

Session Visual Aids

Runway Incursions – 3 Markings

3.12.2 A **runway-holding position** ...shall be established:

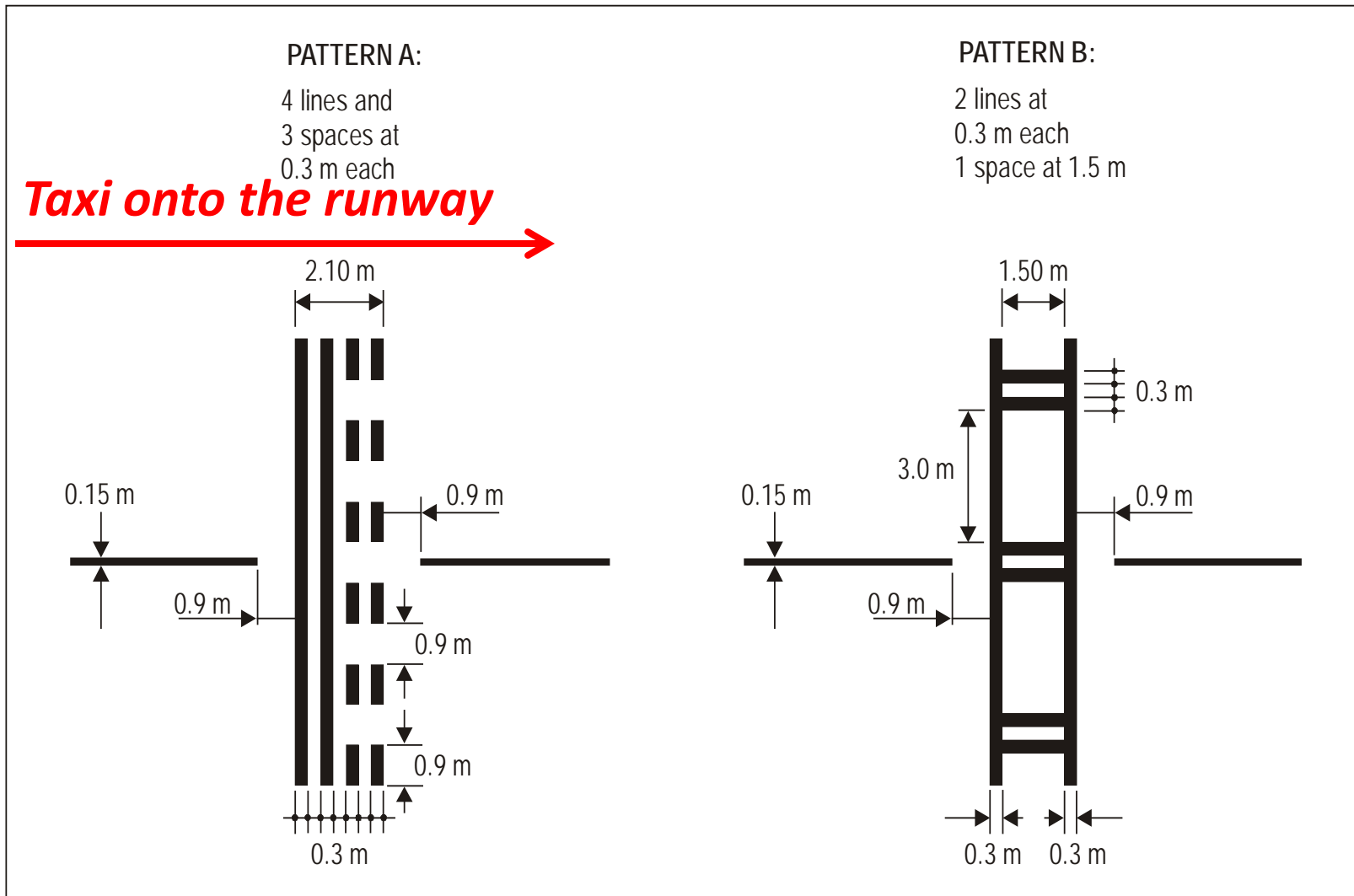
a) on the taxiway, at the intersection of a taxiway and a runway; and

b) at an intersection of a runway with another runway when the former runway is part of a standard taxi-route.

