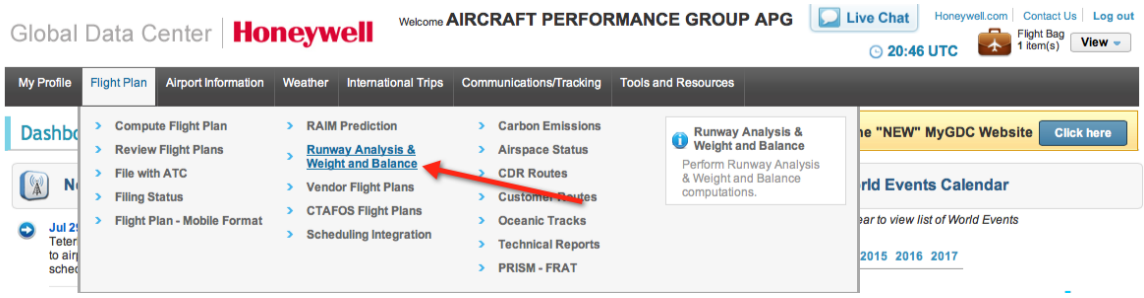
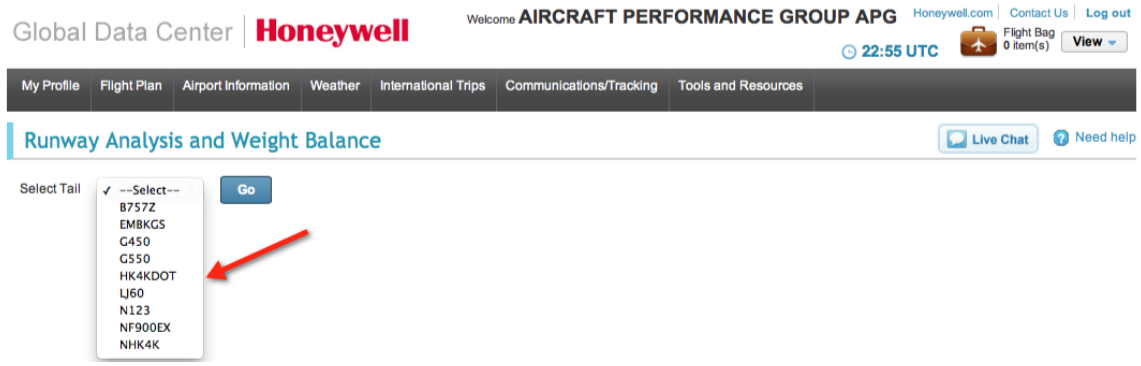
Runway Analysis User Guide

The Runway Analysis & Weight and Balance functions are accessed by selecting 'Runway Analysis & Weight and Balance' from the Flight Plan drop down menu.

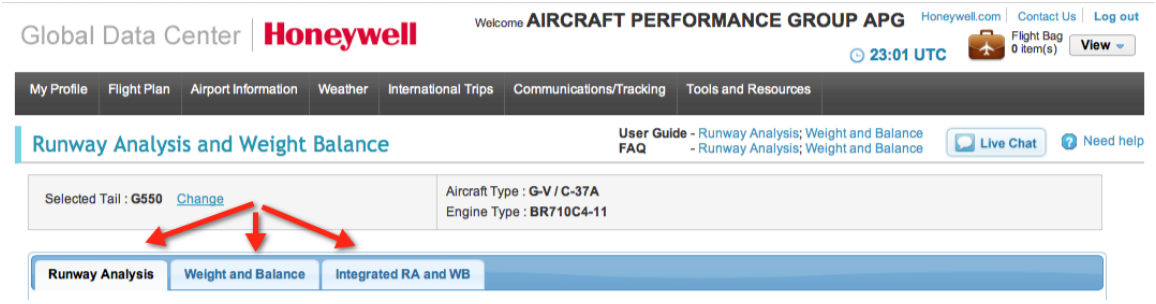


Select the tail to be used for the analysis from the Select Tail drop down menu.



