



# **CIVIL AVIATION PUBLICATION**

## **CAP-102**

**Dated: 18 July 2024**

### **CALCULATION OF DECLARED DISTANCES**

## **Preface**

This Civil Aviation Publication (CAP) on criteria and associated guidelines on the Calculation of declared distances the reported has been prepared by Aviation safety and security directorate (DASS) of Bahrain Civil Aviation Affairs (BCAA) to aid the Aerodrome operators in the Kingdom of Bahrain measuring and providing information on declared distances is to allow pilots to determine the allowable aircraft loading based on aircraft performance requirements.

It is important to note that this CAP on calculation of declared distances associated guidelines applicable to all Aerodromes in the Kingdom of Bahrain.

The guidance can be amended from time to time upon introduction of new methods and techniques through the International Civil Aviation Organization (ICAO).

**Director Aviation Safety & Security**

15, Jan. 2018

# RECORD OF AMENDMENTS

Amendments				
Serial No.	Issue No.	Revision No.	Date	Description
01	01	0	30, Jan 2017	Initial Issue
02	01	01	15, Jan 2018	CAP. serial number revised ( CAP- 61 revised as CAP.102 )
03	01	01	18 July 2024	Change Logo (cover)

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## **Intent**

- The purpose of this Civil Aviation Publication (CAP) is to provide supplementary guidance to aerodrome operators on the calculation of declared distances for each runway direction at a certified aerodrome. It provides guidance on what is acceptable to the Aerodrome safety section, under Aviation safety and security directorate of the Bahrain Civil Aviation Affairs (BCAA) to compliance with regulatory requirements in section 6.2.8. of Civil aviation regulations – CAR001
- Explain different distances required to be calculated for a runway direction intended to be used and illustrate the suggested format for providing information on declared distance.

## **Applicability**

- This Civil Aviation Publication (CAP) applies to all certified aerodrome in the kingdom of Bahrain

## Introduction

1. Declared distances are the available operational distances notified to a pilot for take-off, landing or safely aborting a take-off. These distances are used to determine whether the runway is adequate for the proposed landing or take-off or to determine the maximum payload permissible for a landing or take-off.
2. Declared distances are a combination of the runway (i.e. full strength pavement), any stop way (SWY) and clearway (CWY) provided.

## Objective

1. The objective of measuring and providing information on declared distances is to allow pilots to determine the allowable aircraft loading based on aircraft performance requirements.

## Definitions

- Clearway (CWY) :  
A defined rectangular area on the ground or water under the control of the aerodrome operator, selected or prepared as a suitable area over which an aero plane may make a portion of its initial climb to a specified height.
- Stop way (SWY):  
A defined rectangular on the ground at the end of take-off run available (TORA) prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take off.
- Take-off run available (TORA)  
The length of runway declared available and suitable for the ground run of an aero plane taking off.
- Take-off distance available (TODA)  
The length of the take-off run available plus the length of the clearway, if provided.
- Accelerate-stop distance available (ASDA)  
The length of the take-off run available plus the length of the stop way, if provided.

- Landing distance available (LDA)  
The length of runway which is declared available and suitable for the ground run of an aero plane landing.

### Calculation of Declared Distances

- 1. The declared distances shall be calculated to the nearest meter for each runway direction. These declared distances comprise of the take-off run available (TORA), take-off distance available (TODA), accelerate-stop distance available (ASDA) and landing distance available (LDA).
- 2. Where a runway is not provided with a stop way (SWY) or clearway (CWY) and the threshold is located at the extremity of the runway, the four declared distances should normally be equal to the length of the runway, as shown in Figure 1.

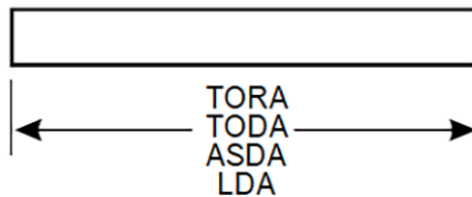


Figure 1

- 3. Where a runway is provided with a clearway (CWY), then the TODA will include the length of clearway, as shown in Figure 2.

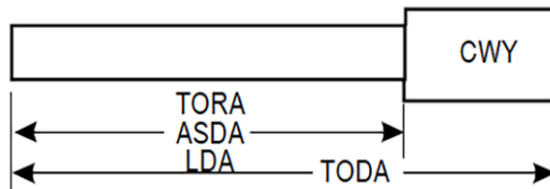


Figure 2

4. Where a runway is provided with a stop way (SWY), then the ASDA will include the length of stop way (SWY), as shown in Figure 3.

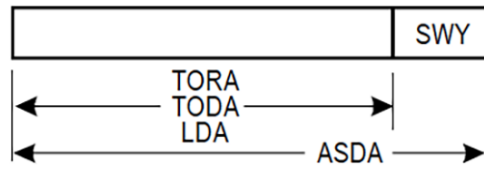


Figure 3.

5. Where a runway has a displaced threshold, then the LDA will be reduced by the distance the threshold is displaced, as shown in Figure 4. A displaced threshold affects only the LDA for approaches made to that threshold; all declared distances for operations in the reciprocal direction are unaffected.