5.2.10.1 A **runway-holding position marking** shall be displayed along a runway-holding position. (**PATTERN A**)

Annex 14 Figure 5-8 *Pattern A*

Runway-holding position markings





Runway Incursions – Markings

Paragraph 5.2.8 - Taxiway centre line marking

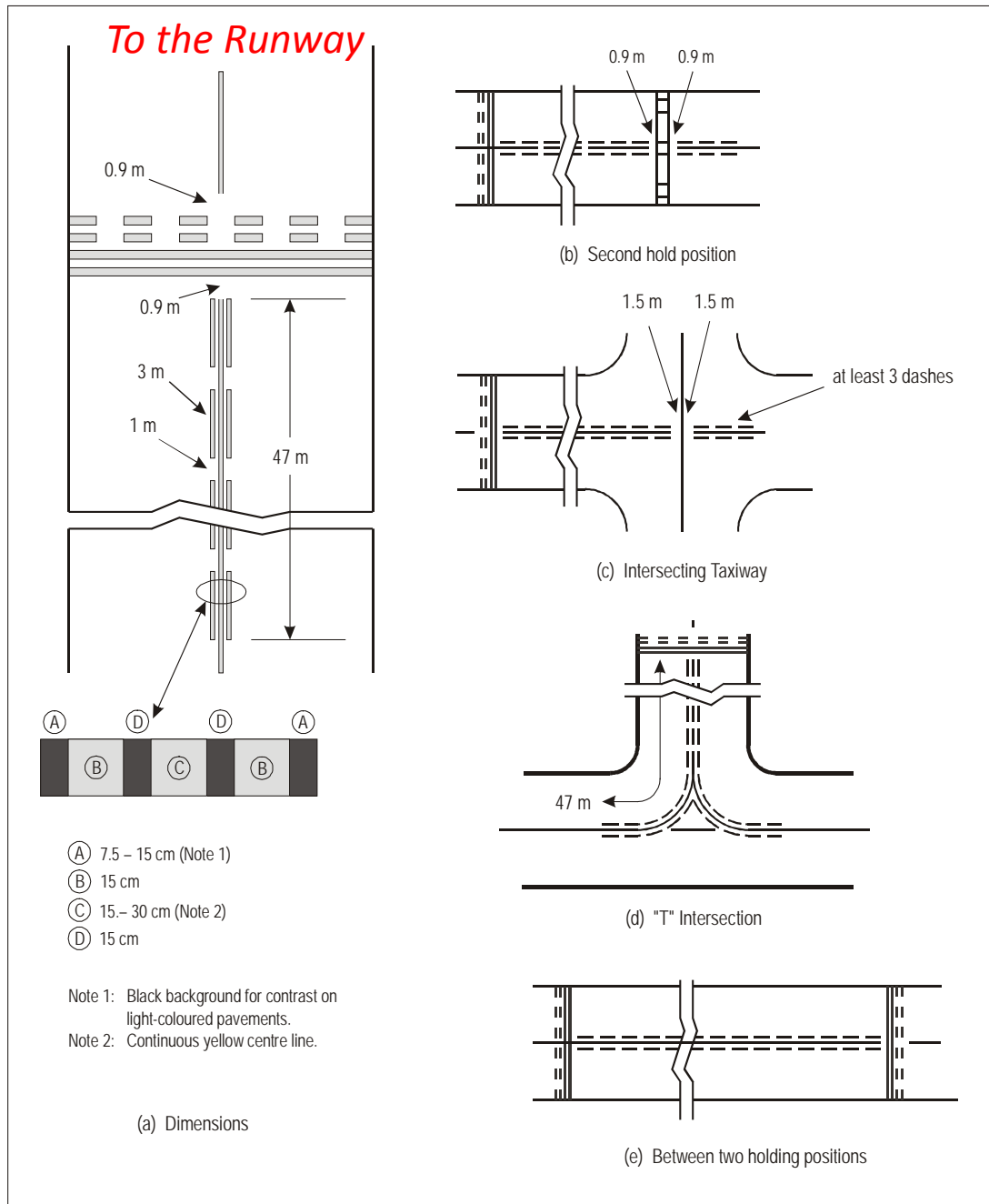
- 5.2.8.1 ... shall be provided ... code number is 3 or 4
- 5.2.8.2 ... should be provided ... code number is 1 or 2
- 5.2.8.4 Recommendation.— Where it is necessary to denote the proximity of a runway-holding position, **enhanced taxiway centre line marking** should be provided.