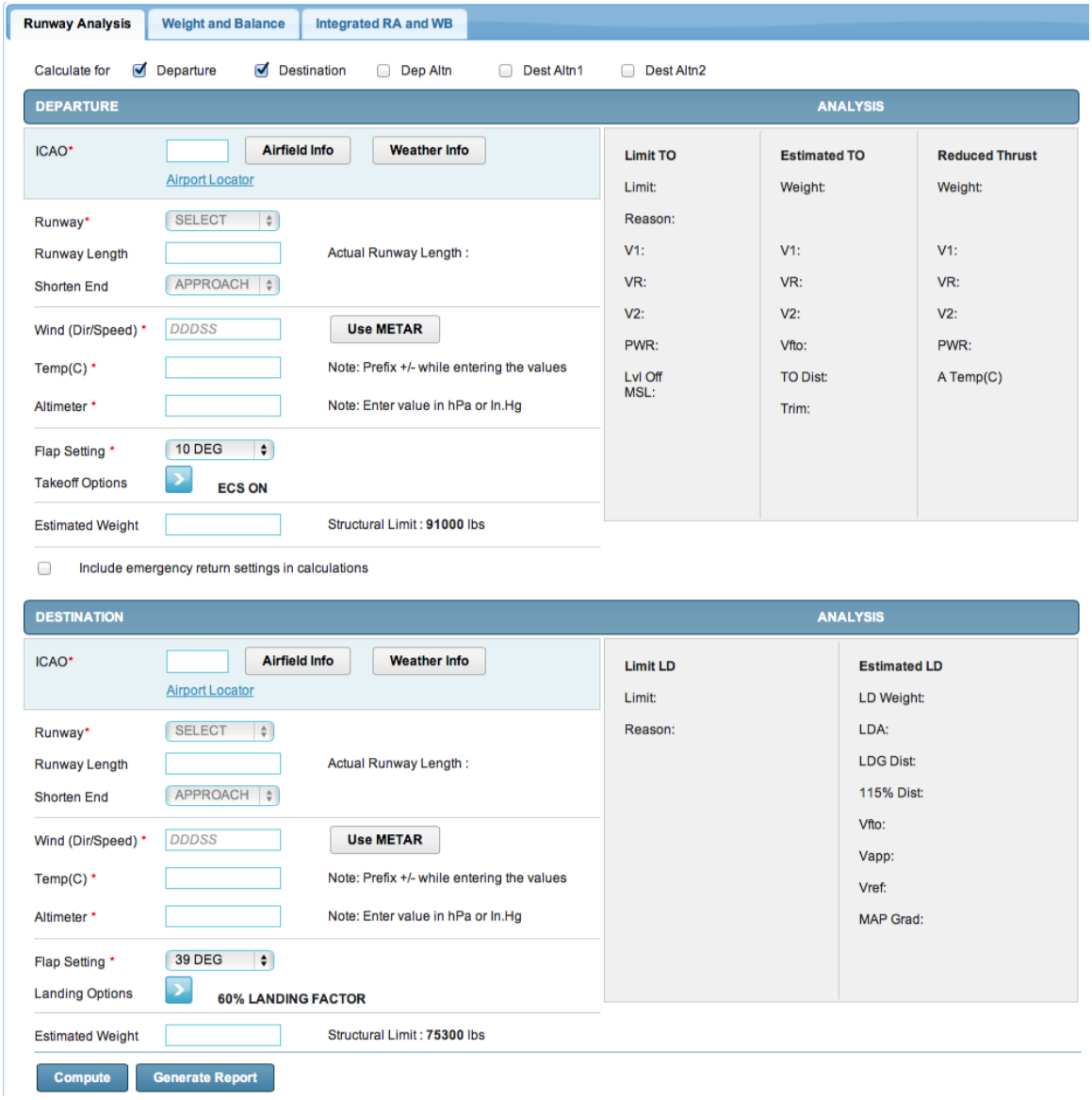
The next page displays the three selections available for Runway Analysis (RA) and Weight and Balance (WB):

- Runway Analysis – for running RA alone.
- Weight and Balance – for running WB alone.
- Integrated RA and WB – for running RA and WB combined into an integrated solution.



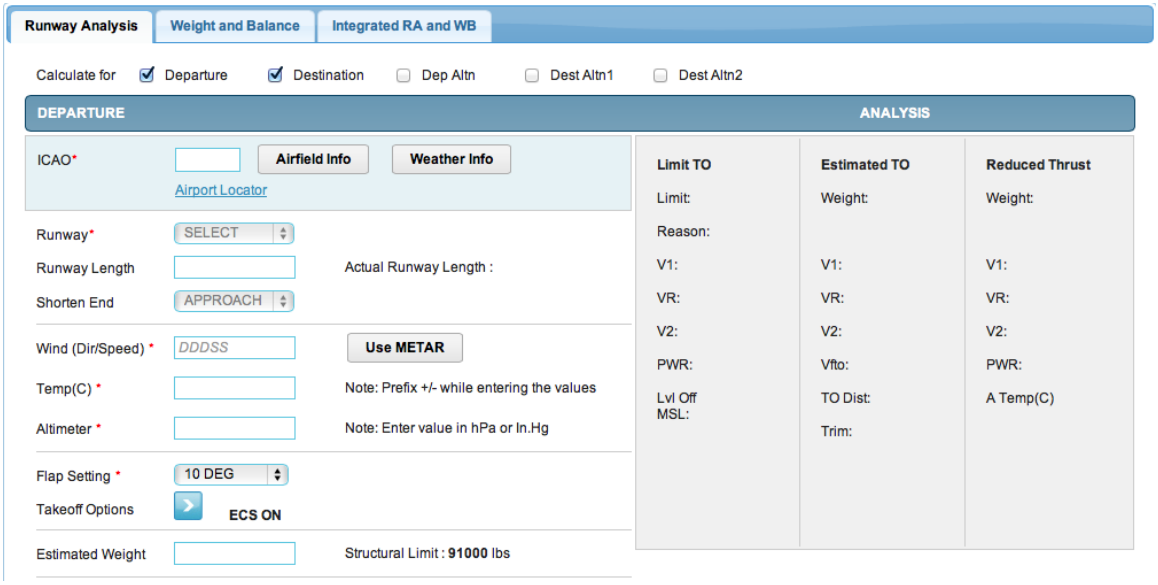
Runway Analysis

Selecting the Runway Analysis tab brings up the Departure and Destination screen, used for entering the required data for a standalone RA.

