

# Technical note

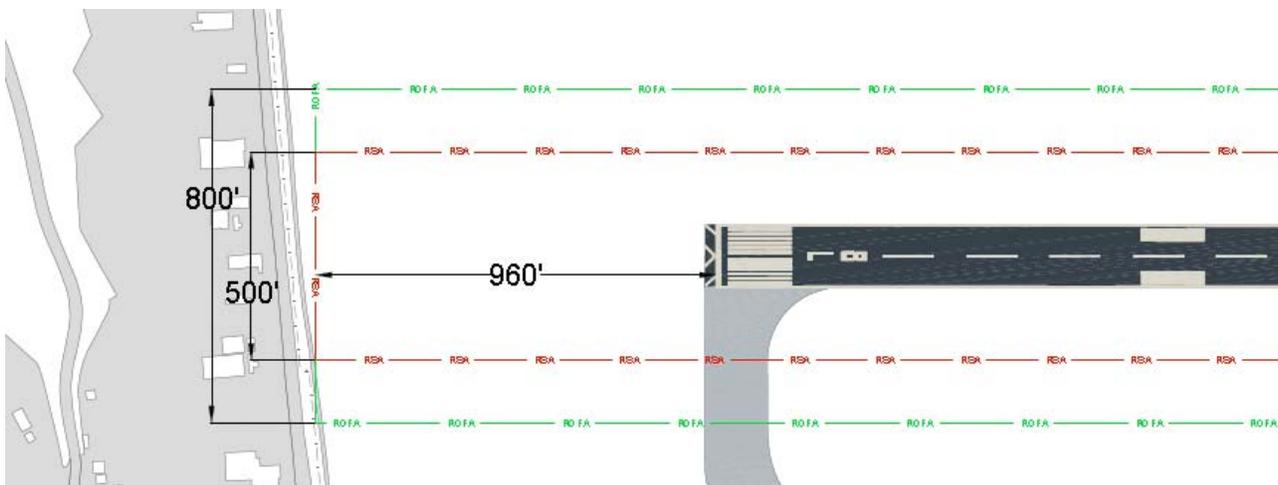
<b>Project:</b>	SDM ALP Update	<b>To:</b>	City of San Diego
<b>Subject:</b>	SDM Declared Distances	<b>From:</b>	Anna Marron, Atkins
<b>Date:</b>	Oct 19, 2018	<b>cc:</b>	C&S Companies

## Declared Distances Background

While developing the Airport Layout Plan (ALP) for Brown Field Municipal Airport (SDM), airfield safety areas were analyzed to ensure that appropriate safety clearances are present at SDM. The following sections document the deficiencies in Runway Safety Area, and Runway Object Free Area west of the Runway 8L threshold due to impacts from the existing airport perimeter fence adjacent to Heritage Rd. This technical note aims to mitigate these impacts by proposing the implementation of declared distances for Runway 8L-26R.

**Figure 1** depicts the Runway 8L-26R RSA and ROFA west of the Runway 8L threshold. The airport perimeter fence impacts both the ROFA and the RSA in this area.

**Figure 1. Available RSA & ROFA west of Runway 8L-26R**



## Runway Safety Area

A Runway Safety Area (RSA) is a graded surface centered on a runway, free of any objects, except for objects that are 'fixed by function.' The purpose of the RSA is to protect aircraft in the event of an under-shoot, over-shoot or excursion from a runway during landing or take-off operations. In case of an emergency, the area must be able to support emergency vehicle operations and maintenance vehicles. The width and length of an RSA depend on an airport's Runway Design Code (RDC) and approach visibility minima. Meeting RSA requirements is one of the FAA's highest priorities in maintaining safety at the nation's airports. **Tables 1 & 2** note the existing and future RSA dimensions for Runway 8L and 26R respectively. The Runway 26R RSA is impacted by the perimeter fence beyond the departure end by 3 feet.

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**Table 1. RSA– Runway 8L**

RUNWAY SAFETY AREA - RUNWAY 8L					
	STANDARD LENGTH		AVAILABLE LENGTH		CONTROLLING OBJECT
	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	
APPROACHES	600'	1,000'	600'	1,000'	NONE
DEPARTURES	600'	1,000'	600'	1,000'	NONE

**Table 2. RSA – Runway 26R**

RUNWAY SAFETY AREA - RUNWAY 26R					
	STANDARD LENGTH		AVAILABLE LENGTH		CONTROLLING OBJECT
	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	
APPROACHES	600'	1,000'	600'	1,000'	NONE
DEPARTURES	600'	1,000'	600'	997'	PERIMETER FENCE