Note.— The provision of enhanced taxiway centre line marking may form part of runway incursion prevention measures.

- 5.2.8.5 Where provided, enhanced taxiway centre line marking **shall be installed at each taxiway/runway intersection.**

Annex 14 Figure 5-7

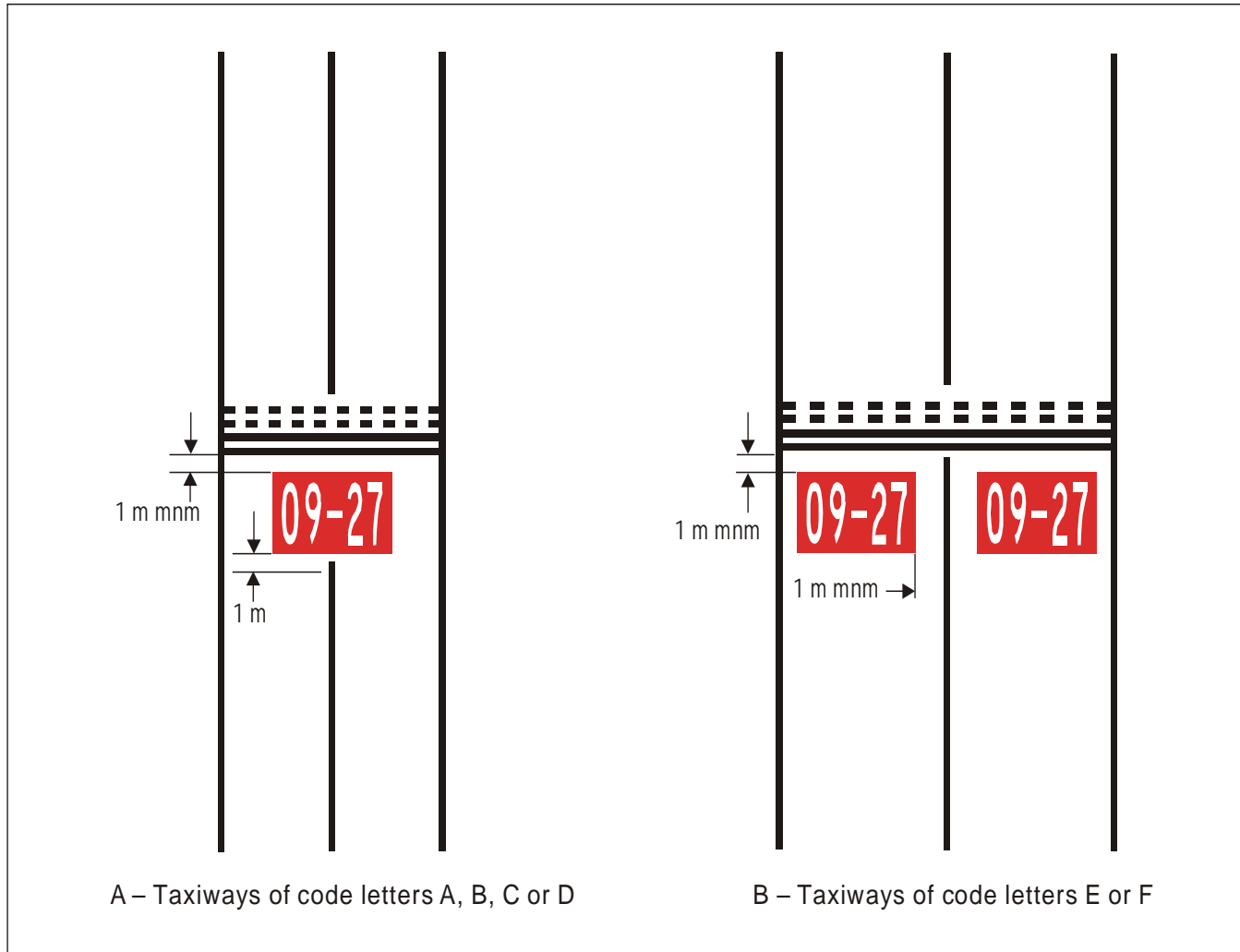
Enhanced taxiway centre line marking





Annex14 Figure 5-10

Mandatory instruction marking



Runway Incursions: Markings

- 5.2.16.1 Where it is impracticable to install a mandatory instruction sign in accordance with 5.4.2.1, a **mandatory instruction marking shall be provided** on the surface of the pavement.
- 5.2.16.2 Where operationally required, such as on taxiways **exceeding 60 m in width**, or to assist in the **prevention of a runway incursion**, a mandatory instruction sign should be **supplemented by a mandatory instruction marking**.

An Airport in the United States



Runway Incursions: 3 Signs

- 5.4.2.1 A **mandatory instruction sign** shall be provided to identify a location beyond which an aircraft taxiing or vehicle shall not proceed unless authorized by the aerodrome control tower.