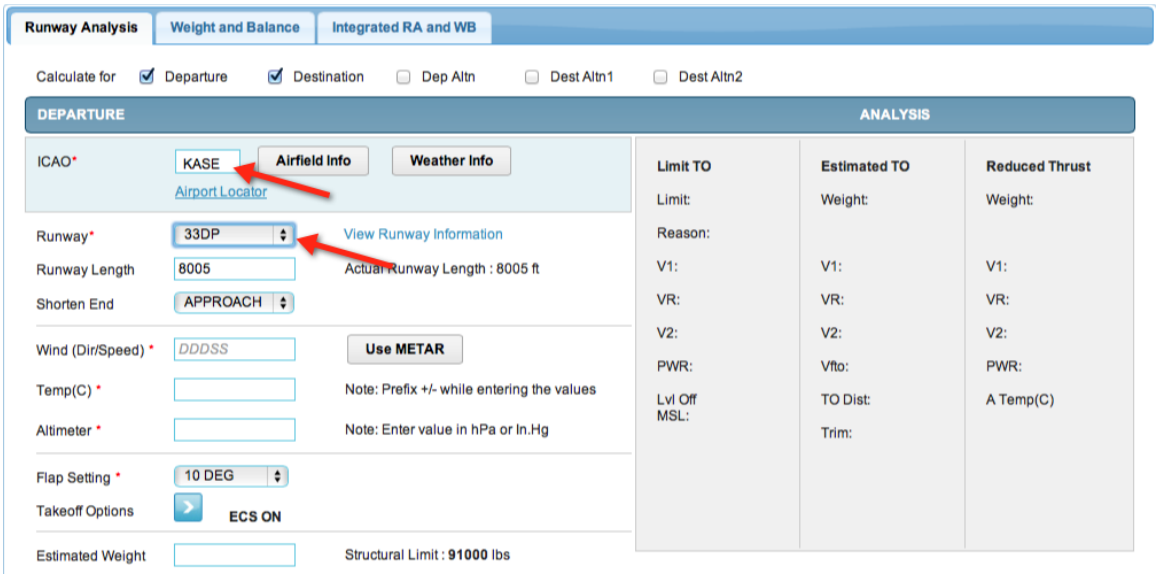


The Runway Analysis function is used to prepare a Takeoff (TO) analysis for the departure airport, and/or Landing (LD) analyses for the destination, departure alternate and destination alternate (2) airfields. In addition, a LD analysis can be prepared for Emergency Return (ER) to the departure airfield while preparing TO data.

For preparing TO data, complete the top portion of the page.

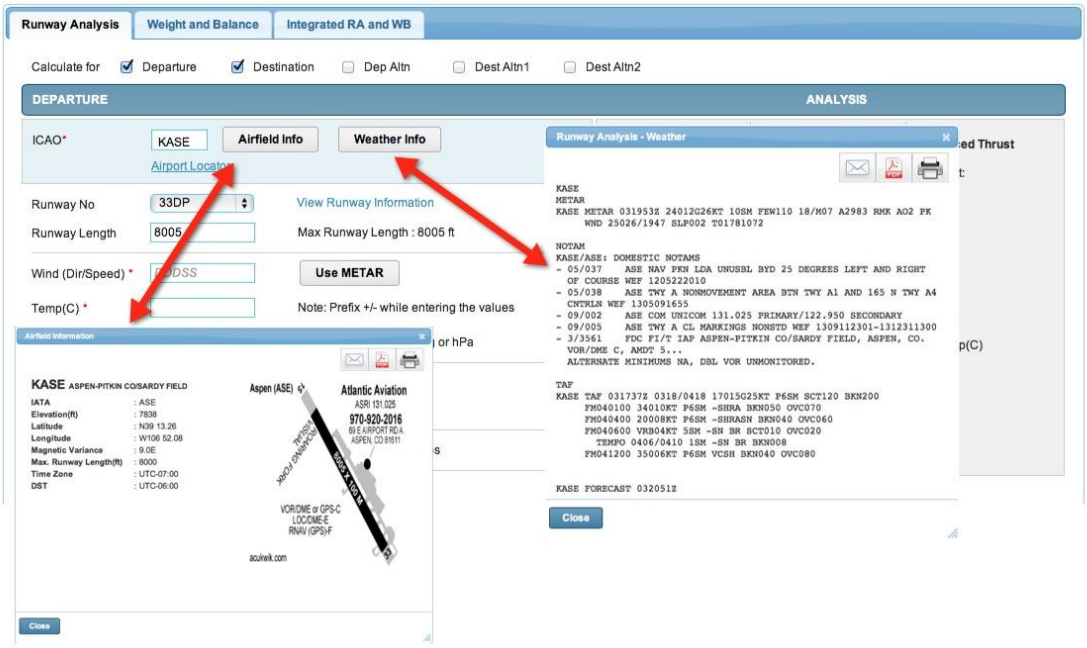


Enter the departure airport ICAO identifier and then select a runway.

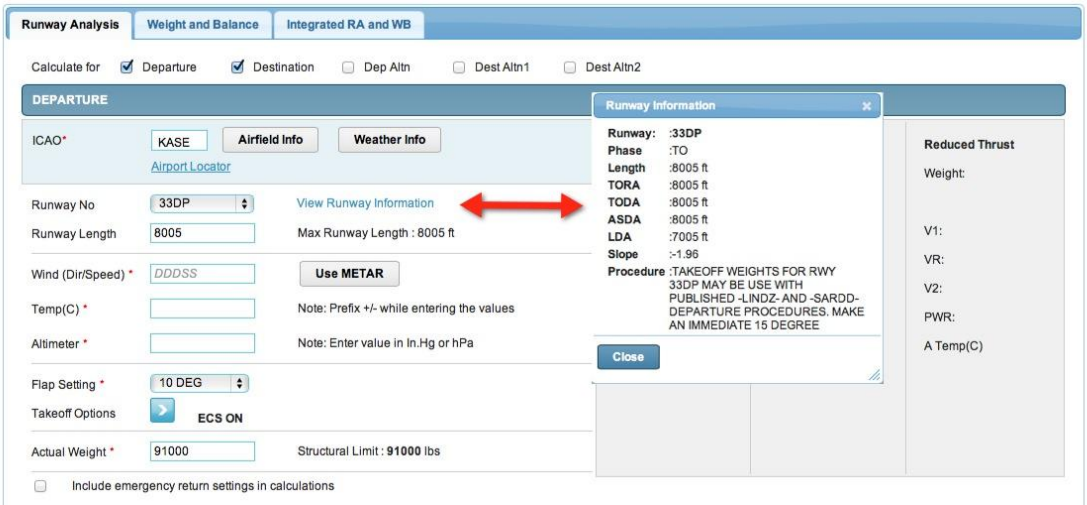


Tools are provided to assist completing the departure information.

Airfield and Weather Information, including NOTAMS may be reviewed.

