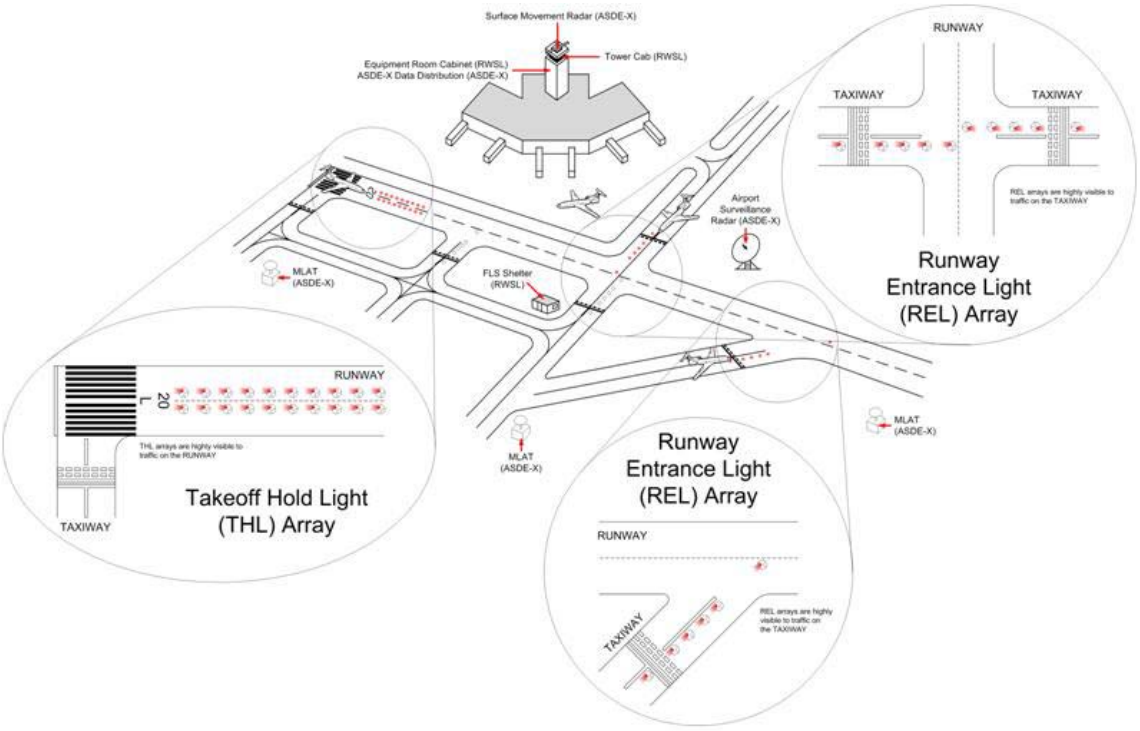
## RUNWAY STATUS LIGHTS : FAA PILOT REFERENCE GUIDE

Runway Status Lights is a fully automated system that provides runway status information to pilots and surface vehicle operators to indicate when it is unsafe to enter, cross, or takeoff from a runway. The Runway Status Lights system processes information from surveillance systems and activates Runway Entrance Lights and Takeoff Hold Lights in accordance with the motion and velocity of the detected traffic. Runway Entrance Lights and Takeoff Hold Lights are in-pavement light fixtures that are directly visible to pilots and surface vehicle operators. Runway Status Lights is an independent safety enhancement that does not substitute for an Air Traffic Control clearance. Clearance to enter, cross, or takeoff from a runway must still be issued by Air Traffic Control. Although Air Traffic Control has limited control over the system, personnel do not directly use, and may not be able to view, light fixture output in their operations.




**The Runway Status Light System**

**Runway Entrance Lights:** The Runway Entrance Lights system is composed of flush mounted, in-pavement, unidirectional fixtures that are parallel to and focused along the taxiway centerline and directed toward the pilot at the hold line. A specific array of RELs will include the first light at the hold line followed by a series of evenly spaced lights to the runway edge; and one additional light at the runway centerline in line with the last two lights before the runway edge. When activated, these red lights indicate that there is high speed traffic on the runway or there is an aircraft on final approach within the activation area.

1. Operating Characteristics - Departing Aircraft:

When a departing aircraft reaches 30 knots, all taxiway intersections with Runway Entrance Lights arrays along the runway ahead of the aircraft will illuminate. As the aircraft approaches a Runway Entrance Lights equipped taxiway intersection, the

lights at that intersection extinguish approximately 2 to 3 seconds before the aircraft reaches it. This allows controllers to apply "anticipated separation" to permit Air Traffic Control to move traffic more expeditiously without compromising safety. After the aircraft is declared "airborne" by the system, all lights will extinguish.

