Ground Operations

Airport Markings

Objective

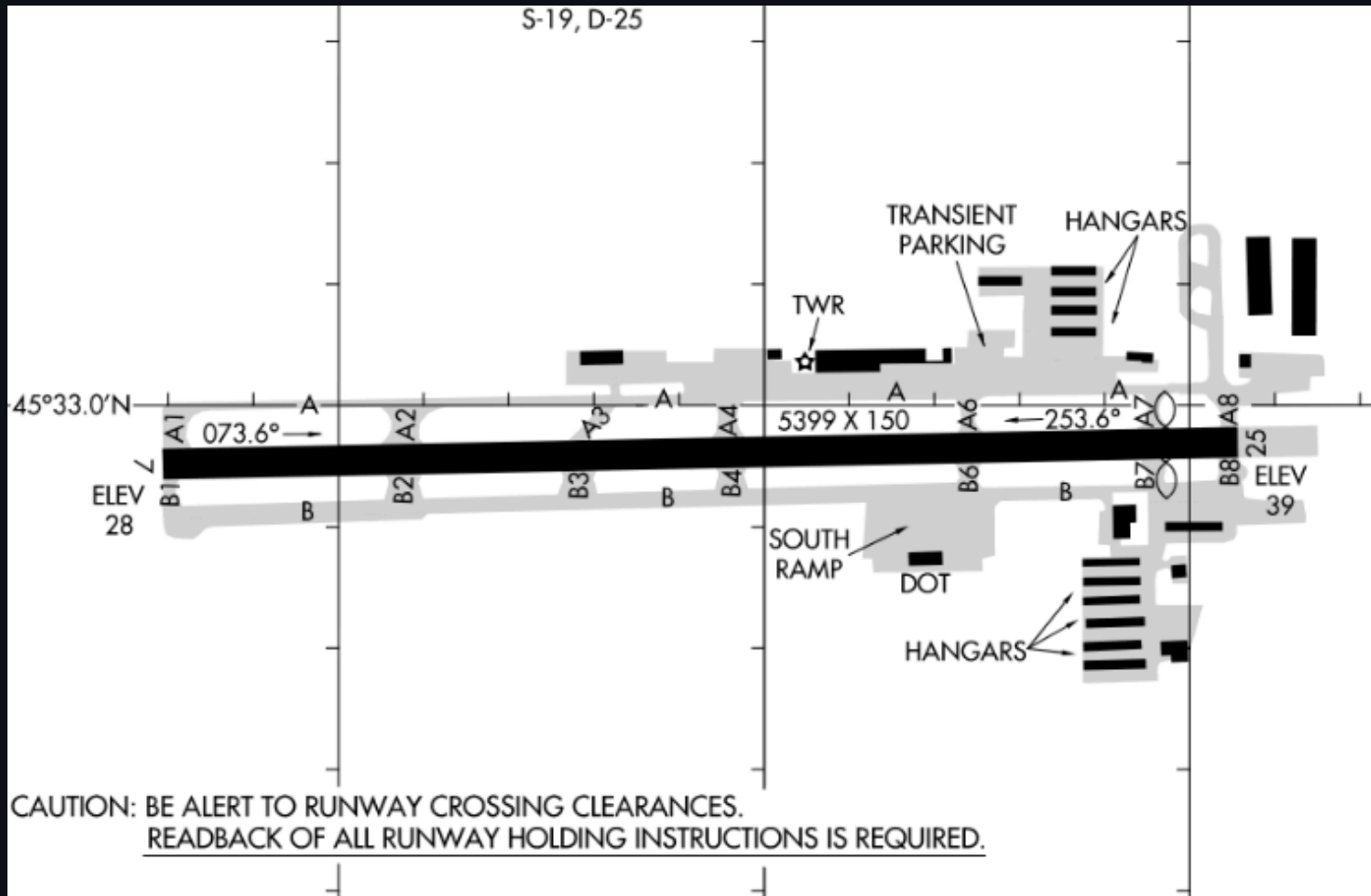Identify airport markings, signage, and lighting, and understand their meanings.

Motivation

Airport markings, signage, and lighting are critical for safe ground operations. Understanding these elements is essential for pilots to navigate the airport environment safely and efficiently.
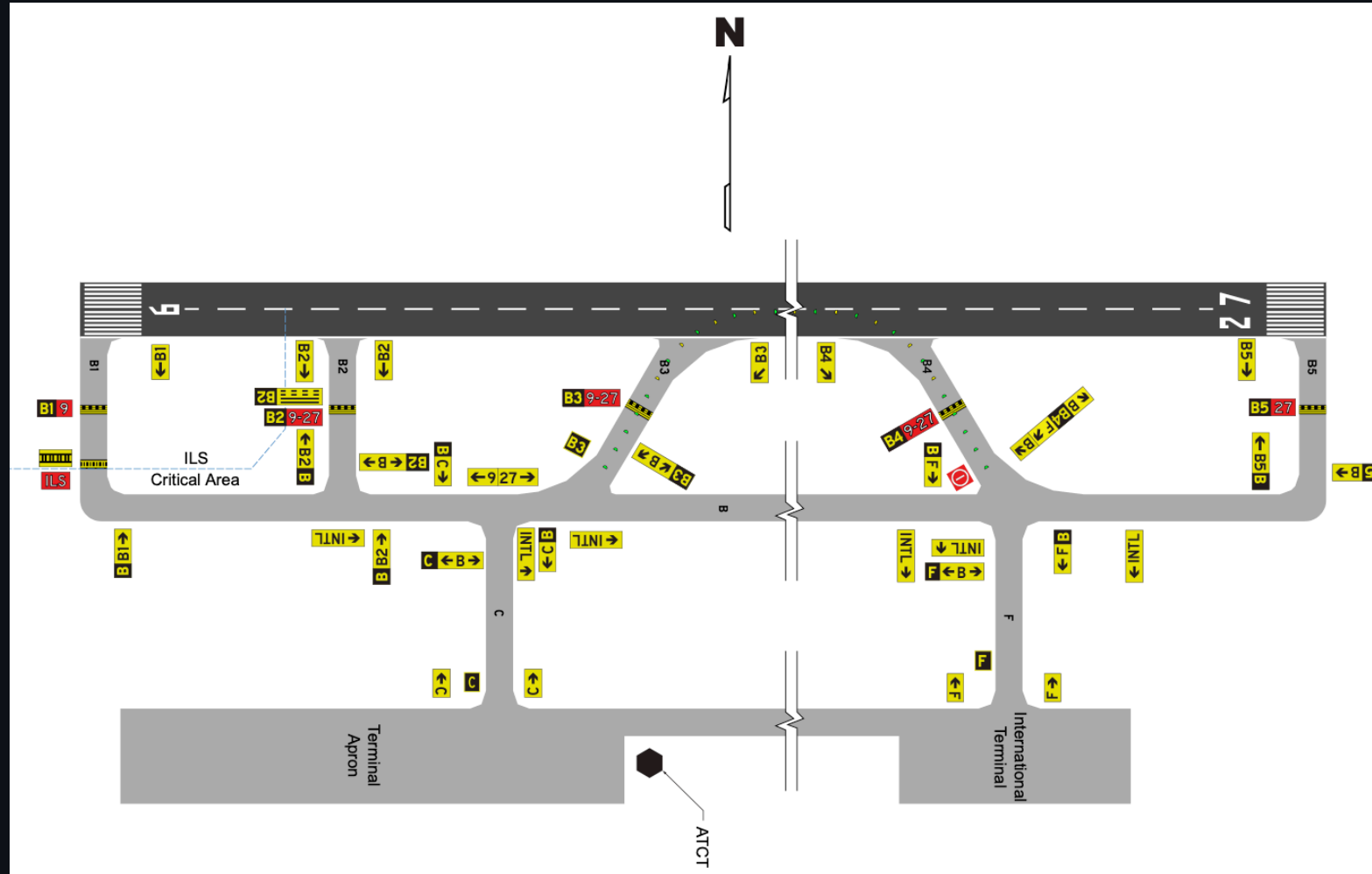
Overview