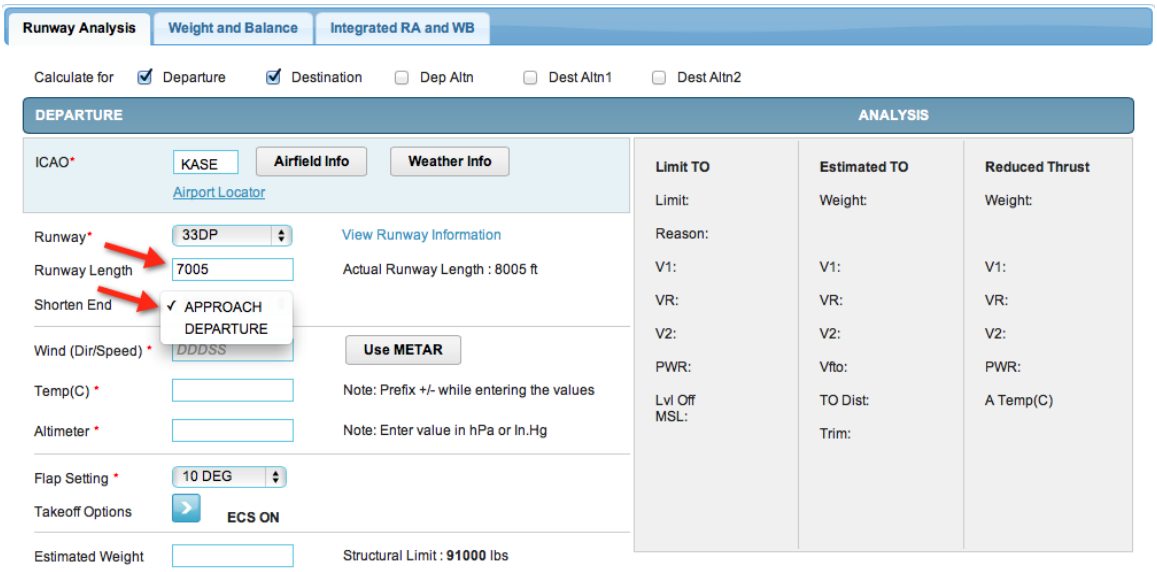


In addition, Runway Information, including Declared Distances and Engine Out Procedures, may be reviewed.



A runway shortening tool is also available for shortening a runway length to account for temporary conditions/NOTAMS.

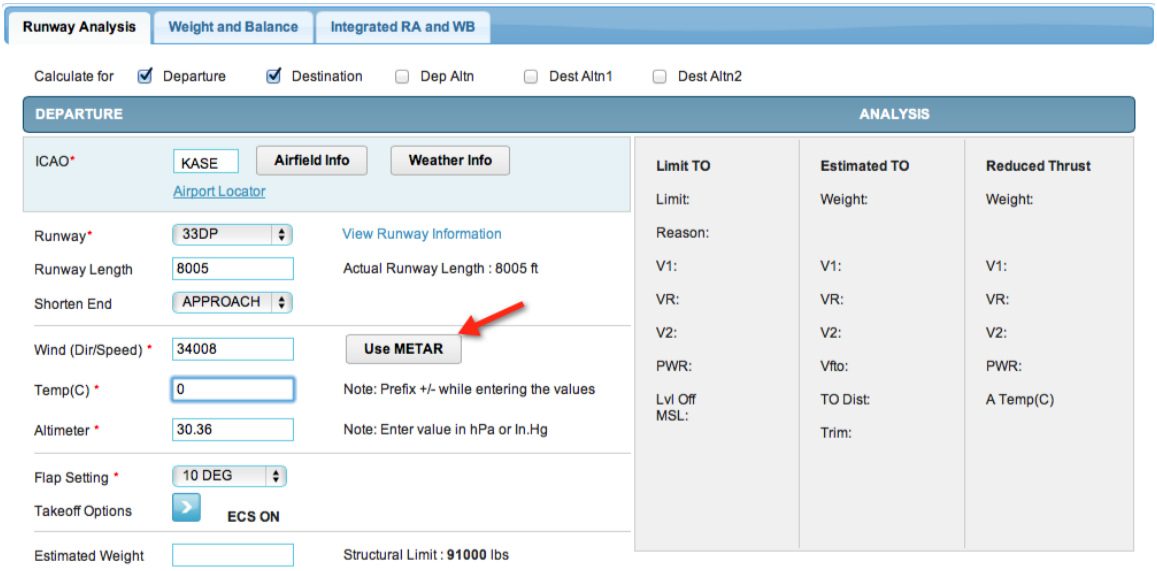
To shorten a runway, first enter the 'shortened' runway length value in the Runway Length field. Then, from the drop down menu, select the end of the runway that has been altered/closed. In the example below, the Approach end of the runway has been shortened by 1000 feet and the runway length subsequently reduced from 8005 feet to 7005 feet.



