

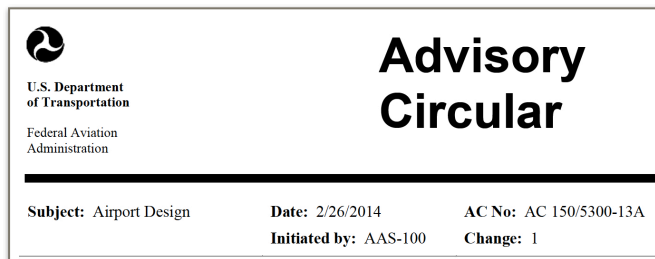
## Assignment 1: Familiarization with Aviation Data and Aircraft Classifications

Date Due: September 1, 2021

Professor: Dr. Trani

### Problem 1

Download the latest version (Consolidated version including change 1) of the FAA Advisory Circular 150/5300-13A ([https://www.faa.gov/regulations\\_policies/advisory\\_circulars/index.cfm/go/document.information/documentID/1020359](https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1020359)). Read carefully paragraphs 105 and 106 before answering the following questions. Also become familiar with Appendix 1 in the same Advisory Circular.



- Name and briefly explain in your own words the three “design aircraft” parameters considered in the geometric design standards of the airport.
- For airports with multiple runways, is it feasible to select a different design aircraft for each runway? Briefly explain.
- Briefly explain the components of the Runway Design Code (RDC).
- A commercial airport with a single runway has RDC code C-V-1200. Can the airport accommodate an Airbus A330-200 (see the picture below)? Explain.
- A new airline would like to start operations next year to the airport in part (d) with Boeing 777-300 aircraft (see the picture below). Can the airport support such operations? Explain.



Airbus A330-200.



Boeing 777-200.

- The Virginia Tech Montgomery County Executive Airport has an RDC code C-II-6000. Can the airport accommodate a Bombardier Challenger CL-601 (see the picture below)? Explain.
- Can a small airline start service from the Virginia Tech airport using a Bombardier DHC-8-300 (see the picture below)? Explain.



Bombardier CL-601.





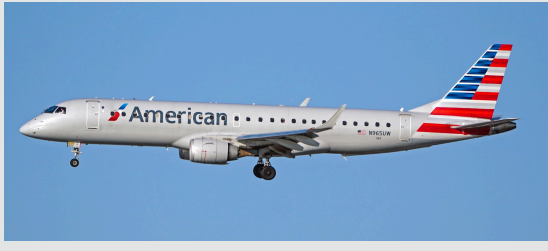
Bombardier DHC-8-300.







**Problem 2**

Identify the commercial aircraft presented in the Table 1. State the FAA Aircraft Design Group (ADG), Taxiway Design Group (TDG) and Aircraft Approach Class (AAC). Here is a list of possible choices (more choices than pictures to add a little challenge): Cessna CitationJet 2, Boeing 757-200, Boeing 747-400, Airbus A330-200, Boeing 787-8, Boeing 737-800, Bombardier CRJ-700, Airbus A380-800, Airbus A320-200, Embraer 190, Bombardier DHC-8-400 (or Q400).

You can consult various web sites to help you identify these aircraft. Examples are: my web site (<https://photos.app.goo.gl/8bdSvdwPQU7IHIDi2>), [Airliners.net http://www.airliners.net](http://www.airliners.net) and [Jet Photos http://www.jetphotos.net](http://www.jetphotos.net).

**Table 1. Aircraft for Problem 2.**

Picture	Aircraft Name	ADG	TDG	AAC
				
				
				

Picture	Aircraft Name	ADG	TDG	AAC
				
				
				
				
				
				

### Problem 3

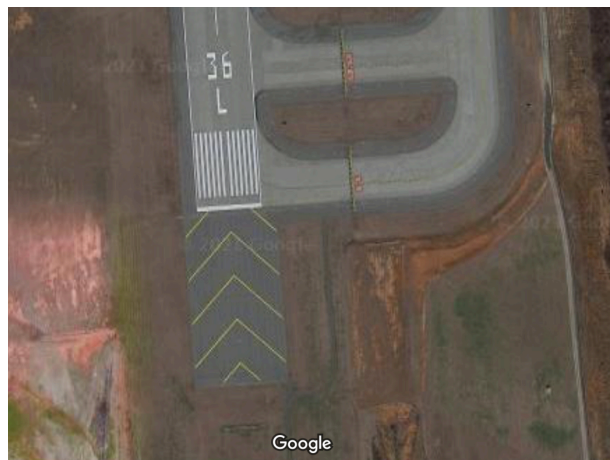
Airport features using the Airnav.com and BTS web sites.

Go to the Airnav web site (accessible through our page with "[Interesting Web Sites](#)") and look at the following airports:

- 1) Charlotte-Douglas International Airport (CLT).
  - 2) Virginia Tech Montgomery County Executive Airport (BCB).
- a) For each airport create a simple table with the following data: list the runway name (numeric or alphanumeric label) , runway length and runway width for each runway. Note: A runway has two runway ends labeled numerically. For example Runway 18/36 indicates the number of degrees from the magnetic North multiplied by 10. So an aircraft landing on runway end 18 would be flying South (180 degrees from the magnetic North)
  - b) Find out if runway 13 at BCB has any obstructions according to the Airnav database.
  - c) Does runway 13 has approach lights? State what kind of lights.
  - d) Find out if the longest runway at CLT has approach lights. State what kind of lights.
  - e) What kind of pavement is used on runway 18R/36L at CLT airport?
  - f) Use Google maps to examine runway 18R/36L at CLT airport. Tell me how many runway exits for you see. Are all the runway exits the same? Explain.



Runway 18R end at CLT airport. Note the direction of landing will be South (180 degrees from magnetic North).



Runway 36L at CLT airport. Note the direction of landing will be North (360 or 0 degrees from magnetic North).

- g) Use the Bureau of Transportation Statistics web site to find the number of departures (called scheduled departures) at CLT airport in the year 2019. the link is: <https://www.transtats.bts.gov/airports.asp>. The link is also accessible through our accessible through our page with "[Interesting Web Sites](#)"
- h) Find the number of passengers transported by American Airlines in the year 2019.



Select a month:  Select an airport:    
(The month selection does not apply to on-time data.) [Show all airports \(by state\)](#)

**Charlotte, NC: Charlotte Douglas International (CLT)** Scheduled Services except Freight/Mail BTS Data as of 8/25/2021

BTS Web site with airport data.

## Problem 4

### True or false section.

Question	True / False
The Douglas DC-3 was the first successful commercial aircraft.	
The Ford Tri-motor required 1,000 meters of runway to operate safely.	
The British Comet I was the second commercial jet-powered aircraft in the world following the Boeing 707-120.	
Regional jets aircraft became popular in the US in the period 2004-2008.	
Federal Aviation Regulations parts 23 and 25 apply to the certification of aircraft.	
There are more than 20,000 landing facilities in the US.	
The average runway length in the US is 5,320 feet.	
More than 3,000 public airports in the US are eligible to receive federal funds.	
At sea level and maximum takeoff weight conditions, a turboprop aircraft like the Bombardier Dash 8-300 (DH8C-300) requires 53% of the runway needed by an Embraer E-175 regional jet.	