- Parts of an Airport

- Airport Signage

- Movement Areas

- Runway Safety Areas

- Crossing a Runway

- Runway Markings
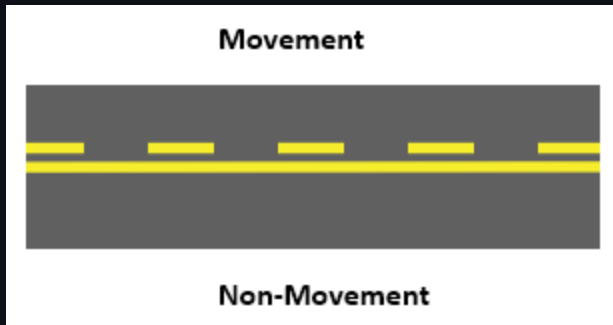
- Runway Lighting

- VASI and PAPI

Parts of an Airport

- Ramp, apron
- Taxiway
- Runway
- "Movement area": runways, taxiways

Signs We'll Encounter as We Taxi
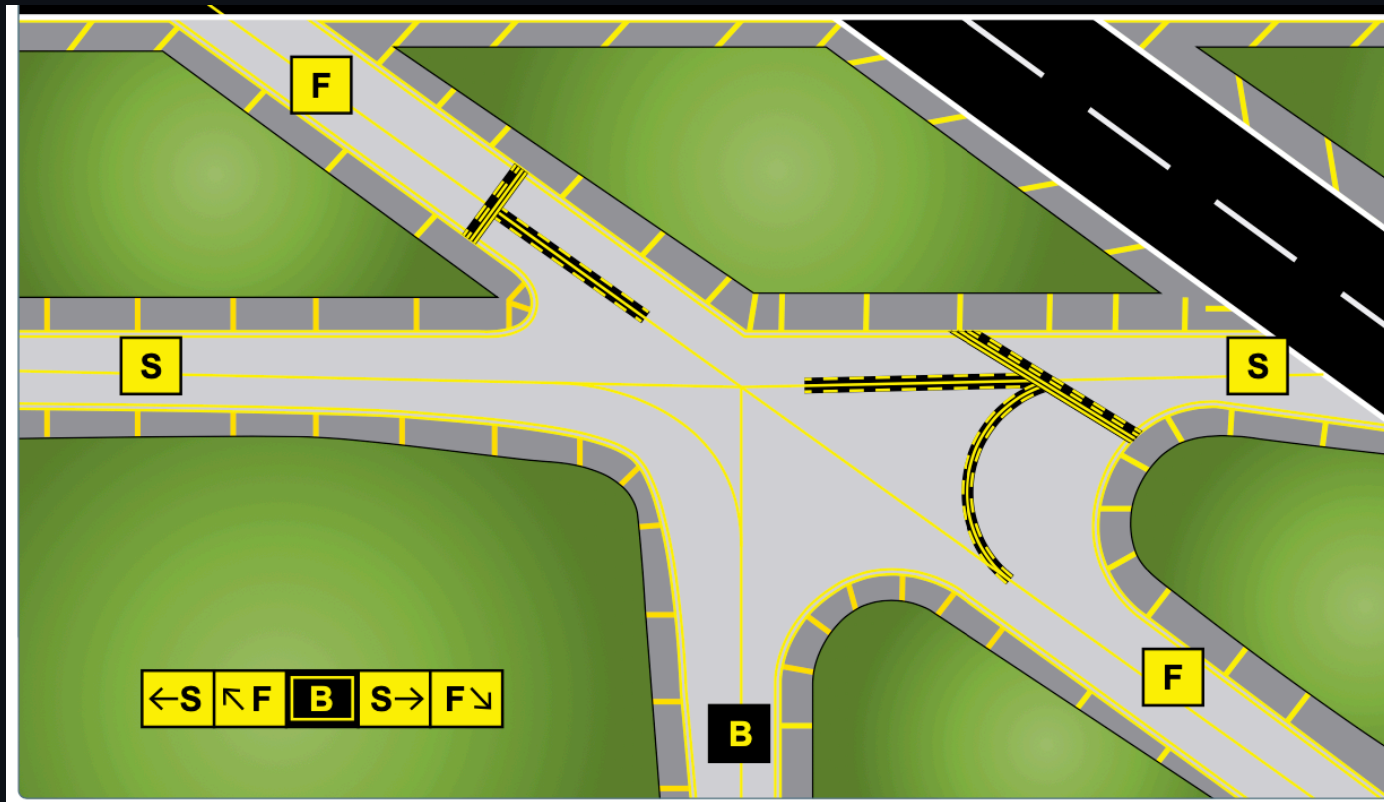
Movement Area Boundary

- Lines works similar to a highway passing lane
- Separates ramp from movement area
  - Need a clearance to cross at an airport with a control tower
  - Announce taxi on CTAF at an uncontrolled airport

