Helipad Perimeter Lighting

2011-IESALC
Wilmington, NC

Vertical Flight

- Advisory Circular (AC) 150/5390-2B provides guidance for illuminating the heliport landing and taxi areas

U.S. Department
of Transportation

Federal Aviation
Administration

Advisory Circular

Subject: HELIPORT DESIGN | Date: 09/30/04 | Initiated by: AAS-100 | AC No: 150/5390-2B | Change:

1. PURPOSE. This advisory circular (AC) provides recommendations for heliport design and describes acceptable requirements to develop a heliport. This AC applies to anyone who is proposing to construct, activate or deactivate a heliport.

2. APPLICABILITY. This AC is not mandatory and does not constitute a regulation except when Federal funds are specifically dedicated for heliport construction.

3. EFFECTIVE DATE. The effective date is September 30, 2004.

4. CANCELLATION. AC 150/5390-2A, *Heliport Design*, dated January 20, 1994, is canceled.

5. EXECUTIVE SUMMARY. The modern helicopter is one of the most versatile transportation vehicles known to man. Typically, a heliport is substantially smaller than an airport providing comparable services. The helicopter has the capability of providing a wide variety of important services to any community that integrates this aircraft

Vertical Flight

- The AC details the requirements in respect to the color, number and spacing of heliport perimeter lights at the Touchdown and Liftoff (TLOF) area and the Final Approach and Takeoff (FATO) area.

- The operational specifications for the perimeter lighting fixture are not stated.

Research Objective

- The Federal Aviation Administration (FAA) Airport Safety Technology Sub-team's Visual Guidance Program is tasked with determining the necessary distance for pilots to identify a helipad of intended landing; and to determine recommendations for operational specifications for heliport perimeter lights.

Vertical Flight

- The heliport perimeter lighting is intended to be the cue that pilots use to acquire the heliport.

- To be effective the lighting should enable the pilot to both establish the position of the heliport and identify the outline shape.

FAA WJHTC Flight Trials

- The research initiative comprised a number of nighttime flight trials at the FAA WJHTC Heliport in Visual Meteorological Conditions (VMC).

- The trials were used to establish the applicable intensity and coverage of the heliport perimeter lighting fixture.

FAA WJHTC Standard Heliport

FAA WJHTC Experimental Heliport

Flight Trials

- During the flight trials certain assumptions were made, namely that:

1. The heliport lighting is the predominant visual feature
2. The fixture is considered to be a point source
3. The visibility is uniform vertically, as well as horizontally
4. The atmosphere is not significantly spectrally selective over the distances involved

FAR Requirements

- The minimum operating visibility and cloud base that was assumed is three statute miles and 1200 feet to meet Federal Aviation Regulations (FAR) Part 91.155 requirements for basic Visual Flight Rules (VFR) weather minimums

Part 91.155

(b) Class G Airspace. Notwithstanding the provisions of paragraph of this section, the following operations may be conducted in Class G airspace below 1,200 feet above the surface:

(1) Helicopter. A helicopter may be operated clear of clouds if operated at a speed that allows the pilot adequate opportunity to see any air traffic or obstruction in time to avoid a collision

Airspace	*Flight Visibility*
Class G, Night	*3 statute miles*

FAA WJHTC Flight Trials

- The aircraft used were the FAA WJHTC Sikorsky S-76A helicopter United States Coast Guard Eurocopter HH-65 Dolphin Helicopter

Lights

- The FAA furnished in-pavement and elevated heliport lights that have been found favorable.

- Specifically
  - 12 in-pavement at the edge of the 45 ft. TLOF
  - 16 elevated at a 75 ft FATO perimeter.

Markings

- Heliport was painted Handicap Blue
  - White cross in center.
  - Red H in center of white cross.

Old Pad

- Simple unmarked 45 x 45 ft piece of concrete.
  - 14 inches thick, reinforced rebar cage
- Pilots had difficulty finding the correct place to land.
- Patient's family would park RV's on the pad.