Source: FAA AC 150/5300-13A, *Airport Design*, Atkins Analysis 2018

## Runway Object Free Area - ROFA

Similar to the RSA, the Runway Object Free Area (ROFA) must be free of objects except those required to support air navigation and ground maneuvering operations. The function of the ROFA, also centered on the runway, is to enhance the safety of aircraft operating on the runway. It is not permissible to park an airplane within the ROFA. The width and length of the ROFA depend upon an airport's specific RDC and approach visibility minima. The ROFA does not have specific slope requirements, but the terrain within the ROFA must be relatively smooth and graded to be at or below the edge of the RSA. **Tables 3 & 4** outline the existing and future ROFA dimensions for Runway 8L and 26R respectively. The Runway 26R ROFA is impacted by the perimeter fence beyond the departure end by 40 feet.

**Table 3. ROFA – Runway 8L**

RUNWAY OBJECT FREE AREA - RUNWAY 8L					
	STANDARD LENGTH		AVAILABLE LENGTH		CONTROLLING OBJECT
	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	
APPROACHES	600'	1,000'	600'	1,000'	NONE
DEPARTURES	600'	1,000'	600'	1,000'	NONE

# Technical note

**Table 4. ROFA – Runway 26R**

RUNWAY OBJECT FREE AREA - RUNWAY 26R					
	STANDARD LENGTH		AVAILABLE LENGTH		CONTROLLING OBJECT
	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	
APPROACHES	600'	1,000'	600'	1,000'	NONE
DEPARTURES	600'	1,000'	600'	960'	PERIMETER FENCE

Source: FAA AC 150/5300-13A, *Airport Design*, Atkins Analysis 2018

## Proposed RSA & ROFA Mitigation - Declared Distances

The FAA requires GA airports having certain operational limitations to publish declared distances for each runway. Declared distances represent the maximum distances available and suitable for meeting take-off, rejected take-off, and landing performance requirements for turbine-powered aircraft. This information informs pilots what the available runway lengths are for different types of operations to maintain standard safety areas and protection zones. Declared distances may also be used to obtain additional RSA and/or ROFA prior to the runway’s threshold (the start of the LDA) and/or beyond the stop end of the LDA and ASDA. The following defines the various types of declared distances at SDM:

- Takeoff Run Available (TORA) – The runway length declared available for the ground run of an aircraft.
- Takeoff Distance Available (TODA) – The runway length declared available for the ground run of an aircraft plus any remaining clearway.
- Accelerated Stop Distance Available (ASDA) – The length of runway plus any stop way declared available and suitable for the safe deceleration of an aircraft after aborting a take-off.
- Landing Distance Available (LDA) – The length of runway declared available for landings.

It is recommended that safety area impacts be mitigated by implementing declared distances to allow for an additional 40 feet of ROFA west of the Runway 8L threshold for aircraft operating on Runway 26R.

Proposed declared distances for Runway 8L-26R are outlined in **Table 5** and depicted in **Figure 2**, and **Figure 3**.

