

Assignment 5: Runway Separations and Air Traffic Control

Solution

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Problem 1

Use Google Earth and Airnav (www.airnav.com) and your knowledge of runway separations, to answer the following short questions.

Fort Lauderdale-Hollywood International Airport (FLL)

- 1) Can the airport conduct simultaneous approaches under IMC conditions? Name the runways that meet the requirement for simultaneous approaches.

Yes, FLL can do simultaneous independent arrival procedures in IMC conditions. The runway separation is 4,020 feet. With high-update surveillance such as ADS-B, the separations is enough to allow independent arrival procedures.

Runways 10R and 10L can be used for independent arrivals. Runways 28R and 28L can also be used for independent arrivals.

- 2) Comment on the runway configuration and the location of the airline gates at FLL.

Airport gates are located between the two runways and on the East side of the airport. Landings on runways 10R and 10L would be more favorable to reduce taxi times to the gates.

Detroit International Airport (DTW)

- 2) Can the airport conduct simultaneous approaches in Instrument meteorological conditions? State the two runways that can offer enough separation to conduct simultaneous approaches at DTW. Briefly explain the FAA rule used and the distance between the runways in question.

Yes, DTW can do simultaneous independent arrival procedures in IMC conditions. Runways 3R and 4L are separated by 8,800 feet. With high-update surveillance such as ADS-B, the separations is enough to allow independent arrival procedures. Runways 27R and 27L are separated by 6,500 feet. With high-update surveillance such as ADS-B, the separations is enough to allow independent arrival procedures.

The FAA rule states:

"For straight-in approaches, the minimum parallel runway centerline separation between adjacent runways is 3,200 feet (975 m)"

Chicago O'Hare International Airport (ORD)

- 3) Can the airport conduct simultaneous approaches to runways 27R, 27L and 28C in instrument meteorological conditions? Briefly explain the rule used.

Yes, ORD can do simultaneous independent arrival procedures to three parallel runways. Runways 27R and 27L are separated by 6,900 feet. With high-update surveillance such as ADS-B, the separations is enough to allow independent arrival procedures. Runways 27L and 28C are separated by 6,000 feet. With high-update surveillance such as ADS-B, the separations is enough to allow independent arrival procedures.

Problem 2

Use Google Earth and Webtrak (<https://us.webtrak.aero/>) to study runway operations at Fort Lauderdale-Hollywood International (FLL) and London Heathrow (LHR) Airports and answer the following questions. Figure 1 illustrates the annotated Webtrak interface to review historical airport operations.

- 1) Use Webtrak and observe the historical flights at FLL on August 26, 2026 starting at 10:00 AM local time. Observe traffic between 10:00 and 10:30 AM to understand the runway operations. 10:00 AM local time is hour 10 in Webtrak. You can speed up the replay of runway operations as needed.

- a) Use Google Earth to measure the distance between the parallel runways at FLL.

4,020 feet between runways.

- b) Name the runways used for arrivals and departures in the period of interest.

Runways 10R and 10L in use on August 26 at 10 AM.

- c) Based on your observations, can FLL do dual simultaneous arrivals? Name the runways used in such procedures.

Yes.

- d) Briefly explain the FAA runway separation rule that applies and the distance between arrival runways in part (c).

The FAA rule states:

"For straight-in approaches, the minimum parallel runway centerline separation between adjacent runways is 3,200 feet (975 m)"

2) Use Webtrak and observe the historical flights at LHR between 3:00 and 3:30 PM on August 26, 2026 to understand the operations at the airport. 3:00 PM local time is hour 15 in Webtrak. You can speed up the replay of runway operations as needed.

- a) Use Google Earth to measure the distance between the parallel runways at LHR.

4,600 feet.

- b) Name the runways used for arrival and departure operations in the period of interest.

Runway 9L is used for arrivals. Runway 9R used for departures.

- c) Based on your observations, can LHR do dual simultaneous arrivals (recall LHR operates under ICAO rules)? Name the runways used in such procedures.

Runways 9R and 9L can be used for dual arrivals. Nevertheless, LHR operates mostly in segregated model - one runway used for arrivals (9L) and one for departures (9R).

- d) Compare and contrast the runway operations at FLL and LHR. Explain the differences and similarities observed.

LHR operates mostly in segregated model - one runway used for arrivals (9L) and one for departures (9R). FLL can use both runways for arrivals during busy arrival periods. In London, the traffic mix is comprised by many CWT A, B, and C aircraft. London operates with more conservative rules to avoid mixed operations on one runway (i.e., arrivals and departures like FLL).