- 5.4.2.2 Mandatory instruction signs shall include runway designation signs, category I, II or III holding position signs, **runway-holding position signs, road-holding position signs and NO ENTRY signs**

Annex 14 Figure 5-30

Mandatory instruction signs

LEFT SIDE



LOCATION/RUNWAY DESIGNATION

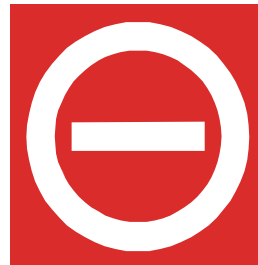


RUNWAY-HOLDING POSITION



LOCATION/RUNWAY DESIGNATION

*At the ends
of runways*



NO ENTRY

RIGHT SIDE



RUNWAY DESIGNATION/LOCATION



RUNWAY DESIGNATION/
CATEGORY II HOLDING POSITION



RUNWAY DESIGNATION/LOCATION

Runway Incursions: Signage

- 5.4.2.3 A pattern “A” runway-holding position marking shall be supplemented at a taxiway/runway intersection or a runway/runway intersection with a runway designation sign.
- REPEAT - 5.2.16.1 Where it is impracticable to install a mandatory instruction sign in accordance with 5.4.2.1, a mandatory instruction marking shall be provided on the surface of the pavement.

An Airport in the United States with a Mandatory Instruction Sign --- “Runway Holding Position Signs 3-21”

