

## Assignment 5: Declared Distances and Runway Separations

Date Due: October 4, 2024 Instructor: Trani

### Problem 1

Examine the runway configuration presented in Figure 1. The runway is 7,100 feet long and is located at an elevation of 2,400 feet. The runway has a slope of 0.5%. Use the declared distance concept to answer the following questions.

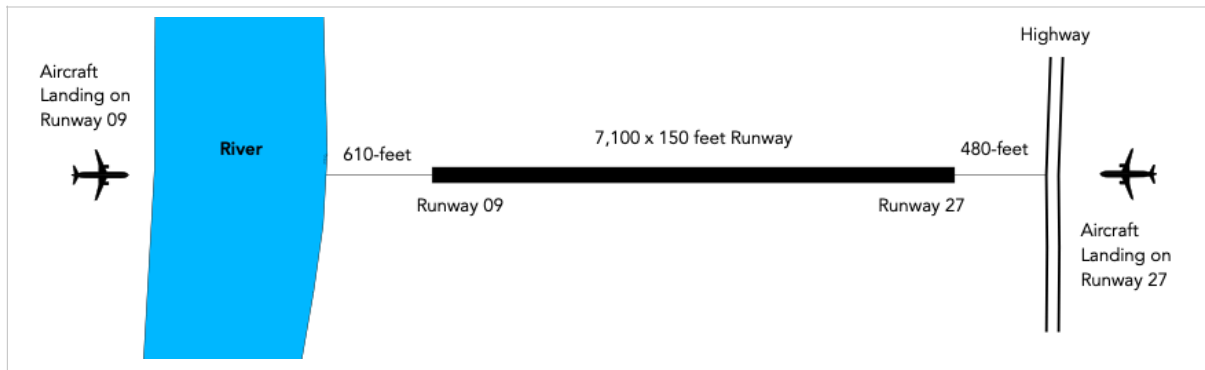


Figure 1. The Geometry of Runway for Problem 1.

- For aircraft landing on runway 27, find the landing distance available (LDA) if the runway safety area is to be protected on the landing threshold 27 and the opposite end (runway 09). Clearly state your assumptions.
- Find the landing distance available for aircraft landing on runway 09. Assume complete protection of the runway safety area on the landing threshold 09 and the opposite end (runway 27). Comment on any difference with part (a).
- Find the accelerate-stop distance available (ASDA) for aircraft departing runway 27. Assume complete protection of the runway safety areas during the abort maneuver.
- Find the takeoff run available (TORA) for aircraft departing on runway 27. Your solution should protect the runway safety area.
- Would you consider building an EMAS on runway end 27? Explain the safety advantages it would bring to the airport. Describe a scenario (in words) if you want to answer the question.
- The largest and most critical aircraft operating at the airport is the Gulfstream 450 (see Figure 1). Using SARLAT 2, verify if the aircraft can operate at 85% useful load using the ASDA distance calculated in part (C). Comment on the solutions for both a dry and wet runway.



*Figure 1. Gulfstream 450 Departs Virginia Tech Montgomery Executive Airport(BCB).  
Source: A. Trani.*

## Problem 2

Use Google Earth to verify the runway separations and answer the following questions.

### Cincinnati/Northern Kentucky International Airport (CVG)

- Can the airport conduct simultaneous approaches to runways 36L and 36C in Instrument meteorological conditions?
- Briefly explain the FAA runway separation rule that applies and the distance between the runways in question.
- Can CVG air traffic controllers allow simultaneous departures from runways 36C and 36R? State the rule used.

### San Francisco International Airport (SFO)

- Can the airport conduct simultaneous approaches to runways 28R and 128L in Instrument meteorological conditions?
- Under what meteorological conditions can SFO conduct simultaneous approaches to runways 28R and 28L? Name the procedure used.
- Load the Webtrak data for San Francisco International Airport (SFO) on September 2, 2024 (see Figure 2). Specifically, the focus should be on the airport operations starting at 11:00-11:20 AM (morning), which is a busy period. The WebTrack 6 site is located at: <https://webtrak.emsbk.com/>. Are simultaneous operations from runways 1R and 1L possible based on your observations?
- Explain some of the challenges you see for Air Traffic Control based on your observations using Webtrak.

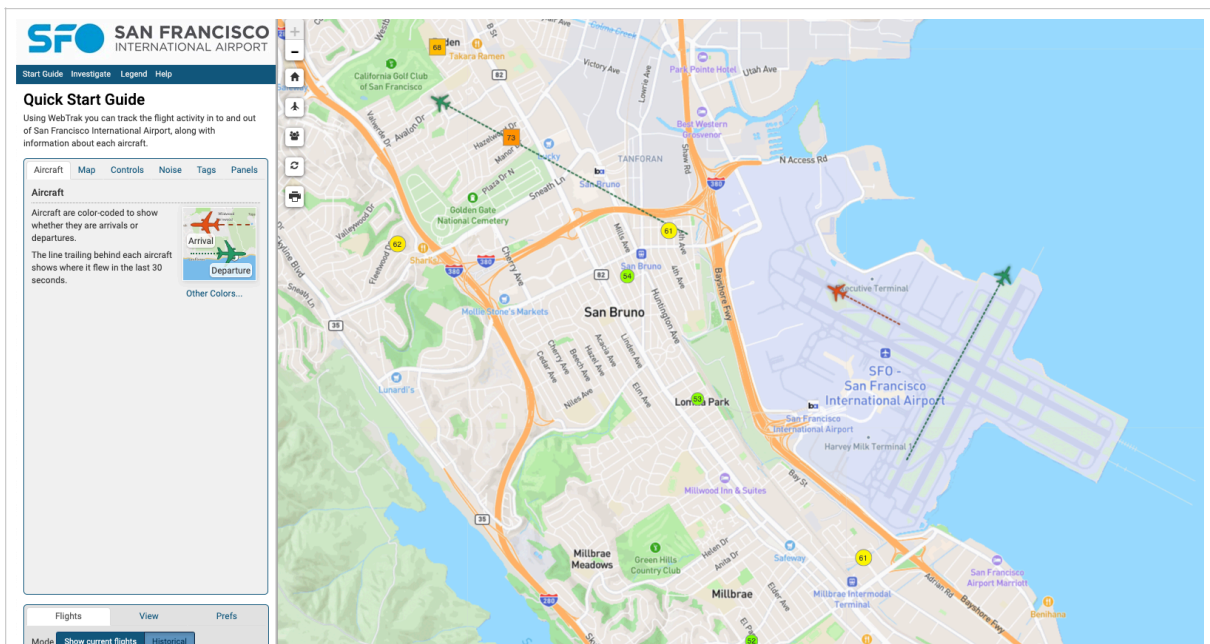


Figure 1. WebTrack 6 Display for San Francisco International Airport (SFO).

### Istanbul Havalimani International Airport (IST)

- Can the airport conduct simultaneous approaches to the parallel runways in Instrument meteorological conditions? Name the ICAO rule used and the estimated distance between runways.
- Name the runways selected in your assessment.

## Problem 3

Briefly answer the following questions with three short sentences.

- a) What are converging runway operations (CRO)? Give an example airport impacted by CRO operations.
- b) Explain the differences in ICAO and FAA runway separation standards for visual runways.
- c) State the minimum runway separation for simultaneous departures from parallel runways in the US (assume instrument meteorological conditions).
- d) Briefly explain the purpose of the Terminal Radar Approach and Departure Control Facility at an airport.
- e) State two benefits of using the Automatic Dependent Surveillance-Broadcast (ADS-B) technology compared to radar technology.
- f) Explain the reason for the assignment of cruise altitudes based on headings.