

Assignment 2: Runway Length Analysis

Date Due: June 28, 2016

Instructor: Trani

Problem 1

The Pudong International Airport Authority would like to request your services to estimate if an airline can operate a new nonstop service Shanghai Pudong International Airport (PVG) to Chicago, O'Hare International Airport (ORD) using the Boeing 787-9 with General Electric engines and a maximum takeoff weight of 560,000 lb.

- Find the route distance from to Shanghai (PVG) to Chicago (ORD) using the Great Circle Mapper application demonstrated in class. Use a 5% detour factor above the Great Circle Distance (GCD) to estimate the route distance.
- Find the runway length needed to operate this non-stopping service from PVG. Assume the aircraft has a two class seating configuration.
- Look at the existing runway conditions at PVG. Do you need a runway extension? Comment.
- With the existing runway length and carrying full passengers estimate the maximum "belly cargo" load the Boeing 787-9 could carry departing the longest runway at PVG.

Problem 2

A new international airport is being constructed for Beijing. Estimate the runway length requirement using the Boeing 747-400ER with General Electric CF6-80C2B1 engines and maximum takeoff weight of 396,894 kilograms, departing the new Beijing airport. Provide maximum flexibility for the airline to operate the aircraft at maximum takeoff weight. Use the typical seating arrangement suggested in the Boeing airport planning document.

Problem 3

For the airport assigned to your group, find the two longest routes flown according to the Official Airline Guide schedule. Select both routes and estimate the runway length needed for each route individually. In your analysis use the appropriate aircraft flying those routes and assume a full passenger load to be carried.

Problem 4

A new general aviation airport is planned near Shanghai (at sea level conditions). The airport will serve general aviation (i.e., piston-powered) aircraft and would like to serve corporate jets such as the Falcon 900 (shown in Figure 1).

- Estimate a suitable runway length to operate all aircraft safely at the airport.



Figure 1. Falcon 900 Aircraft Departing San Jose International Airport (A.A. Trani)