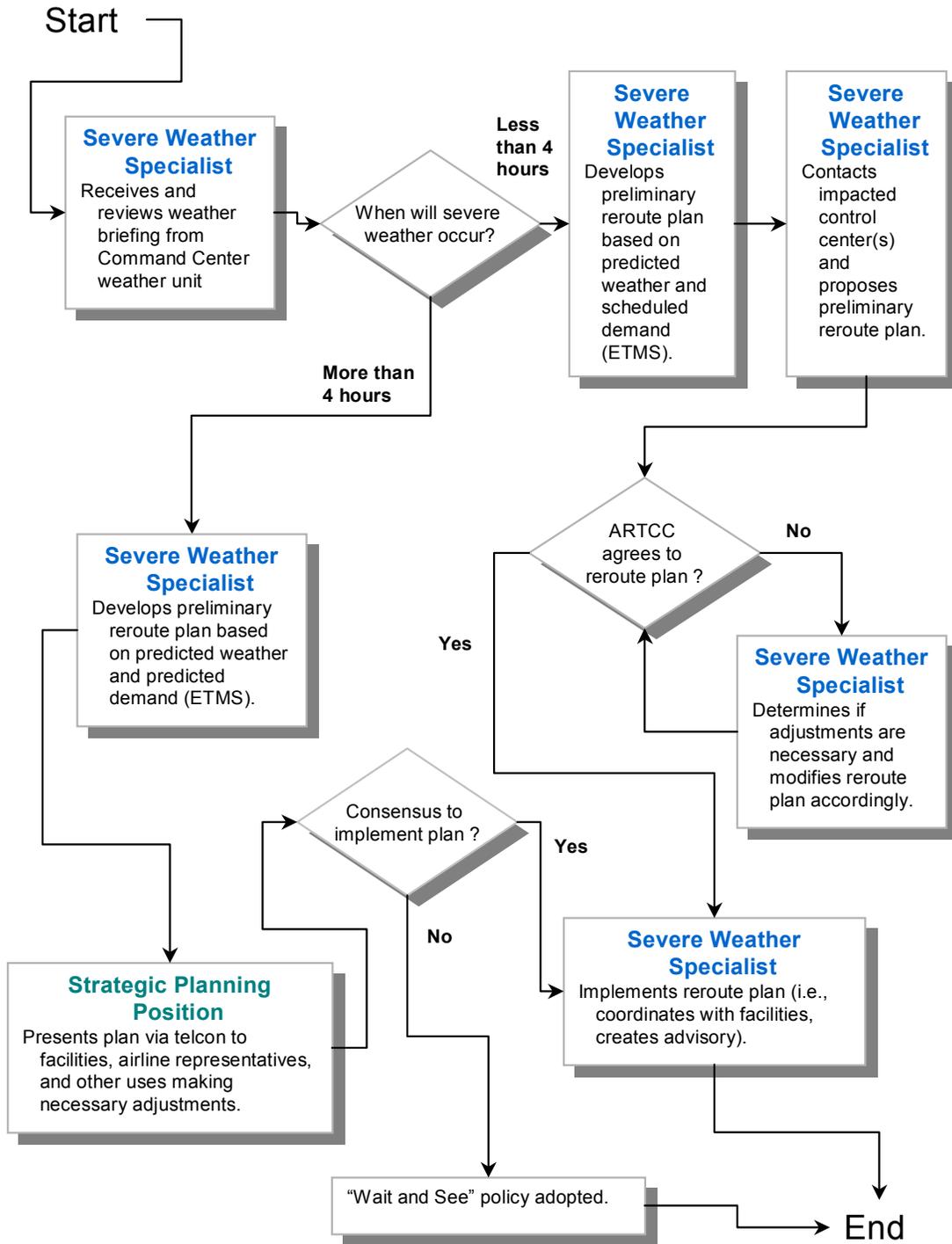
HAR is in the process of a measured implementation in the NAS, beginning with western facilities. The aim of HAR is to establish an advanced navigation (ANAV) structure in the high altitude stratum giving system users added routing flexibility and providing ATC with established fixes for avoiding recurring system impacts (i.e., ATCAA, MOA or Warning Areas). The latitude-longitude navigation points within the ANAV system will be contained within the Navigational Reference System (NRS) naming convention.

III. Developing and Implementing Reroutes

Guidelines for developing reroutes with a systemic perspective:

1. Determine the area impacted by severe weather or other operational concerns; i.e., equipment outage, sector volume or flight delays. Discuss with the ATCSCC weather unit and field facilities the expected extent of the weather, emphasizing the time of development, affected area, tops, movement and duration.
2. Examine the flights traversing the impacted area, either through ETMS or FEA/FCA list. Focus on the number of flights and their filed routes. When reading the flight plans, remember that the reliability of routing information varies with flight status. The best way to determine the accuracy of the routing information is to relate it to the accuracy of the estimated time of departure (ETD) information. The ETD prefixes are:
 - A: Actual departure time based on NAS departure message.
 - E: Estimated departure time. NAS messages indicating the flight is active have been received, but no departure message has been received.
 - T: Flight has pushed from the gate and is in taxi status. This is derived from NAS user Out-Off-On-In (OOOI) data.
 - P: Proposed departure time and filed route from flight plan.
 - N: Early intent message from NAS user.
 - S: Scheduled time from Official Airline Guide (OAG) and “best guess” routing information from ETMS.
3. Determine the initiative required. Many times the users have already filed themselves around the impacted area, precluding the need for reroutes. If this is the case, the situation may be handled tactically. Alternately, the situation may be handled with deviations or MIT. Advise the SVRWX Coordinator of your intentions, to help avoid conflicts with other active or planned initiatives.
4. If a reroute is necessary, the first resource for developing reroutes is the National Playbook, which features prevalidated routes for many different scenarios. The Playbook does not, however, address every situation and specialists should be prepared to create ad hoc routes as necessary.
5. Discuss the route with the affected facilities, making any necessary route adjustments. Field facilities are expected to favor and accept rerouted traffic. This may result in facilities restricting their internal traffic with MIT, altitude caps, or other traffic management initiatives to accommodate the rerouted volume.
6. Complete a Severe Weather Reroute Advisory, which will automatically be entered in the Severe Weather log. Remember to enter your operating initials along with the advisory in the log when more than one person is signed on in Severe Weather.

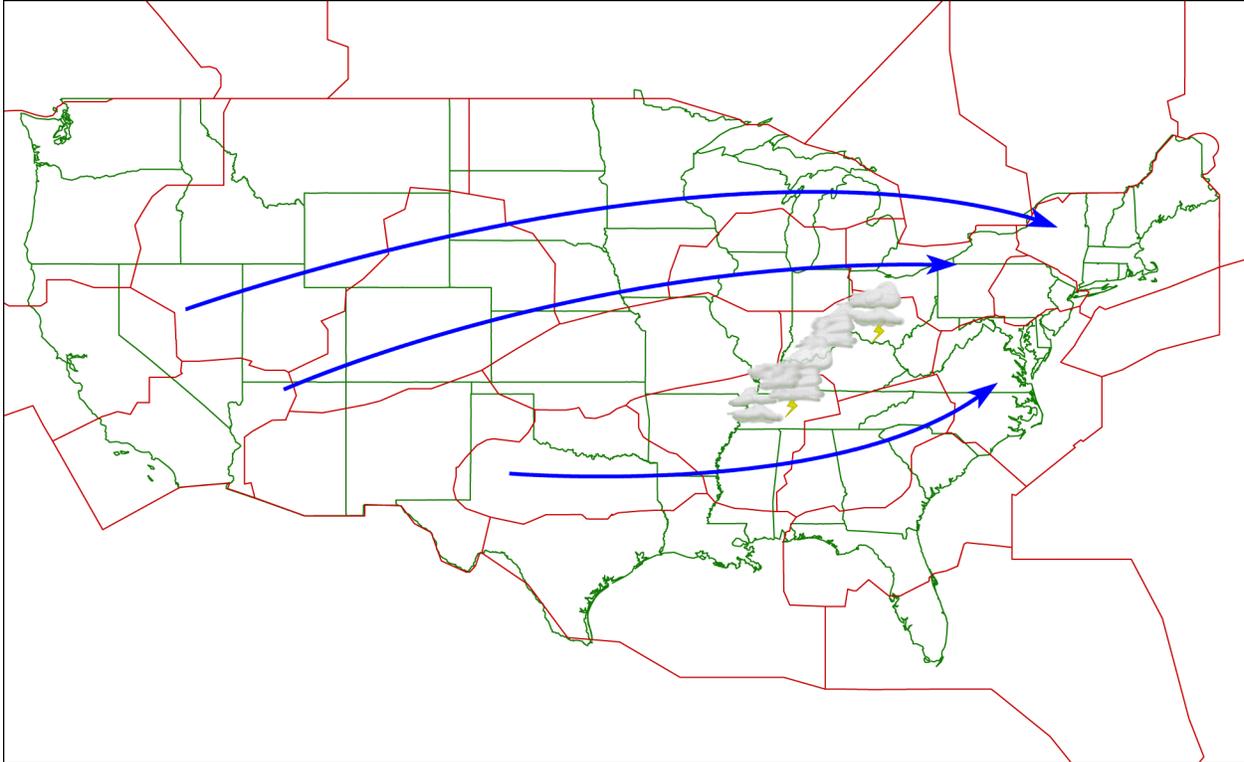
Severe Weather Reroute Planning Process



Principles of SWAP

While there are many different theories and techniques for rerouting aircraft, for the purposes of this discussion two major categories will be used: Proactive and Reactive. Proactive SWAP refers to the utilization of strategic planning and weather forecasts to preemptively reroute traffic flows around areas of anticipated system impact. System impact being not only the area of convective weather, but also the areas of increased volume levels associated with aircraft deviations and user operations in proximity to the weather. Proactive reroutes enable ATC to efficiently manage the NAS with more predictability than is possible with tactical reactive actions.

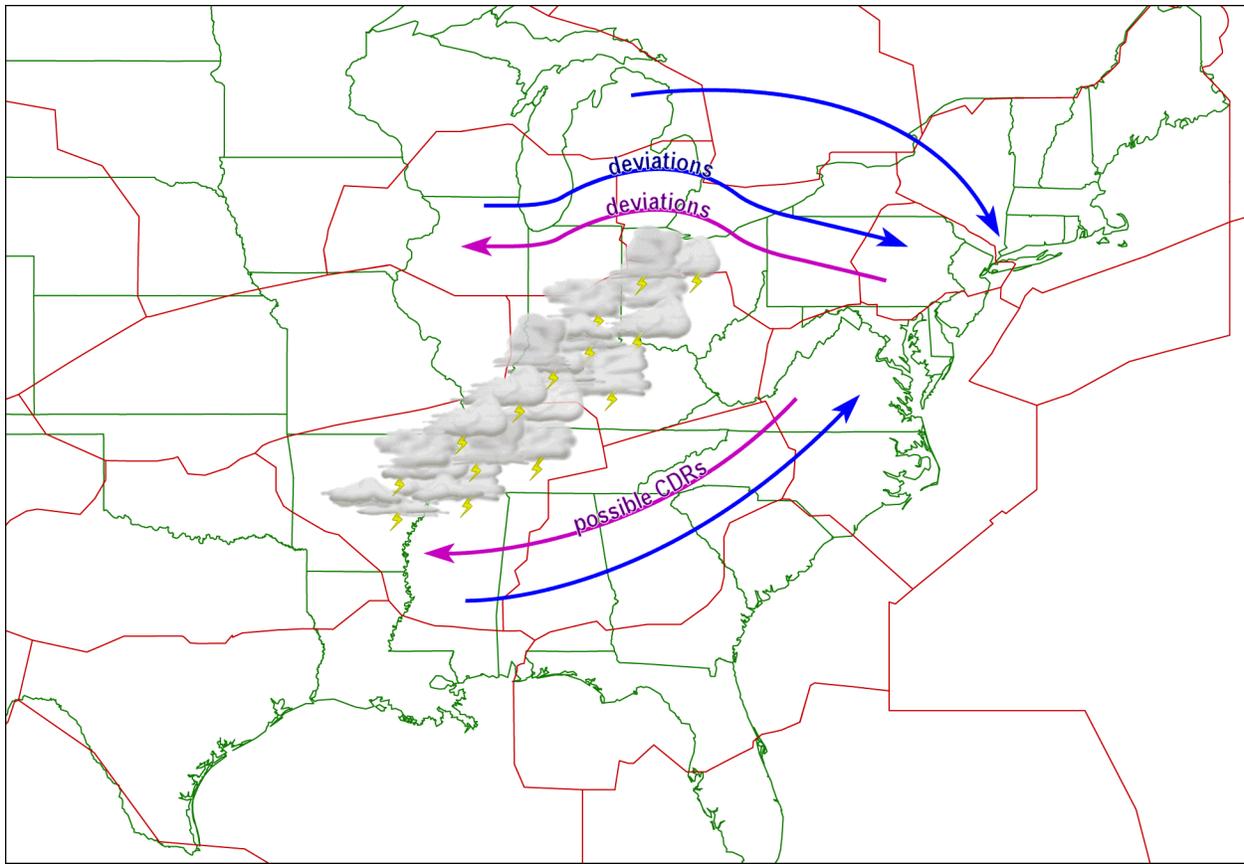
Reactive SWAP occurs when convective activity is forecast, but the confidence in its location and/or intensity is low, or the weather is not forecast. Commonly referred to as a “wait and see” approach, reactive reroutes frequently occur when there is no strategic consensus for a proactive approach and system users fly their filed user preferred trajectories (UPT) with the understanding that should the weather develop to the degree that NAS operations are impacted, ATC will implement tactical initiatives to manage deviations, volume and complexity. It is important to note that reactive does not necessarily equate to inaction. Alternative reactive initiatives include FEAs with associated recommended routes or pre-coordinated reroutes with a trigger mechanism. In cases where collaboration is not reached but action must be taken to manage the NAS, the ATCSCC may proactively implement initiatives to ensure system integrity.



Proactive SWAP

Proactive reroutes are usually implemented after collaboration on the SPT. In the example above, current scattered thunderstorms along a frontal zone are forecast to increase in intensity and impact the NAS throughout the afternoon. The proactive actions include:

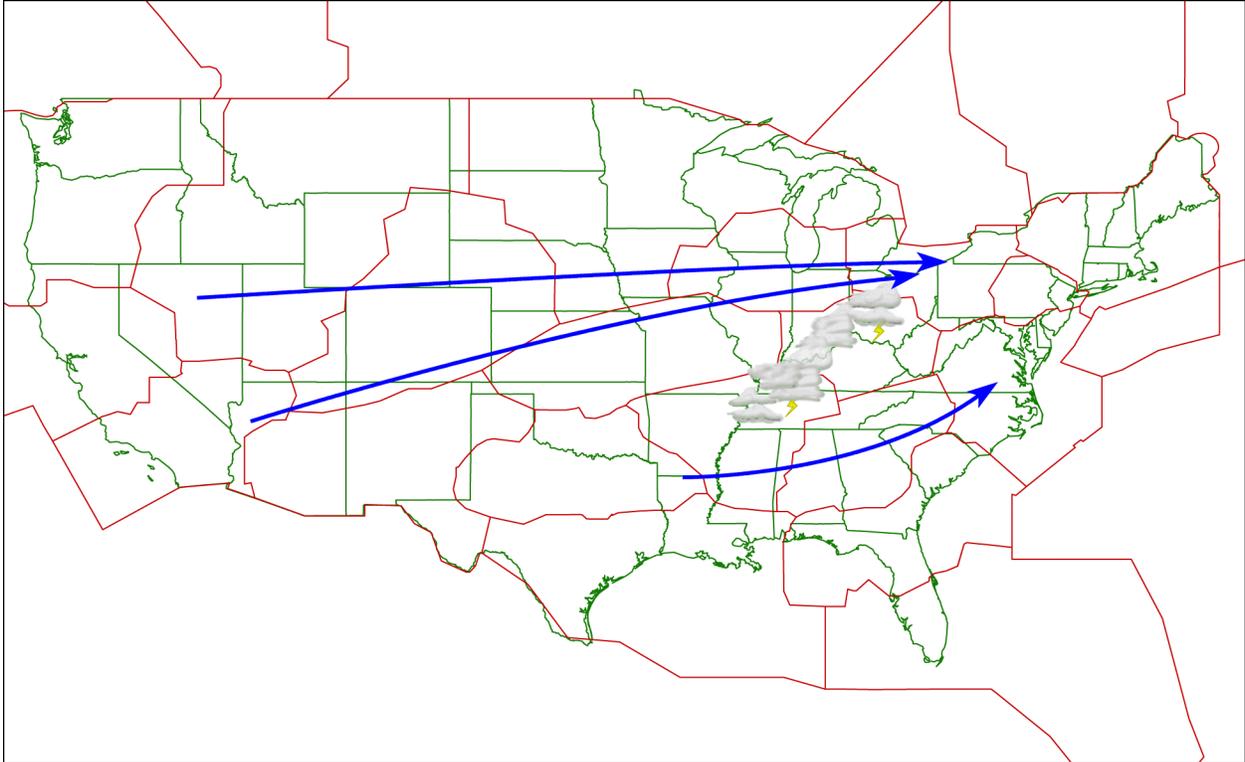
- Canadian Route: shifts volume north of the constrained area.
- ZOB Chokepoints: structure the remaining major eastbound arrival volume, allowing ATC to accommodate deviations and miscellaneous flights.
- MGM Playbook: shifts volume south of the constrained area.
- FEA/FCA: may be used to evaluate an area of current or anticipated constraint or require FAA facilities and system users to avoid a constrained area. During significant events, multiple playbook routes may be used in association with an FEA or FCA.



Proactive Outcomes

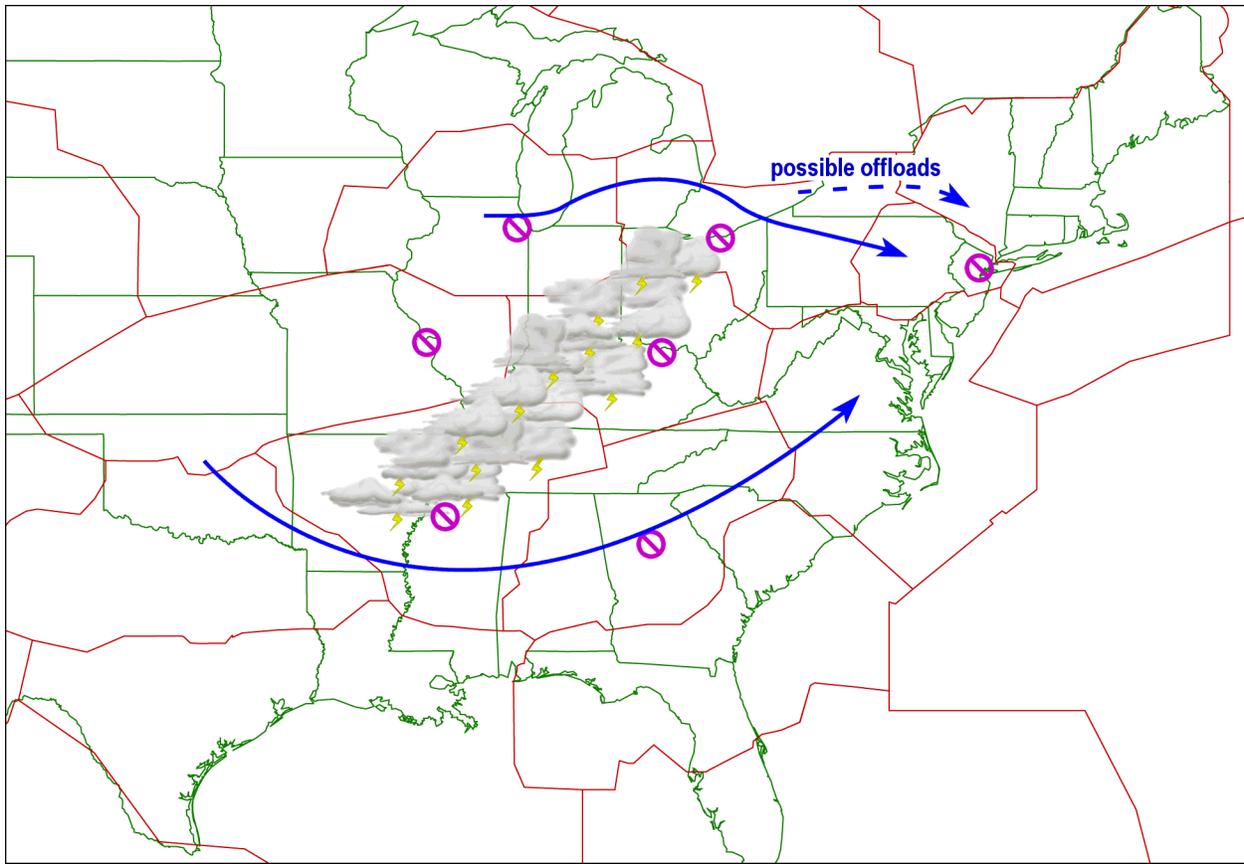
As convective activity develops, pre-established routes around areas of system impact allow ATC to accommodate user operations closer in to the weather. Eastbound Playbook routes also allow for increased availability of westbound departure routes with deviations in lieu of SWAP or CDR use. Should the system impact become more significant, westbound CDRs may be utilized to minimize departure delays.

Ground stops and other high-impact traffic management initiatives are kept to a minimum, only being necessary where unforeseen volume and complexity affects the enroute structure, or where weather impacts terminal areas unrelated to SWAP routes.



Reactive SWAP

Reactive SWAP commonly occurs when no consensus for proactive reroutes is reached on the SPT, confidence in the weather’s location and/or intensity is low, or the weather is not forecast. In the example above, current widely scattered thunderstorms have some probability of building, but forecast confidence is low. System users file and fly their UPTs. Alternately, ATC could have issued an FEA with recommended routes around anticipated constrained areas or pre-coordinated reroutes with triggers for implementation.



