Advisory Circular

Subject: Collaborative Trajectory Options Program (CTOP)	**Date:** 6/24/14	**AC No:** 90-115
	Initiated by: AJR-1	

1. PURPOSE.

This Advisory Circular provides guidance to customers of the National Airspace System (NAS) regarding a new traffic management initiative for managing flights through a constrained area. The new traffic management initiative builds upon concepts found in Ground Delay Programs (GDPs), Airspace Flow Programs (AFPs; AC 90-102A) and required reroutes. The new initiative is called the Collaborative Trajectory Options Program or CTOP. The CTOP is one of many new traffic management initiatives being developed within Collaborative Air Traffic Management Technologies (CATMT) as we progress toward the Next-Generation Air Transportation System (NextGen).

2. WHAT IS A CTOP?

A Collaborative Trajectory Options Program is a method of managing demand through constrained airspace. This constrained airspace may be identified by one or more Flow Constrained Areas or FCAs. Each FCA is assigned a capacity, and then, through automation, customers will be assigned either:

- A route assignment that avoids the CTOP
- A combination of assigned route through the CTOP and controlled departure time.

A new concept in the CTOP is that customers are able to communicate their preferences, with regard to both route and delay, in a Trajectory Options Set or TOS. CTOPs are managed by the Air Traffic Control System Command Center (ATCSCC).
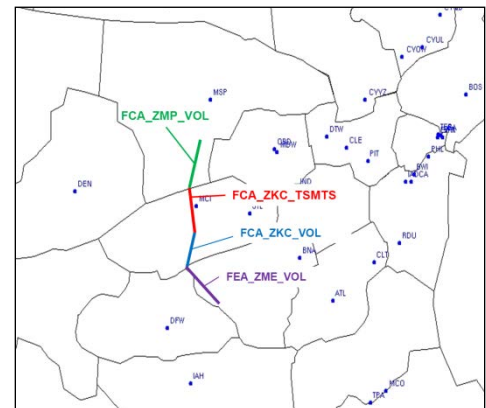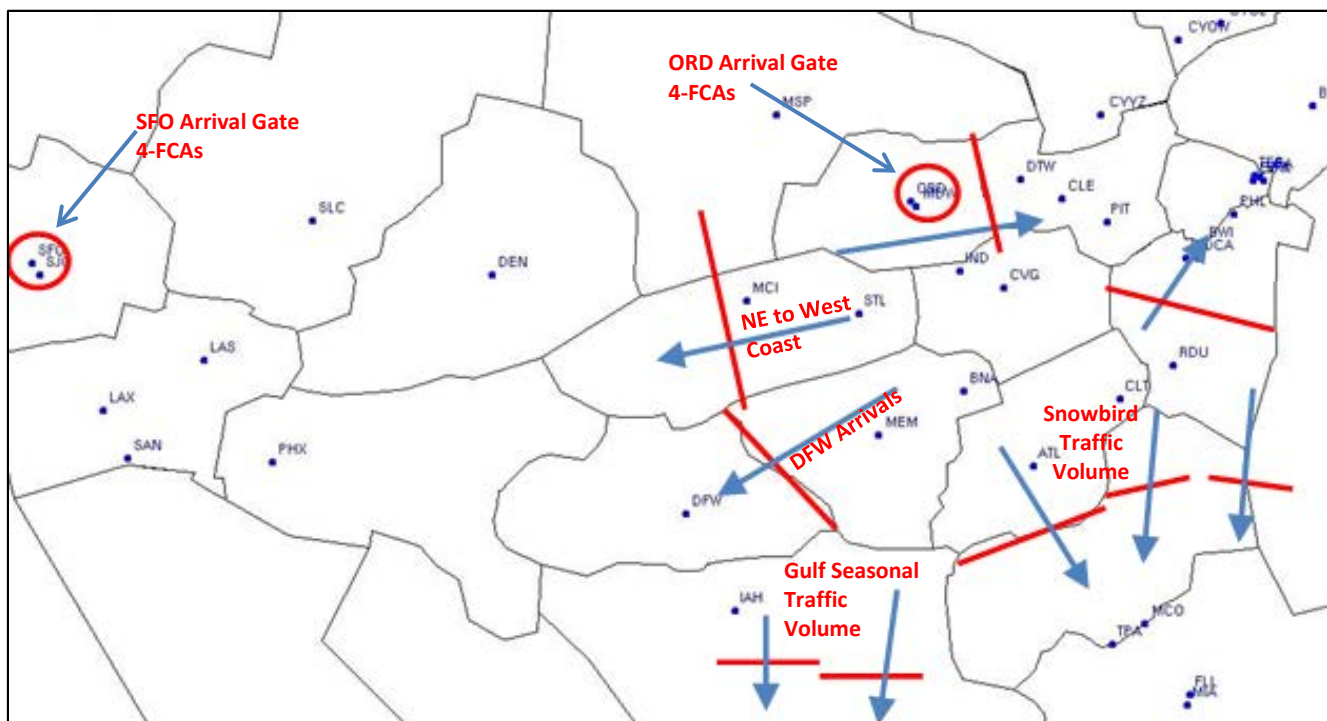
Figure 1: Use of Multiple FCAs in a CTOP program to manage the constrained airspace

