# Terminal Aerodrome Forecast-based Tactical Decision Aid

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http://www.srh.noaa.gov/zhu/www/tda.php

## 1. INTRODUCTION

The National Weather Service (NWS) Terminal Aerodrome Forecast (TAF) product is used by members of the aviation community to make critical decisions regarding the National Air Space (NAS). The Tactical Decision Aid (TDA) is a tool that transforms the coded TAF into a visual format using a table to display the forecast parameters. The Decision Aid is available over the Internet and has a built-in interface that allows the user to specify any NWS TAF site for viewing.

The Decision Aid uses color coding to provide a quick visual interpretation of forecast conditions. Displayed parameters include ceilings, visibility, precipitation, wind, low-level wind shear when forecast, and runway specific cross wind information. The information is automatically refreshed every five minutes to ensure the display of the latest hourly observation or any TAF amendments or updates. Ceiling, visibility, and wind speed values in the Decision Aid are customizable to the user's threshold/specifications and can be saved for future reference.

## 2. FORMAT

### 2.1 General format

The current hourly observation is displayed in the first column of the Decision Aid with the observed conditions and observation time. The Decision Aid uses this time to then display the next twelve hour forecast parameters from the latest NWS TAF for the specified airport. The time is adjusted every hour to move the Decision Aid forecast out twelve hours from the current observation time. The user enters a three letter airport code and can also specify the time to be displayed in UTC (Zulu) time or local time.

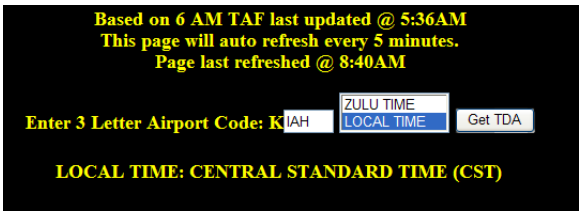


**Fig. 1** Close up of the interface where the user can enter an airport three letter identifier and desired time format.

A table is located below the Decision Aid and provides a key for the color coding for ceilings, visibility, precipitation and wind. Wind shear is included in the key whenever it is included in the TAF. The color

thresholds for ceilings and visibility are defaulted to the standard flight rules. The categories include green for VFR, blue for MVFR, yellow for IFR and red for LIFR. Precipitation is indicated by green for none, blue for rain, yellow for snow, red for thunderstorm and purple for freezing precipitation. Wind is indicated as green from 0 to 9 knots, blue from 10 to 14 knots, yellow from 15 to 19 knots, orange from 20 to 24 knots and red to indicate winds in excess of 24 knots. When wind shear occurs, but not forecast, the Decision Aid will be color-coded as green; when wind shear is forecast to occur, the Decision Aid will be color-coded red.

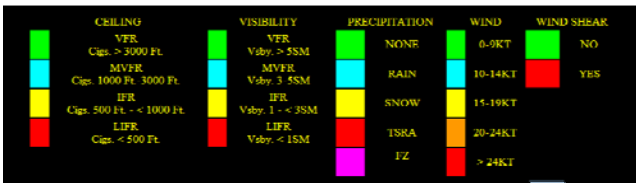


**Fig. 2** Color legend for the Decision Aid.

Under each category the first line indicates the prevailing conditions in the TAF with the following line indicating any temporary conditions that are forecast. The Decision Aid assesses TEMPO and PROB groups similarly and will be displayed under the prevailing conditions for the respective forecast hour.

## 2.2 Ceilings

Ceilings are indicated with the abbreviation “CIG”. The Decision Aid will output “UNL” to indicate a forecast of unlimited ceiling height. The corresponding number identifies the lowest forecast ceiling height. Any lower clouds forecast to be “FEW” or “SCT” will be ignored. The ceilings category indicates forecast ceiling heights. The output of the values is identical to the format used by the NWS TAF. If more than one ceiling height is indicated, only the lowest value will be indicated on the Decision Aid.

## 2.3 Visibility

The visibility group is indicated by the abbreviation “VSBY” with values reported in statute miles(SM). Each value will be indicated by observed visibility followed by “SM”. When visibilities are forecast to be greater than 6SM, the Decision Aid will show “P6SM” as per the NWS TAF parameters. When visibilities are lowered due to mist, fog, or smoke a second line will be added to the visibility group with the restriction abbreviation.

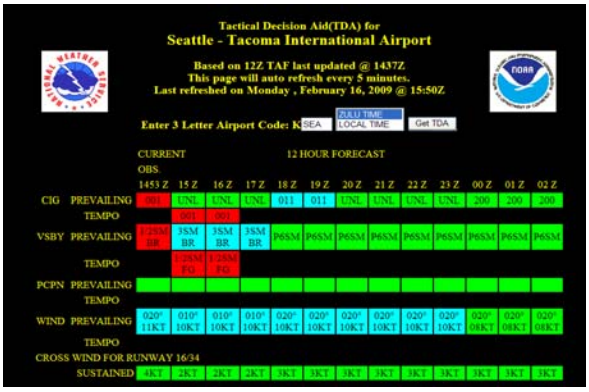


**Fig. 3** Example Decision Aid showing Low Instrument Flight Rule (LIFR) conditions occurring and temporarily forecast for Seattle-Tacoma International Airport (KSEA).

## 2.4 Precipitation

The next section displays precipitation and is indicated by the abbreviation “PCPN”. Values indicated under the precipitation category will show the NWS TAF abbreviation for the observed or forecast weather event. When observed or forecast, the Decision Aid will also indicate vicinity events. The Decision Aid will also display intensity, when observed or forecast, by a “+” or “-“sign. When a cumulonimbus cloud is forecast the Decision Aid will color-code the block red to indicate thunder and display “CB” in the precipitation block.