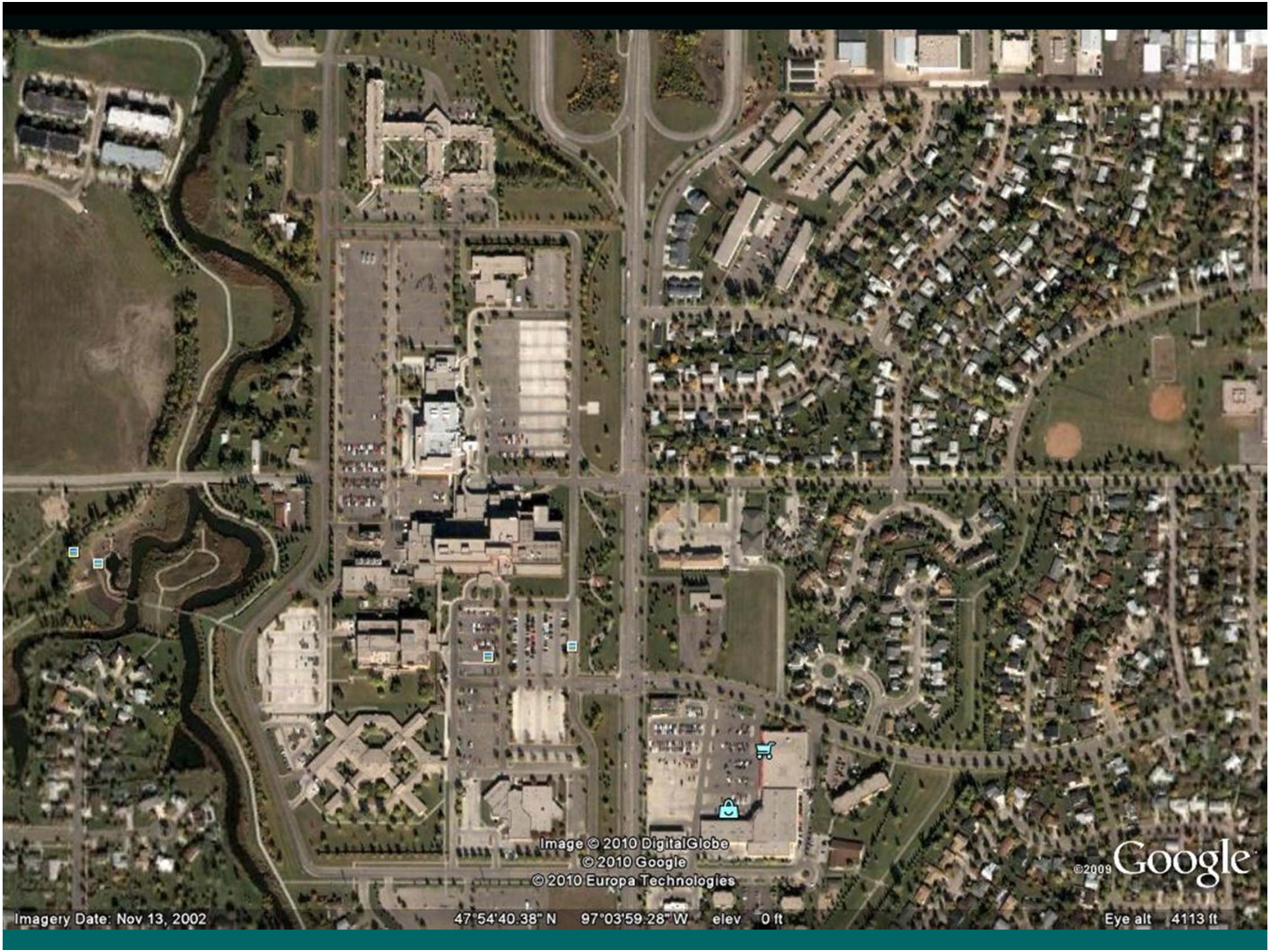
Image © 2010 DigitalGlobe