3. WHEN WOULD A CTOP BE USED?

A CTOP may be used anywhere there is a constraint in the system. The two most common constraints are weather (thunderstorms) and volume. A few examples of how they may be used would include:

- A north/south line of thunderstorms may require a CTOP with one FCA for the constraint, one FCA to control the volume passing north of the constraint and one FCA to control the volume passing south of the constraint
- Thunderstorms impacting the arrival routes into a terminal area may require a CTOP with one FCA for each of the four "corner posts".
- A CTOP may be required to manage departure demand. For example, in the NY area, an FCA may be built for each of the "West Gates" (ELIOT, PARKE, LANNA, BIGGY).

4. WHAT IS A TRAJECTORY OPTIONS SET (TOS)?

A TOS is an electronic message, submitted by the Flight Operator (FO), and is the fundamental building block of the CTOP concept. The TOS will allow the customer to manage a flight by expressing the route and delay options that they are willing to accept. Whereas a traditional flight plan contains a single request with a defined route, altitude and speed, a TOS may contain multiple trajectory options with each option containing a different route, altitude or speed. In addition to multiple options within a single TOS, each option may contain the "start" and "end" times in which they are willing to accept for that particular option. Each option will be evaluated based on customer preference expressed through the use of the Relative Trajectory Cost (RTC).

Unique Flight Data

ACID	ORIG	DEST	IGTD	TYPE	ERTD
ABC123	DEN	IAD	05/1945	B757	05/1957

TRAJ_OPTION

RTC	RMNT	TVST	TVET	Route	ALT	SPEED
0				GLD SLN J24 MCI J24 STL J134 FLM J24 HVQ SHNON2	350	435
25				GLD SLN J24 MCI J80 VHP APE AIR J162 MGW VERNI ESL SHNON2	350	435
35				PLAIN4 HCT J128 OBH J10 IOW BDF J64 WHETT J30 APE AIR MGW MGW121 VERNI ESL ROYIL2	310	430
50		1945	2145	YELLO6 HANKI OBH J10 IOW BDF J64 WHETT J30 APE AIR MGW MGW121 VERNI ESL ROYIL2	350	425
65		2030	2200	YELLO6 HANKI ONL J148 MCW J16 BAE J34 AIR MGW MGW121 VERNI ESL ROYIL2	310	430
90	45	1945	2145	PIKES4 PUB J28 ICT FAM J78 HVQ SHNON2 DEN PIKES4 PUB TBE BGD IRW FSM BNA BKW ROYIL2 IAD	350	435
120	45	2045	2245	PIKES4 PUB TBE BGD IRW FSM BNA BKW ROYIL2	350	440

IGTD – Initial Gate Time of Departure; ERTD – Earliest Runway Time of Departure;　⎫ Optional values
RTC – Relative Trajectory Cost RMNT- Required Minimum Notification Time;　　　　　⎬ provided by the
TVST – Trajectory Valid Start Time; TVET- Trajectory Valid End Time　　　　　　　　⎭ Flight Operator
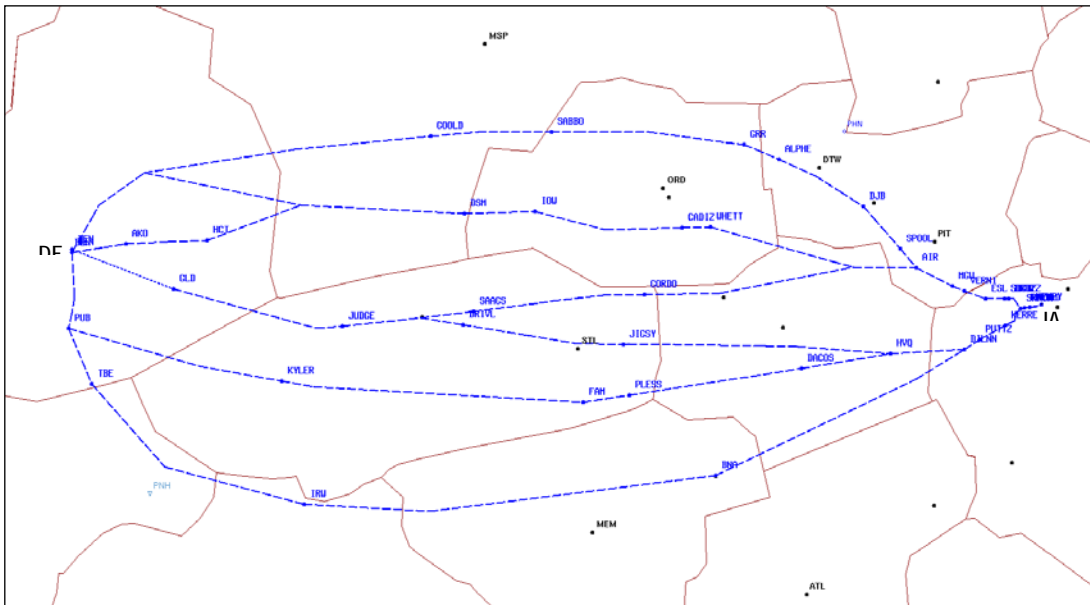

Figure 2 - EXAMPLE OF A TRAJECTORY OPTIONS SET

5. DO I HAVE TO FILE A TOS?

No. You may continue to file flights plans in the traditional manner; however, this will not allow you to define customer preferences with regard to route versus delay options.