Reactive Outcomes

In the event that the convective activity does not develop into a system that impacts NAS operations, a reactive approach would be satisfactory. However, in this example weather has developed enough in scope and intensity that NAS operations are impacted. Unrestricted volume levels and complexity require ATC to implement initiatives with little or no notice to manage the NAS' reduced capacity levels. Tactical reroutes are required as pilots deviate north and south of the weather, leading some facilities to enter into periods of ground stops in order to accommodate the complexity of airborne reroutes and holding.

IV. Facility Overviews

ZAU

Overview

ZAU TMU is staffed with Arrival, Departure, Overflight, Weather (usually combined) and Military (usually combined) Coordinators. Similar to the ATCSCC, you have an equal chance of reaching any of these specialists when calling. You should expect to ask for the specialist you are requesting by position.

Major Traffic Flows

Eastbound Overflights:

J16.....ZBW arrivals
J34/J584/J554....EWR arrivals
J94/J70.....JFK arrivals
J146.....LGA/PHL/PIT arrivals
J30.....IAD arrivals
BAE MKG/VHP FWA....DTW arrivals

Westbound Overflights:

J94/J10/J60....DEN arrivals
J64.....LAX arrivals (very dependent on NRP routings)
J36/J34.....SFO arrivals (very dependent on NRP routings)

The majority of ZAU overflights fall into the transcon category, which are most easily managed with Playbook reroutes. To be effective, however, these reroutes must be implemented several hours in advance of reaching the Midwest. East Coast events will lessen the severity of ZAU overflight problems due to ZNY CDR or Playbook usage, as will NRP at times.

Arrivals

ORD arrivals:

| | |
|--------------------|---|
| KUBBS.....PMM STAR | ZNY/ ZBW/ Canadian |
| BEARZ.....OXI STAR | PHL/ ABE/ MDT/ PIT/ DC Metros |
|OKK STAR | ATL/ Florida |
| PLANO.....BDF STAR | LA Basin/ Desert Southwest/Texas/ COS |
|CAP PNT | offload route for STL departures, by apre |
| KRENA.....JVL STAR | SFO/ Pacific NW/ DEN |
|DLL MSN | offload route for MSP departures and international arrivals, by apre |

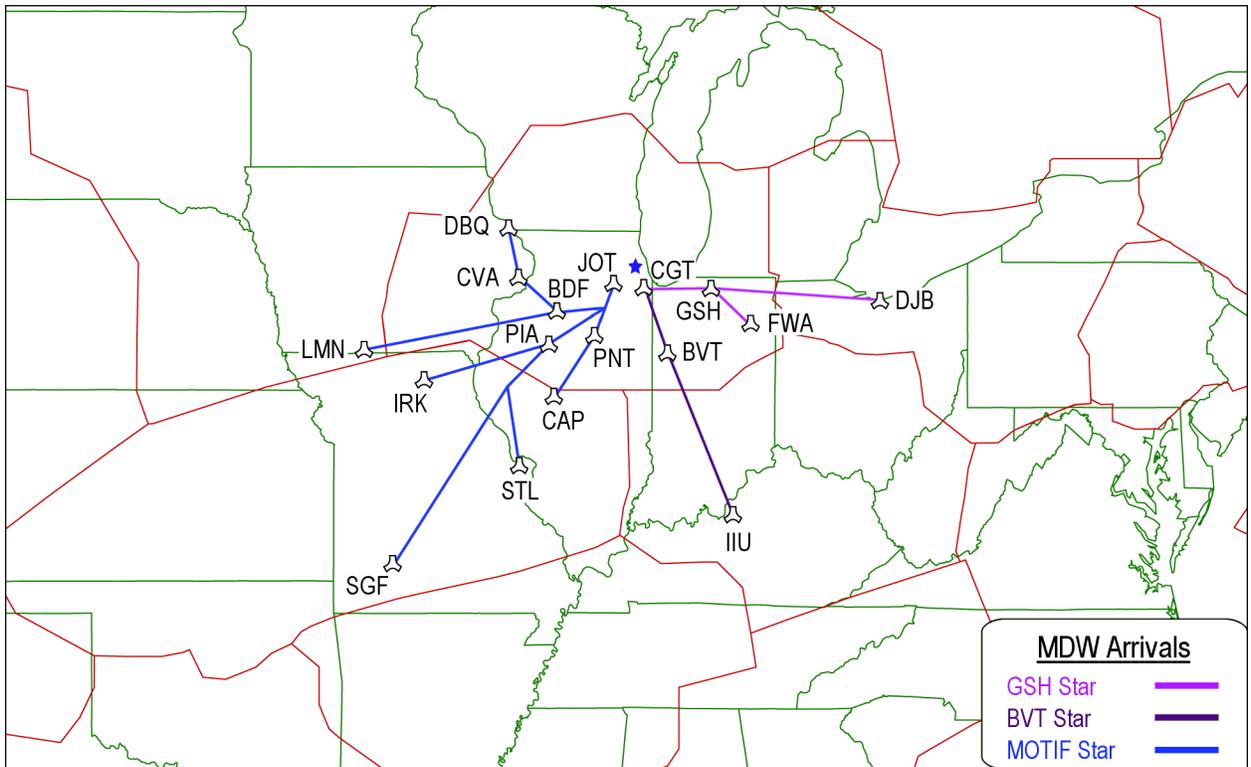
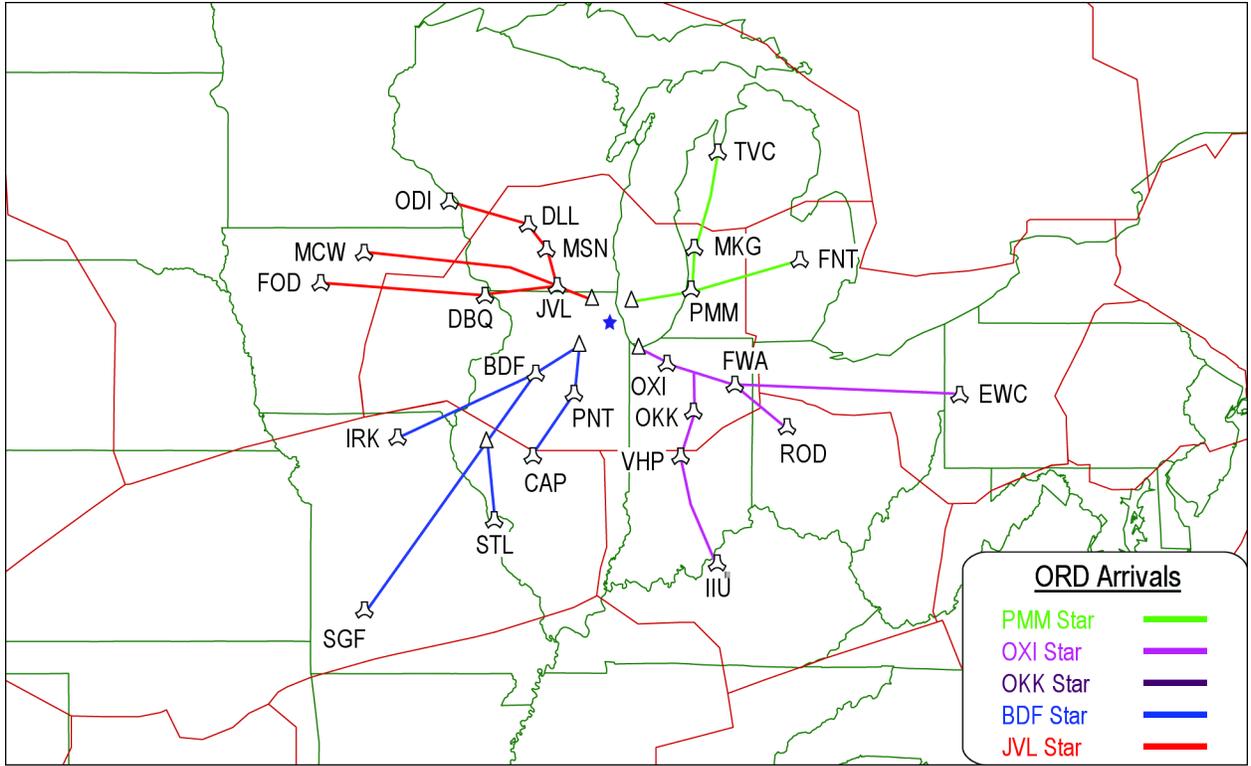
MDW arrivals:

| | |
|--------------------|---|
| JOT.....MOTIF STAR | All facilities north, northwest, west and southwest |
| CGT.....BVT STAR | Facilities south and southeast |
|GSH STAR | Facilities east and northeast |

Common Arrival Reroutes

When swapping ORD arrivals, it is easiest to treat them like an airway swap, shifting them around to maintain as much balance as possible to avoid overloading any particular fix. If BEARZ becomes impacted, a common reroute is moving ZMA/ZJX departures to the BDF STAR via STL and the MAGOO transition. Once this is accomplished, examine ZFW/ZHU to ORD volume and if necessary move this to J96 BDF and off of STL. This action would normally be enough, as Texas and Florida (east and west) arrival pushes rarely happen concurrently. However, an examination of the west coast to ORD demand would be prudent.

Should ZNY and ZBW enter into a swap for ORD through Canadian airspace, remember that PHL, ABE, and MDT normally file J64 to the OXI STAR and are not easily swapped north by ZNY. It is relatively easy for ZOB to accommodate the ABE/MDT departures transitioning to PMM. PHL departures are best served being swapped to J6 EYTEE J149 ROD FWA, or via PHL DQO offload routes ESP'd with ZDC.



Departures

ORD/MDW east departures:

ELX.....Canada/ EWR/ JFK/ ZBW/ Atlantic Overseas
GIJ.....DC Metro/ PHL/ LGA/ PIT/ EWR (MDW)

ORD/MDW south departures:

EON.....ATL/ MCO/ RDU/ CVG/ CLT
GUIDO (J73)..BNA/ MEM/ Florida (minus MCO)
RBS.....ZFW/ZHU/ STL

ORD/MDW west departures:

PLL.....SLC/ SJC/ SFO/ DEN/ PHX
IOW.....LAS/ DEN/ PHX/ LAX (common NRP)
MZV.....MCI/ PHX/ LAX

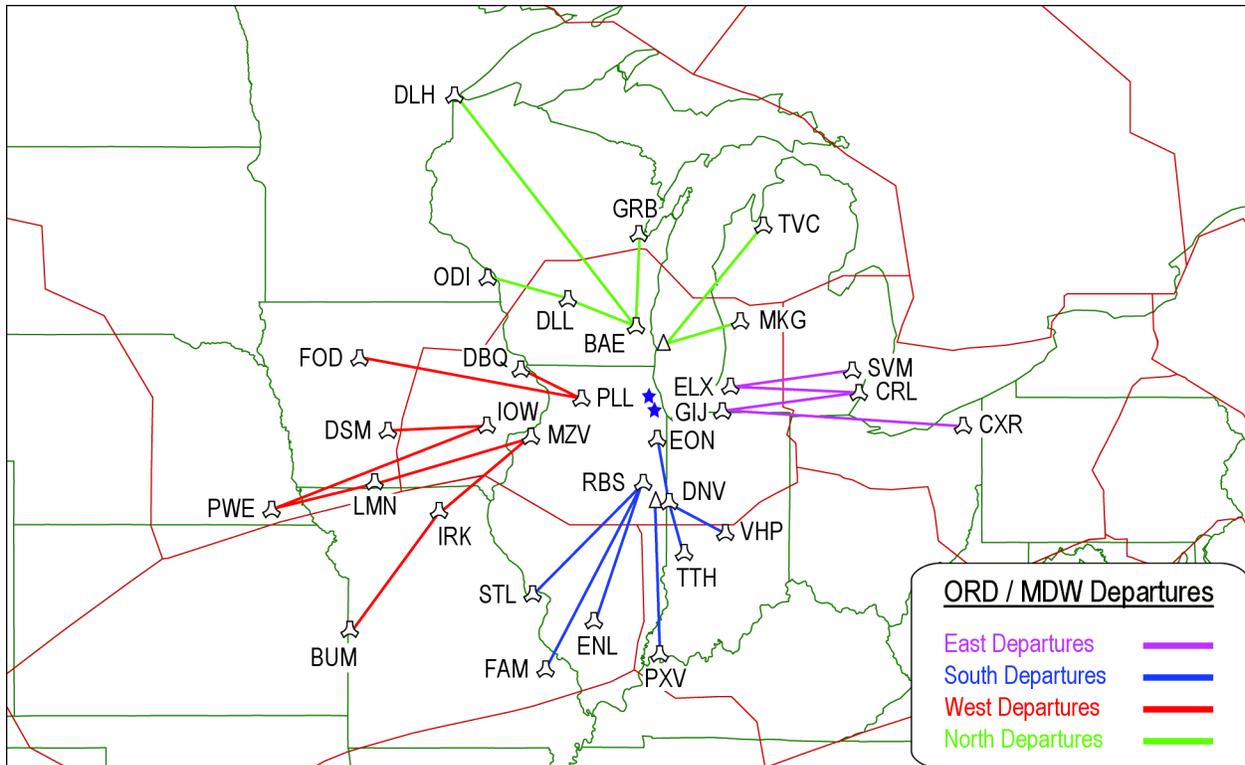
ORD/MDW north departures:

BAE.....ZSE/ Pacific Overseas/ MSP (MDW)
PETTY.....DTW/ Atlantic Overseas

Common Departure Reroutes

Common swap routes from ORD and MDW are coordinated CDRs and located within the RMT and ORD swap book. When possible, ZAU prefers to swap north. There are fewer volume constraints in that area, so a BAE J34 reroute to ZOA, ZSE, ZLC or even ZDV is easily implemented. Additionally, PETTY swaps to ZBW, ZNY and Canadian destinations through CZY are easily implemented. If ORD arrival demand via J36 PMM is low, ZOB may be willing to use J16 eastbound as well, avoiding ZMP.

When east departures are heavily restricted or unusable, a common reroute is to swap the DC Metros and PHL if possible, from GIJ (east) to EON (south) and over BKW. If south departure routes become impacted, swapping departures to ZFW/ZHU from RBS to MZV is a good option, as is moving some EON volume (ATL, RDU, CLT) to GIJ J146 GERBS and then south. ZOB and ZID are both very interested in any swap via GIJ J146 GERBS, as their internal volume conditions influence its implementation.



NAVAIDS

| | | | | | |
|------------|------------|------------|------------|------------|-----------------|
| BAE | Badger | BDF | Bradford | CGT | Chicago Heights |
| CVA | Davenport | DBQ | Dubuque | DLL | Dells |
| DNV | Danville | ELX | Keeler | EON | Peotone |
| FWA | Fort Wayne | GIJ | Giper | GSH | Goshen |
| IOW | Iowa City | JVL | Janesville | JOT | Joliet |
| MKG | Muskegon | MSN | Madison | MZV | Moline |
| OKK | Kokomo | OXI | Knox | PIA | Peoria |
| PLL | Polo | PMM | Pullman | PNT | Pontiac |
| RBS | Roberts | | | | |

Special Use Airspace

There are no SUAs in ZAU that would normally have an impact on reroutes.

ZBW

Overview

ZBW TMU is staffed with MOS, DSP/ESP, Metering and Reroute positions. The MOS is generally not involved in TM issues. All positions except TMCIC (if applicable) and MOS are rotated throughout the shift.

The Metering position at ZBW is a true meter. That is, they manage fix-crossing times to deliver a pre-set AAR. The metering TMC observes the BOS final as well as the ZBW holding patterns and assigns meter times to various other Tracons (i.e. MHT, PVD and Cape).

Major Traffic Flows

Departures from New England

SYR J547...ORD/DTW/CLE/MSP and some CVG

J6.....DFW/BNA/MEM

J75.....CLT and Some Florida

J48.....ATL

J80..... STL/most to LA Basin/CVG pref

J121/J174... AR traffic

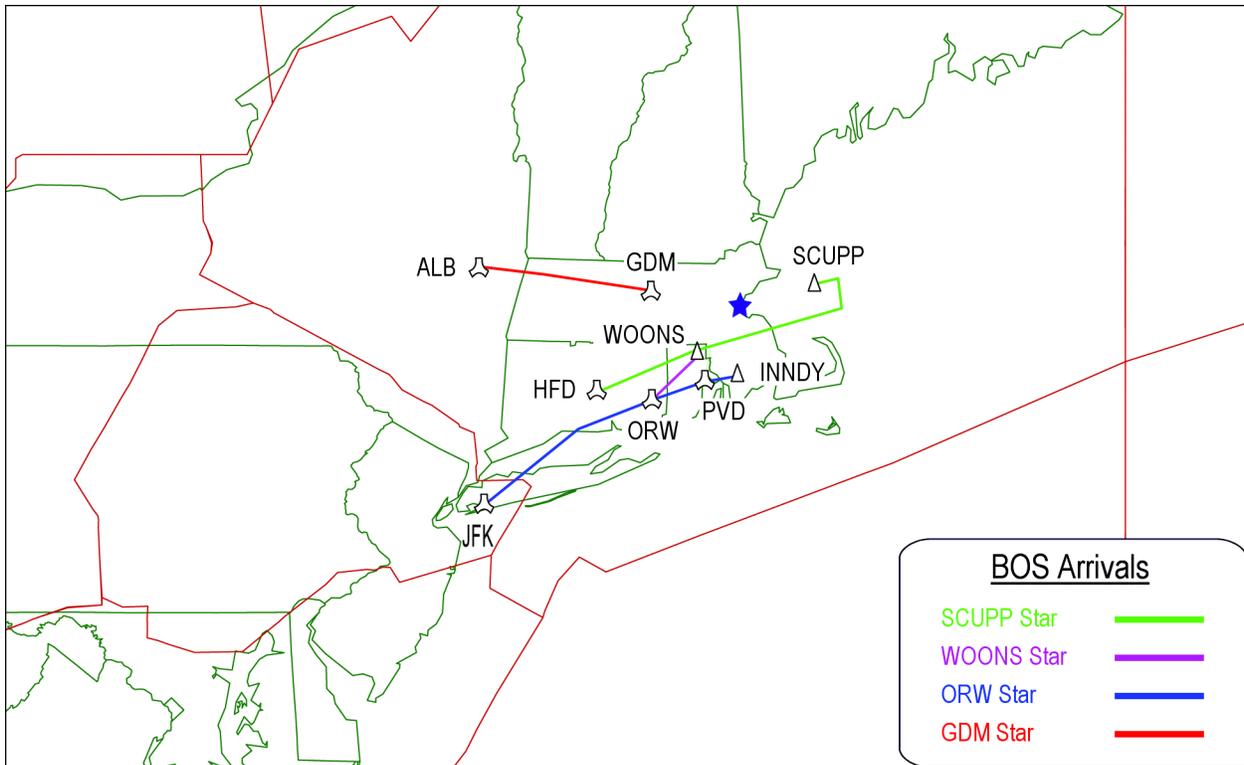
PHL arrivals have two routes, east via HTO and west via DNY SPUDS star. The two routes can be swapped without significant impact. ZBW can accept PHL offloads via DNY from ZOB.

JFK arrivals also have two routes. The internationals from Europe arrive via ROBER, which is south of BOS. There is a heavy international arrival push from 3-6pm local and early coordination of changes is imperative. JFK arrivals may also be routed via HNK IGN; however, this route runs back into ZNY at LENDY. Offloading JFK arrivals from ZOB through ZBW is not effective if they resume the LENDY route, as it increases the probability of holding in ZOB. Swapping IGN and ROBER traffic is feasible with appropriate coordination with N90 and ZNY.

EWR arrivals are via SAX and the SHAFF star. Routing all EWR arrivals through ZBW from the west may be accommodated by ZBW.

LGA arrivals are routed via RKA and overfly IGN. Much like EWR, ZBW may accept all LGA arrivals from the west with MIT.

HPN arrivals from the west are also via DNY, and come from both ZNY and ZOB. The volume for HPN is much less than the other N90 airports and will generally not impact the ZBW operation significantly.



BOS arrivals from the west are via ALB and the GDM STAR. BOS arrivals from the northeast, i.e. Europe, are via SCUPP. Arrivals from N90 and ZDC are via ORW and the ORW STAR. Arrivals from the south and west may be offloaded to SCUPP.

Common Reroutes

When J6/J80 are impacted or ZNY volume or departure delays are a concern, utilize SYR J29 through ZOB. ZOB is usually amenable. If J48 or J75 are impacted, swap to the route used by ZNY, if available. This has little impact on ZBW. If J75/J48 are both unusable, HTO J121 may be utilized after coordination with ZDC.

Utilization of Canadian Airspace

ZBW abuts Toronto (CZY) and Montreal (CZU) Centers. CZY is the primary Canadian facility for coordinating swaps. Should you need to swap N90 Northgate departures to ZBW and then westbound, GREKI swaps are the norm. Should volume become a concern during a period when both ZBW and N90 are swapping through CZY, stopping all ZBW westbound departures to favor N90 (or vice-versa) is an option to mitigate these concerns.

NAVAIDS

| | | | | | |
|------------|-------------|------------|------------|------------|--------------|
| ACK | Nantucket | ALB | Albany | ART | Watertown |
| BAF | Barnes | BDL | Bradley | CAM | Cambridge |
| DNY | Delancy | ENE | Kenebunk | GDM | Gardner |
| HFD | Hartford | HTO | Hampton | IGN | Kingston |
| MHT | Manchester | MSS | Messina | ORW | Norwich |
| PLB | Plattsburgh | PVD | Providence | PWM | Portland, ME |
| RKA | Rockdale | SAX | Sparta | SLK | Saranac Lake |

Special Use Airspace

The Falcon MOAs east of ART impact ZBW's ability to utilize ART for reroutes. The Playbook Canadian Routes have been developed to avoid this area. When active, W105 off the east coast (between Long Island and ACK) impacts southern North Atlantic Tracks.