Taxiway signs

- Black-backed text indicates taxiway you are on (taxiway direction sign)
- Yellow-backed text indicates direction to destination (taxiway location sign)
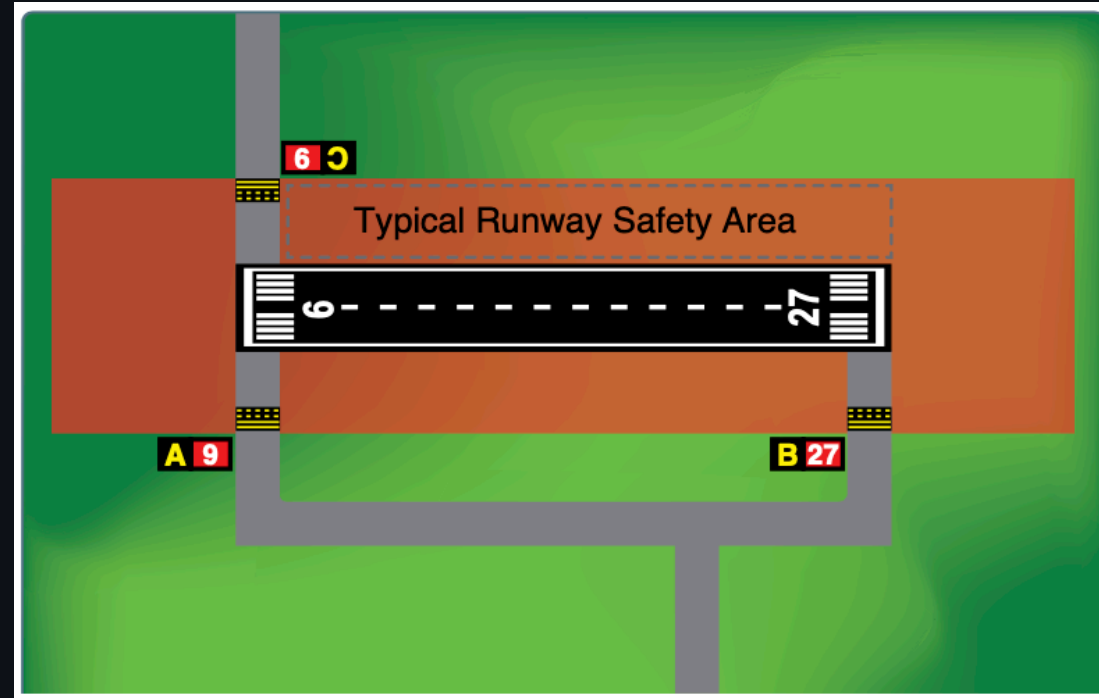
Taxiway Intersection

- Signs show direction to each taxiway

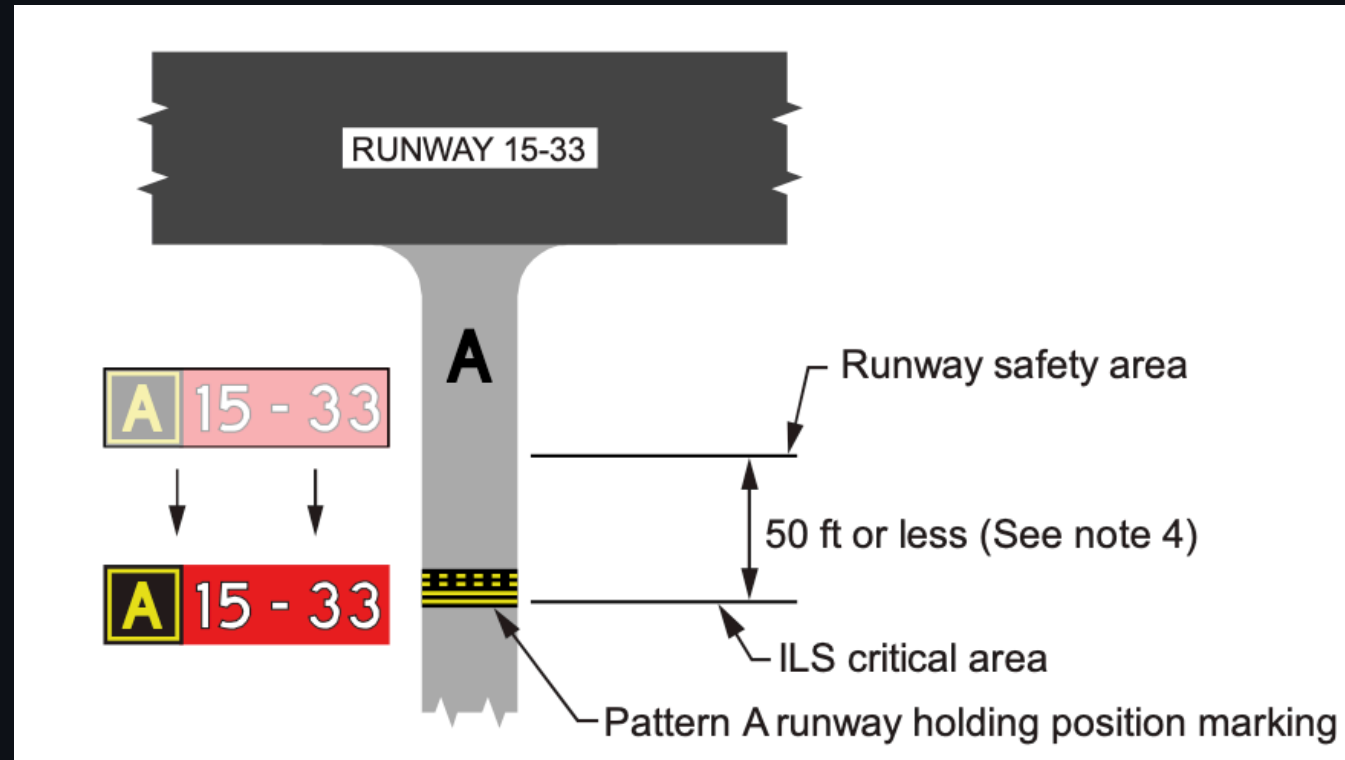- Black-backed text indicates taxiway you are on

Destination Signs

- Runway destination signs

- Dot separates multiple runways
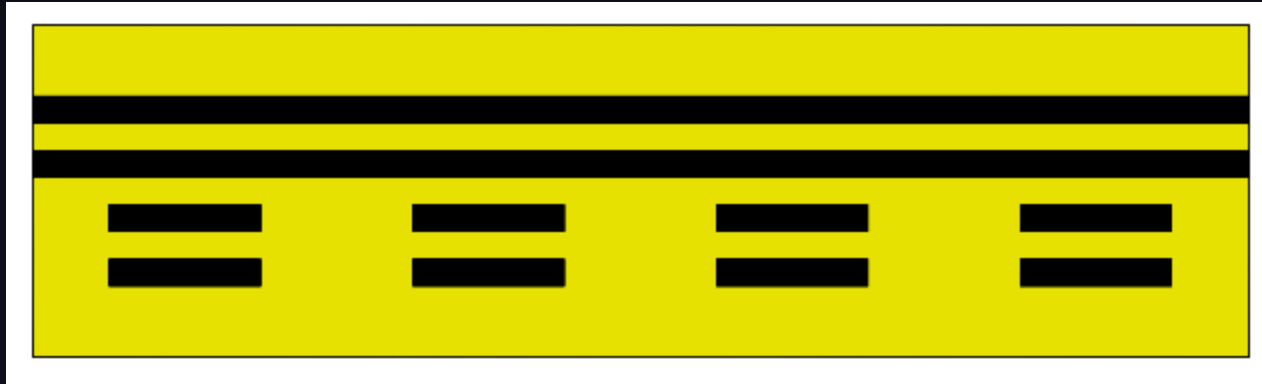
Runway Safety Area