**Table 5. Runway 8L- 26R Proposed Declared Distances**

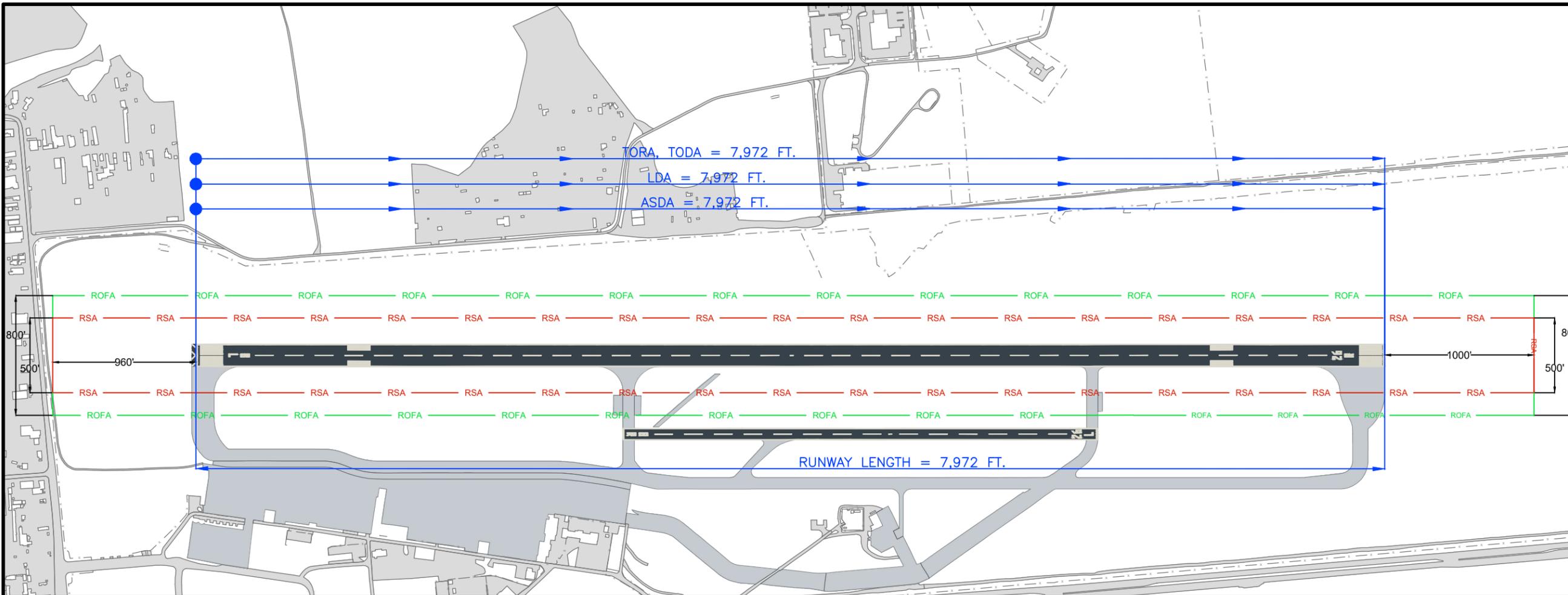
Runway	TORA	TODA	ASDA	LDA
8L	7,972	7,972	7,972	7,972
26R	7,972	7,972	7,932	7,932

Source: Atkins Analysis, 2018

**Figure 2: Proposed  
Runway 8L Declared  
Distances**

**LEGEND:**

- ROFA — RUNWAY OBJECT FREE AREA
- RSA — RUNWAY SAFETY AREA



**RUNWAY 8L OPERATIONS**

- ASDA** ACCELERATE-STOP DISTANCE AVAILABLE: LENGTH OF RUNWAY PLUS STOPWAY SUITABLE FOR ACCELERATE-STOP DISTANCE REQUIREMENTS.
- LDA** LANDING DISTANCE AVAILABLE: LENGTH OF RUNWAY AVAILABLE AND SUITABLE FOR SATISFYING LANDING REQUIREMENTS.
- TORA** TAKEOFF RUN AVAILABLE: LENGTH OF RUNWAY SUITABLE FOR SATISFYING TAKEOFF RUN REQUIREMENTS.
- TODA** TAKEOFF DISTANCE AVAILABLE: THE TORA PLUS ANY STOPWAY OR CLEARWAY AVAILABLE FOR SATISFYING TAKEOFF RUN REQUIREMENTS. TODA LENGTH IS DETERMINED BY AIRCRAFT OPERATOR PRIOR TO TAKEOFF.

**NOTES:**  
- RUNWAY PROTECTION SURFACES DESIGNED IN ACCORDANCE TO FAA ADVISORY CIRCULAR 150/5300-13A, AIRPORT DESIGN

DECLARED DISTANCES - PROPOSED				
	TODA	TORA	LDA	ASDA
RUNWAY 8L	7,972'	7,972'	7,972'	7,972'