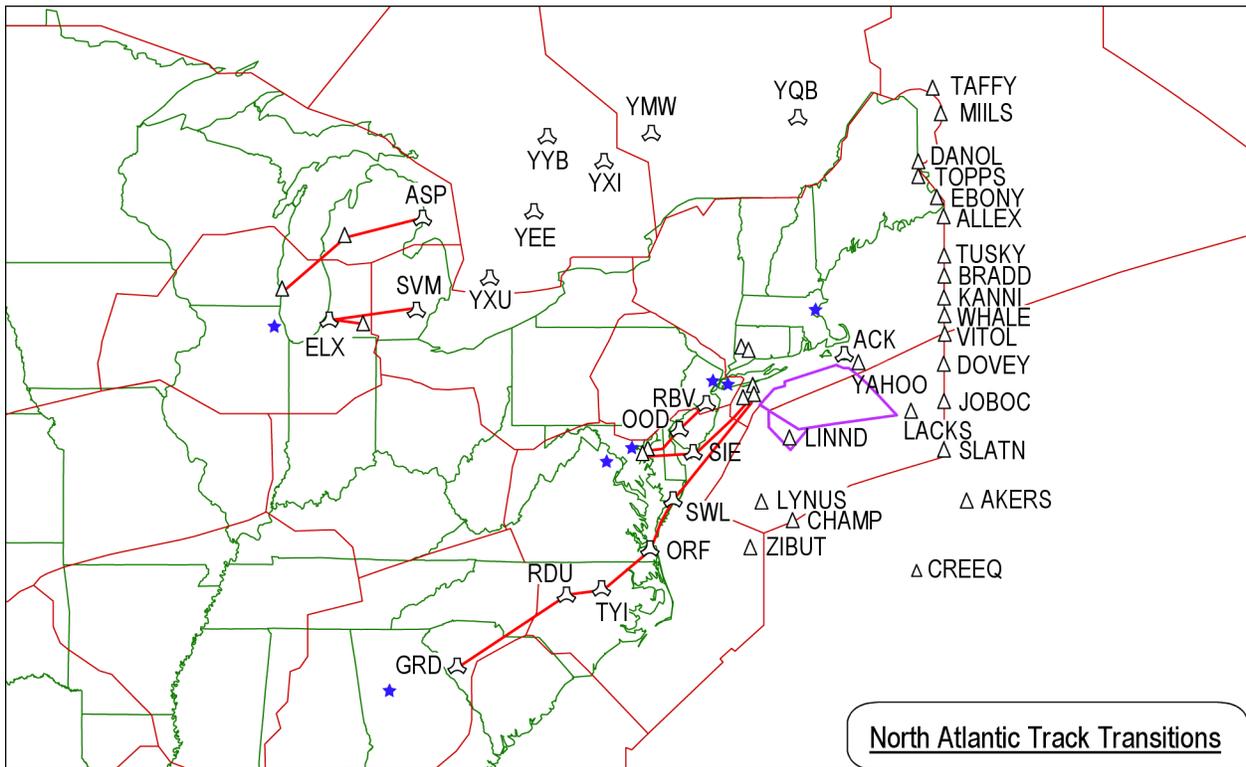
North Atlantic (NAT) Tracks

The North Atlantic Tracks (NATs) are non-radar routes established by Gander Area Control Center up to 8 hours in advance, and transmitted from Gander and Shanwick Oceanic Area Centers via Teletype to users and control facilities. The tracks are dynamic, changing daily to optimize capacity and establish a minimum time track (MTT). This minimum time track is loaded with most of the North Atlantic volume and additional tracks are assigned north and south of the MTT for increased capacity.

The ZBW North Atlantic Advisory message is prepared by ZBW, and after coordination with ZNY TMU, ZNY North Atlantic Supervisor, and ZDC STMC, is transmitted as a numbered advisory to all domestic and international users and facilities. This message identifies the routes that international departures will file to gain entrance to the NATs via Inland Navigation Fixes (INFs).

There are four departure routes for the highest volume flows from JFK and EWR airports: GREKI, which tracks north and northeast bound from N90; MERIT, which heads northeast over BOS; BETTE and HAPIE, which track overhead Long Island and the vicinity of ACK, heading eastbound. Note: HAPIE cannot be used while W-105 is active. Generally, half of the JFK international departures are routed via BETTE and/or HAPIE. The sectors that receive the BETTE and HAPIE departures are optimized for the higher volume of eastbound departures, alleviating potential departure delays at JFK.

A southern jet stream may necessitate the use of DOVEY as one of the INF's, complicating the track allocations and increasing the potential for departure delays. DOVEY tracks go directly from ZBW radar separation, into a narrow ZNY radar sector and then into non-radar ZNY Oceanic airspace at 67 degrees west. The transition from radar separation to non-radar requires an increase in longitudinal spacing and quickly backs up to the departures on the ground at JFK and EWR. When delays are anticipated on a DOVEY track, ZBW will request JFK departures via SHIPP LINND DOVEY for delay mitigation. This route is longer, but can help reduce overall departure delays. Alternately, increased MIT via BETTE and MERIT or airborne offloads to more northerly INFs in Moncton Control Center may be utilized.



ZDC

Overview

ZDC specialists rotate through operating positions, including TMCIC. The TMCIC will primarily answer DCC calls, although during busy periods, an assistant TMCIC is assigned to assist with coordination. The ZDC ESP position is dynamic and may be monitoring any combination of: PHL, EWR, LGA, JFK, TEB MMU, DCA, IAD, BWI, CLT, ATL, BOS, PIT OR RDU; depending on current requirements.

Major Traffic Flows

The sectors in central ZDC are tasked with sequencing several destinations at once. It is common to have several sectors blend the same flows due to airspace stratification. This process becomes further complicated during periods of convective activity.

ZBW Arrivals:

- ...J79 JFK
- ...PXT J191 RBV J222 JFK
- ...J174 HTO

ZNY Arrivals:

From ZTL:

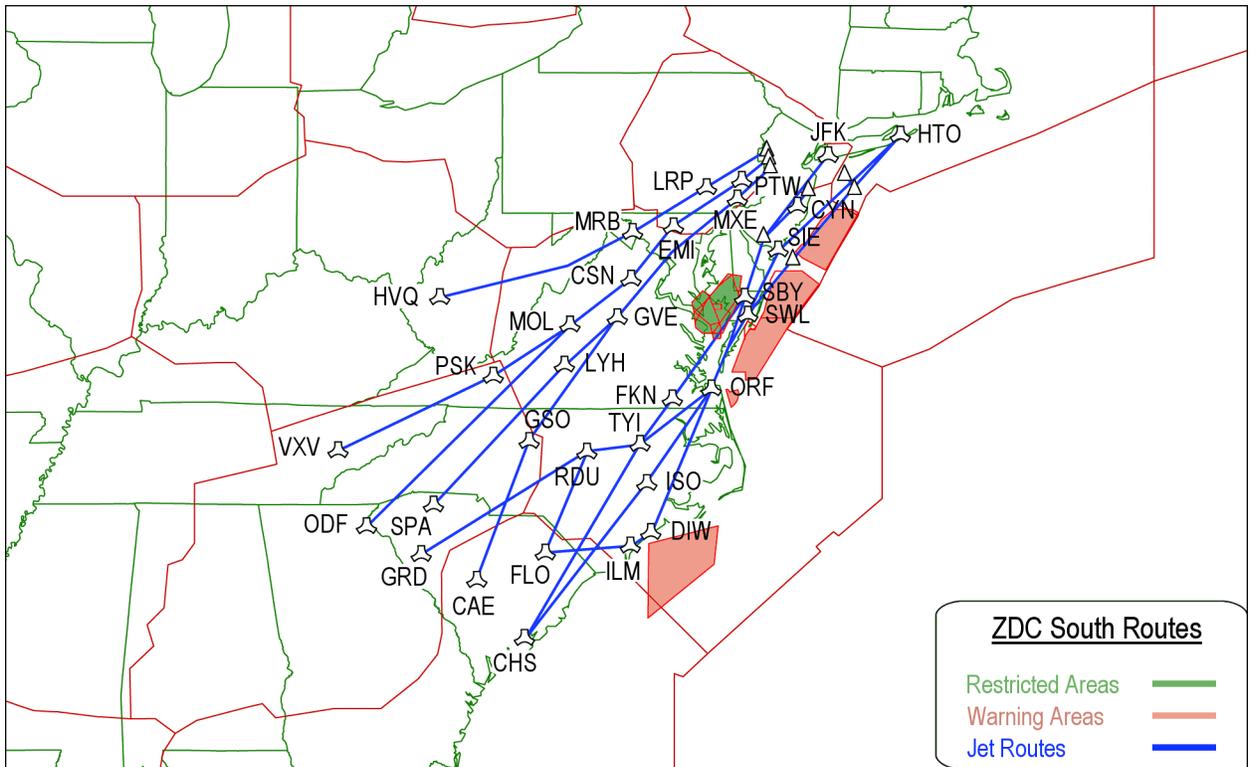
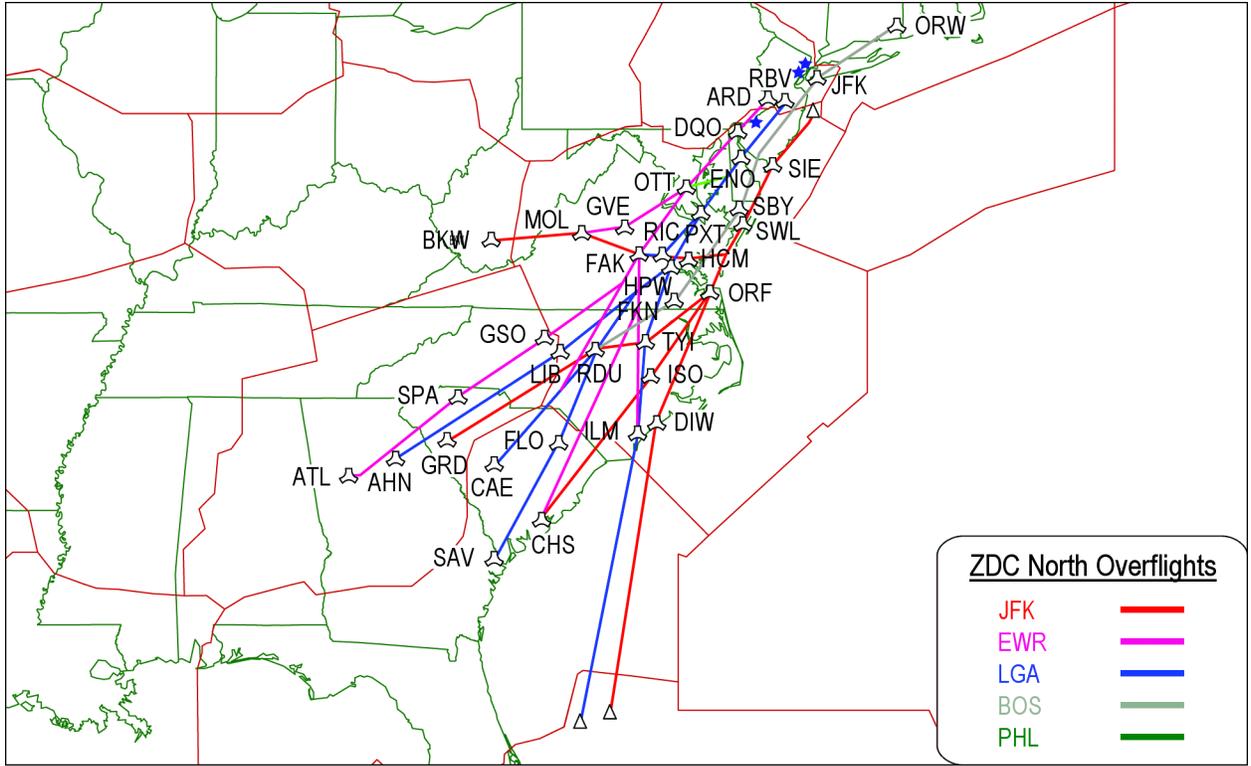
- ...J208 HPW J191 PXT (LGA/TEB/MMU)
- ...J14 RIC (LGA/TEB/MMU)
- ...J14 J51 FAK (EWR/PHL)

From ZJX:

- ...J51 FAK (EWR/TEB/MMU/PHL)
- ...J207 RDU J55 HPW (LGA/TWB/MMU)
- ...J121 SWL (PHL)
- ...J191 HUBBS J61 OTT (PHL/EWR)
- ...J174 ORF J121 SIE (JFK)

From ZID:

- ...J42 GVE (PHL/EWR/TEB/MMU)
- ...J42 MOL FAK (PHL/LGA/TEB/MMU)



Washington, DC Arrivals:

From ZOB:

- ...J30 BUCKO (IAD/DCA)
- ...J162 MGW (BWI)

From ZID:

- ...HVQ (IAD/DCA/BWI)
- ...J42 BKW (IAD/DCA/BWI)

From ZJX:

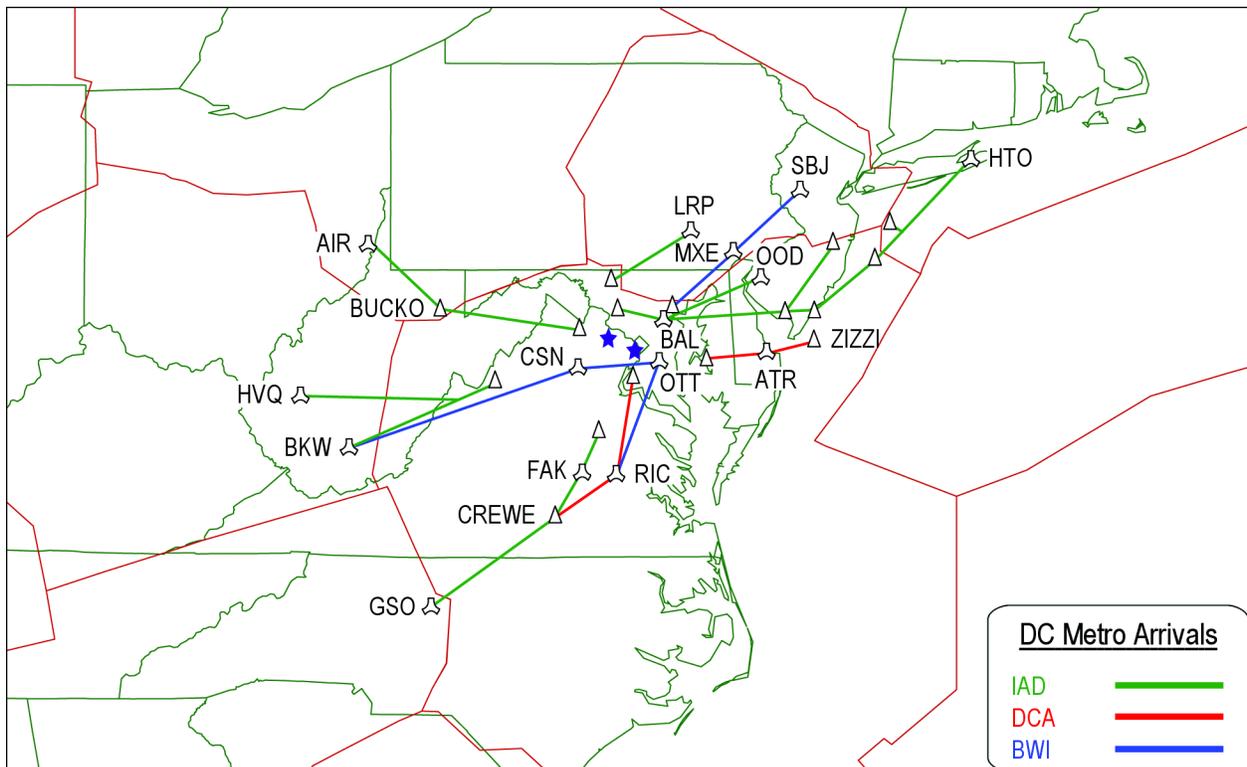
- ...J165 RIC (DCA/BWI)
- ...J52 RIC (DCA/BWI)
- ...ILM J40 RIC (DCA/BWI)
- ...J51 FAK (IAD)

From ZTL:

- ...J14 J51 FAK (IAD)
- ...J14 RIC (DCA/BWI)

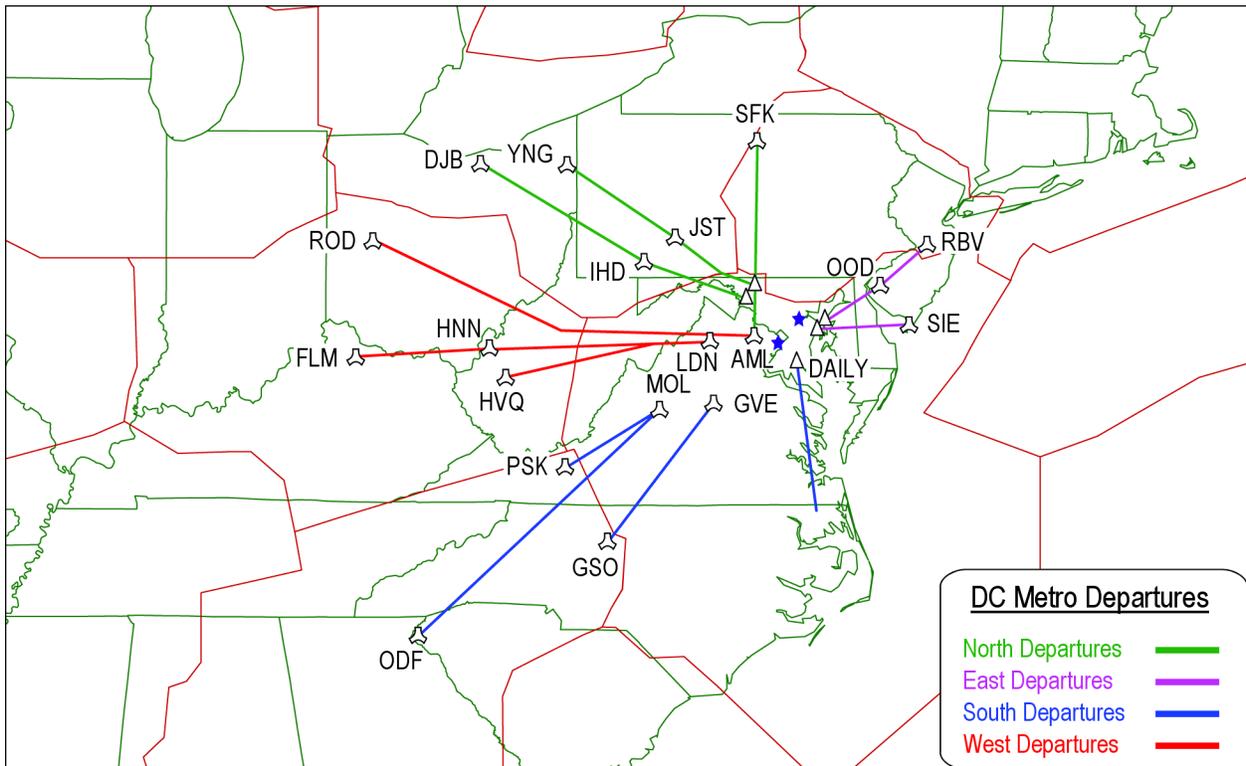
From ZBW:

- ...RIFLE J174 ZIZZI BILIT (BWI)
- ...SAX J6 LRP (IAD)



Washington, DC Departures:

SWANN.....ZBW/EWR
PALEO.....LGA/JFK
JERES.....DTW
BUFFR.....PIT
AML.....ORD
LDN.....ZID/ZKC/DFW/MEM/BNA
MOL.....IAH/ZTL
GVE.....West Coast of Florida
DAILY.....East Coast of Florida



Common Reroutes

ZDC may operate a single flow to EWR/LGA either over ARD or RBV. JFK cannot utilize either of these fixes, instead using routes over SIE. If SIE is impacted and warning areas are available, a reroute via SIE OWENZ may be possible. If arrival routes through ZDC are unavailable, rerouting to J220 may be an option; however, the volume of traffic arriving from ZOB limits this.

Arrival and departure routes are combined internally to ZDC as much as possible prior to implementing swap. For example, western arrival routes will be combined with more easterly routes as weather enters ZDC from the west. Once the weather progresses east, the easterly routes will be combined with the western routes.