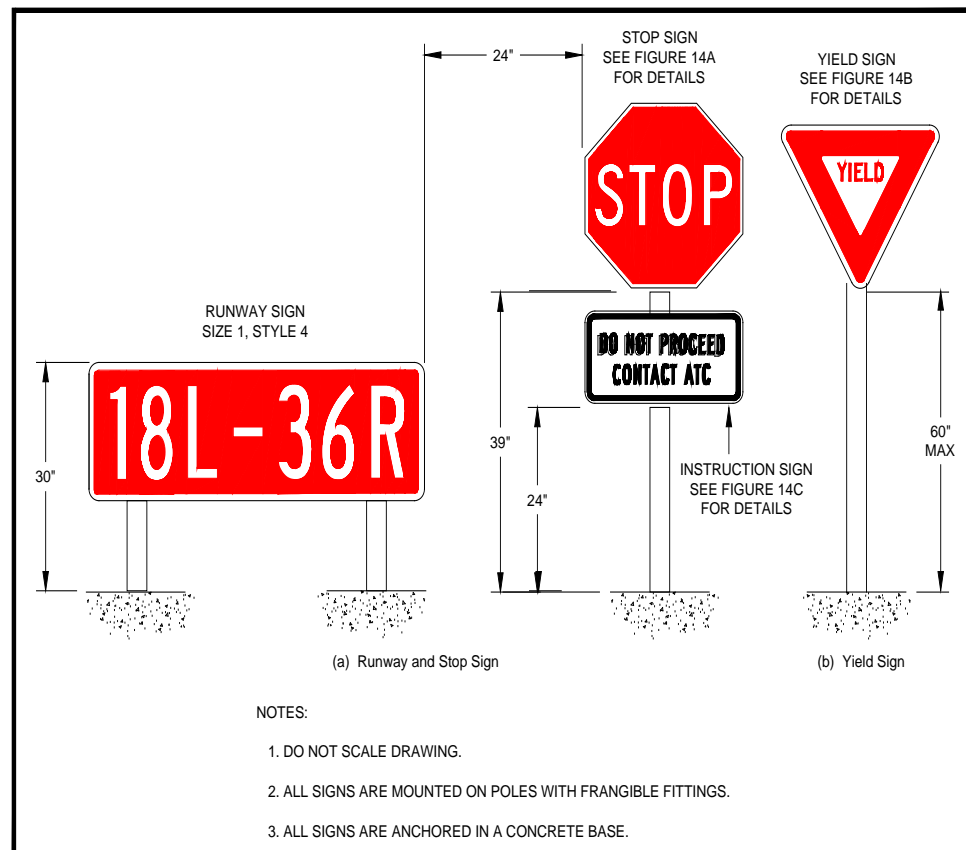


5.4.7.1 A **road-holding position sign** shall be provided at all road entrances to a runway.

Examples of road-holding position signs are contained in the *Aerodrome Design Manual (Doc 9157), Part 4*

**Example:
US FAA**

**Vehicle
Service Roads
in graded
portion of the
runway strip**





Runway Incursions: 2 Lighting

- 5.3.20 **Stop bars**

- Note 2.— Runway incursions may take place in all visibility or weather conditions. The provision of stop bars at runway-holding positions and their use at night and in visibility conditions greater than 550 m runway visual range can form part of **effective runway incursion prevention measures**.

- 5.3.20.6 Stop bars shall consist of lights spaced at uniform intervals of no more than 3 m **across the taxiway**, showing **red** in the intended direction(s) of approach to the intersection or runway-holding position

IN-PAVEMENT STOP BAR



- 5.3.20.7 *Recommendation.*— A **pair of elevated lights** should be added **to each end of the stop bar** where the in-pavement stop bar lights might be obscured from a pilot's view, for example, by snow or rain, or where a pilot may be required to stop the aircraft in a position so close to the lights that they are blocked from view by the structure of the aircraft