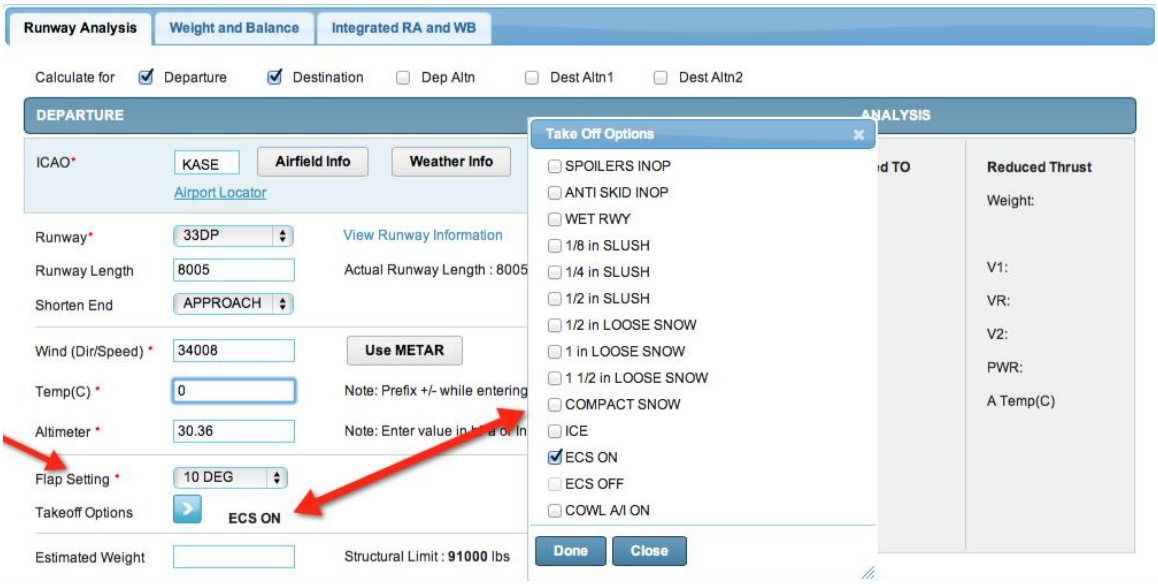
NOTE: it is important to select the correct end of the runway which is closed. Closing the Approach end has no effect on the distance from the departure end of the runway (DER) to the obstacle(s), whereas selecting the Departure end for shortening will 'increase the distance from the DER to the obstacle(s).

In this example, the takeoff performance will be calculated using the temporary runway length of 7005 feet and the original distances from the DER to the obstacles.

The environmental conditions may be entered individually by entering Wind (in 5-digit METAR format), Temperature (° C) and Altimeter (in Hg or millibars/hPa) in the appropriate fields. Alternatively, the Use METAR button may be selected for entering the last reported METAR values.

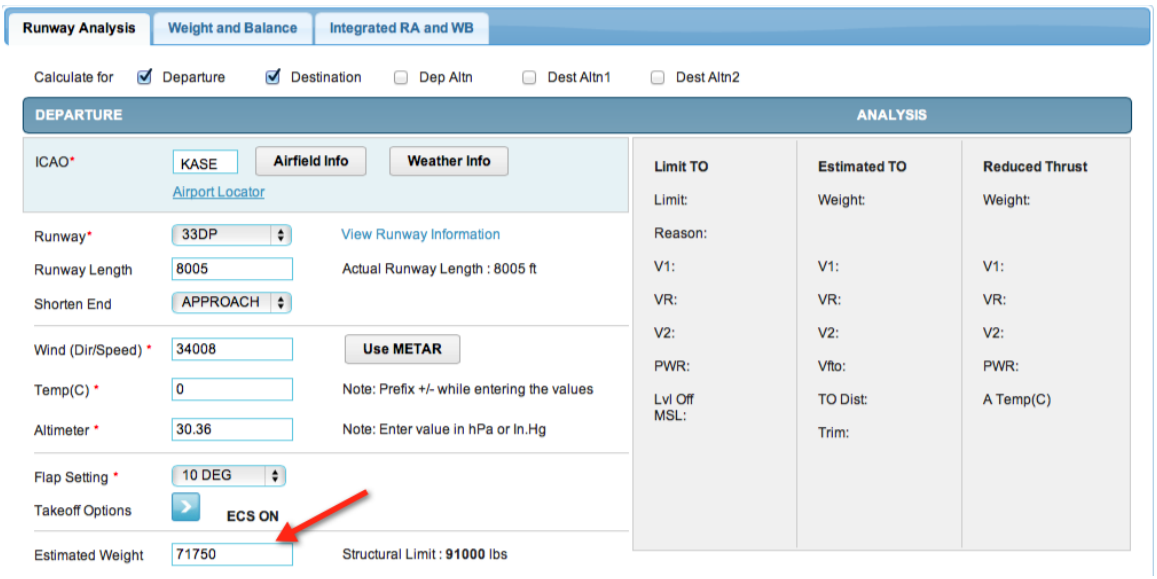


Select the intended Flap Setting along with any Options that may be applicable for the takeoff.