NAVAIDS

| | | | | | |
|------------|----------------|------------|--------------|------------|-----------|
| AML | Armel | ATR | Waterloo | BAL | Baltimore |
| BRV | Brooke | CSN | Casanova | CVI | Cofield |
| CYN | Coyle | DIW | Dixon | DQO | Dupont |
| ENO | Smyra | ESL | Kessel | FAK | Flat Rock |
| FKN | Franklin | GVE | Gordonsville | HCM | Harcum |
| HPW | Hopewell | ILM | Wilmington | ISO | Kingston |
| LDN | Linden | LIB | Liberty | LYH | Lynchburg |
| MOL | Montebello | MRB | Martinsburg | OOD | Woodstown |
| ORF | Norfolk | OTT | Nottingham | PXT | Patuxent |
| RDU | Raleigh-Durham | RIC | Richmond | SBY | Salisbury |
| SIE | Sea Isle | SWL | Snow Hill | TYI | Tar River |
| VCN | Cedar Lake | | | | |

Special Use Airspace

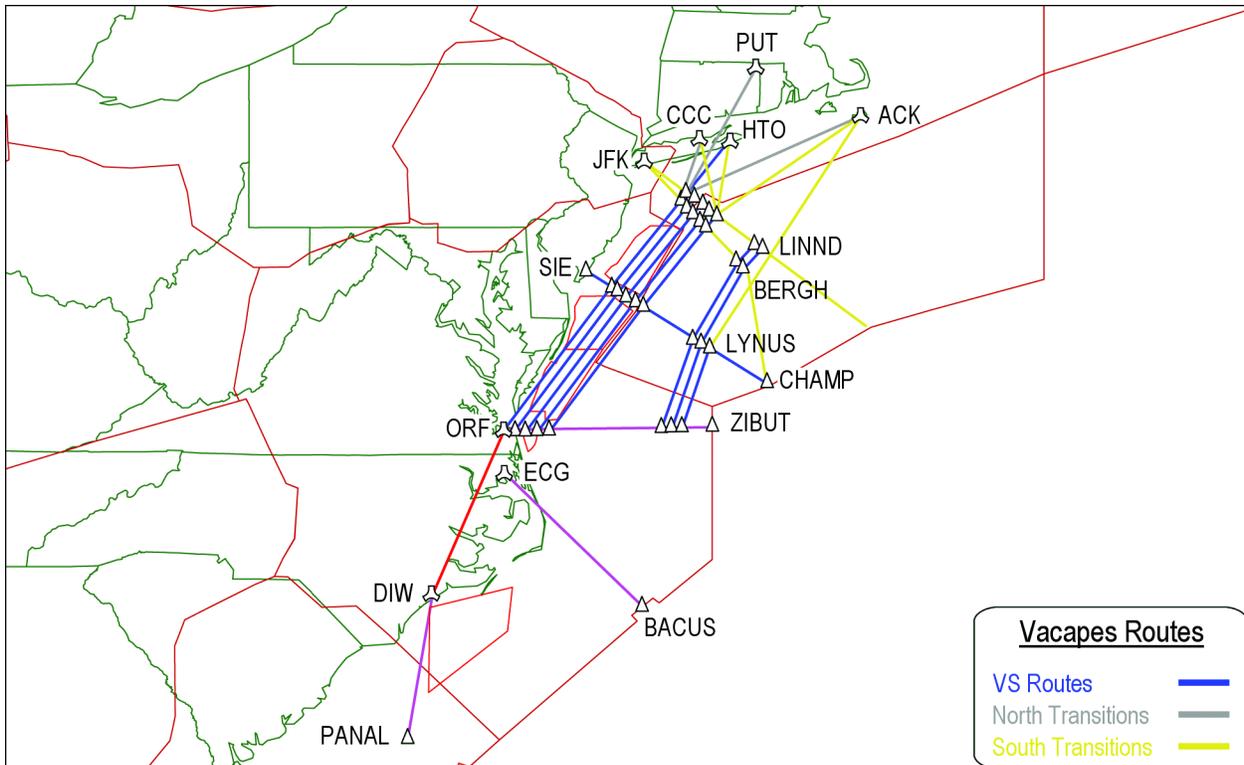
Large warning areas border the Atlantic Coast in eastern ZDC and ZJX. During episodes of convective activity, these areas pose a significant challenge to the continued operation of civil operations. Once ZDC advises that the warning areas will be needed to accommodate aircraft deviations, coordination with the military should be accomplished; usually by the Severe Weather NTMO or the NOM. The areas available for use with coordination are:

Vacapes1: Vacapes Areas A, B, C, D and E

Vacapes 2: Defined by waypoints : IMELY-WUZYU-GLENA-FUMES-OLDEY, and includes the airspace west of that line

Vacapes 3: Defined by waypoints: IMELY-BRACK-BOHJO-ECOSE-KENSI-OLDEY, and includes the airspace west of that line.

Additionally, the Vacapes (VS) Routes along the East Coast provide another alternative to explore when the East Coast is impacted. The Department of Defense and the FAA developed these R-Nav only routes to help reduce delays and provide additional routes to civil aircraft.



Other SUAs within ZDC that may restrict operational flexibility are:

Wallops Island (R6604): Along with W386 (part of Vacapes B), Wallops Island operations impact WHITE/WAVEY departures and may prompt MIT or the rerouting of BOS/PHL arrivals away from central ZDC.

PATUXENT (R4002-8): When active, PATUXENT is usually restricted for the entire day with altitudes ranging from 070 and up to FL270 or FL470. PATUXENT activities can significantly restrict ZDC's flexibility in accommodating deviations or alternate routes.

ZDV

Overview

ZDV TMU is normally staffed with three operating positions: Metering and two ESP positions. Metering handles all responsibilities surrounding arrivals into and departures out of the Denver terminal area. Two ESP positions are operated to manage enroute spacing and reroutes. During the winter months, ZDV utilizes an additional position to manage Ski Country traffic.

Major Traffic Flows

Eastbound Overflights:

ORD arrivals.....BFF ONL FOD JVL (OBH FOD may be used during off-peak periods)
.....SLN IRK BDF

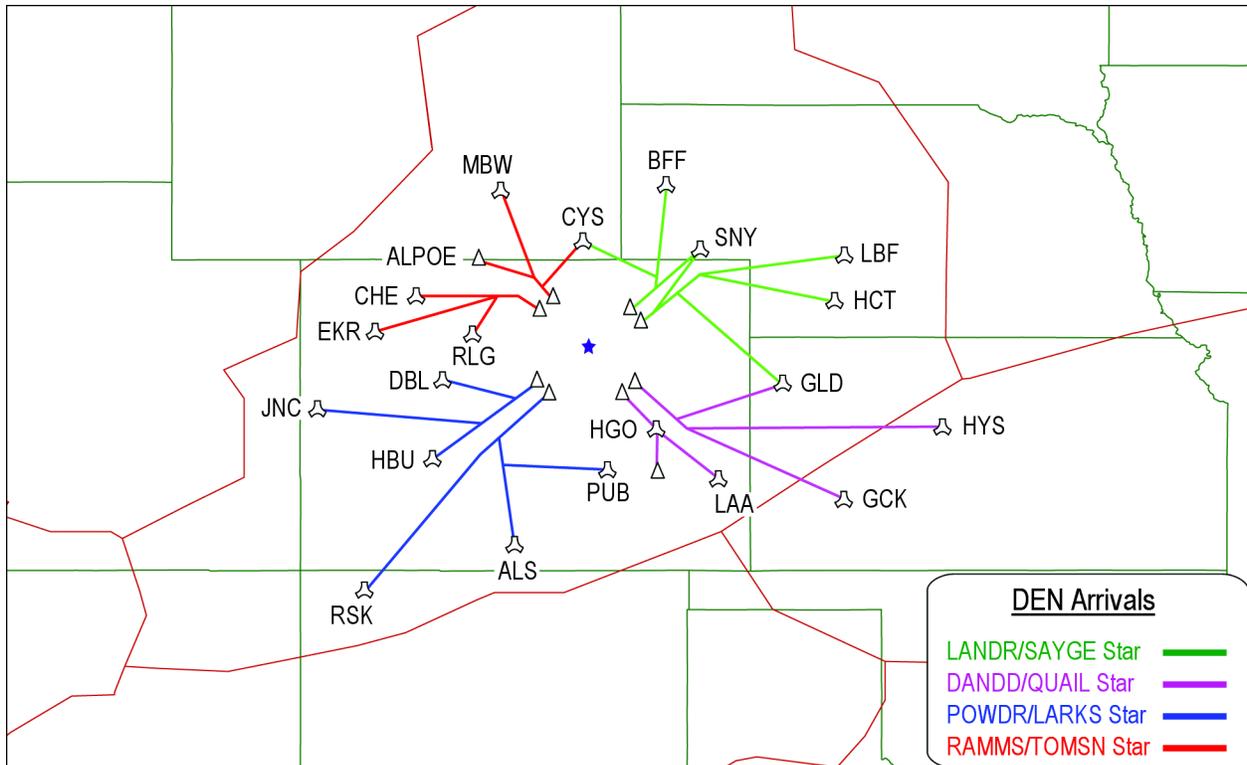
Westbound Overflights:

LAX arrivals.....J64 TBC (alternate north route through ZLC via J60 BCE)
LAS arrivals.....J64 PGS (alternate north route through ZLC via J60 BCE)
PHX arrivals.....ALS J102 GUP

Common Reroutes

The DEN airport operates a four corner-post arrival gate system, with each gate having dual arrival routes. DEN arrivals are almost always handled internally since eight arrival gates allow for quick reroute changes in severe weather situations. During more significant weather events, when all west or east gates are impacted, first tier facilities may be called upon to tactically reroute this traffic. When severe weather impacts DEN area departures, CDRs are typically used to accommodate SWAP. All CDRs return to normally filed routes before leaving ZDV airspace.

Playbook routes for transcon flights from the west to east coast, may combine into a single route in ZDV. This poses a challenge in achieving required spacing on these routes and could necessitate pass-back MIT restrictions as this traffic competes for routes leaving ZDV airspace.



NAVAIDS

| | | | | | |
|------------|--------------|------------|--------------|------------|----------------|
| ALS | Alamosa | BFF | Scottsbluff | CHE | Hayden |
| CYS | Cheyenne | CZI | Crazy Woman | DBL | Red Table |
| EKR | Meeker | GLD | Goodland | HBU | Blue Mesa |
| HCT | Hayes Center | HGO | Hugo | JNC | Grand Junction |
| LAA | Lamar | LBF | North Platte | MBW | Medicine Bow |
| PUB | Pueblo | RSK | Rattlesnake | SNY | Sidney |

ZFW

Overview

ZFW TMU has a specialist assigned as the TMCIC who usually answers the phone and can do all necessary coordination. When reroutes are implemented, they are usually implemented for DFW Terminal, including DAL and other satellites (ADS, RBD, AFW, FTW, etc.).

Major Traffic Flows

DFW Arrivals:

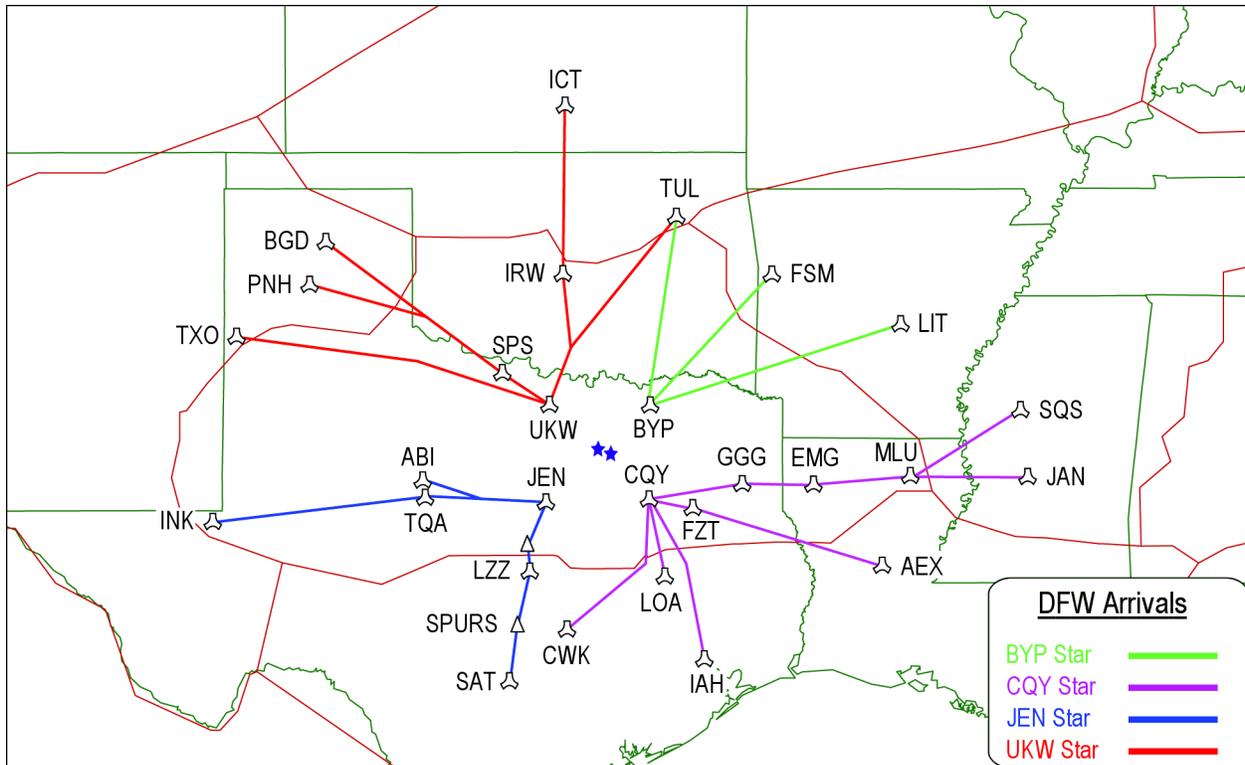
BYP: Aircraft departing the East Coast usually file via J6 LIT BYP. This route contains heavy volume during arrival pushes. In addition to the J6 LIT flow, BYP receives DFW arrivals via RZC FSM from destinations in eastern ZKC, ZAU, ZID and ZOB.

CQY: Aircraft departing ZJX and ZMA destined DFW usually file via AEX CQY. Departures from southern ZDC, ZTL and ZME file via SQS or JAN and the CQY STAR. Also included in the CQY demand are departures from the Houston terminal area.

JEN: Aircraft departing western ZHU, as well as ZLA, ZAB and western ZFW normally utilize the JEN star. JEN volume concerns will be based largely on upper winds. When winds are favorable, users will file NRP from the LA basin airports to the UKW arrival fix, leaving JEN largely unused.

UKW: Traffic departing ZMP, Western ZKC, ZLC, ZSE, ZDV and ZOA utilize the UKW star to DFW. Transitions include flows via IRW, TXO, AMA and BGD.

*NOTE - There is also an arrival route for DFW via TUL, joining either the BYP or UKW STAR.



DFW Departures:

EAST Departures: (busiest departure routes)

- LIT (TTT 064R)- DTW/CLE/Western ZID
- TXK (TTT 074R) – ZBW/ZNY(except LGA/JFK)/DC Metros
- ELD (TTT 084R) – ZTL/LGA/JFK
- EIC/SWB (TTT 094R) - ZJX ZMA CARIBBEAN

NORTH Departures:

- ADM (FUZ 348R)- ZDV/ZSE/ZOA/ZLC
- TUL (FUZ 360R)- ZMP/Western ZKC
- OKM (FUZ 012R)- ORD
- MLC (FUZ 022R)- STL

WEST Departures:

- PNH (TTT 285R)- ZDV/Pacific NW/ZLC
- TCC (TTT 275R)- ZOA
- LBB (TTT 264R)- LAS/Northern ZLA
- ABI (TTT 250R)- Southern ZLA/PHX

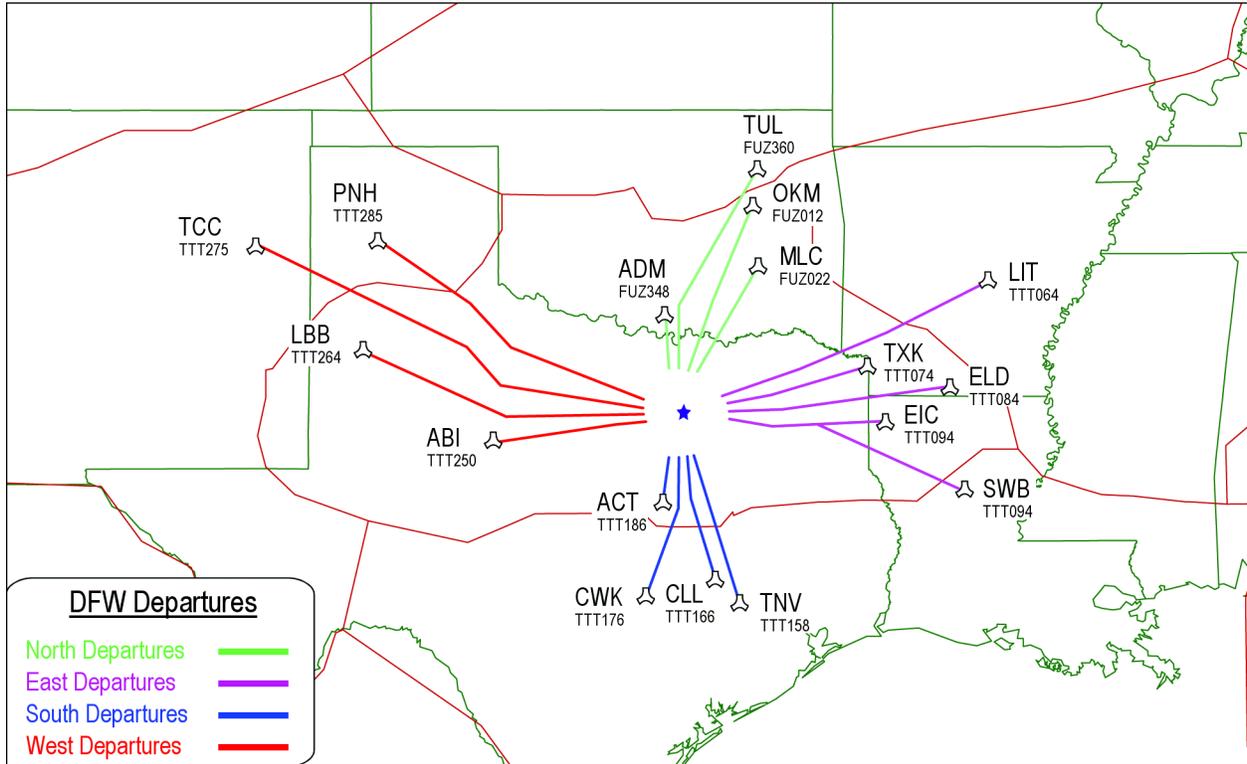
SOUTH Departures:

TNV (TTT 156R)- IAH

CLL (TTT 166R)- HOU

CWK (TTT 176R)- Southern TX/Mexico

ACT (TTT 186R)- SAT/Western Mexico



Other Major Traffic Flows:

J180 South.....IAH arrivals

J29/101 North.....IAH to ZAU/STL/ZOB/ZID

J17 Northwest.....ZHU to ZDV/Pacific NW

Common Reroutes

Arrivals:

BYP impacted:

FSM BYP - reroute to TUL UKW or ICT IRW UKW

LIT BYP – reroute to SQS CQY or BWG ARG FSM BYP

CQY impacted:

ZTL/ZME – reroute to LIT BYP

FLA – reroute to LIT BYP or IAH J86 SPURS LZZ JEN

IAH/HOU- IAH J86 SPURS LZZ JEN

JEN impacted:

South TX - CWK CQY

West Coast -UKW

UKW impacted:

ZMP/western ZKC - TUL BYP

Pacific Northwest - TQA JEN

Departures:

Departure swap at DFW is generally accomplished through CDRs.

NAVAIDS

| | | | | | |
|------------|------------|------------|---------------|------------|--------------|
| ABI | Abilene | ACT | Waco | ADM | Ardmore |
| AMA | Amarillo | BGD | Borger | BGS | Big Springs |
| BYP | Bonham | CQY | Cedar Creek | CVE | Cowboy |
| EIC | Belcher | ELD | El Dorado | EMG | Elm Grove |
| FUZ | Ranger | FZT | Frankston | GGG | Gregg County |
| IFI | Kingfisher | INK | Wink | IRW | Will Rogers |
| JEN | Glen Rose | LBB | Lubbock | MLC | McAlester |
| MLU | Monroe | MQP | Millsap | OKM | Okmulgee |
| SJT | San Angelo | SPS | Wichita Falls | TXK | Texarkana |
| TXO | Texaco | UKW | Bowie | | |

Special Use Airspace

When swapping to the UKW STAR through ZKC, R-5601 will, when active, require the addition of SYO to avoid the restricted area.

ZHU

Overview

ZHU TMU does not have specialists for specific airports. Any TMC can do all necessary coordination.

Major Traffic Flows

J2 East - IAH to ZBW/ZNY/ZDC/ZTL

J2 West - Florida to Texas

J86/Q100/Q102 East - Texas to Florida (overwater)

J86/Q100/Q102 West - Florida to Texas (overwater)

J33 North - IAH to DFW

J87 South - DFW to IAH

J29/J101 Northeast - ZHU to ZBW/ZNY

J86 West - (west of IAH) - IAH to ZAB/ZLA/ZOA

Common Reroutes

IAH to ZSE/ZOA/ZLC - reroute via CWK LLO ABI

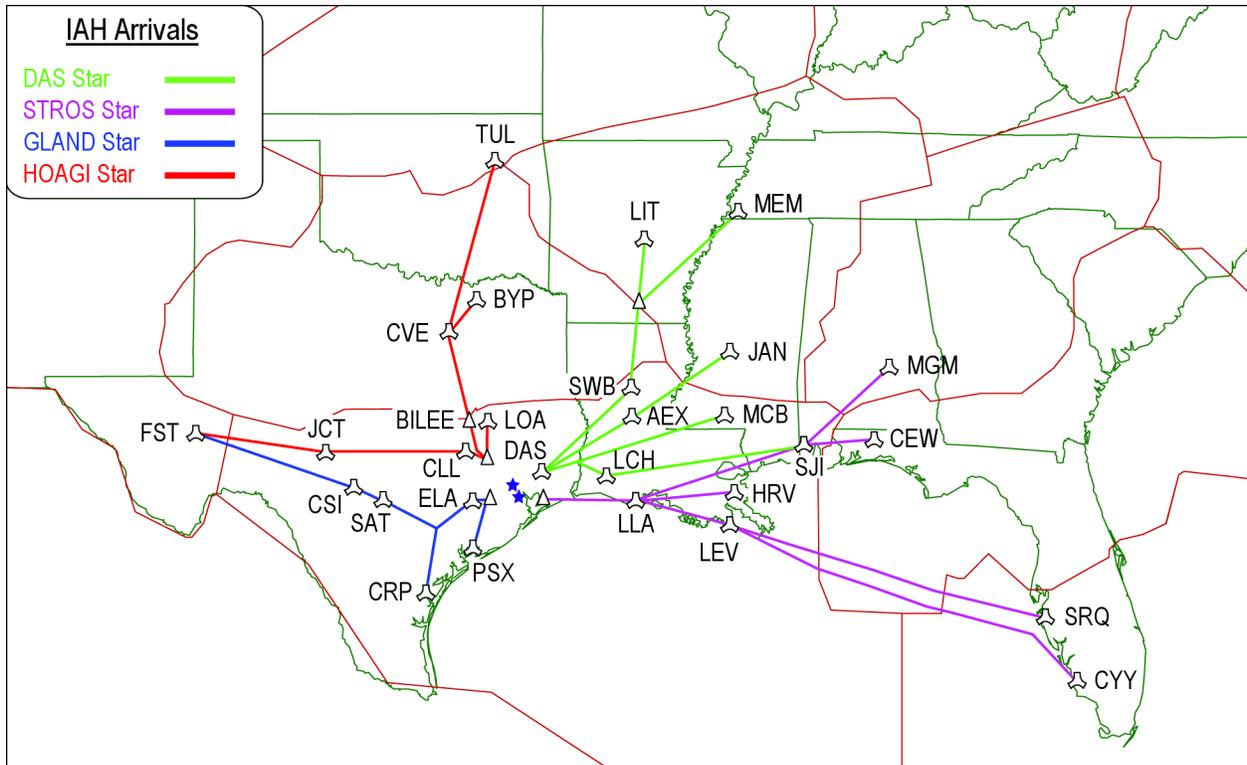
IAH J29/J101 departures - reroute via J22 MCB MEM

IAH to ZLA/ZAB - reroute via PSX CRP DLF FST

IAH to ZMP/ZAU - reroute via LOA RIKKS CQY BYP TUL J87 IRK

IAH J180 arrivals - via LIT J66 BYP CVE J87 BILEE

IAH arrivals normally via JAN AEX - via SJI STROS STAR



NAVAIDS

| | | | | | |
|------------|-------------|------------|-----------------|------------|-----------------|
| AEX | Alexandria | CLL | College Station | CRP | Corpus Christie |
| CSI | Centerpoint | CWK | Centex | DAS | Daisetta |
| ELA | Eagle Lake | GCV | Greene County | HRV | Harvey |
| IAH | Humble | JCT | Junction | LCH | Lake Charles |
| LEV | Leeville | LFK | Lufkin | LLA | White Lake |
| LLO | Llano | LOA | Leona | LRD | Laredo |
| MCB | McComb | PSX | Palacios | SAT | San Antonio |
| SBI | Sabine Pass | SJI | Semmes | SWB | Sawmill |
| TNV | Navasota | | | | |

Special Use Airspace

There are no SUAs in ZHU that would normally have an impact on reroutes.