6. WHAT IS REQUIRED TO SUBMIT A TOS?

Flight Operations Centers will have needed to complete automation upgrades to current systems for messaging capabilities. Individual flight operators will need to utilize a service provider who has this capability.

7. IF I SUBMIT A TOS, AND THERE IS NO CTOP, WHAT HAPPENS?

If **no** CTOP is in place impacting your particular route of flight, nothing happens. The Traffic Flow Management System (TFMS) will use your least cost option as an early intent message, this will improve Traffic Flow Management demand projection. If a CTOP is issued later, you can choose to submit an updated/new TOS.

8. WHEN SHOULD I SUBMIT A TOS?

While a TOS may be submitted at any time, there are many advantages to submitting a TOS well in advance of a planned flight. There is never a disadvantage to submitting a TOS.

9. HOW DO I KNOW IF A CTOP IS IN PLACE?

When a CTOP is issued, the FAA will send an Advisory that is accessible at http://www.fly.faa.gov/adv/advAdvisoryForm.jsp

A CTOP will also appear in graphic and text formats on the ATCSCC Operational Information System page at http://www.fly.faa.gov/ois/

10. WHAT HAPPENS IF MY FLIGHT IS CAPTURED IN THE CTOP?

If your flight is captured in the CTOP, it will be assigned a route from your TOS to avoid the CTOP or a route through the CTOP with an Expect Departure Clearance Time (EDCT). If a Ground Delay Program (GDP) is in effect for your destination airport, you will keep your EDCT for the GDP and be assigned your least cost option route from your TOS.

11. HOW WILL I KNOW WHAT ROUTE OR DELAY I HAVE BEEN ASSIGNED?

This information will be available through your Flight Operations Center. The flight operator receives this information through an automated process much the same as is used today.

12. IF I DO NOT HAVE A FLIGHT OPERATIONS CENTER, HOW DO I FIND OUT IF MY FLIGHT HAS AN EDCT?

At airports with an airport traffic control tower, controllers will provide you with the EDCT.

If you are departing an airport without a control tower, you should determine if your flight has an EDCT prior to departure. To do so, you may:

- Contact the overlying TRACON or En Route Center by radio, or telephone, if available.
- Contact Flight Service.
- Use the ATCSCC's EDCT Lookup Tool - http://www.fly.faa.gov/edct

FIGURE 2. EXAMPLE OF THE EDCT LOOK UP TOOL

13. WHAT IS THE EDCT "WINDOW"?

Flights are requested to depart as close to their EDCT as possible. If conditions warrant, you may depart no earlier than 5 minutes before, and no later than 5 minutes after, the EDCT [AIM 5-2-6(4)].

Outside of that window, you may exercise the following options:

- At airports with a control tower, the tower has a process for requesting a new time.
- At airports without a control tower, you may contact:
  - The overlying TRACON or En Route Center or
  - Flight Service.
- Contact your Flight Operations Center

14. HOW DO I FIND OUT WHAT ROUTE I HAVE BEEN ASSIGNED?

Your Flight Operations Center or ATC will be able to provide you with the assigned route. Future development of the "EDCT Look Up" Tool will allow for the route to be displayed along with the EDCT information.

15. WHAT OPTIONS DO I HAVE TO MANAGE MY FLIGHT(S)?

Your flight preferences are best expressed through the TOS.

These TOS options include defining preferences with regard to:

- Route: The Flight Operator may route out of a CTOP FCA into another CTOP FCA or out of the CTOP altogether. Submissions should conform to standard flight plan requirements (i.e. NRP, required reroutes, preferred routes, etc.).
- Altitude: The Flight Operator may file different altitudes, thereby changing the assigned TOS option.

- Speed: The Flight Operator may file different speeds, thereby changing the assigned TOS option.
- RTC: The Flight Operator may file different RTCs, thereby changing the assigned TOS option.
- TVST/TVET: The Flight Operator may file different TVSTs/TVETs (start/end times), thereby changing the assigned TOS option.
- RMNT: The Flight Operator may file different RMNTs, thereby changing the assigned TOS option.

After the delay and/or route has been assigned, your Flight Operations Center may be able to provide assistance through the substitution process.

- Your Flight Operations Center is permitted to exchange and substitute CTAs between multiple FCAs within a single CTOP.
- Your Flight Operations Center is permitted to exchange trajectories between multiple FCAs within a single CTOP.

16. WHERE CAN I FIND ADDITIONAL INFORMATION?

Additional information can be found on the FAA's Collaborative Decision Making (CDM) website.

http://cdm.fly.faa.gov/ad/CDM-GDP_specs.htm

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