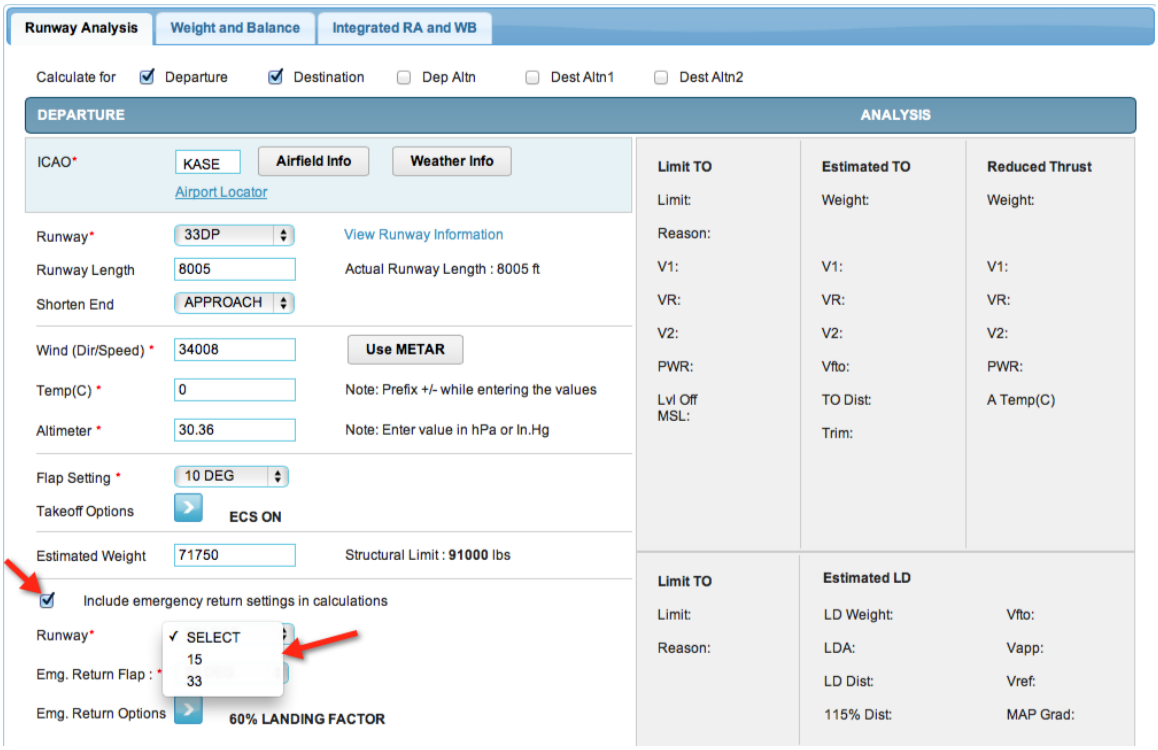


NOTE: Options which are ‘mutually exclusive’, such as Anti Skid Inoperative and Wet Runway, are automatically prevented from being selected simultaneously.

Entering the Estimated TO Weight completes the required entries for TO data.

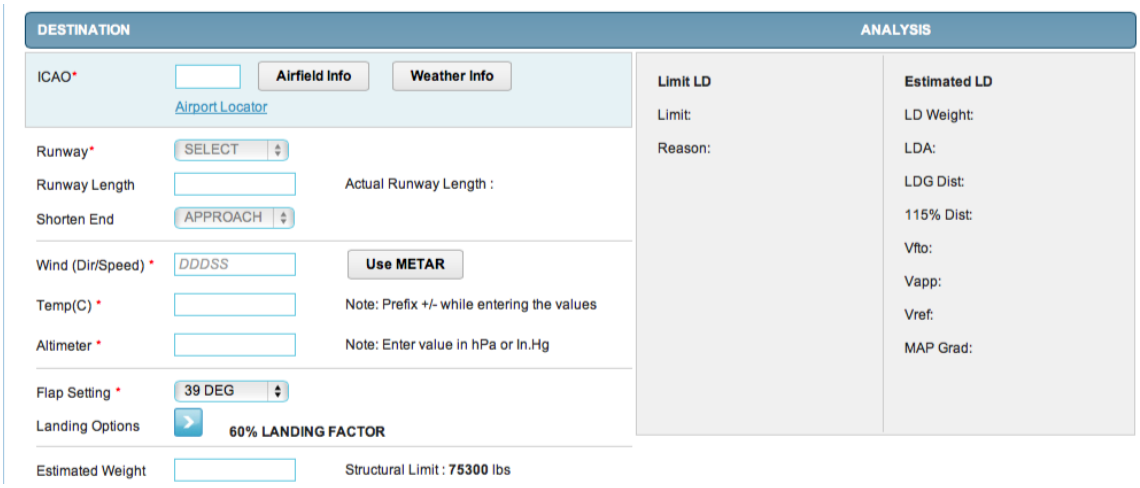


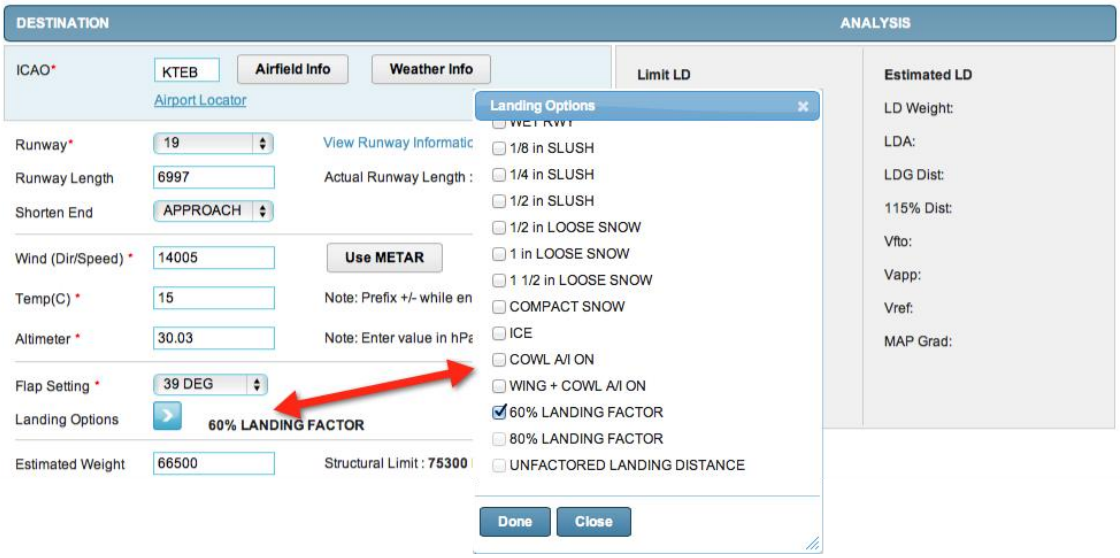
Emergency Return may be selected, if desired. Select the landing runway and flap setting desired for the emergency return.



From the Runway drop down menu select, the departure airport runway that is expected to be used for landing in the event of an emergency return immediately after takeoff. The LD data will be calculated using the actual takeoff weight previously entered.

Landing performance for the destination airfield requires similar entries as the departure data.