ZID

Overview

ZID has a specialist assigned as the coordinator. This specialist usually answers the phone and can do all necessary coordination, except for CVG. One specialist is assigned to CVG and that specialist must be included when discussing CVG arrivals or departures.

Major Traffic Flows

J29 NE.....Texas to DTW, CLE, New York metros, and ZBW
J29 SW.....ZOB to Texas and ZME
J6 SW.....ZBW/ZNY/ZDC to DFW/BNA/MEM
J42 NE....Texas and ZME to Washington and New York metros.
J80 W.....ZNY and PIT to CVG, IND, STL, MCI, and points west.
J134 W.....Washington, DC metros to CVG, MCI, DEN and points west.
J149 W.....Washington, DC metros to ORD
J89 N.....ZTL, ZJX, ZMA, to ORD, MSP
J43 N.....ZTL, ZJX, ZMA to CVG, CLE, DTW
J43 S.....DTW, CLE to ATL and Florida
J73 S.....ORD to Florida
J83 S.....CLE, PIT to Florida

Common Reroutes

Enroute:

If J80 is unusable, reroute this traffic to J60/64 thru ZOB or via J6. When swapping to J6, examine volume on that airway to determine if reroutes to J48/J22 would be beneficial to balance demand.

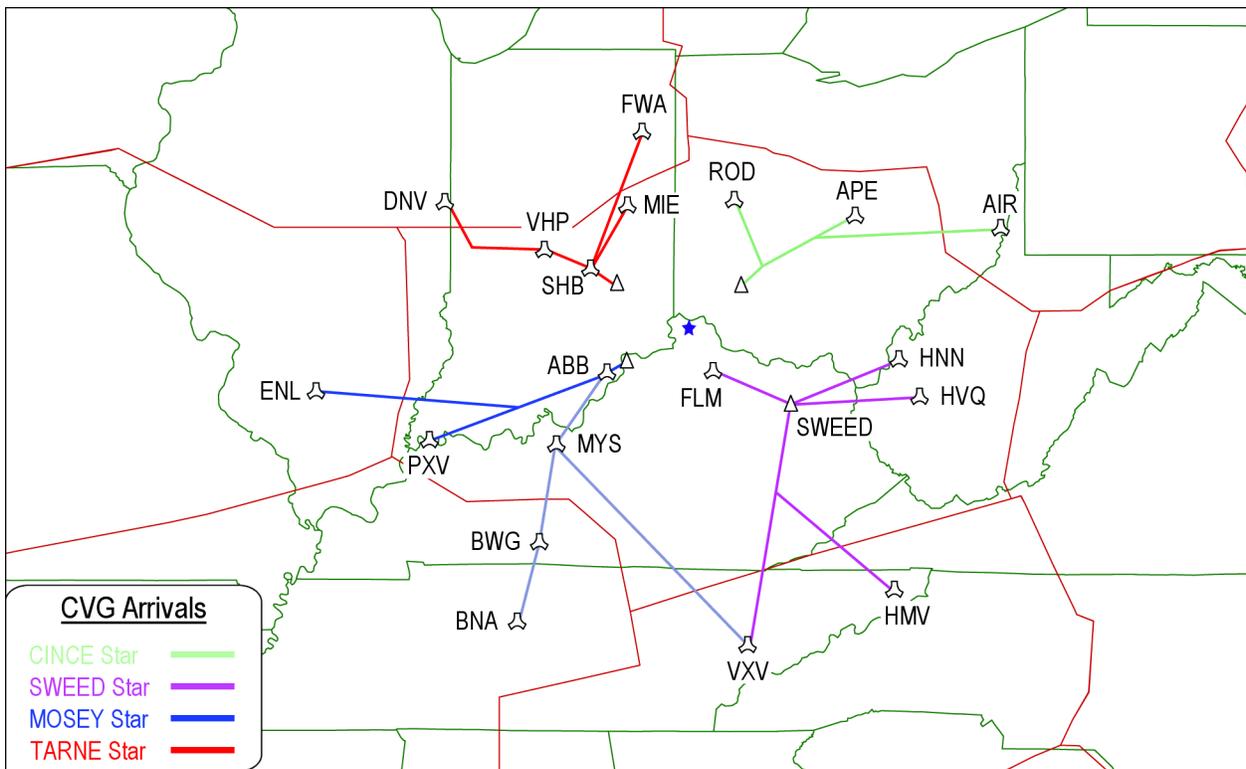
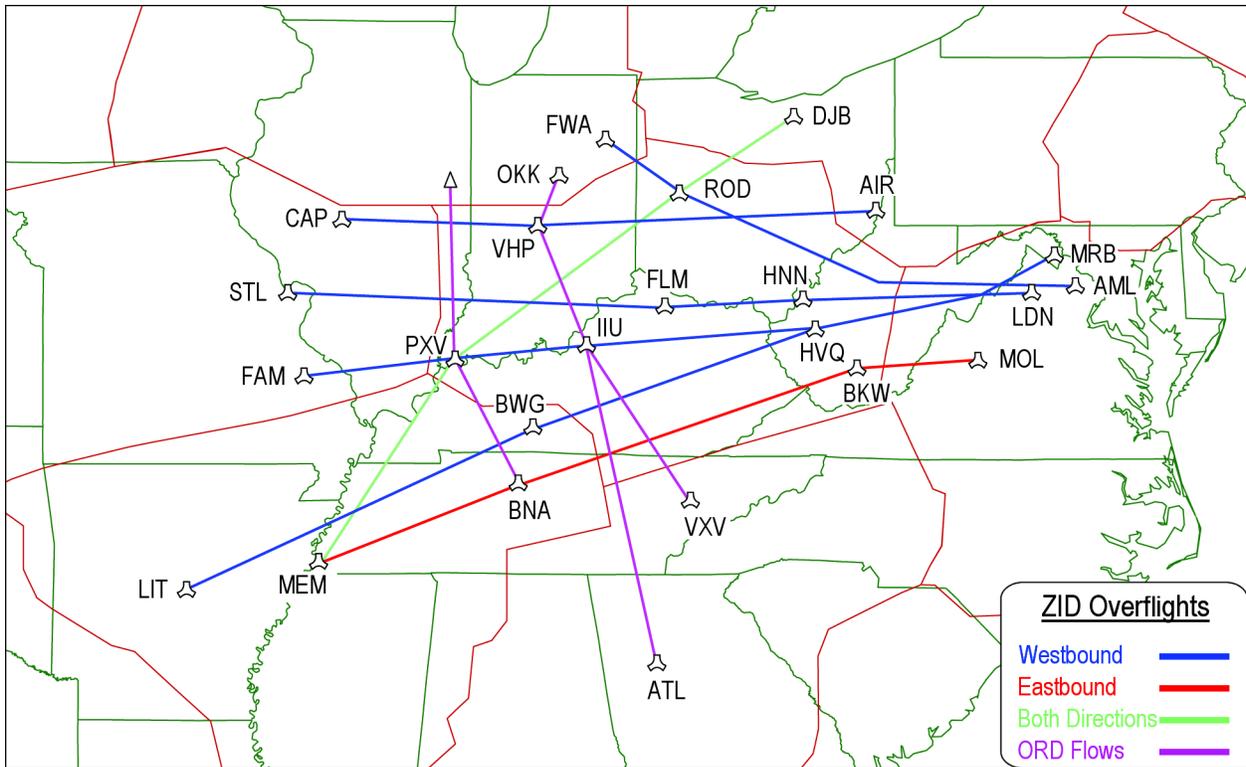
If J6 is unusable, reroute ZBW and ZNY traffic to J80/29 and the ZDC traffic via J48/22. At times, all the J6 traffic must be routed via J48/22.

If J42 is unusable, reroute ZFW departures to ZBW and ZNY via J29, thru ZOB, or via J52 ATL and onto those prefs. Reroute the ZFW departures to the Washington, DC metros and PHL over ATL, as well.

If J73 is unusable, ORD departures to ATL and Florida may be rerouted to CDRs via RBS, thru ZKC. Sometimes the traffic can be swapped east thru ZOB/ZID via CDRs via GIJ GERBS.

If J89 is unusable, ORD arrivals via VHP should be swapped west thru ZME/ZKC via BNA STL MAGOO BDF. MSP arrivals may be moved west to BNA STL IOW ALO.

If J43 is unusable, DTW and CLE departures to ATL and Florida may be rerouted via J83.



CVG

CVG has become a major concern for ZID. A specialist is assigned to manage CVG arrivals and departures. Usually, CVG alternates arrival banks from the east and west.

NAVAIDS

| | | | | | |
|------------|------------|------------|----------------|------------|-------------|
| ABB | Nabb | APE | Appleton | BKW | Beckley |
| CVG | Cincinnati | DQN | Dayton | FLM | Falmouth |
| HNN | Henderson | HVQ | Charleston, WV | IIU | Louisville |
| MIE | Muncie | MYS | Mystic | PXV | Pocket City |
| ROD | Rosewood | TTH | Terre Haute | VHP | Brickyard |

Special Use Airspace

The Buckeye MOA lies between HNN and ROD. This may cause problems when swapping traffic off of J149.

ZJX

Overview

The TMC/TMCIC answering the phone will be able to handle any/all coordination related to ZJX operations. During SVRWX season, ZJX utilizes an internal playbook along with capping and tunneling procedures for MCO/TPA. Most of these traffic management initiatives are internal and do not impact ZJX first tier facilities.

Major Traffic Flows

ZBW/ZNY/ZDC to east coast of FLA (including MCO) - ILM ARs to south FLA, if not over-water equipped - via CHS J79 OMN.

ZBW/ZNY/ZDC to west coast of FLA - J75

ZHU/ZFW/Mid-west and points west - SZW J43 for inland routes or Gulf routes (Q100/Q105) for over-water equipped.

East coast of FLA to ZHU/ZFW/Mid-west and points west - Via LAL

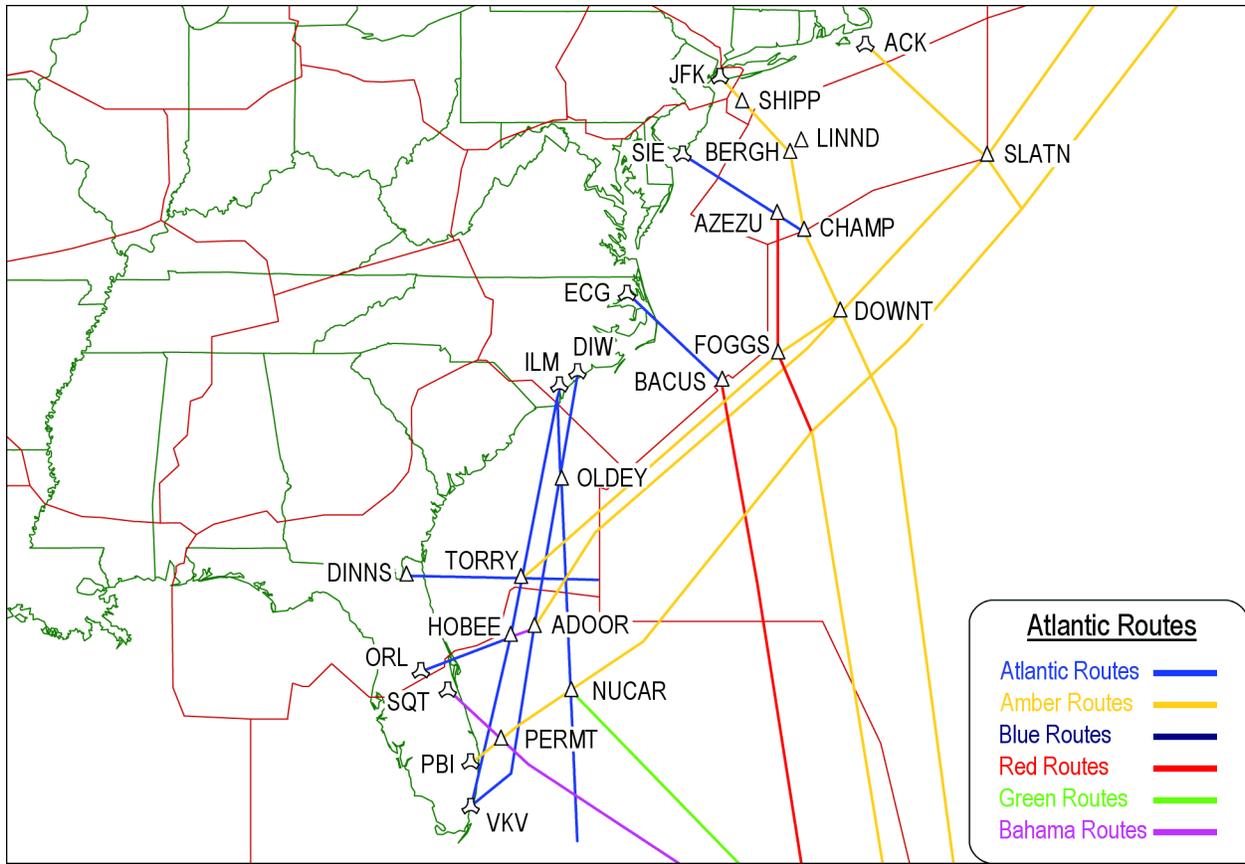
East coast of FLA to ZBW/ZNY/ZDC - via ORL

West coast of FLA to ZHU/ZFW/Mid-west and points west - Via CTY

West coast of FLA to ZBW/ZNY/ZDC - Via TAY/ORL

Atlantic Routes (ARs)

The AR routes are two-way airways through ZJX. These routes are essentially corridors through the east coast warning areas and large deviations (20 miles or more) cannot be accommodated.



Common Swaps

To FL

From ZBW/ZNY/ZDC:

ARs closed - reroute via J79 OMN

ARs and J79 closed - reroute via J75 TAY PIE

ARs, J79 and J75 closed - reroute via J48 MOL J22 PSK J53 SPA J85 TAY PIE

From ZHU/ZFW/Mid-west and points west:

Q100/Q105 closed - reroute via SZW CEW J2/J50

Q100/Q105, J2/J50 closed - reroute via SZW MGM or SZW VUZ

From FL

ARs closed - ORL J53 CRG J51

ARs and ORL closed - via LAL TAY CAE J51

ARs, ORL, LAL closed - via PIE SZW (ZJX/ZMA will then shift arrivals further west into Gulf i.e. PIE270045 to accommodate this).

NAVAIDS

| | | | | | |
|------------|----------------|------------|------------|------------|-----------------|
| AMG | Alma, GA | CAE | Columbia | CEW | Crestview |
| CHS | Charleston, SC | CRG | Craig | CTY | Cross City |
| FLO | Florence | GNV | Gainsville | LAL | Lakeland |
| LAL | Lakeland | LBV | LaBelle | OMN | Ormand Beach |
| ORL | Orlando | OTK | Valdosta | PBI | West Palm Beach |
| PIE | St. Petersburg | SAV | Savannah | SRQ | Sarasota |
| SZW | Seminole | TAY | Taylor | VAN | Vance |
| VQQ | Cecil | | | | |

Special Use Airspace

Warning areas off the east coast of Florida are controlled by SEALORD. Warning areas off the west coast of Florida and Gulf of Mexico are a conglomeration.

Space (missile/ Shuttle) Launches

ZMA is the controlling agency for missile or shuttle launches, but ZJX implements the restrictions/reroutes. During shuttle launches, the ARs are generally closed. Missile launches have a little less impact and ARs are still used at times.

ZKC

Overview

ZKC TMU is comprised of two ESP positions (STL/ORD), floorwalkers, and the TMS/TMCIC. The TMS/TMCIC that answers the phone should be able to handle all coordination related to ZKC operations including STL or ORD.

Major Traffic Flows

ORD departures via RBS and MZV
ZNY departures via J80 to LA basin, STL, and MCI
Washington, DC metro departures via J134 to PHX, ZLA and DEN
ORD arrivals via J96
ORD arrivals via J101/181

Common Reroutes

If J80 is unusable and the WX activity is in the vicinity of CAP, a reroute via VHP J24 MCI is possible. Otherwise, swap the traffic to J134. To accommodate this, traffic normally on J134 may need to be rerouted via J78, depending on sector volume. If necessary, J80 could also be swapped to J64 and out of ZKC. J60/64/80/134/78 may all be moved in the same manner.

ORD departures via RBS STL impacted, reroute to CDRs via MZV IRK/MZV J18 or GUIDO J73 PXV.

ORD departures via MZV IRK/MZV J18 impacted, reroute to CDRs via RBS STL or MZV LMN.

ORD arrivals via J96 impacted, reroute via J19/J105 BDF or through ZMP.

ORD arrivals via J101/181 impacted, reroute via J87 IRK, J25 MKC IRK or reroute through ZID.

At times, ORD arrivals from the southeast are swapped via J45 STL MAGOO. To accommodate the additional volume, ZFW/ZHU departures to ORD may be swapped via J87 IRK BDF. Additionally, flights departing or traversing ZAU to ZFW may be rerouted via MZV J87 TUL for sector volume issues.

ZKC will often handle STL arrivals and departures from the west internally, due to the amount of internal airspace available. STL arrivals and departures from the east may require the assistance of adjacent facilities to reroute around impacted areas, either by playbook reroute, dynamic reroute or CDR.

The route through ZKC airspace to CVG is via ENL MOSEY. If thunderstorms are impacting the route, swapping the traffic through ZAU or ZME is normally possible.

NAVAIDS

| | | | | | |
|------------|-------------|------------|-------------|------------|-------------|
| BUM | Butler | CAP | Capitol | ENL | Centralia |
| EOS | Neosho | FAM | Farmington | GAG | Gage |
| GCK | Garden City | HYS | Hays | ICT | Wichita |
| IRK | Kirksville | LBL | Liberal | MKC | Kansas City |
| PER | Pioneer | SGF | Springfield | SLN | Salina |
| STJ | St. Joseph | STL | St. Louis | TUL | Tulsa |
| UIN | Quincy | VLA | Vandalia | | |

Special Use Airspace

There are no SUAs in ZKC that would normally have an impact on reroutes.

ZMA

Overview

The TMC/TMCIC answering the phone will be able to handle all coordination related to ZMA operations.

Major Traffic Flows

ZBW/ZNY/ZDC to east coast of FLA (including MCO) - ILM ARs to south FLA, if not over-water equipped, via CHS J79 OMN.

ZBW/ZNY/ZDC to west coast of FLA - J75 or ARs with prior coordination.

ZHU/ZFW/Mid-west and points west - SZW J73 for inland routes or Gulf routes (Q100\Q102) for over-water equipped.