Typical Runway Safety Area

- Buffer zone which reduces the risk of damage to airplanes in the event of an undershoot overshoot, or excursion from the runway

Crossing a Runway

- Stop before the hold short bars

- Need a clearance to cross

- Runways numbers are placed on the corresponding side of the sign

Crossing a Runway

- Dashed to solid, crossing ok

- Solid to dashed, need a clearance

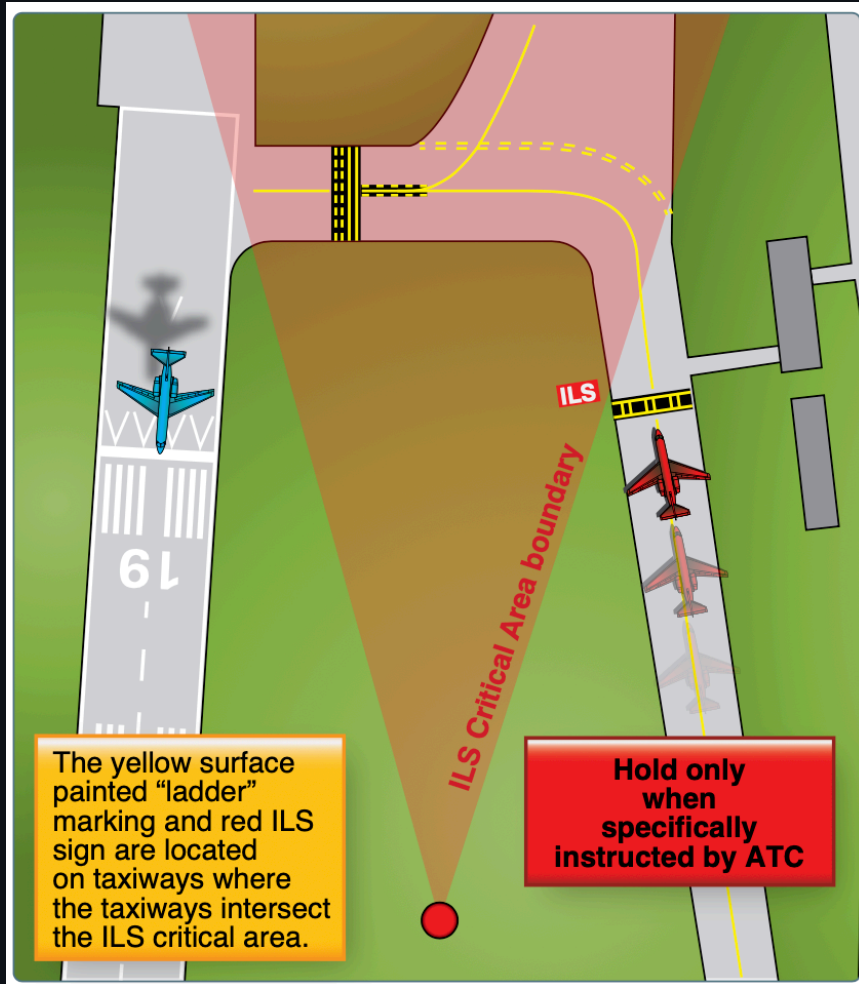- Completely cross the entire line to be clear of the runway

Crossing a Runway

- Runway identifiers also painted on the ground
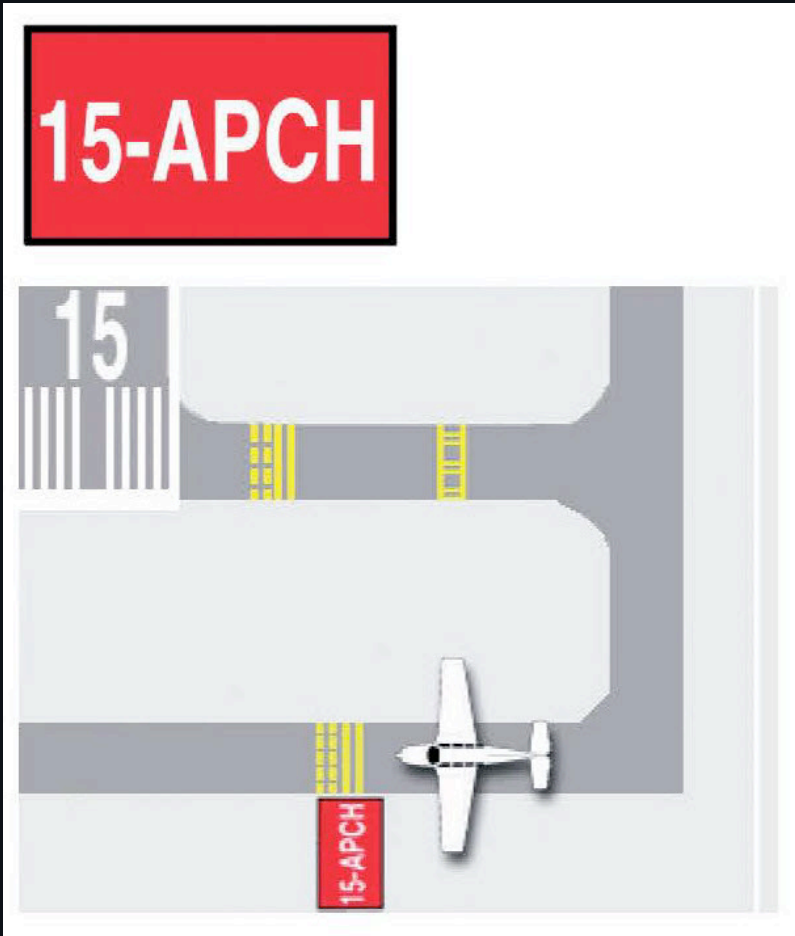- See red, think STOP

Holding Short of a Runway

- Runway holding position sign (at runway end)

ILS Hold Position Area

The yellow surface painted "ladder" marking and red ILS sign are located on taxiways where the taxiways intersect the ILS critical area.