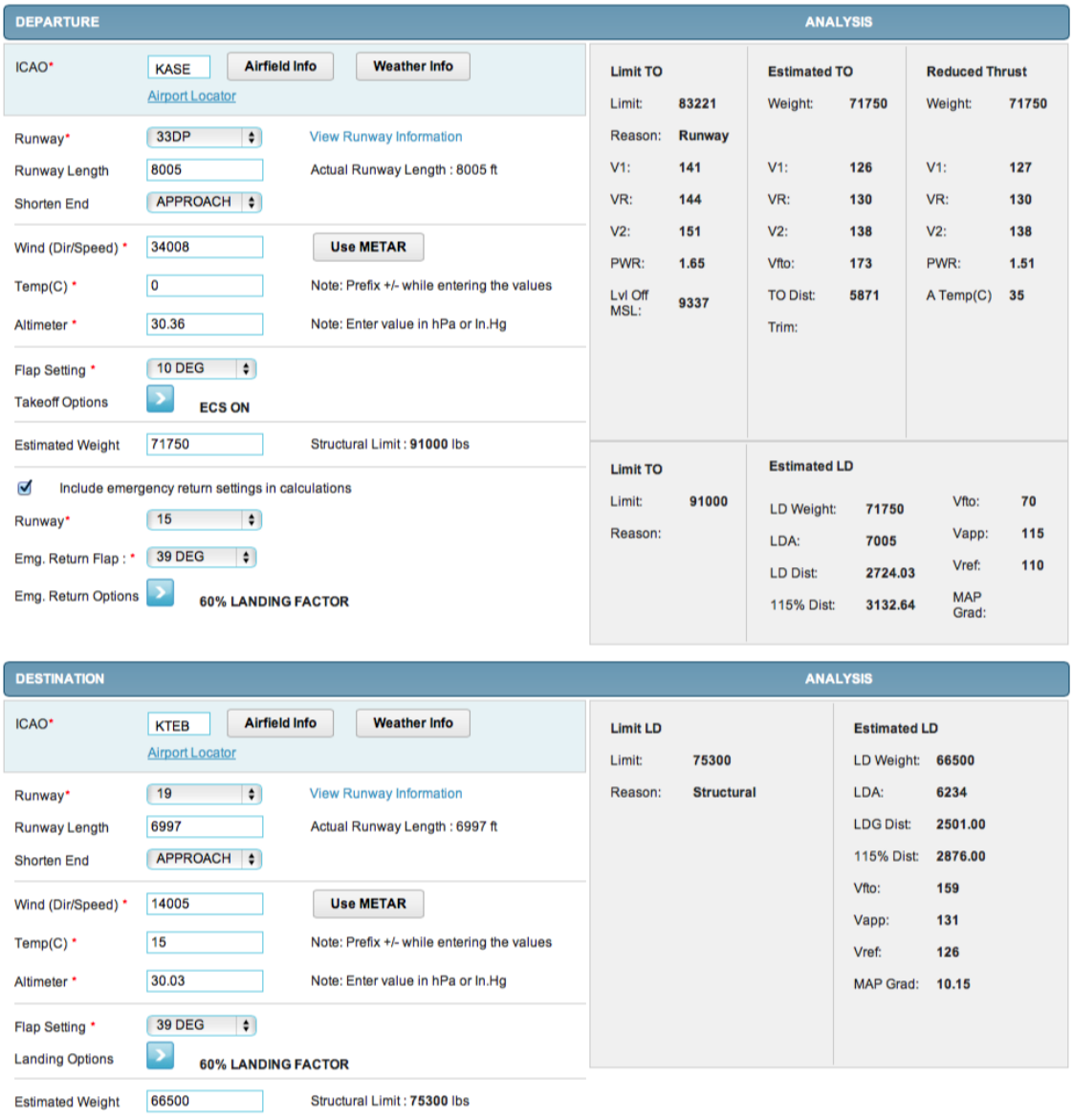




NOTE: Landing Options include the ability to select landing factor values of 60%, 80% or Unfactored. The selected landing factor will be used to determine the Limit LD Weight. The selection will also be used to determine if the weight of the aircraft entered for the landing Estimated Weight, will be able to stop within:

- 60% of the Landing Distance Available (LDA), or
- 80% of the LDA, or
- Unfactored – using up to 100% of the LDA

Once all of the required entries have been made, select the Compute button to run the RA. The calculated data will be displayed on the right side of the screen.



The output displays Limit TO/LD Weights, the Estimated TO/LD Weights and, for those aircraft capable of takeoff with reduced thrust, the Reduced Thrust performance information. In addition, if Emergency Return is selected, the ER data will also be displayed.

Limit TO
The Limit TO field displays the takeoff performance Limit Weight, determined using the environmental conditions, flap and options selections for the departure airport. The limit Reason is also displayed denoting the factor determined to be the most limiting. Takeoff speeds V_1, V_R, V_2, and V_{FTO} are displayed for the Limit Weight. The power setting for the selected flap setting, environmental conditions and selected options (as required) are also displayed. The calculated Level Off Altitude (MSL) is displayed, defining the altitude to which the aircraft must climb to, level off, and accelerate in level flight to V_{FTO}.

Estimated TO
Similarly, the Estimated TO field displays the takeoff performance data for takeoff at the Estimated Weight value. In addition, the TO Distance and Trim are displayed.

Reduced Thrust
For those aircraft capable performing a takeoff at reduced thrust, performance data is provided. While similar to the Estimated TO data, the Reduced Thrust data also includes the reduced thrust power setting and the assumed temperature.