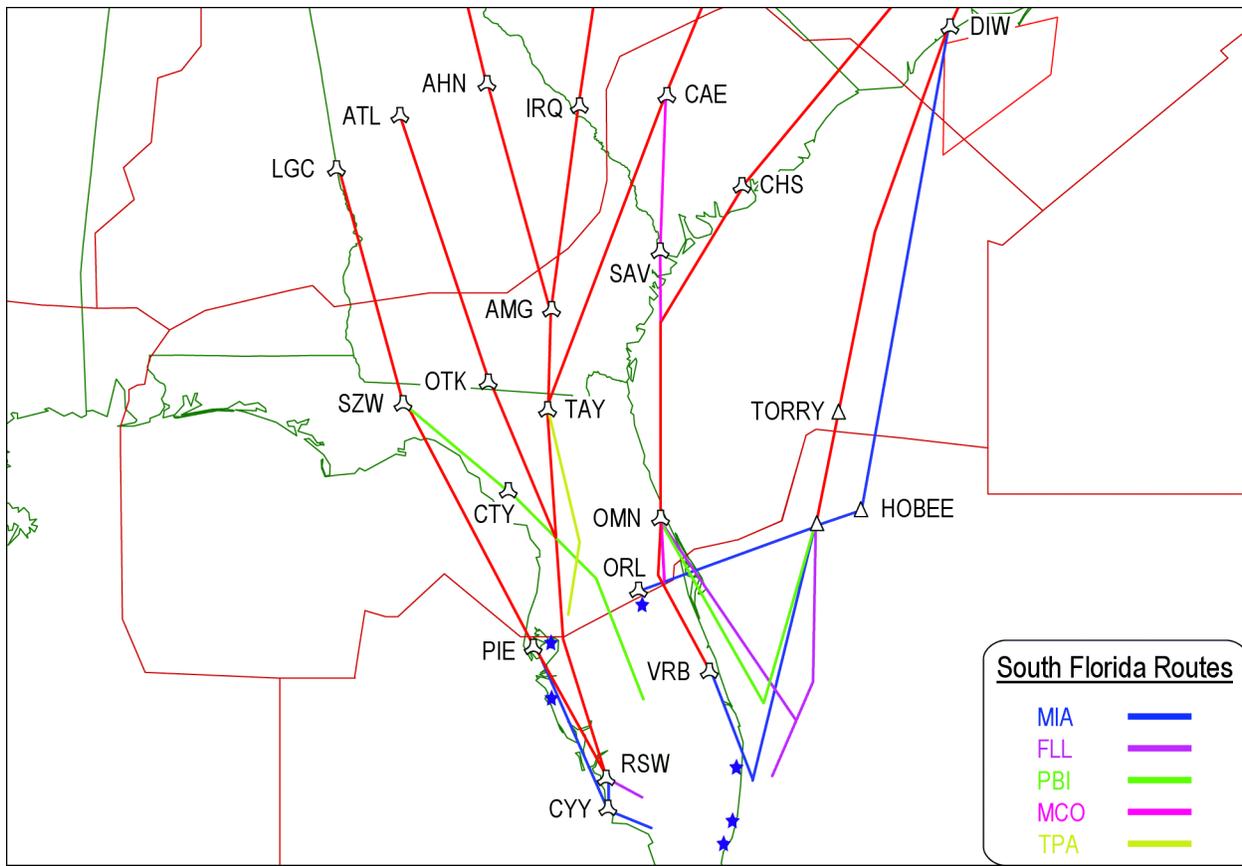
East coast of FLA to ZHU/ZFW/Mid-west and points west - Via LAL
East coast of FLA to ZBW/ZNY/ZDC - via ORL

West coast of FLA to ZHU/ZFW/Mid-west and points west - Via CTY
West coast of FLA to ZBW/ZNY/ZDC - Via ORL

Atlantic Routes (ARs)

Although the AR routes are two-way airways further north, in ZMA they are really one-way routes. AR-1 is used as a southbound arrival route, AR-7 is used as a northbound departure route and AR-3 is generally utilized (two-way) for aircraft into or out of the Caribbean\ocean.

The AR routes often serve as corridors through the east coast warning areas, and large deviations (20 miles or more) cannot normally be accommodated.



Common Swaps

To FL:

From ZBW/ZNY/ZDC:

ARs closed - reroute via J79 OMN

ARs and J79 closed - reroute via J75 TAY PIE

ARs, J79 and J75 closed - reroute via J48 MOL J22 PSK J53 SPA J85 TAY PIE

From ZHU/ZFW/Mid-west and points west:

Q100\Q102 - closed - reroute via J2/J50 CEW SZW

Q100\Q102- J2/J50 closed - reroute via MGM SZW or VUZ SZW

From FL:

ARs closed - ORL J53 CRG J51

ARs and ORL closed - via LAL J73 J119 TAY

ARs, ORL, LAL closed - via PIE SZW\CTY (ZJX/ZMA will then shift arrivals further west into Gulf i.e. PIE270045 to accommodate this).

NAVAIDS

| | | | | | |
|------------|--------------|------------|----------------|------------|-----------------|
| CYY | Cypress | DPH | Dolphin | LAL | Lakeland |
| OMN | Ormand Beach | ORL | Orlando | PBI | West Palm Beach |
| PHK | Pahokee | PIE | St. Petersburg | RSW | Fort Meyers |
| SRQ | Sarasota | SZW | Seminole | VKZ | Virginia Key |
| VRB | Vero Beach | | | | |

Special Use Airspace

Warning areas off the east coast of Florida are controlled by SEALORD. Warning areas off the west coast of Florida and Gulf of Mexico are a conglomeration.

Space (missile/ Shuttle) Launches

ZMA is the controlling agency for missile or shuttle launches, but ZJX implements the restrictions/reroutes. During shuttle launches, the ARs are generally closed. Missile launches have a little less impact and ARs are still used at times.

ZME

Overview

Due to ZME's proximity to major hubs in their first tier centers, they monitor and manage many different airport flows. Any TMC may answer the phone and you should expect to ask for the specialist you are requesting by task (i.e., DFW arrivals, IAH arrivals, MEM, etc...).

Major Traffic Flows

J105 North.....ZFW to ORD
J101 North.....ZHU to ORD
J6 Southwest.....ZBW/ZNY/ZDC to DFW/BNA/MEM
J42 Northwest....DFW/MEM to DC METROS/ LGA/PHL
J29 North.....IAH to ZOB/ZNY/ZBW
.....MEM to ORD/ZOB/ZBW
J41 North.....ATL to ZKC/ZDV
J41 South.....ZDV/West ZKC to Florida
J22 Southwest....ZBW/ZNY/ZDC to IAH
J52 East.....DFW to ZBW/CLT/EWR/JFK
J4 East.....DFW to ZTL
J151.....STL Arrivals from ZJX/ZMA
J180.....ZOB/ZID/ZAU/East ZKC to IAH
J73.....ZAU to ZJX/ZMA

Common Reroutes

J6 impacted - ZBW reroute via SYR J29 PXV J131 LIT BYP
ZNY reroute via ELIOT J80 J29 PXV then above
ZDC - reroute via J48 MOL J22 VXV BNA LIT BYP
(BNA via PXV/VXV direct MEM via PXV direct or VXV BNA direct)

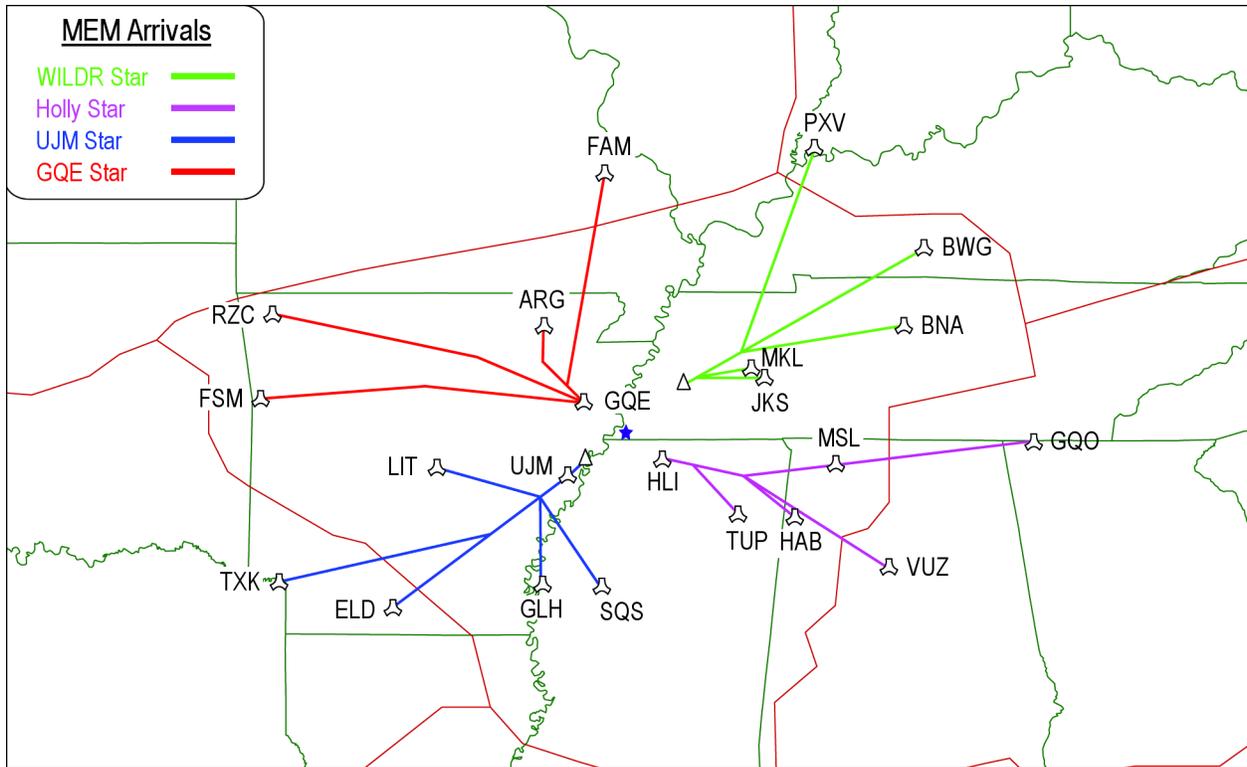
J42 impacted - Reroute via overhead ATL SPA to join east coast prefs

DFW arrivals via LIT impacted- via BWG RZC FSM BYP or BWG SQS CQY

IAH arrivals via J180 impacted - via- J66 BYP CVE J87 BILEE

IAH departures via J29/J101 impacted - via- J22 MCB MEM

If weather is affecting ORD landing traffic in ZID, reroute via BNA J45 STL STL349 MAGOO from ZMA/ZJX/ZTL is an option traversing ZME.



MEM

MEM has a large volume of cargo flights (FedEx hub) during the midnight shift. During the severe weather season, it may become necessary to reroute these cargo flights when convective activity impacts the enroute system.

NAVAIDS

| | | | | | |
|------------|----------------|------------|---------------|------------|---------------|
| ARG | Walnut Ridge | BNA | Nashville | BWG | Bowling Green |
| CGI | Cape Girardeau | FSM | Fort Smith | GQE | Gilmore |
| HLI | Holly Springs | IGB | Bigbee | JAN | Jackson |
| LIT | Little Rock | MEI | Meridian | MEM | Memphis |
| MKL | Mc Kellar | MSL | Muscle Shoals | RZC | Razorback |
| SQS | Sidon | UJM | Marvell | | |

Special Use Airspace

There are no SUAs in ZME that would normally have an impact on reroutes.

ZMP

Overview

ZMP TMU is staffed with three operating positions: ASP, ESP and SWAP. The SWAP position deals primarily with severe weather issues. During especially busy periods, the ESP position will also answer the severe weather line. The ASP position deals primarily with MSP arrivals and departures.

Commonly Used Swaps

ZMP is often tasked with managing transcontinental flights via the playbook Canadian Routes. Volume is often a concern on these routes, especially given the large sector sizes in northern ZMP. If multiple Canadian Routes are run, they will very likely still transition through the same eastern sector in ZMP.

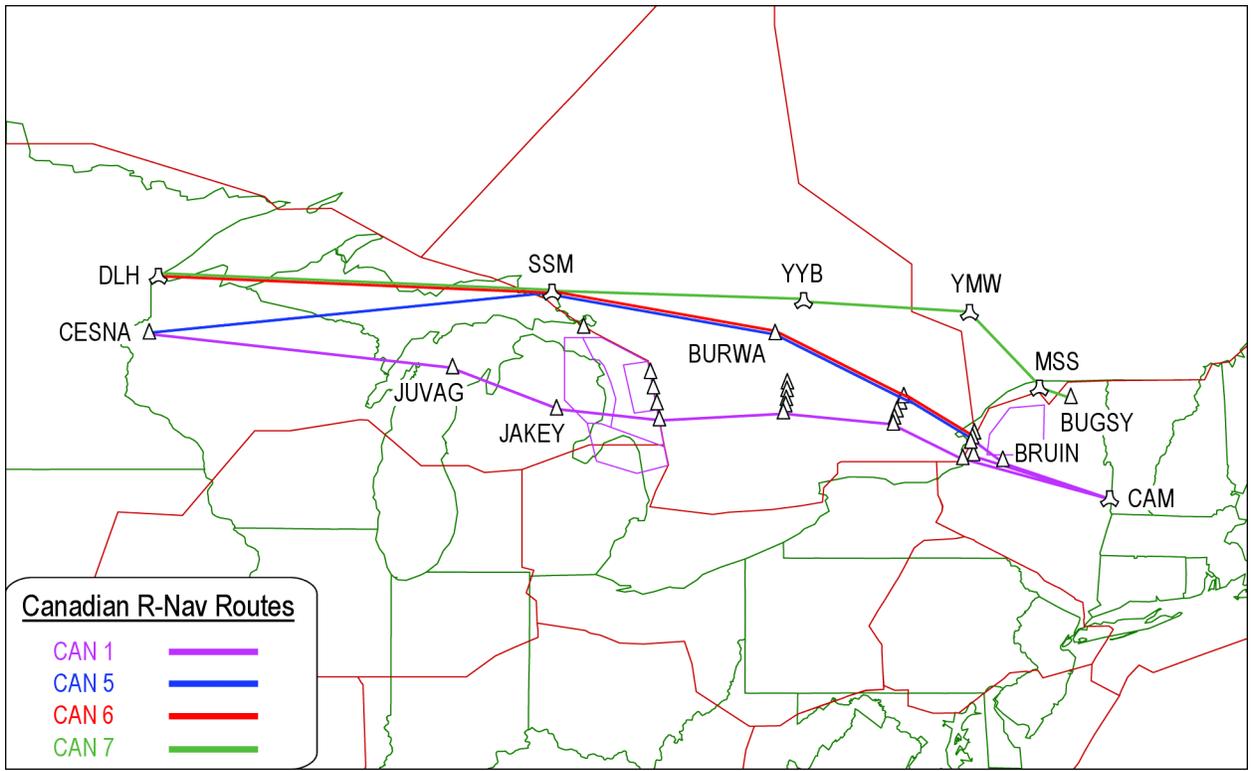
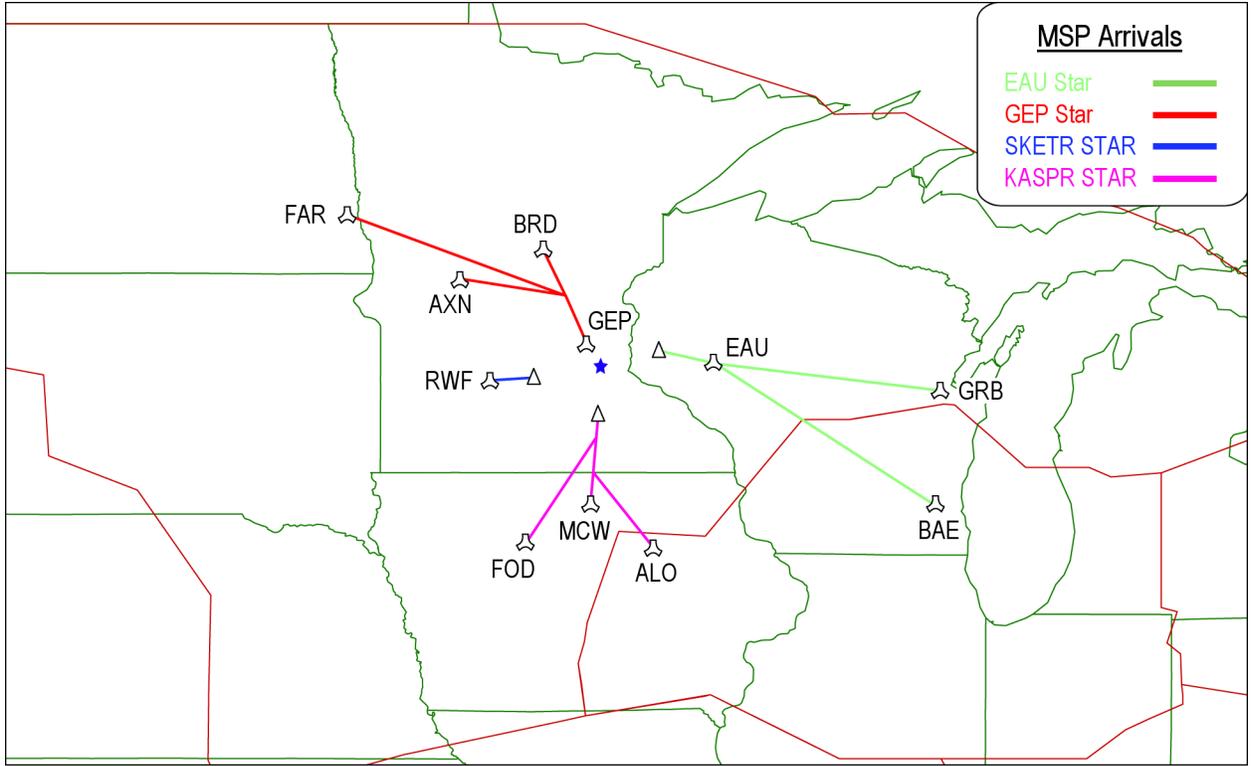
MSP arrival swap is usually accomplished via the playbook. Departure swap at MSP is generally accomplished through CDRs.

NAVAIDS

| | | | | | |
|------------|--------------------|------------|-----------------|------------|---------------|
| ABR | Aberdeen | ASP | Au Sable | AXN | Alexandria |
| BRD | Brainerd | DIK | Dickinson | DLH | Duluth |
| DPR | Dupree | DSM | Des Moines | EAU | Eau Claire |
| FAR | Fargo | FOD | Fort Dodge | FSD | Sioux Falls |
| GEP | Gopher | GRB | Green Bay | HML | Humboldt |
| LMN | Lamoni | LNK | Lincoln | MCW | Mason City |
| MOT | Minot | OBH | Wolbach | ODI | Nodine |
| ONL | O'Neill | OVR | Omaha | PWE | Pawnee City |
| RWF | Redwood Falls City | SSM | Sault Ste Marie | TVC | Traverse City |

Special Use Airspace

If active, R-4207 and the Pike MOA/ATCAA complex in eastern ZMP may conflict with reroutes through Canadian airspace. The Playbook Canadian Routes have been developed to avoid or minimize this impact.



ZNY

Overview

ZNY TMU usually operates with 3 to 4 specialists and a supervisor. SVRWX primarily coordinates with the Departure Director (DD).

During SWAP, the DD communicates directly with the towers regarding the lineup for departure, and ensures the Departure "Pit" at ZNY has entered the appropriate routes into the flight plans. The Traffic Management Director, who keeps an overall log of departure/arrival restrictions and misc. activities, primarily answers the ZNY line. A third specialist, the Arrival Director, watches the airports and implements MIT as well as monitors sector alerts. The STMC usually does not answer the phone unless a disagreement with another facility or DCC exists. An Oceanic Planner position is functional for issues such as oceanic track implementation. However, it may be necessary to contact the Area Supervisor using the "ZNY.CARIB" line for AR route issues, oceanic routings to the Caribbean, etc. The "ZNY.N.ATL" line is the North Atlantic Supervisor who works NAT track issues to and from Europe/Iberian Peninsula.

NRP flights frequently overload the ZNY departure gates, requiring fix balancing reroutes for delay mitigation. ZNY will normally call requesting to move some of these NRP flights to the preferential routes.

Major Traffic Flows

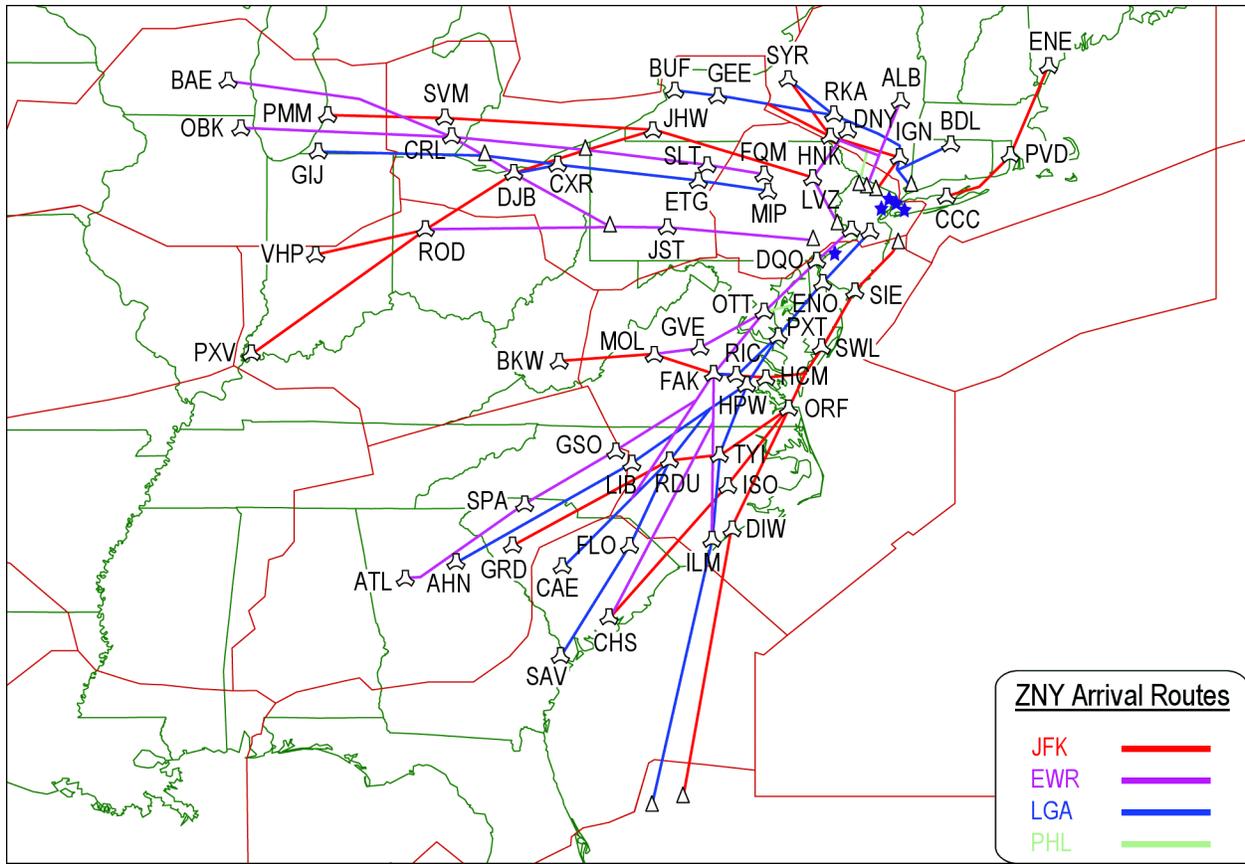
Arrivals:

JFK: JHW J70 LVZ LENDY STAR
ACY V44 CAMRN

EWR: SLT J584 FQM PENNS
(ZNY Oceanic also feeds EWR and JFK from Caribbean/North Atlantic)

LGA: ETG J146 MIP LIZZI

PHL: JST J152 HAR BUNTS
LHY LVZ ETX MAZIE
HTO V139 BRIGGS VCN



Departures:

NOTE: Users routinely file NRP between the north and west gates. It is important to determine where the heavy concentration of NRP traffic exists when considering swapping flows.