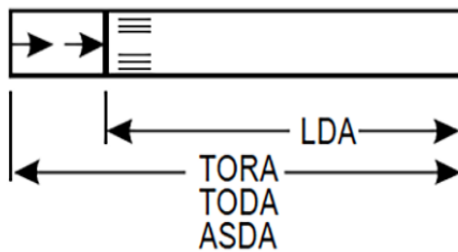


Figure4

6. Figures 2 through 4 illustrate a runway provided with a clearway or a stopway or having a displaced threshold. Where more than one of these features exist, then more than one of the declared distances will be modified - but the modification will follow the same principle illustrated. An example showing a situation where all these features exist is shown in Figure 5.

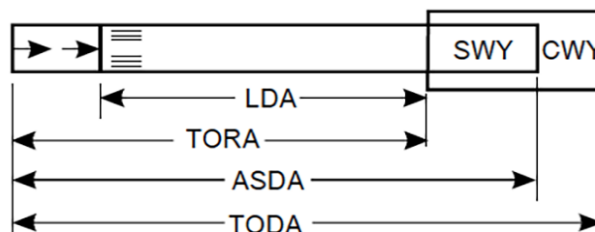
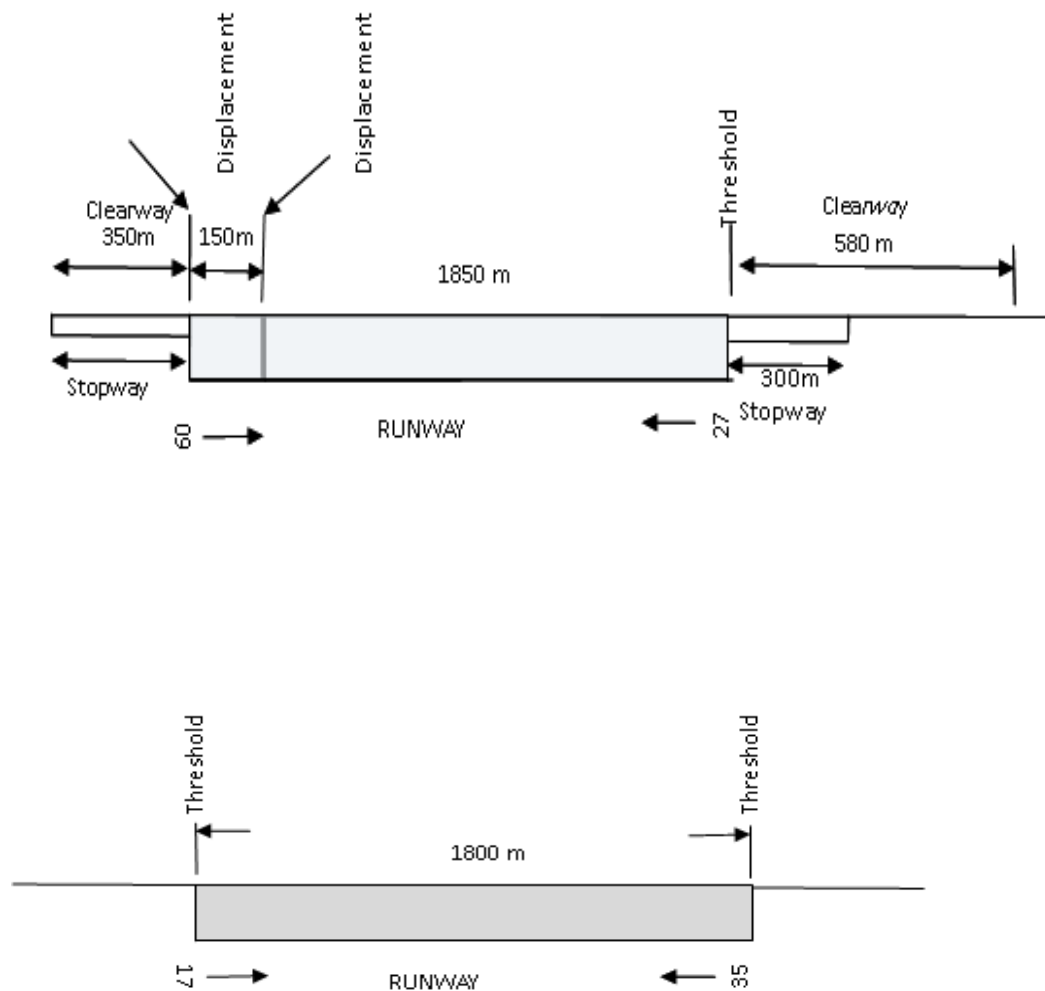


Figure 5



7. A suggested format for providing information on declared distances is given in Figure 6. If a runway direction cannot be used for take-off or landing, or both, because it is operational forbidden, then this should be declared and the words “not usable” or the abbreviation “NU” entered



Runway	TORA m	ASDA m	TODA m	LDA m
09	2000	2300	2580	1850
27	2000	2350	2350	
17	NU	NU	NU	
35	1800	1800	1800	

Figure 6.

## **Information to be reported to Aeronautical Information Services**

1 Under Section 4.11.8 of the CAR001, the declared distances shall be calculated and reported by the aerodrome operator to Aeronautical Information Services (AIS). Such information should be subsequently made available to pilots via the Bahrain Aeronautical Information Publication (AIP).

## **References**

1. CAR 001, Aerodrome standards and certification regulations
- 2.. ICAO Annex 14, Volume I