Hold only when specifically instructed by ATC

ILS Critical Area boundary

- ILSs have critical areas that must be kept clear of all obstacles

- When in use, ATC will say `HOLD SHORT OF RUNWAY 36 ILS CRITICAL AREA.`

Runway Approach Area Holding

15-APCH

15 APCH - 33 DEP

- Similar to an ILS critical area, but used to protect approach/departure areas at the end of runways

- ATC: `Hold short of Runway XX approach or Runway XX departure area`
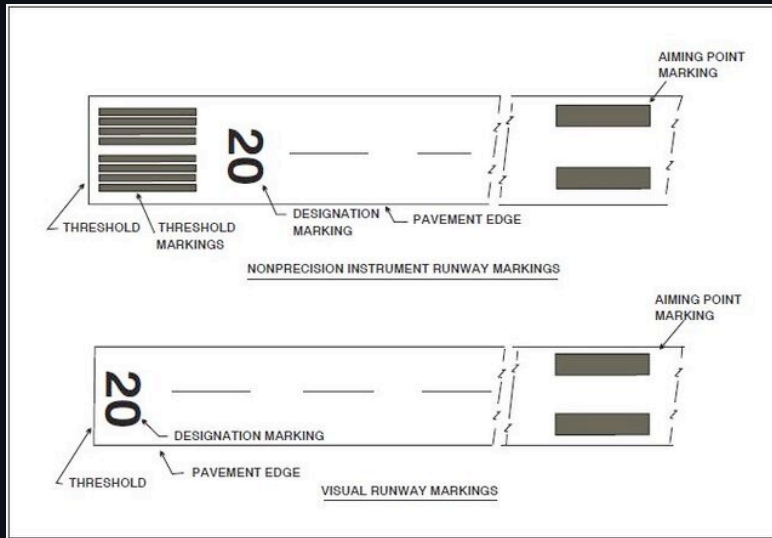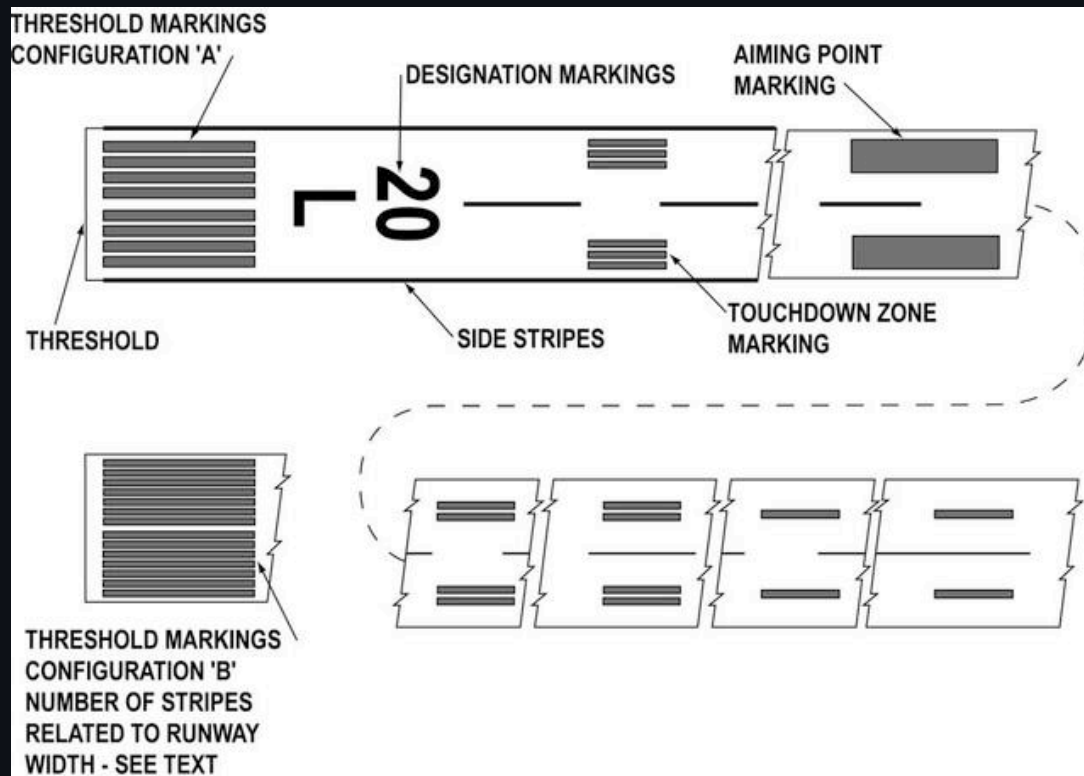
No Entry Sign

Runway Signs and Markings

Non-Precision Runway Markings

- Threshold blocks: Depending on the width of the runway, there may be 2-16 stripes
- Aiming point: 1000' from threshold
- Lines are 120' long with 80' in between them

Precision Runway Markings - Runways with Instrument Approach

- Double bars, touchdown: 500' from threshold
- Single bar, aiming point: 1000' from threshold
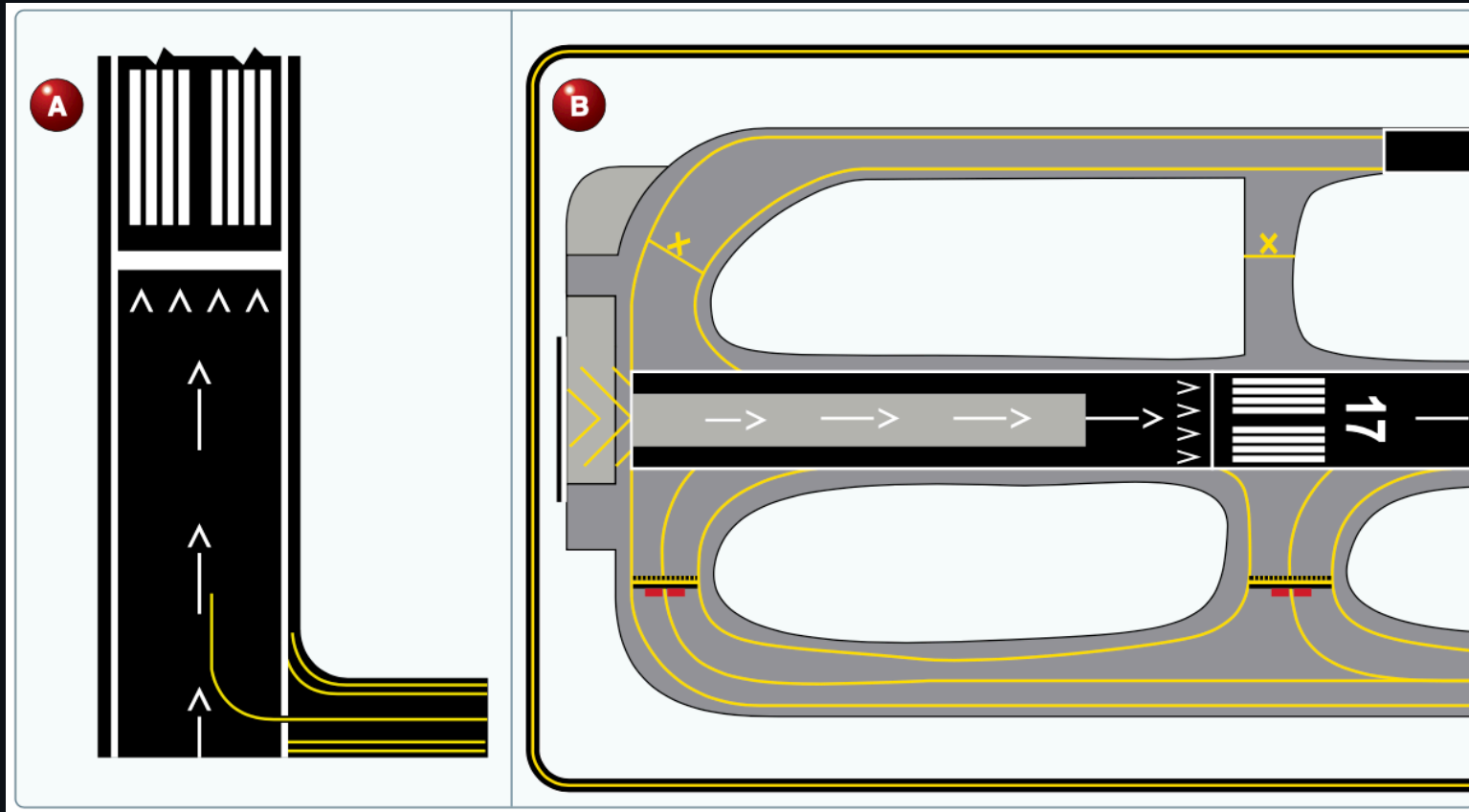- Dashed bars are 500' from each block