Northgates - N90

GAYEL J95.....ZMP/ZOA/ZLC/ZMP/SYR/ROC/YYZ

NEION J223.....DTW/BUF

COATE J36.....ORD/MKE/PIT/ELM

Westgates - N90 (minus JFK)

ELIOT J60/J64....ZOB/ZDV

ELIOT J80.....ZKC/ZLA/ZAB/ZKC/ZID (minus CVG)

PARKE J6.....ZFW/ZME/CVG

LANNA J48.....ZTL/ZHU/ATL

BIGGY J75CLT/West Florida

RBV J64/J80/J6/J48/J75 (JFK departures)...All above destinations plus IAD/DCA/BWI

WHITE J209MCO/East Florida/RDU (N90 -JFK departures)

WAVEY J121/J174....Same as WHITE for JFK departures

Eastgates - N90

GREKI, & MERIT.... Cleared by ZNY, N90 hands off directly to ZBW

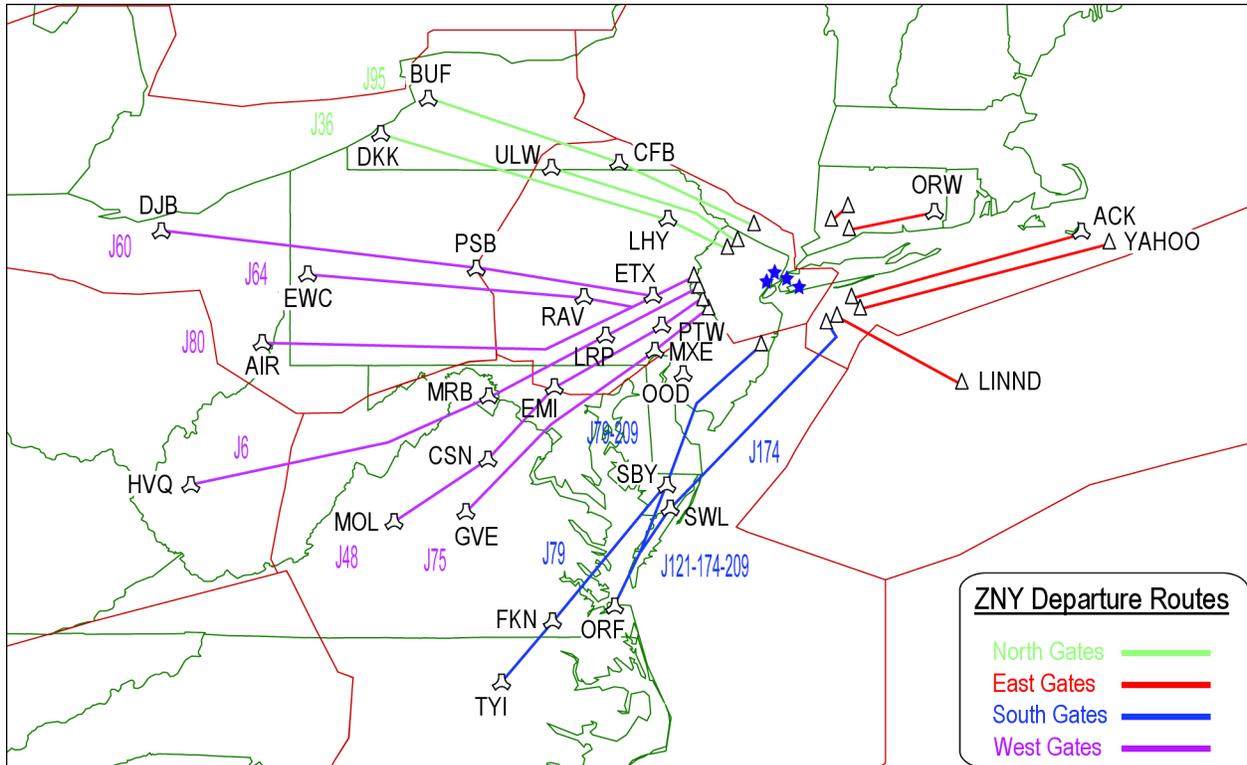
PHL

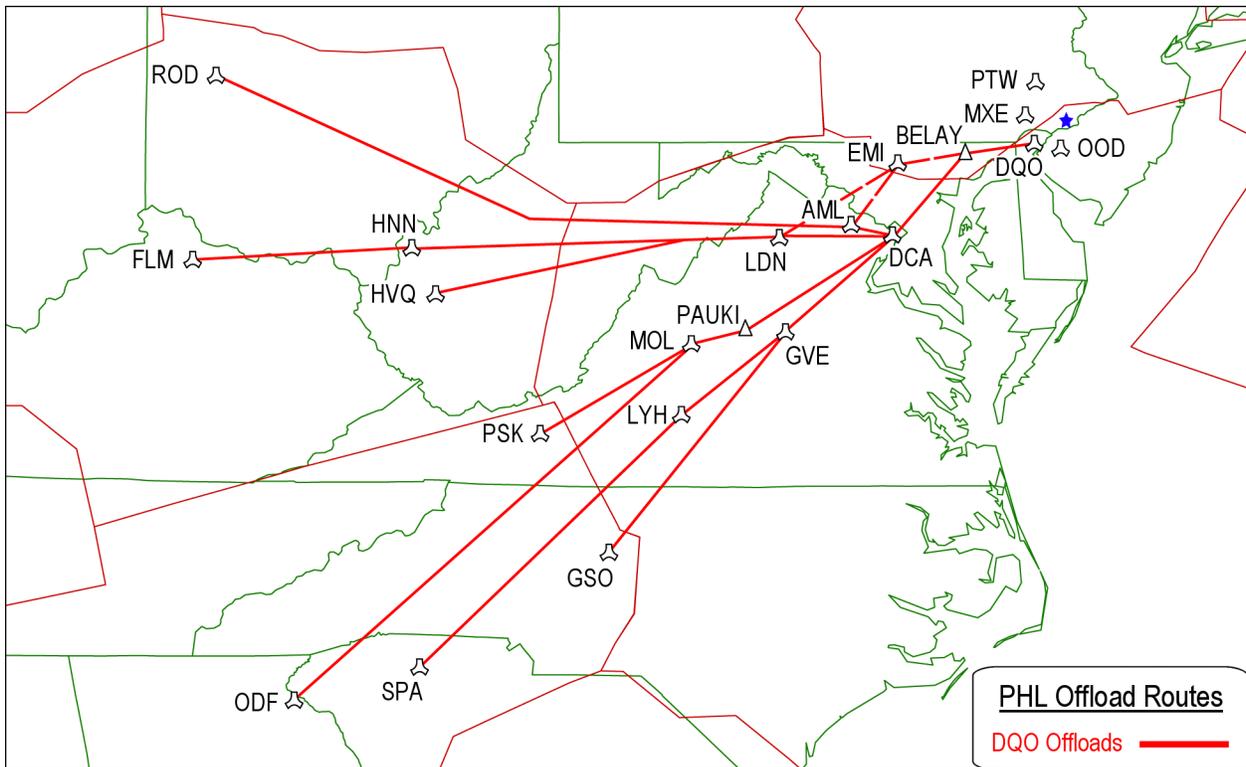
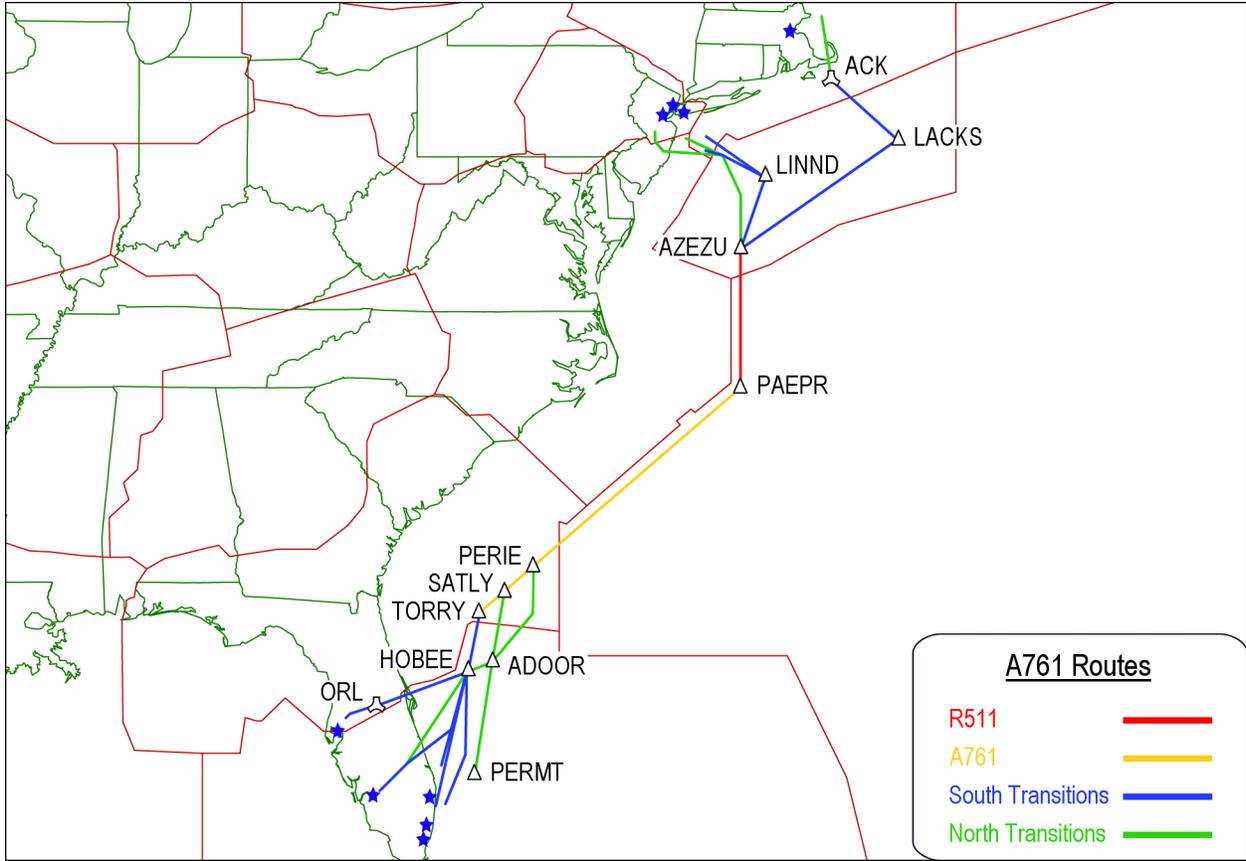
PTW J60/J64.....same destinations as N90 westgates

MXE J80/J6/J48/J75...same destinations as N90 westgates

OOD.....same destinations as WHITE/WAVEY

DITCH.....New England/international destinations



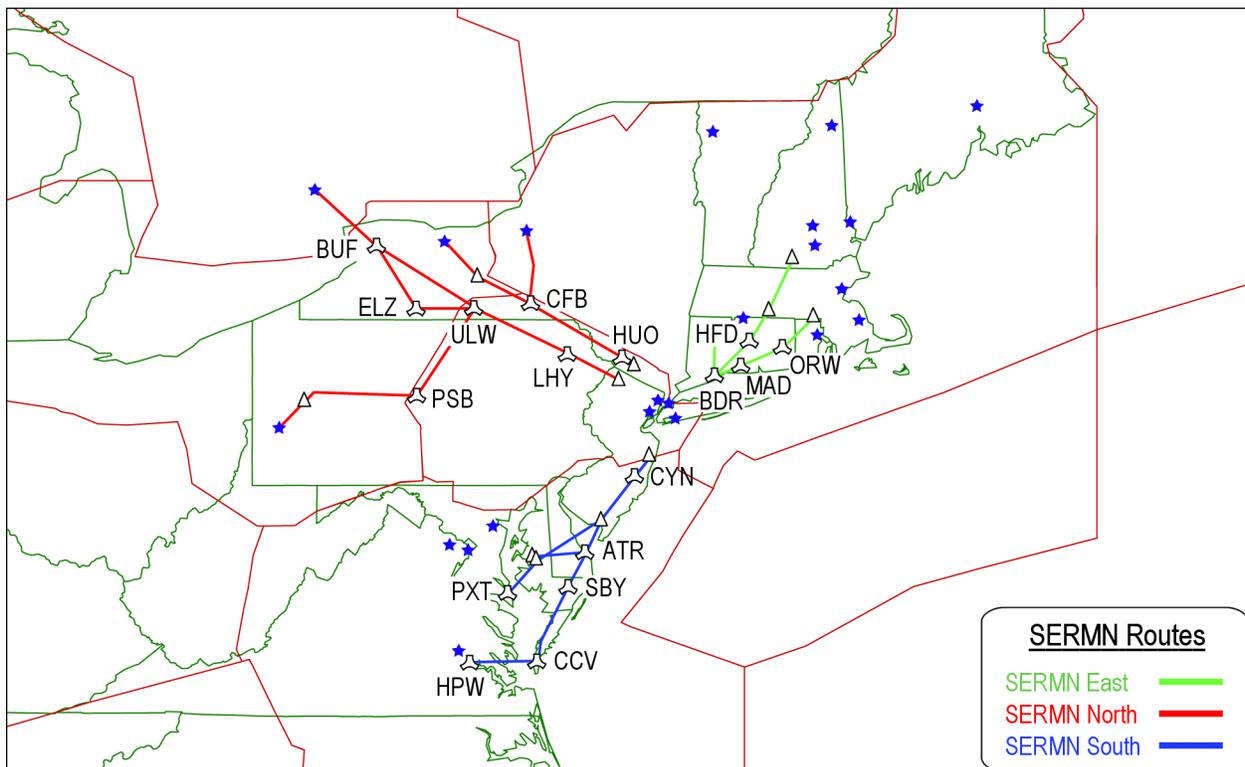


Common Reroutes

Departures:

Usually, the initial attempt is made to swap Northgates to Northgates, or Westgates to Westgates. For example, if J80 were impacted, offloading traffic to J64 or J6 would be the first option. WHITE/WAVEY departures may be swapped to J75, but again, additional traffic may need to be moved to preclude large MIT restrictions on J75. Incorporation of Offshore Radar Routes via A761 has significantly increased capacity in the oceanic routing system when traditional transitions to the Atlantic Routes are impacted. Whether the impact resides within ZNY at the departure fix, ZDC at the overland transitions, or ZJX at the Atlantic Routes, the Offshore Radar Routes remain a viable routing option. The SERMN (SWAP Escape Routes, Metro New York Area) tower enroute routes provide additional flexibility for N90 departures during SWAP or when volume impacts certain departure corridors. User participation is solicited on the SPT, with N90 being the focal for ATC coordination.

Regarding PHL, MXE & PTW are in close proximity, so swapping between these two fixes is limited. An additional option when these fixes are impacted is to utilize the PHL DQO offload routes through PCT. The PHL departures will be capped at 10,000 ft. and treated like a BWI departure. OOD & DITCH may be used on a limited basis.



Arrivals:

If the ZNY arrival routes from the west become unusable, one initial move is to swap PHL arrivals south through ZID/ZDC via BKW. N90 arrivals are most easily swapped north through ZBW, although volume will be a consideration. JFK arrivals present a unique challenge in that the reroute rejoins the ZNY star at LENDY. If the impact is LENDY or east, this option is no longer viable and consideration to utilizing a more extensive reroute to ENE must be made. EWR presents the most difficult reroute because it represents the heaviest flow of traffic. One possible short-term EWR solution is to swap from ZOB through ZBW for a limited number of aircraft. Next, establish a reroute from the west thru CZY, which requires extensive coordination and always involves MIT. Yet another technique is to feed ZNY with one stream of traffic for two airports (this is most effective for EWR/LGA).

NAVAIDS

| | | | | | |
|------------|------------|------------|------------|------------|--------------|
| ARD | Yardley | BWZ | Broadway | EMI | Westminster |
| ETG | Keating | ETX | East Texas | FQM | Williamsport |
| HAR | Harrisburg | HNK | Hancock | HUO | Huguenot |
| LHY | Lake Henry | LRP | Lancaster | LVZ | Wilkes-Barre |
| MIP | Milton | MXE | Modena | PSB | Phillipsburg |
| PTW | Pottstown | RAV | Ravine | RBV | Robbinsville |
| SAX | Sparta | SBJ | Solberg | SLT | Slate Run |

Special Use Airspace

There are no SUAs in ZNY that would normally have an impact on reroutes. However, the Vacapes areas in ZDC may impact ZNY south departures.

ZOB

Overview

ZOB TMU is configured so that specialists are responsible for certain geographical areas. The specialist answering the SVRWX line is responsible for the overall operation and will be able to coordinate routes for most of the enroute traffic through ZOB. Additionally, there are specialists responsible for PIT, DTW, CLE and ORD. If you have questions pertaining to those areas you must ask to speak to that specialist. NRP flights frequently present ZOB with flow complexities. For example, flights filed over DJB and transitioning north over CRL are an immediate conflict with other westbound traffic, as well as the ORD east departures. NRP flights departing on J64 and transitioning to DJB conflict with J60 westbound traffic.

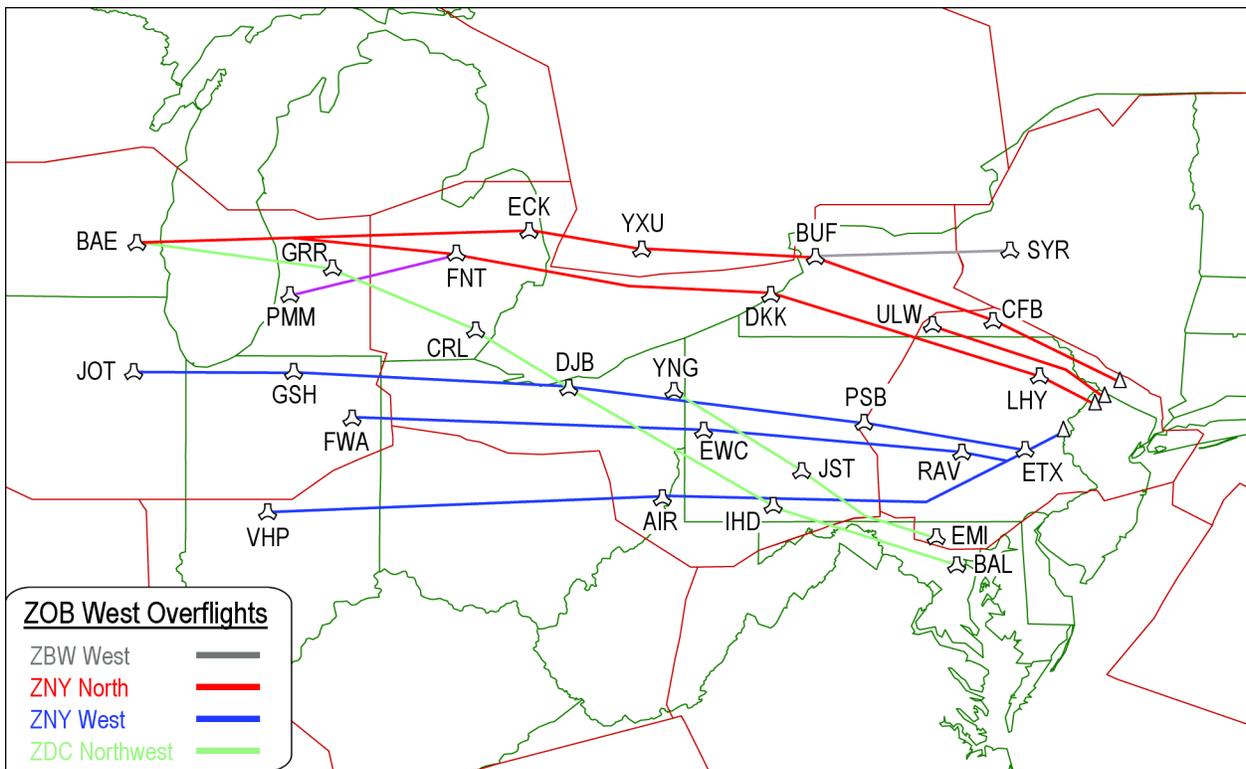
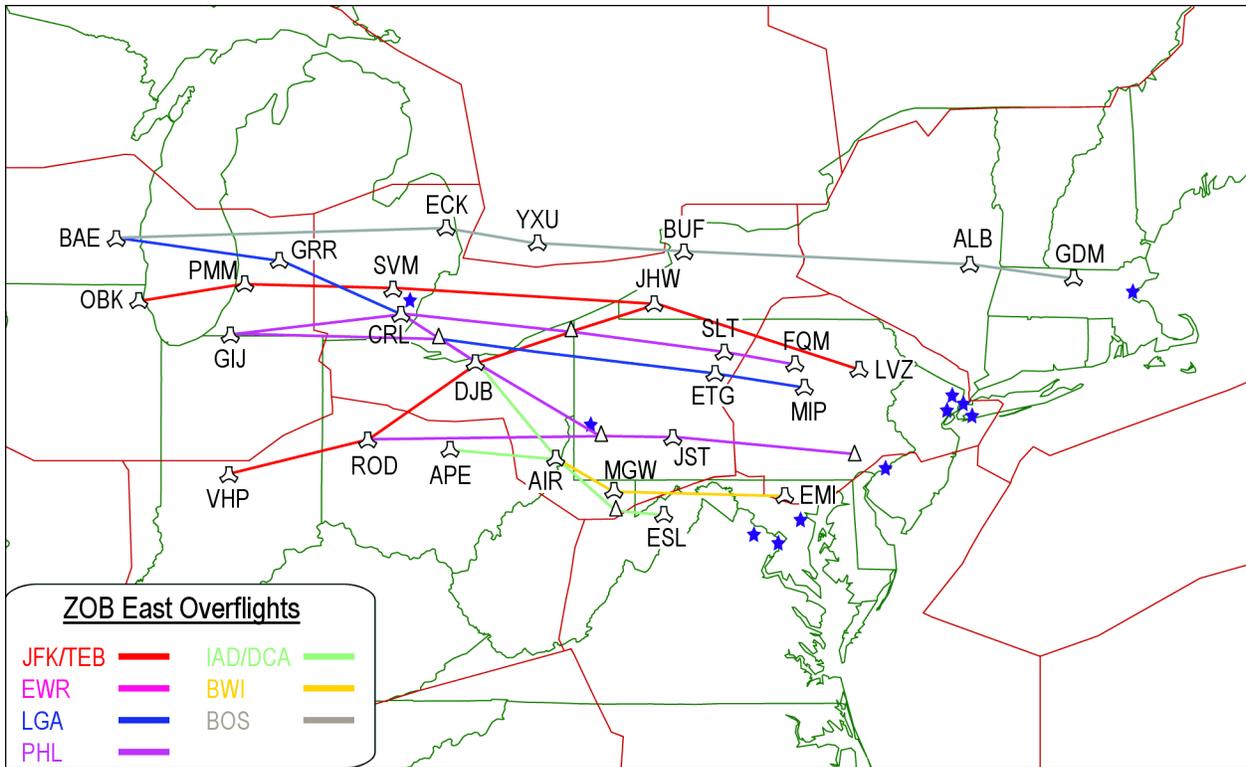
Major Traffic Flows