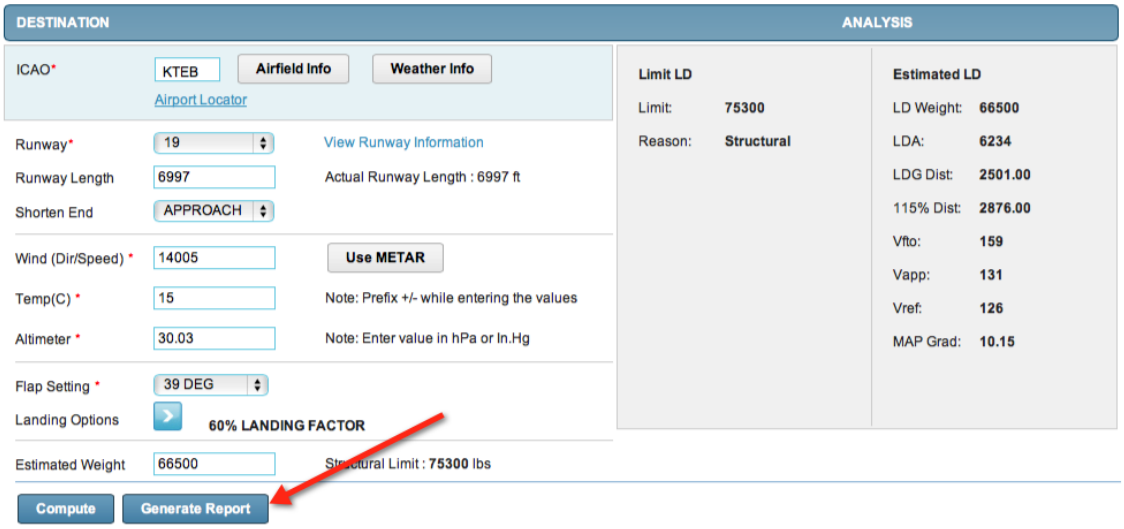
Limit LD
The Limit LD field displays the landing performance Limit Weight, determined using the environmental conditions, flap and options selections for landing at the destination airport. The limit Reason is also displayed denoting the factor most limiting for landing.

NOTE: the limit weight is calculated using the selected Landing Factor option, i.e. when the limit Reason is Field Length, the aircraft can be stopped using all of the factored value of the LDA only when flown using the same technique as during the aircraft landing certification process (example: FAR 25.125).

Estimated LD
The Estimates LD field displays the landing performance data for landing at the landing Estimated Weight value. In addition, the LDA, LD Distance (AFM actual landing distance – without factor), 115% of the LD Distance (for compliance with FAA Safety Alert for Operators – SAFO 06012, August 31 2006), V-speeds (V_{FTO}, V_{APP} and V_{REF}), and the Missed Approach Gradient (MAP Grad), are displayed.

NOTE: The missed approach gradient is the most limiting of the Approach Climb (FAR 25.121, one engine inoperative) and Landing Climb (FAR 25.119, all engines operating).

After computing the RA data, if a report is desired, select the Generate Report button.



Reports are generated containing all of the pertinent performance data and displayed in pdf format (only the top part of each RA is displayed in the following samples). All pages are watermarked with the aircraft's registration number and the date of report generation:

Takeoff

Takeoff
G550 G-550 BR710
10 DEG

Actual TOW: 71750
Wind: 34008
Altimeter: 30.36

ECS ON

KASE	33DP	33DP5			Runway
TEMP C PWR	8005/8005/8005	8005/8005/8005			TORA/TODA/ASDA
-03 1.65	83579 / FL 125 / 130 / 138 / 173 5817 / 9337	83579 / FL 125 / 130 / 138 / 173 5817 / 10863			Limit Weight/Code Actual V1/VR/V2/VFTO TOFL/Accel (MSL)

Engine Out Procedures – as required

Departure Procedures

KASE 33DP
TAKEOFF WEIGHTS FOR RWY 33DP MAY BE USE WITH PUBLISHED -LINDZ- AND -SARDD- DEPARTURE PROCEDURES. MAKE AN IMMEDIATE 15 DEGREE BANKED CLIMBING -RIGHT- TURN TO A HEADING OF 343 DEGREES. AT 10.3 DME SOUTH OF DBL VOR (DBL R-165/D10.3 -OR- IASE LOC DME D3.75) MAKE A 15 DEGREE BANKED CLIMBING -LEFT- TURN TO HEADING 273 DEGREES. INTERCEPT THE IPKN LDA NORTHWEST COURSE (OUTBOUND ON BACKCOURSE - IPKN 303/D15.0) DIRECT LINDZ INTXN (DBL VOR 244/12.6). CLIMB IN HOLDING PATTERN AT LINDZ INTXN. (WEST, LEFT TURNS, 064 INBOUND).

Reduced Thrust – when applicable

Reduced Thrust
G550 G-550 BR710
10 DEG

Actual TOW: 71750
Wind: 34008
Altimeter: 30.36

ECS ON

KASE	33DP	33DP5			Runway
TEMP C PWR	8005 / 8005 / 8005	8005 / 8005 / 8005			TORA/TODA/ASDA
-03 1.65	83579 / FL / 35 127 / 130 / 138 7639 / 9337	83579 / FL / 35 127 / 130 / 138 7639 / 10863			Limit/Code/Assum Temp Actual V1/VR/V2 TOFL/Accel (MSL)

Emergency Return – when selected

Emergency Return
G550 G-550 BR710
39 DEG

Actual LDW: 71750
Wind: 34008
Altimeter: 30.36

60% LANDING FACTOR

KASE	15	33			Runway
TEMP C	7005	7005			LDA
-03	91,000 / ST / 5.9 3510 / 4037 136 / 141 / 173	91,000 / ST / 5.9 3060 / 3520 136 / 141 / 173			Limit/Code/MAP Grad LD Dist/115% Dist VRef/VApp/VFTO

Landing

Landing
G550 G-550 BR710
39 DEG

Actual LDW: 66500
Wind: 14005
Altimeter: 30.03

60% LANDING FACTOR

KTEB	01	06	19	24	Runway
TEMP C	5319	6015	6234	6015	LDA
12	75300 / ST 2684 / 3063 126 / 131 / 159	75300 / ST 2531 / 2910 126 / 131 / 159	75300 / ST 2501 / 2876 126 / 131 / 159	75300 / ST 2575 / 2961 126 / 131 / 159	Limit/Code/MAP Grad LD Dist/115% Dist VRef/VApp/VFTO