Runway Location Sign

- Identifies which runway you are on
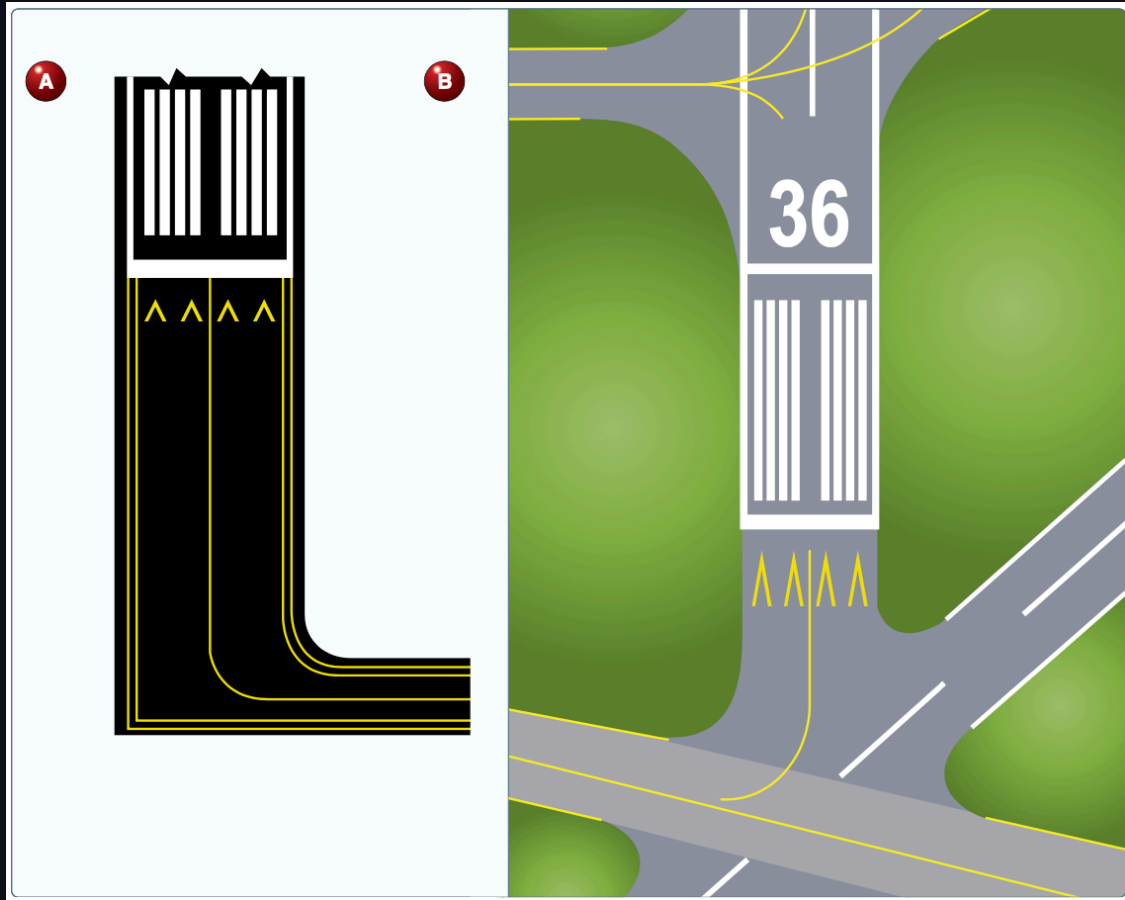
Runway Distance Remaining

- Identifies how much runway is remaining in 1000's of feet
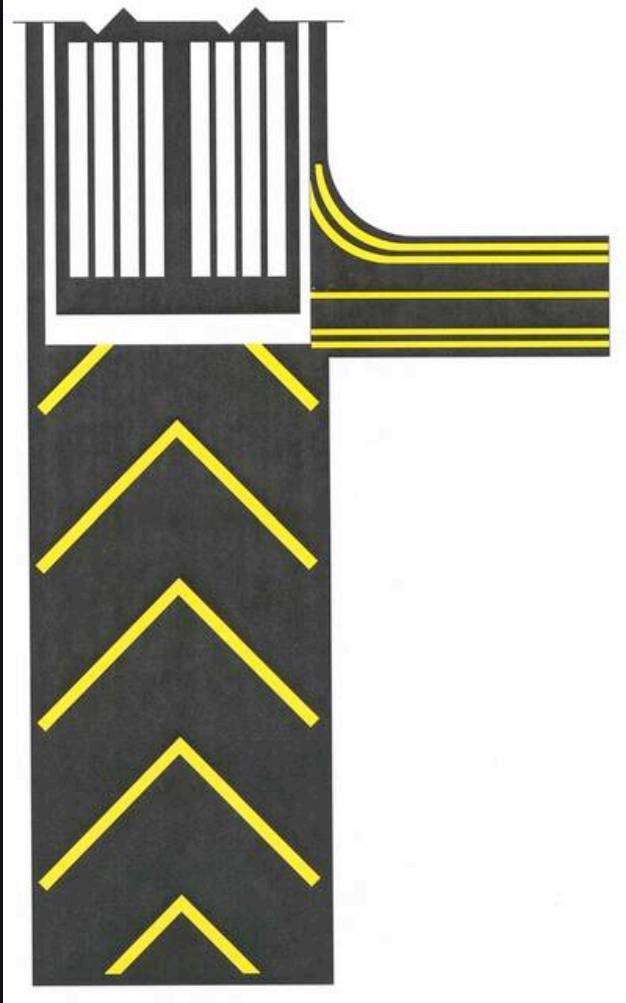
Displaced Threshold