Eastbound:

J16/82.....ZBW arrivals
J70.....JFK/TEB/MMU arrivals
J584.....EWR arrivals
J146.....LGA arrivals
J152.....PHL arrivals
J30/162...IAD/DCA/BWI

Westbound:

J547.....ZBW departures to DTW/ORD and points north and west.
J95.....ZNY departures to MSP/SLC/SFO and the Pacific northwest.
J223.....New York metro to DTW
J36.....New York metro to ORD
J60.....ZNY to CLE/DEN and points west.
.....PHL/MDT/ABE to DTW
J64.....ZNY to LAX/SFO.
.....PHL /ABE/MDT to ORD
J80.....ZNY to PIT/CVG/IND/STL/MCI/PHX



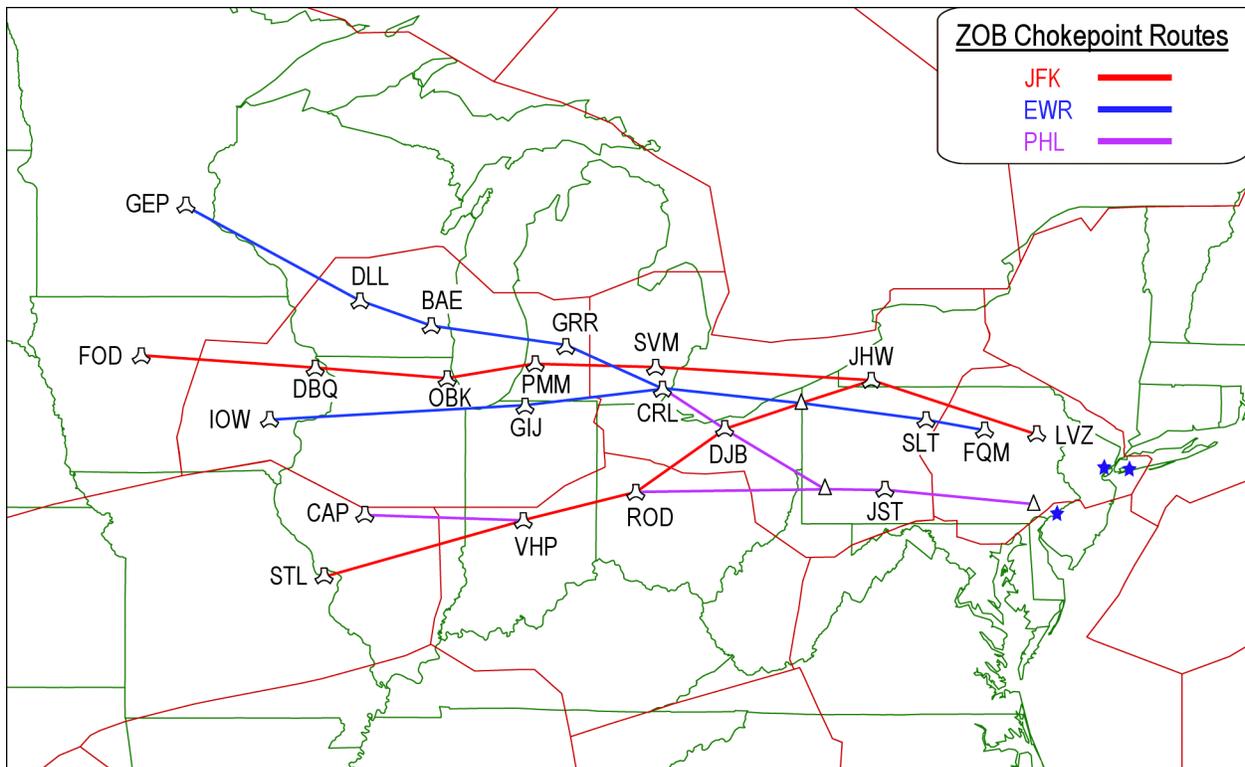
Common Reroutes

Eastbound:

1. NY Chokepoint routes. Chokepoint routings to EWR, JFK and PHL may be implemented at the request of ZOB or ZAU to introduce structure into the enroute environment and ease the implementation of MIT restrictions.
2. Route ZBW arrivals north through ZMP and CZY. The validated reroute can be found in the RMT. Coordinate with ZAU, ZMP, YYZ and ZBW. If CZY can accept this route, the only other concern would be the military area located near ART. ZBW can many times cap this area at FL290 to run the swaps. Also, aircraft destined BUF,SYR, and ROC can be run north on a slightly different route. This swap frees airspace in ZOB to accommodate additional or more complex traffic.
3. Route ZDC and PHL arrivals thru ZID. Coordinate with ZAU, ZID and ZDC to reroute these aircraft via IIU J526 BKW (these routes can also be found in the CDR database or ORD swap book). ZID may request that you move the J42 traffic from ZFW, ZHU and ZME through ZTL in order to accommodate this swap.
4. If necessary, route EWR, JFK or LGA arrivals north through CZY and ZBW or south thru ZID and ZDC. Once this flow has been rerouted, ZOB can handle the remaining arrivals with MIT and deviations, due to the decreased volume and complexity.

Westbound:

1. If J36 and J95 are impacted, reroute that traffic via GREKI or J60/J64 CDRs. Volume will likely be an issue, however, and ZBW/ZOB may have to restrict internal departures to accommodate the additional flow.
2. When J60 and J64 are impacted, ZOB can usually handle the traffic by just using one of these airways with MIT and deviations. If both airways are unusable, CDRs via J80, J6 and the Northgates for transcons are viable options. Be aware that when ZOB is holding for LGA, they will not be able to accept traffic on J60; and if they are holding for PHL, they will not be able to accept J80 traffic. ZOB will usually accept ABE and MDT departures to ORD via PSB J60 DJB FNT PMM. PHL departures to ORD may be rerouted via J6 EYTEE J149 ROD, or via the DQO offload (avoiding ZNY).
3. If all the Westgates are unusable, traffic will need to be rerouted via the Northgates, J6 and J48. Much of the traffic filed via J6 and J48 may need to be moved as well, to better balance the departure flows.



Major Traffic Flows

DTW and PIT:

DTW and PIT are a primary focus for ZOB. Specialists are assigned to specifically deal with these airports.

PIT arrival routes:

From ZAU.....J146 J34 DJB ACO V337 CUTTA

....CRL DJB ACO V337 CUTTA

From ZDC....EKN IHD V474 NESTO

.....J211 BUSTR IHD V474 NESTO

From ZID....CTW V443 WISKE

....PKB V117 WISKE

From ZNY....J80 IHD NESTO

....SLT SLT240 ETG268 V226 GRACE

....PSB V58 GRACE

DTW arrival routes:

From ZAU....LFD V30 V98 MIZAR
.....FWA V11 V98 MIZAR
.....MKG V450 V133 POLAR
From ZBW....BUF YQO V464 SPICA
From ZDC.....J211 HAGUD DJB V26 CETUS
From ZID.....DQN V98 MIZAR
.....J83/85 DJB V26 CETUS
From ZNY.....J60 DJB V26 CETUS
.....ULW303 KOOPR YQO V464 SPICA

NAVAIDS

| | | | | | |
|------------|-------------|------------|-----------|------------|-------------|
| AIR | Belair | BUF | Buffalo | CRL | Carlton |
| CXR | Chardon | DJB | Dryer | DKK | Dunkirk |
| ECK | Peck | ERI | Erie | ETG | Keating |
| EWC | Elwood City | FNT | Flint | IHD | Indian Head |
| JHW | Jamestown | JST | Johnstown | LFD | Litchfield |
| MBS | Saginaw | MFD | Mansfield | MGW | Morgantown |
| SLT | Slate Run | SVM | Salem | ULW | Elmira |
| YNG | Youngstown | YQO | Alymer | | |

Special Use Airspace

There are no SUAs in ZOB that would normally have an impact on reroutes.

ZTL

Overview

The STMC generally answers the ZTL lines. In addition to the STMC position, ZTL Traffic Management consists of the following:

- Atlanta Meter Position (AMP): The AMP is responsible for ensuring the optimum flow of arrival traffic to the Atlanta terminal area, which, in turn, will maximize landing capacity. Minimizing and equalizing the impact of arrival traffic on ZTL arrival sectors is of primary concern to the success of this position. AMP is responsible for setting the MIT requirements for the arrival sectors, fix balancing, and management of arrival delay data for ATL. Personnel from the combined Atlanta Airport Traffic Management Unit (AAMTU) primarily staff the AMP.
- Charlotte Meter Position (CMP): CMP is responsible for the overall flow and coordination on traffic inbound to the CLT airport. Includes setting the MIT requirements for the ZTL arrival sectors, any first tier MIT restrictions, fix balancing, and management of arrival delay data for CLT.
- Enroute Spacing (ESP): ESP is responsible for enroute flows to airports such as ORD, CVG, IAD, etc., and necessary Call for Release (CFR) restrictions placed on internal ZTL airports to fit traffic into the overhead stream.
- Monitor Alert Strategy and Tactics for Evaluation and Resolution (MASTER): The purpose of the Monitor Alert Strategy and Tactics for Evaluation and Resolution (MASTER) position is to perform Monitor Alert (MA) functions and to implement strategic and tactical initiatives to reconcile demand with capacity. This responsibility requires coordination with other TMU positions such as AMP or CMP. The STMC determines the focus of the MASTER position based on a real-time assessment. However, the position always retains the responsibility for compliance with MA requirements.
- Weather Coordinator (WC): The WC functions as the primary interface between the CWSU meteorologist and the TMU/control room personnel. In the absence of a meteorologist, the WC assumes many of their duties (pireps, weather brief at standup, etc.). The WC is staffed 24 hours a day. The WS assumes the duties of WC during the midnight shift.
- Military Operations Specialist (MOS): MOS functions as the primary interface between the military and the TMU/Control Room personnel. The MOS position is staffed during the day and evening shifts. It is collocated with the WC position. The WS assumes the duties during the midnight shift.
- Masters and NASCAR events: ZTL staffs Masters golf events with four specialists, two for arrivals and two for departures. NASCAR events are staffed with one additional specialist.

Major Traffic Flows

J22.....Traffic from the DC area airports to Texas and Gulf states
J14, J37, J208, J209...Traffic destined to the NE airports
J14/52.....CAE/RDU
J4/20, J39, J41, J45,...Major north-south routings for traffic destined to/from FL airports
J43, J73, J89, J91, J151

Additionally, there is a great deal of NRP and point-to-point traffic traversing ZTL, both east-west and north-south. SWAP and Playbook reroutes for the Northeast frequently impact ZTL due to its strategic location. Additionally, weather or volume impacting ZJX and ZMA may result in ZTL dynamic reroutes to and from the Florida airports.

Major Crossing Points:

ATL.....Atlanta, GA
SPA.....Spartanburg, SC
VXV.....Volunteer (Knoxville, TN)
VUZ.....Vulcan (Birmingham, AL)

CLT Arrivals:

MAJIC.....ZDC/ZNY/ZBW/ZEU
CTF.....ZJX/ZDC/ZMA /some Caribbean
UNARM.....ZTL/ZHU/ZME/some ZJX
SHINE.....ZME/ZID/some ZTL

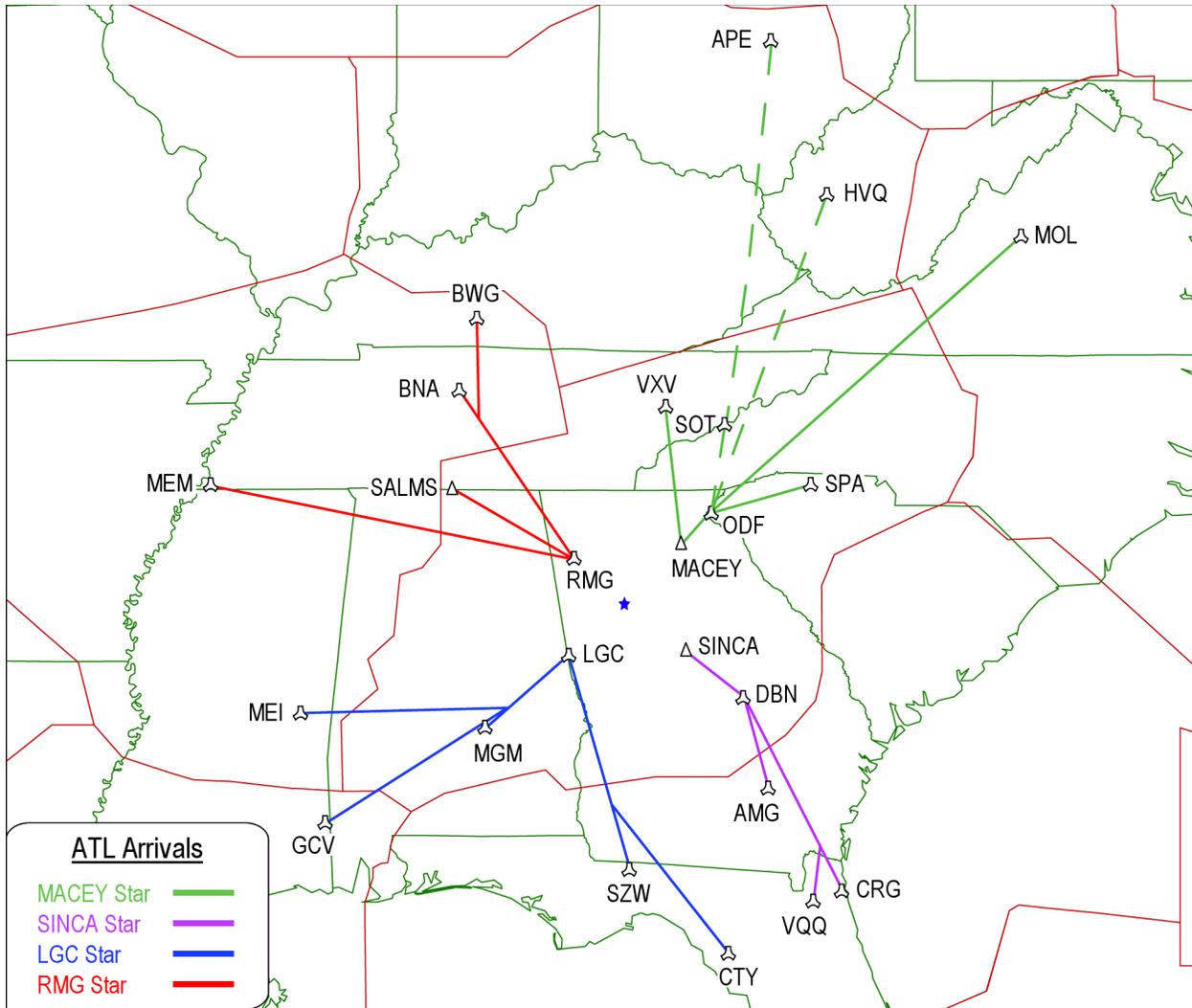
CLT Departures:

Departure swap at CLT is generally accomplished through CDRs.

North.....ZID/ZAU/ZMP/ZOB
East.....ZDC/ZNY/ZBW/ZEU
South.....ZJX/ZMA/Caribbean
West.....ATL/ZFW/ZHU/West Coast/Latin America

ATL Arrivals:

MACEY.....ZDC/ZNY/ZBW/ZID/ZEU/CZY
SINCA.....ZJX/ZMA/Caribbean/Latin America
LGC.....ZJX/ZHU/ZFW/ZME/ZAB/ZLA/some Latin America
RMG.....ZME/ZKC/ZMP/ZAU/ZID



ATL Departures:

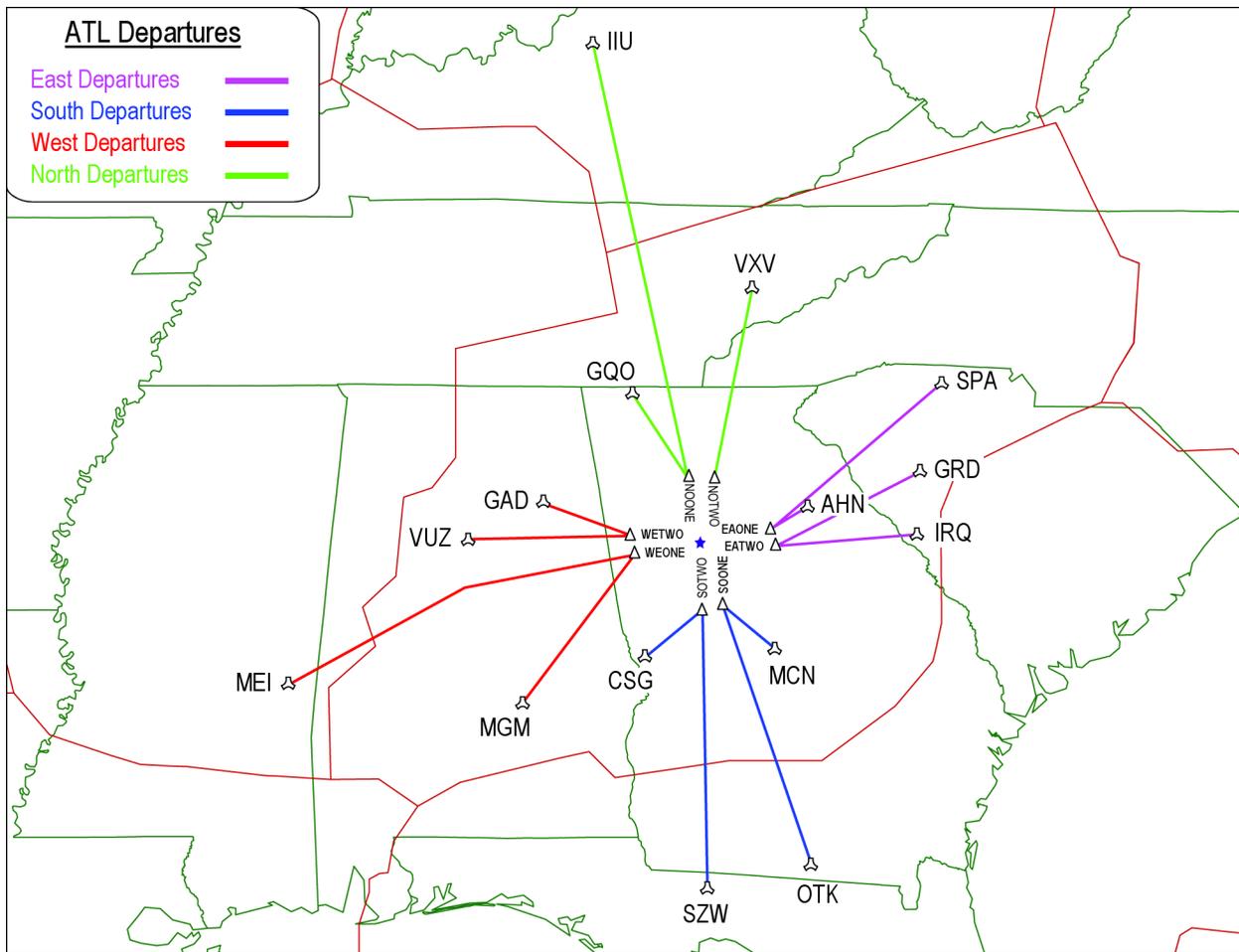
Departure swap at ATL is generally accomplished through CDRs.

East.....ZNY/ZDC/ZBW/ZEU

South.....ZJX/ZMA/Caribbean/Latin America

West.....ZME/ZHU/ZFW/ZAB/ZLA/ZKC/ZDV/ZOA/ZLC

North.....ZID/ZOB/ZAU/CZY/ZMP/ZSE



NAVAIDS

| | | | | | |
|------------|------------|------------|-----------|------------|---------------|
| ATL | Atlanta | AHN | Athens | CTF | Chesterfield |
| CSG | Columbus | DBN | Dublin | GCV | Greene County |
| GQO | Choo-Choo | GRD | Greenwood | GSO | Greensboro |
| IRQ | Collier | LGC | LaGrange | MCN | Macon |
| MGM | Montgomery | ODF | Foothills | PSK | Pulaski |
| RMG | Rome | SOT | Snow Bird | SPA | Spartanburg |
| VUZ | Vulcan | VXV | Volunteer | | |

Special Use Airspace

There are no SUAs in ZTL that would normally have an impact on reroutes.

V. Electronic Version and Feedback

The Severe Weather 2004 handbook is available for download at:

FAA Intranet:

http://www.atcscf.tfmi.nas.faa.gov/Operations/Strategic_Planning/svrwx_handbook.html

Internet:

http://www.fly.faa.gov/Operations/Strategic_Planning/svrwx_handbook.html

Comments and suggestions for this document may be provided to:

7-awa-svr-wx@faa.gov