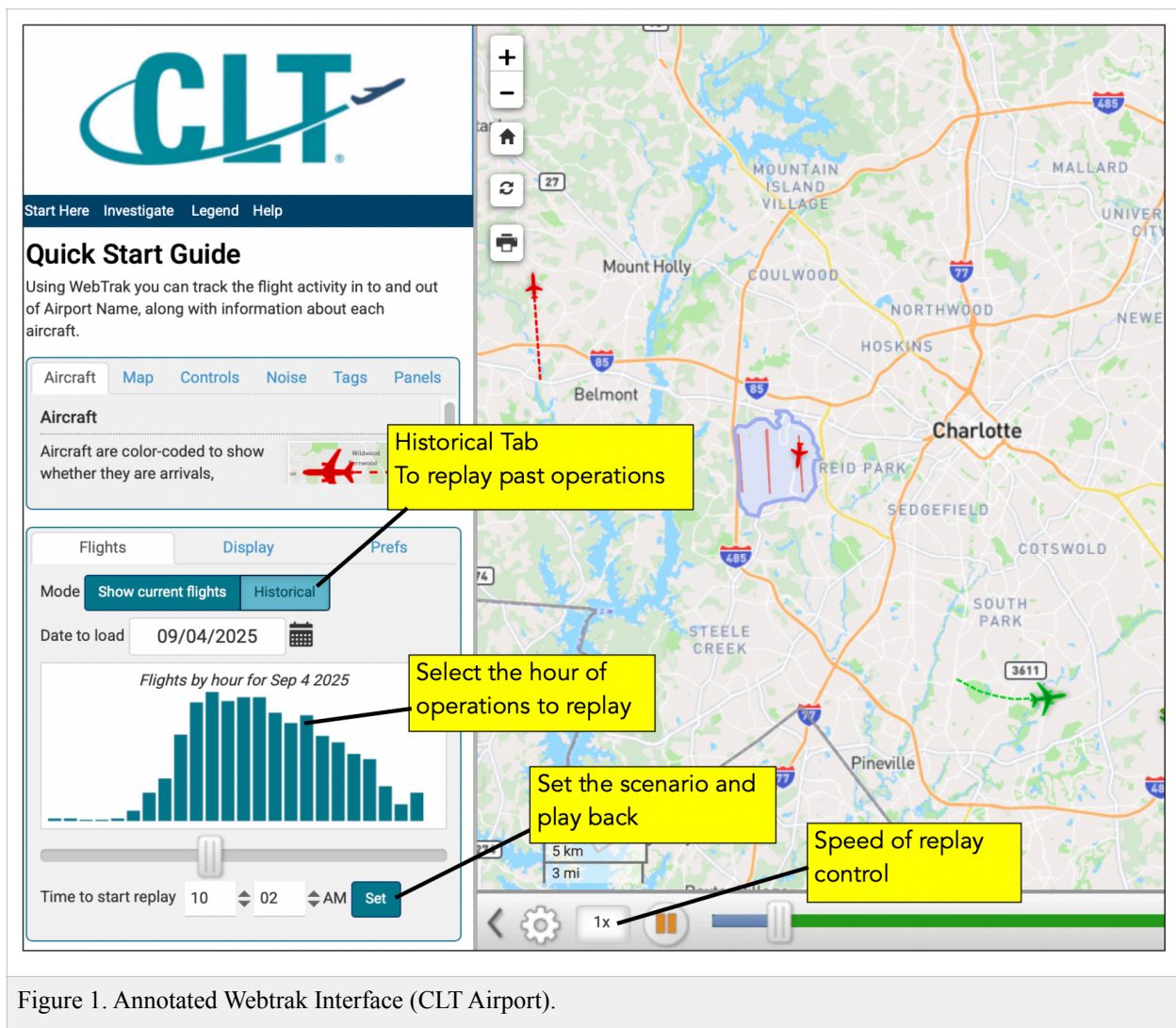


Figure 1. Annotated Webtrak Interface (CLT Airport).

Problem 3

Briefly answer the following questions with two sentences.

- a) Explain why the US is likely to keep airport surveillance radars operational in the future.

Radars are more difficult to jam than ADS-B signals. Radar provide a backup to ADS-B.

- b) Explain why runway separations at higher elevation airports change compared to airports below 2,000 feet.

Faster aircraft approach speeds required slight increase in separation standards (in the past). Faster speeds reduces the safety margins in case an aircraft blunders.

- c) Explain the difference in ATC-pilot communications between air traffic control in the domestic airspace and over oceanic airspace.

Oceanic controllers use Controller-Pilot Data Link Communications (CPDLC). CPDLC uses pre-formatted messages exchanges via text between pilots and ATC. Oceanic controllers do not rely on voice communication like domestic ATC-pilot exchanges.

- d) An Airbus A220-300 (see Figure 2) flies from New York Kennedy Airport to Seattle. State three possible cruise altitudes for this flight. Explain the reason of your choice.

Flying West, the possible cruise flight levels are even values such as: FL300 (30,000 feet), FL320 (32,000 feet), and FL340 (34,000 feet).

- e) Are departures on runway 26L and arrivals on runway 30 at Miami International Airport (LAS) subject to converging runway operations (CRO)? Explain the issue with CRO operations and the rule to identify when CRO applies.