ELEVATED STOP BAR



STOP BAR AT NIGHT

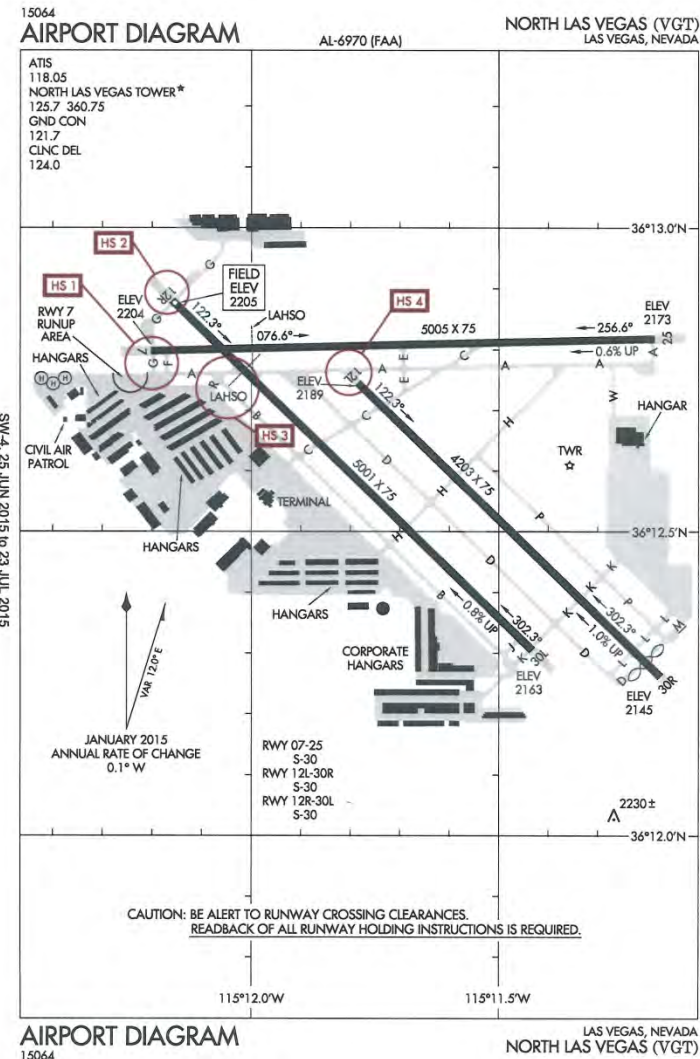
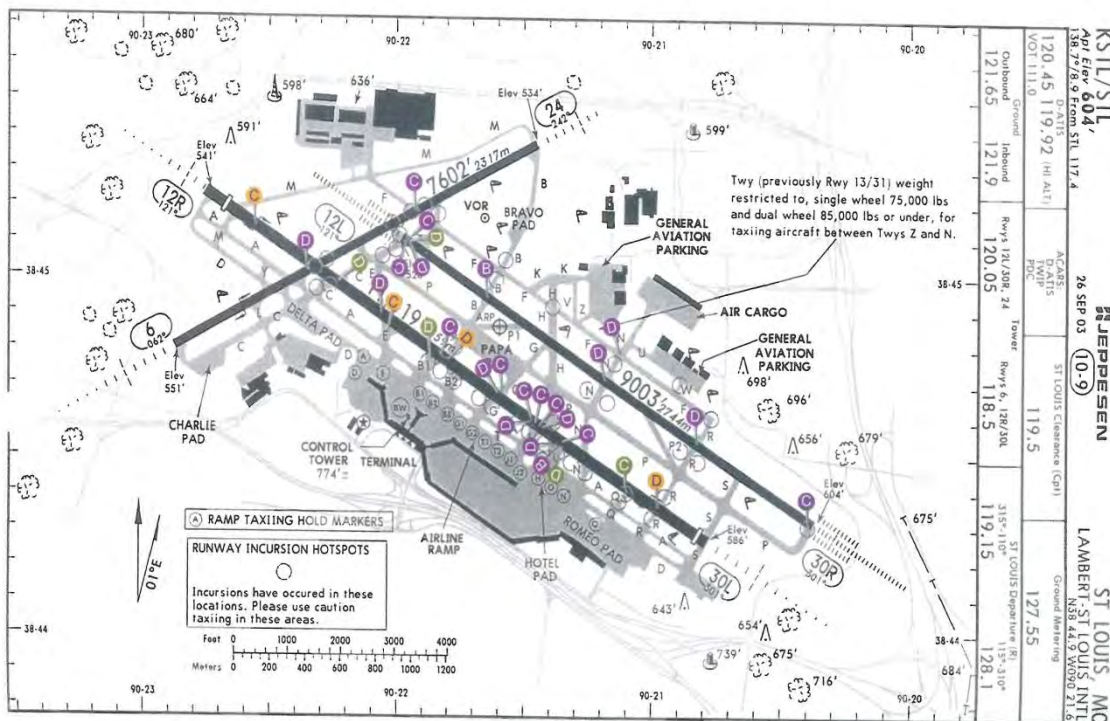


- 5.3.20.1 A **stop bar shall be provided** at every runway-holding position serving a runway when it is intended that the runway will be used in runway visual range conditions less than a value of 350 m, **except where**:
- 5.3.20.2 A **stop bar shall be provided** at every runway-holding position serving a runway when it is intended that the runway will be used in runway visual range conditions of values between 350 m and 550 m, **except where**
 - a) appropriate aids and procedures are available to assist in **preventing inadvertent incursions** of traffic onto the runway; or
 - b) operational procedures exist to limit, in runway visual range conditions less than a value of 550 m, the number of:
 - 1) aircraft on the manoeuvring area to one at a time; and
 - 2) vehicles on the manoeuvring area to the essential minimum.