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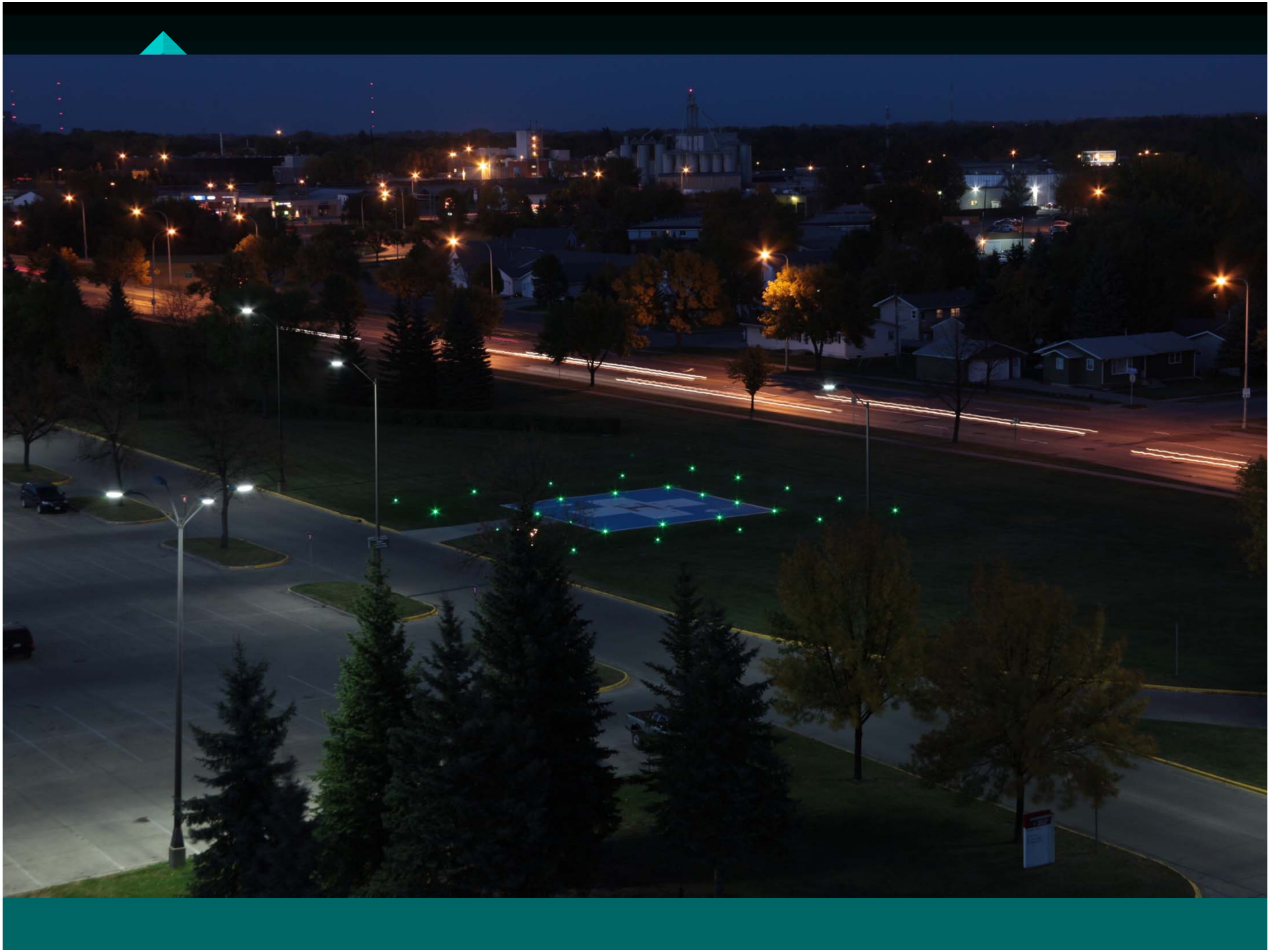