Yes. Arrival on runway 30 and departures on runway 26L are subject of CRO rules and cannot be operated independently. The opposite thresholds (12) and 8L are only 0.1 nm away. There is less than one mile required for CRO rules.



Figure 2. Airbus A220-300. Source: A. Trani.

Problem 4

In late March 2026, the FAA discontinued the use of Simultaneous Offset Instrument Approaches at San Francisco International Airport. The suspension of SOIA procedures reduces the airport arrival capacity from 54 to 36 per hour. Starting August 13, 2026, the FAA reintroduced a new form of staggered approaches to runways 28L and 28R. Read the article <https://sfist.com/2026/08/12/faa-announces-new-landing-procedure-to-speed-up-arrivals-at-sfo/>

- a) Explain the changes in hourly capacity with the new staggered procedures quoted in the article.

The change in arrival operations at SFO reduced the arrival runway capacity by 39% (from 54 to 36 per hour).

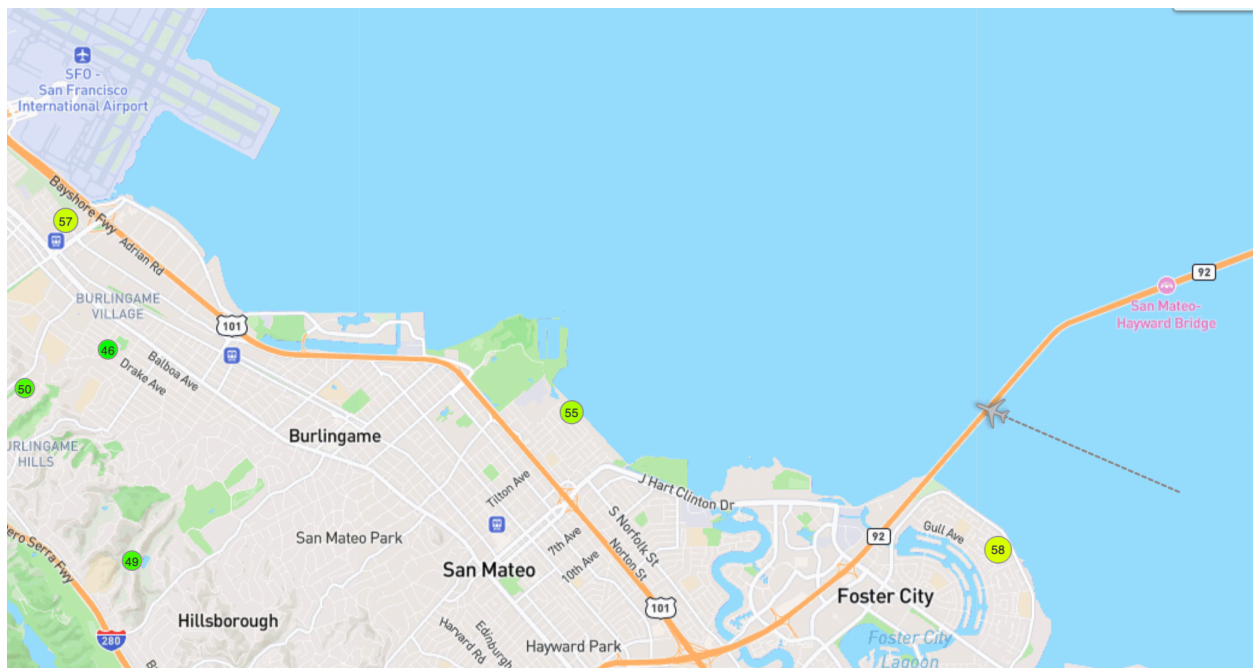
- b) Briefly explain the rationale for the suspension of the SOIA procedures that operated for more than twenty years without accident.

Recent accidents at other airports such as DCA and incidents at SFO, prompted the FAA to reconsider the SOIA operations. In August 2026, the airport operates using staggered approaches which increase arrival capacity from 36 to 42 per hour.

Use Webtrak and observe the historical flights at SFO between 11:00 and 11:30 AM on September 9, 2026 to understand the new staggered operations at the airport. You can speed up the replay of runway operations as needed.

- c) Describe the new staggered operations.

Staggered operations place landings on runways 28R and 28L at a safe diagonal distance (see picture below) instead of landing aircraft side-by-side.



- d) Use the Webtrak map scale to estimate the diagonal distance between few random staggered arrivals to runways 28R and 28L.

Example staggered separation between CWT class F (A321neo) and Gulfstream 700 (CWT class G). The measured staggered separation is 2.9 nm.

- e) Knowing that aircraft wakes can travel laterally in windy conditions, what is your opinion about possible wake encounters with the new procedure.

This can be a problem if light aircraft follow wide-body aircraft which generate stronger wakes. In the risk assessment of staggered runway operations, the FAA has considered the lateral travel of wakes.