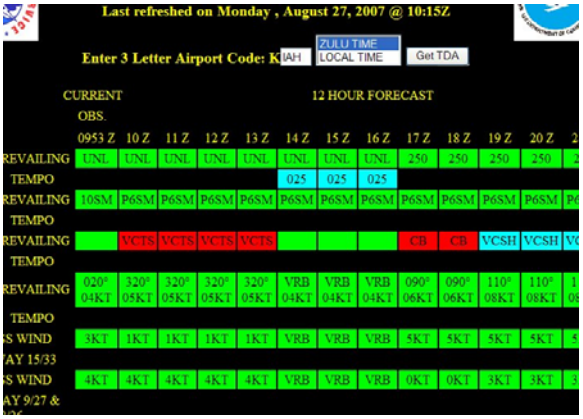


**Fig. 4** Example Decision Aid showing a vicinity thunderstorm, cumulonimbus cloud and vicinity shower group at George Bush Intercontinental Airport (KIAH).

## 2.5 Wind

Wind is displayed in the first line by indicating the direction from which the wind is blowing. The next line indicated the observed or forecast wind speed in knots. When a wind gust is observed or forecast it will be indicated below the wind speed on a new row color coded based on the gust speed. The wind gust speed will also contain a “G” in front of the speed indicating a wind gust is being displayed.

## 2.6 Crosswind

Crosswind values are indicated under the wind group along with the corresponding runway number. When an airport has multiple runways oriented in different directions, a separate row will be displayed for each runway direction. Runways assigned different numbers, but oriented along the same direction, will be indicated by one row corresponding to the runway numbers. All crosswind values are calculated relative to the true north orientation of the runway based on the observed and forecast winds. All values are rounded to the nearest whole number before being displayed.

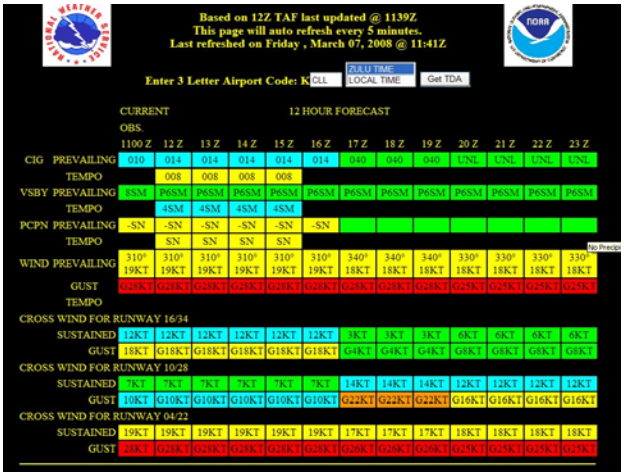


**Fig. 5** Example Decision Aid showing the different crosswind calculations for each runway at Easterwood Field, College Station, TX (KCLL).

## 2.7 Low Level Wind Shear (LLWS)

Low Level Wind Shear is only shown on the Decision Aid when forecast in the TAF. Low Level Wind Shear has three parameters that will each be indicated on a separate line in the Decision Aid. The first line will indicate the top of the wind shear layer in hundreds of feet. The next line will indicate the true direction in ten degree increments at the indicated height. On the third line, the wind speed at the corresponding height is given in knots.

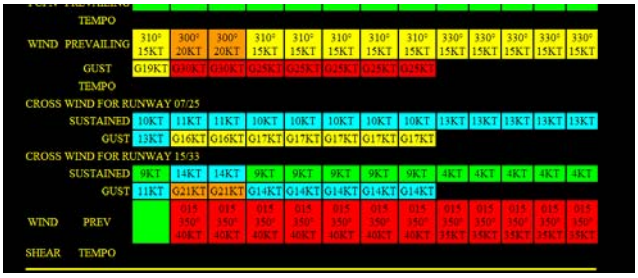


**Fig. 6** Example Decision Aid showing Low Level Wind Shear forecast for Santa Barbara California, Municipal Airport (KSBA).

## 2.8 Other Information

Below the Decision Aid key table is another table containing the previous three hourly observations with a link to the previous twenty-four hour observations. The text version of the TAF and current METAR are also located near the bottom of the page. Finally, a link to the closest NWS WSR 88-D radar site is included. The radar link will open in a separate window with a loop of the latest base reflectivity images.

## 3. Customization

Visibility, ceiling, and wind values are customizable to the user specifications. Clicking the “Customize Values for TDA” button under the key will display a page enabling a user to input desired values. In addition, to customizing actual values, a user can change name tags for ceiling and visibility groups to reflect individual criteria versus standard flight rules. Once a user submits criteria, a customizable Decision Aid will be displayed. If the user scrolls down to the key they will notice that their criterion is being displayed. At the top of the page, a link will enable a user to view a custom Decision Aid display. After clicking the link, a separate page will open containing a URL to the custom Decision Aid page. A user can save this link for future access to the customizable information.

## 4. Conclusion

The Decision Aid is available at the URL on the first page of this paper. This product provides a new way to display the TAF product. The Decision Aid has received positive feedback from customers and partners of NWS aviation services – and provides an innovative way to view official TAF services. The simplicity of the product allows users of different backgrounds and knowledge to easily adapt the TAF aviation standards and interpret the data.