- Can be used for takeoff, but not for landing
- Ok to rollout when landing from opposite direction

Relocated Runway Threshold

- Cannot be used for takeoff or landing, taxi only

Blastpad or Stopway

- Cannot be used for taxi, takeoff, or landing
- Blastpad: Paved area which keeps debris from being flown in a jet blast
  - Not designed to support aircraft weight
- Stopway: Paved area which can be used in the event on an overrun
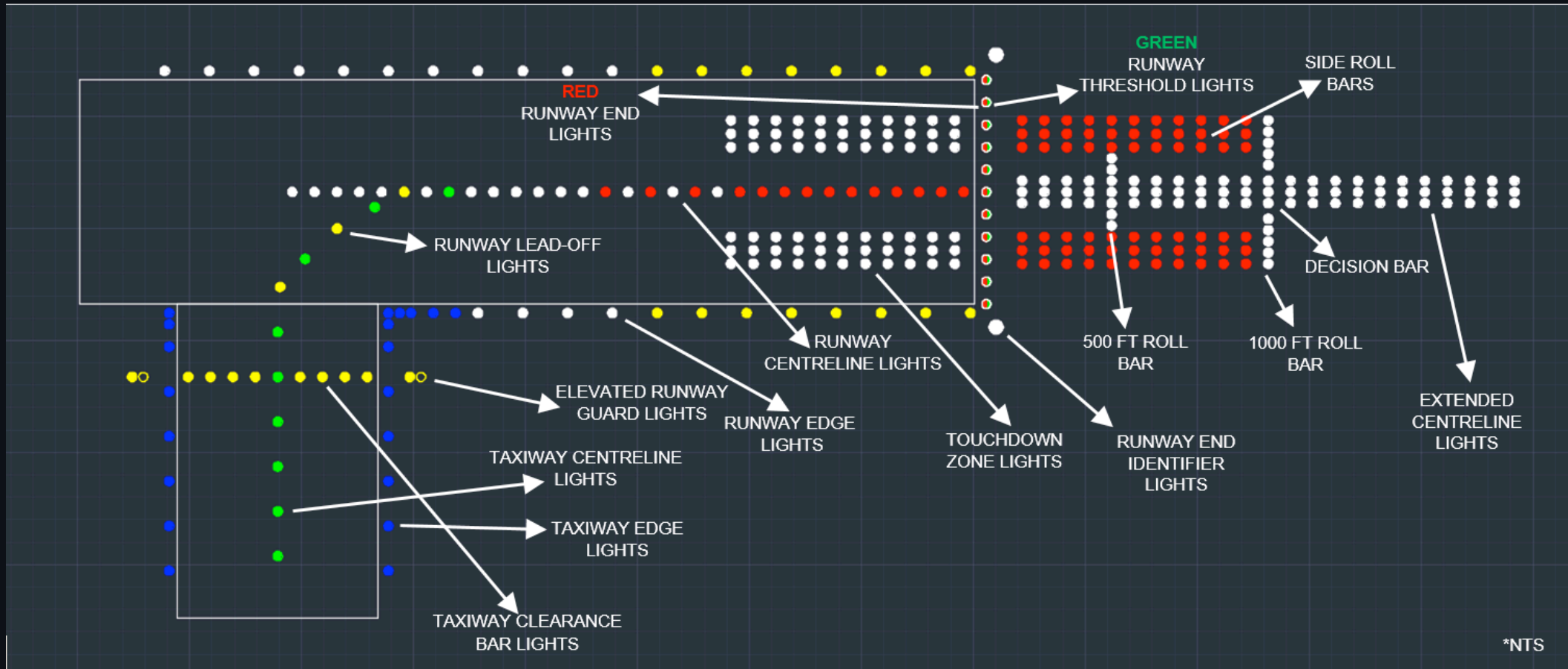 - Included in landing deceleration distances

EMAS

- Engineered materials arresting system
- Dissipates energy in the case of an aircraft overrun

Closed Runway "X"