2. Operating Characteristics - Arriving Aircraft:

When an aircraft on final approach is approximately 1 mile from the runway threshold all sets of Runway Entrance Light arrays along the runway will illuminate. The distance is adjustable and can be configured for specific operations at particular airports. Lights extinguish at each equipped taxiway intersection approximately 2 to 3 seconds before the aircraft reaches it to apply anticipated separation until the aircraft has slowed to approximately 80 knots (site adjustable parameter). Below 80 knots, all arrays that are not within 30 seconds of the aircraft's forward path are extinguished. Once the arriving aircraft slows to approximately 34 knots (site adjustable parameter), it is declared to be in a taxi state, and all lights extinguish.

3. What a pilot would observe:

A pilot at or approaching the hold line to a runway will observe Runway Entrance Lights illuminating and extinguishing in reaction to an aircraft or vehicle operating on the runway, or an arriving aircraft operating less than 1 mile from the runway threshold. Whenever a pilot observes the red lights of the Runway Entrance Lights, that pilot will stop at the hold line, or along the taxiway path and remain stopped. The pilot will then contact Air Traffic Control for resolution if the clearance is in conflict with the lights. Should pilots note illuminated lights under circumstances when remaining clear of the runway is impractical for safety reasons (i.e., aircraft is already on the runway), the crew should proceed according to their best judgment while understanding the illuminated lights indicate the runway is unsafe to enter or cross. Contact Air Traffic Control at the earliest possible opportunity.


**Takeoff Hold Lights:** The Takeoff Hold Lights system is composed of in-pavement, unidirectional fixtures in a double longitudinal row aligned either side of the runway centerline lighting. Fixtures are focused toward the arrival end of the runway at the "line up and wait" point, and they extend for 1,500 feet in front of the holding aircraft (see FIG 2-1-9). Illuminated red lights provide a signal, to an aircraft in position for takeoff or rolling, that it is unsafe to takeoff because the runway is occupied or about to be occupied by another aircraft or ground vehicle. Two aircraft, or a surface vehicle and an aircraft, are required for the lights to illuminate. The departing aircraft must be in position for takeoff or beginning takeoff roll. Another aircraft or a surface vehicle must be on or about to cross the runway.

1. Operating Characteristics - Departing Aircraft:

Takeoff Hold Lights will illuminate for an aircraft in position for departure or departing when there is another aircraft or vehicle on the runway or about to enter the runway. Once that aircraft or vehicle exits the runway, the Takeoff Hold Lights extinguish. A pilot may notice lights extinguish prior to the downfield aircraft or vehicle being completely clear of the runway but still moving. Like Runway Entrance Lights, Takeoff Hold Lights have an "anticipated separation" feature.

NOTE - When the Takeoff Hold Lights extinguish, this is not clearance to begin a takeoff roll. All takeoff clearances will be issued by Air Traffic Control.

2. What a pilot would observe:

A pilot in position to depart from a runway, or has begun takeoff roll, will observe Takeoff Hold Lights illuminating in reaction to an aircraft or vehicle on the runway or about to enter or cross it. Lights will extinguish when the runway is clear. A pilot may observe several cycles of lights illuminating and extinguishing depending on the amount of crossing traffic.

3. Whenever a pilot observes the red lights of the Takeoff Hold Lights, the pilot will stop or remain stopped. The pilot will contact Air Traffic Control for resolution if any clearance is in conflict with the lights. Should pilots note illuminated lights while in takeoff roll and under circumstances when stopping is impractical for safety reasons, the crew should proceed according to their best judgment while understanding the illuminated lights indicate that continuing the takeoff is unsafe. Contact Air Traffic Control at the earliest possible opportunity.


**Pilot Actions:**

1. When operating at airports with Runway Status Lights, pilots should turn the transponder "ON" with Altitude Enabled when operating on all taxiways and runways. This ensures interaction with the FAA surveillance systems which provide information to the Runway Status Lights system.

2. Never cross over illuminated red lights. Under normal circumstances, Runway Status Lights will confirm the pilot's taxi or takeoff clearance. If Runway Status Lights indicates that it is unsafe to takeoff from or taxi across a runway, immediately notify Air Traffic Control of the conflict and confirm your clearance.

4. Do not proceed when lights have extinguished without an Air Traffic Control clearance. Runway Status Lights verifies an Air Traffic Control clearance, it does not substitute for an Air Traffic Control clearance.

**Air Traffic Control of Runway Status Lights:**

1. Controllers can set in-pavement lights to one of five brightness levels to assure maximum conspicuity under all visibility and lighting conditions. Runway Entrance Lights and Takeoff Hold Lights subsystems may be independently set.

2. The system can be shutdown should Runway Status Lights operations impact the efficient movement of air traffic or contribute, in the opinion of the Air Traffic Control Supervisor, to unsafe operations. Whenever the system is shutdown, a NOTAM must be issued, and the Automatic Terminal Information System must be updated.