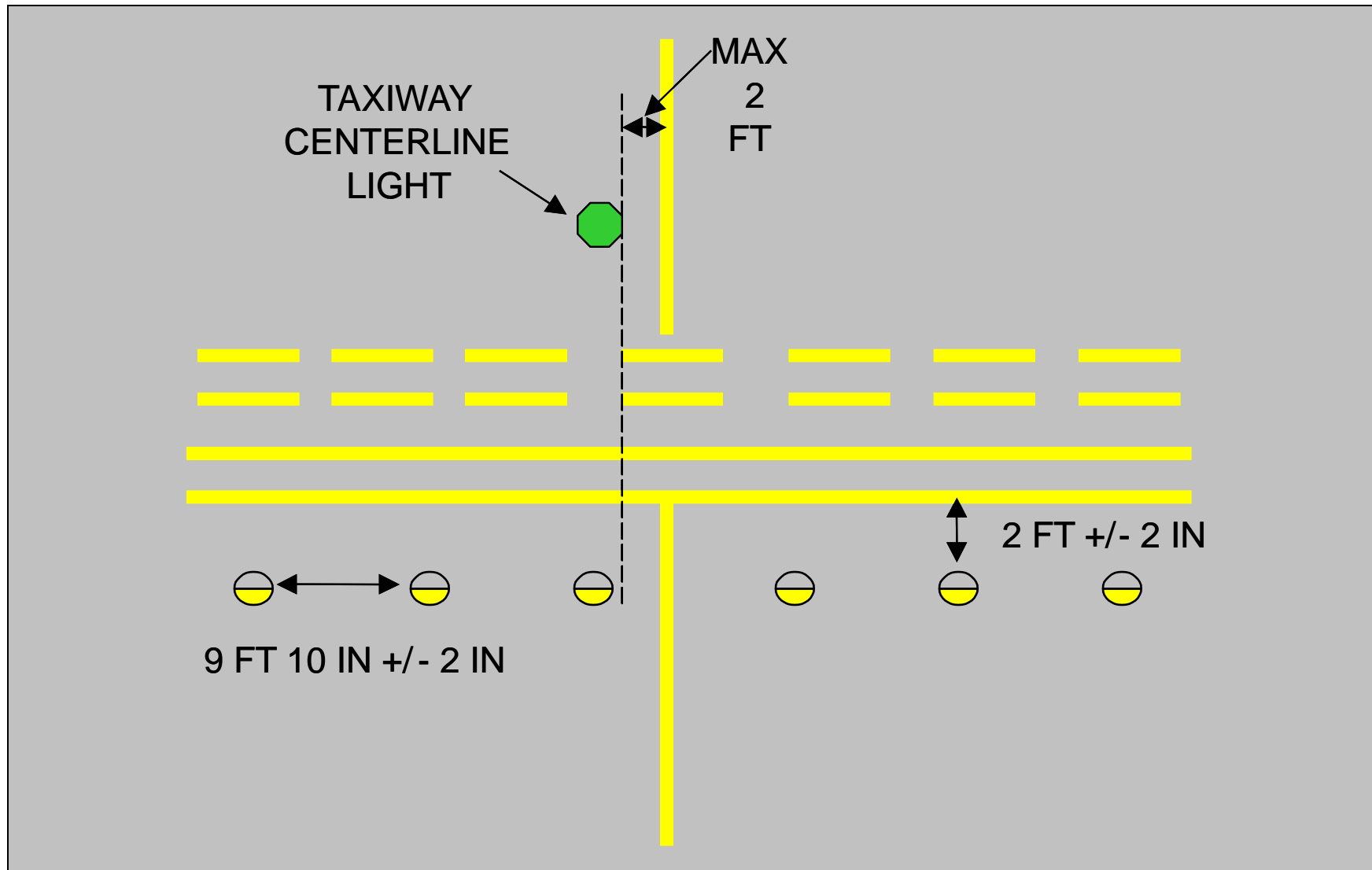
? With so many preventive measures, why do we still have Runway Incursions ?

FY 2000 through FY 2003 Runway Incursions Lambert - St. Louis International Airport

- Operational Errors / Deviations
- Pilot Deviations
- Vehicle / Pedestrian Deviations



RUNWAY GUARD LIGHTS (RGLs)



ELEVATED STOP BAR AND RUNWAY GUARD LIGHT (RGL)



RUNWAY GUARD LIGHTS (RGLs) AT NIGHT



End of Visual Aids Session