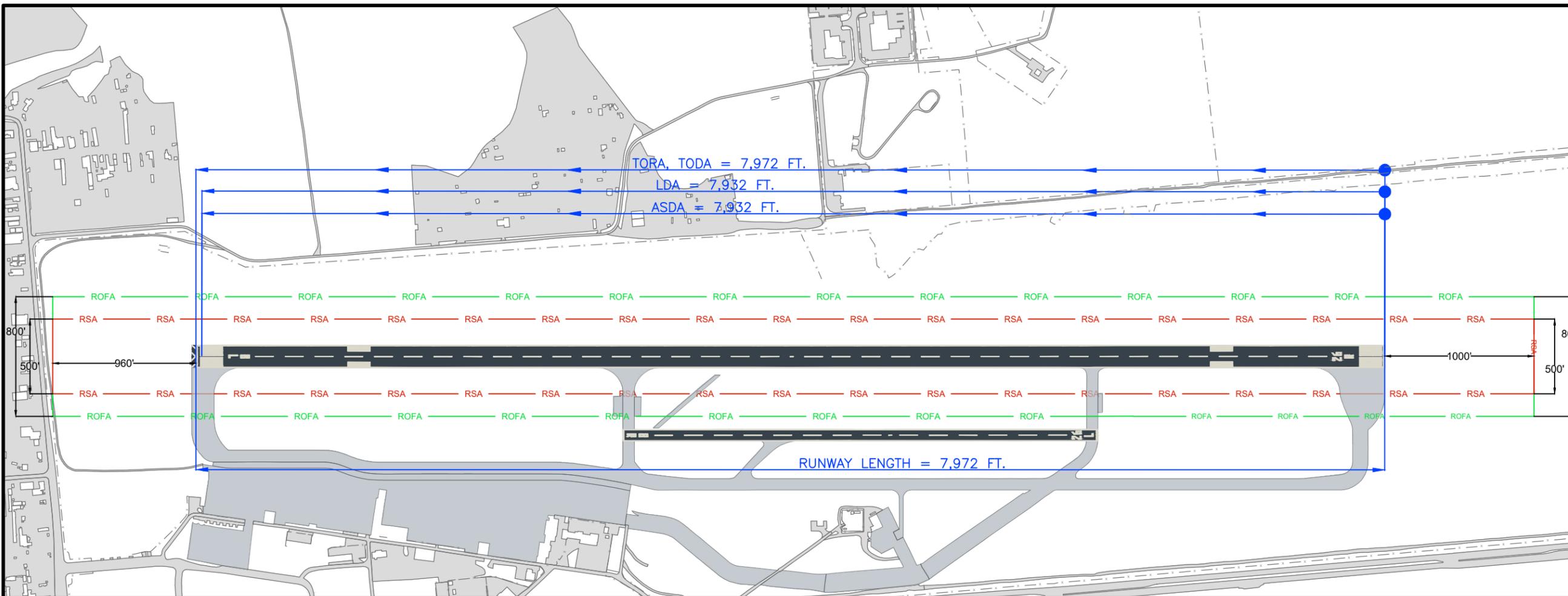
RUNWAY OBJECT FREE AREA - RUNWAY 8L					
	STANDARD LENGTH		AVAILABLE LENGTH		CONTROLLING OBJECT
	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	
APPROACHES	600'	1,000'	600'	1,000'	NONE
DEPARTURES	600'	1,000'	600'	1,000'	NONE

RUNWAY SAFETY AREA - RUNWAY 8L					
	STANDARD LENGTH		AVAILABLE LENGTH		CONTROLLING OBJECT
	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	
APPROACHES	600'	1,000'	600'	1,000'	NONE
DEPARTURES	600'	1,000'	600'	1,000'	NONE

**Figure 3: Proposed  
Runway 26R Declared  
Distances**

**LEGEND:**

- ROFA — RUNWAY OBJECT FREE AREA
- RSA — RUNWAY SAFETY AREA



**RUNWAY 26R OPERATIONS**

- ASDA** ACCELERATE-STOP DISTANCE AVAILABLE: LENGTH OF RUNWAY PLUS STOPWAY SUITABLE FOR ACCELERATE-STOP DISTANCE REQUIREMENTS.
- LDA** LANDING DISTANCE AVAILABLE: LENGTH OF RUNWAY AVAILABLE AND SUITABLE FOR SATISFYING LANDING REQUIREMENTS.
- TORA** TAKEOFF RUN AVAILABLE: LENGTH OF RUNWAY SUITABLE FOR SATISFYING TAKEOFF RUN REQUIREMENTS.
- TODA** TAKEOFF DISTANCE AVAILABLE: THE TORA PLUS ANY STOPWAY OR CLEARWAY AVAILABLE FOR SATISFYING TAKEOFF RUN REQUIREMENTS. TODA LENGTH IS DETERMINED BY AIRCRAFT OPERATOR PRIOR TO TAKEOFF.

**NOTES:**  
- RUNWAY PROTECTION SURFACES DESIGNED IN ACCORDANCE TO FAA ADVISORY CIRCULAR 150/5300-13A, AIRPORT DESIGN

DECLARED DISTANCES - PROPOSED				
	TODA	TORA	LDA	ASDA
RUNWAY 26R	7,972'	7,972'	7,932'	7,932'

RUNWAY OBJECT FREE AREA - RUNWAY 26R					
	STANDARD LENGTH		AVAILABLE LENGTH		CONTROLLING OBJECT
	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	
APPROACHES	600'	1,000'	600'	1,000'	NONE
DEPARTURES	600'	1,000'	600'	960'	PERIMETER FENCE

RUNWAY SAFETY AREA - RUNWAY 26R					
	STANDARD LENGTH		AVAILABLE LENGTH		CONTROLLING OBJECT
	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	PRIOR TO THRESHOLD	BEYOND DEPARTURE END	
APPROACHES	600'	1,000'	600'	1,000'	NONE
DEPARTURES	600'	1,000'	600'	997'	PERIMETER FENCE