CDM
Quick Reference Guide
Concepts I Need to Know for the Exam
What is the principle behind CDM?

– Sharing information between:
  – ATC (all parts – System Command & Control, Centers, TRACONS, Towers)
  – Airlines
  – other users of the NAS (e.g. GA)

– makes for:
  • better utilization of airspace and airports
  • improved safety.
  • Better predictability of arrivals and departures
What is TFM?

- Traffic Flow Management is a function that coordinates flows of traffic across the NAS (Centers, TRACONs, and Towers).
- TFM manages the flow of traffic to ensure that aircraft arriving at a destination at the same time are not in excess of the capacity of the arrival rate of the airports' runways.
- To manage the flow, TFM keeps track of potential choke points and takes proactive actions to prevent excessive traffic.
  - Examples:
    - Increase spacing between aircraft before arriving at airport.
    - Delaying aircraft on the ground before departure (Ground Delay Hold).
- Traffic Management Specialists (TMSs) perform TFM duties.
How is TFM at the ATCSSC different than controller duties at the Centers/TRACONS/Towers?

- **ATCSCC (TFM).**
  - Concerned with nation, strategic outlook, i.e. national weather picture
  - Looks up to six hours in the future to balance demand and capacity

- **ARTCCs (Centers) and TRACONs**
  - Concerned with regions
    - Departing and arriving aircraft in TRACONS
    - Overflights through Centers
  - Looks up to one hour or less into the future to balance demand and capacity

- **Tower**
  - Concerned with getting flights from gate to runway and takeoff
  - Concerned with getting flights to land and to gate
  - Deal only with the present
Name and Describe Techniques used to Manage Traffic?

1. Altitude
   - Use different altitudes to allow crossing, over-taking, …
2. Miles-in-Trail/Minutes-in-Trail
   - Decrease/increase spacing between aircraft on same airway at same altitude
3. Speed Control
   - Slowdown or speedup aircraft
4. Vectoring
   - Instruct aircraft to make S-turns to slow their arrival at a fix
5. Airborne Holding
   - Go round-and-round in the air
6. Sequencing Programs: Departure Spacing Program (DSP), Enroute Sequencing Program (ESP), Arrival Sequencing Program (ASP)
   - Get the aircraft lined-up in the order of the schedule
7. Rerouting
   - Change airways used
8. Ground Delay Programs
   - Delay departure at gate or on ramp
9. Ground Stop
   - No departure or arrivals at an airport
Ground Delay Program

A ground delay program (GDP) is implemented at an airport when arrival demand exceeds capacity.

Demand is under capacity => no problem
Capacity has dropped below demand => problem for 4 hours

Flow into airport is reduced to match available capacity (Airport Acceptance Rate – AAR)
What is an ETE?

• Estimated Time Enroute for a given aircraft

• A prediction used to compute how long an aircraft will take to fly from origin airport to destination airport
  – Uses Vertical/Longitudinal equations of motion of aircraft
  – Includes Wind (headwind, tailwind)
What is an EDCT?

• Estimated Departure Control Time for a given aircraft
• Estimated time at which a given aircraft will depart
  – Airline now knows in advance
• EDCT + ETE = ETA (Estimated Time of Arrival)
How does Ground Delay Hold Program work?

- TFM predicts chokepoints at airports or enroute due to weather, ATC failures, …etc.
- Determines which *scheduled flights* will be affected
- Delays all the scheduled flights.
- Provides EDCT to scheduled flights so that they arrive at a constrained point in orderly manner
What problems can occur that disrupt Ground Delay Hold?

- Aircraft maintenance problem. Aircraft does not depart at EDCT or is diverted or …
- Airline chooses to delay or cancel flight for reasons of airline scheduling
- These problems result in “unused slots” in arrival sequence driven by EDCTs
  - Unused slots are “wasting” scarce resource
- Airlines published (OAG) schedule does not represent their intended schedule
What are the methods use to maximize use of slots after problems with EDCTs occur?

• **Ration-by-Schedule**
  – Airline keeps their slot into airport (even though flight cancelled)
  – Airline keeps their slot into airport (even though flight delayed by airline)

• **Compression**
  – If slot is unused (airline cancels flight and has not other flight to fill the spot), slot is open
  – EDCTs for flights behind that slot can be move forward in time
What is a “Proposed GDP Advisory” ? Why is this important?

- “Proposed GDP Advisory” is the schedule (EDCTs for each flight) proposed by TFM
- “Proposed GDP Advisory” is provided to the airlines for comments and questions
  - Airlines may see ways to improve the proposed schedule
  - Airlines may have additional info (e.g. plan to cancel a flight)
- “Proposed GDP Advisory” creates better situation awareness. Allows airlines and TFM to maximize the schedule