Airport Lighting
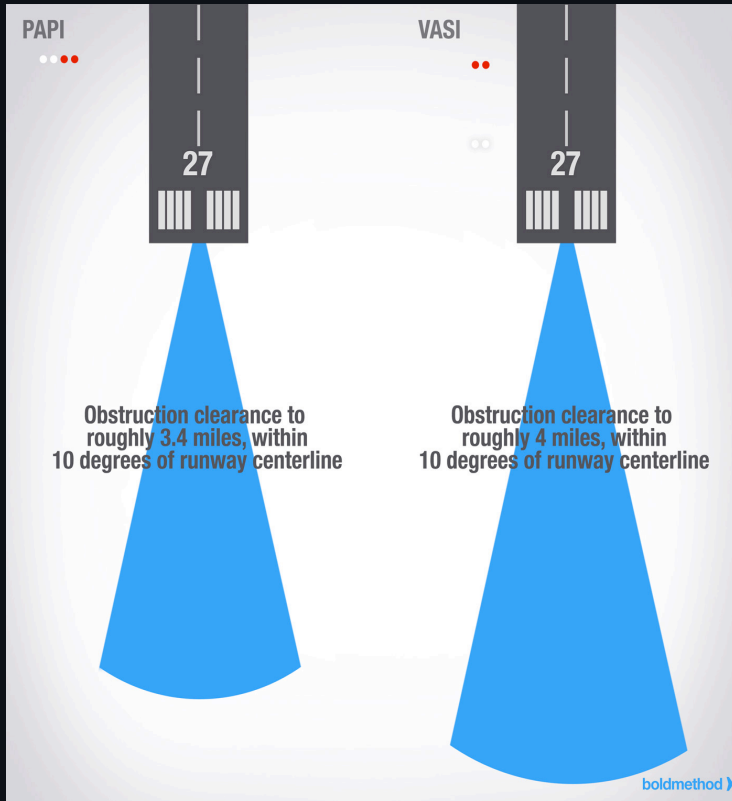
Lighting Overview

Runway Guard Lights - Hold short bars
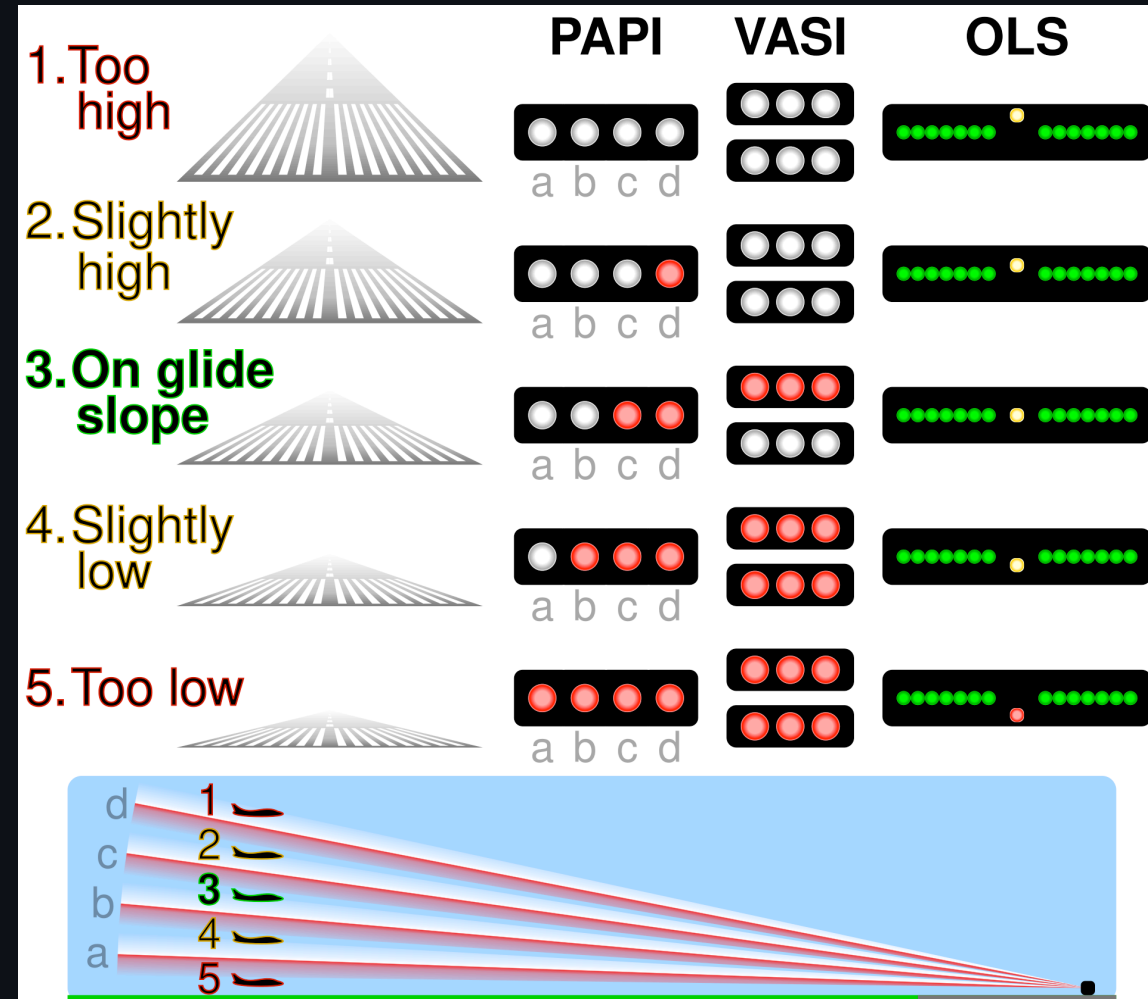
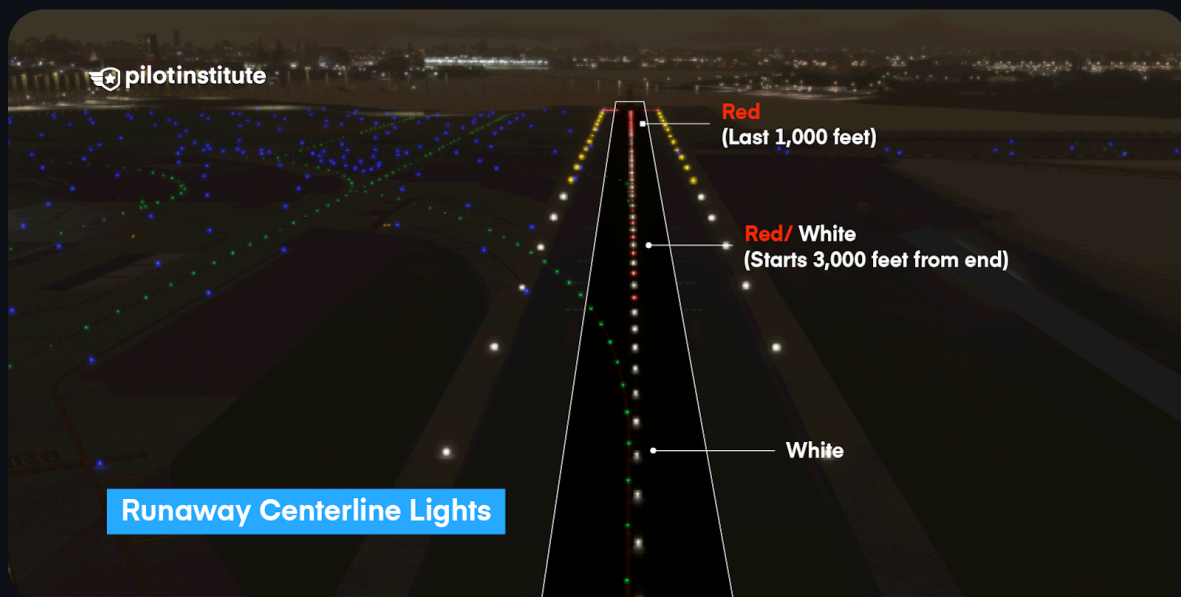Used to indicate hold short bars

VASI and PAPI

- Visual approach slope indicator (VASI): 2 dots
- Precision approach path indicator (PAPI): 4 dots in a row
- Two white/two red means:
  - Usually 3-degree glideslope
  - Approach path is clear of obstructions

PAPI and VASI Indications

Runway Centerline Lighting

- Large runways with precision instrument approaches
- Spaced at 50' intervals

Runway end identifier lights: REIL

Runway End Identifier Lights (REILs)

- Two flashing strobes which indicate end of a runway
- Helpful to distinguishing runways from other

Summary

- Parts of an Airport: Apron, taxiway, runway

- Airport Signage: Movement area boundary, taxiway signs, destination signs

- Movement Areas: Runway safety area, crossing a runway

- Runway Safety Areas: Buffer zone to reduce risk of damage

- Crossing a Runway: Requires a clearance at towered airport

- Runway Markings: Non-precision and precision markings

- Runway Lighting: Runway centerline lighting, REIL

- VASI and PAPI: Visual approach slope indicators, use at night