Testing Protocol

- Night operations – 6&9 degree approach
- VMC – Three miles visibility
- Discover distances for usability for approach.

Results

- Pilot results vary – Too bright at night, too dim during the day.
- One pilot requested blue lights to offset the green grass.
- All agree the heliport markings help.
- Due to surrounding trees and low altitude, they aren’t seeing the pad until about two miles.

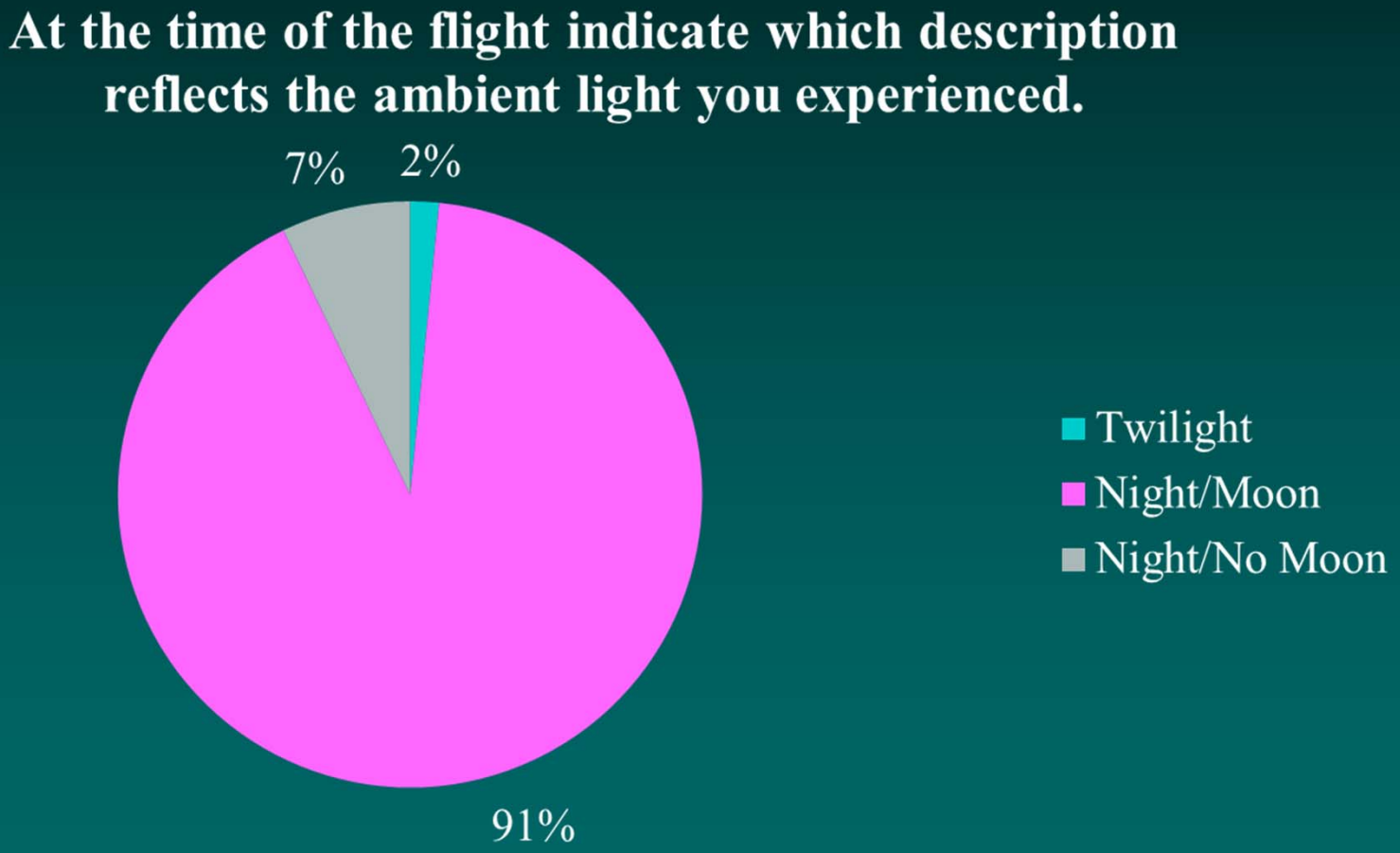
Results

- Many are now complaining about street lights and unlit antenna on roof of hospital.
- Complaints of no beacon.
- Once the pad was properly marked, assumptions were made about the surrounding area.

Demographics

- Total: 300 Data Points
- Participants in the HLS research study included:
  - 18 helicopter pilots
    - EMS Pilots from Merit Care and North Memorial hospitals
    - ROTC helicopter students
    - UND Faculty and staff including UND Helicopter flight instructors
  - Total flight time: Range – 200 to 15,000 hours

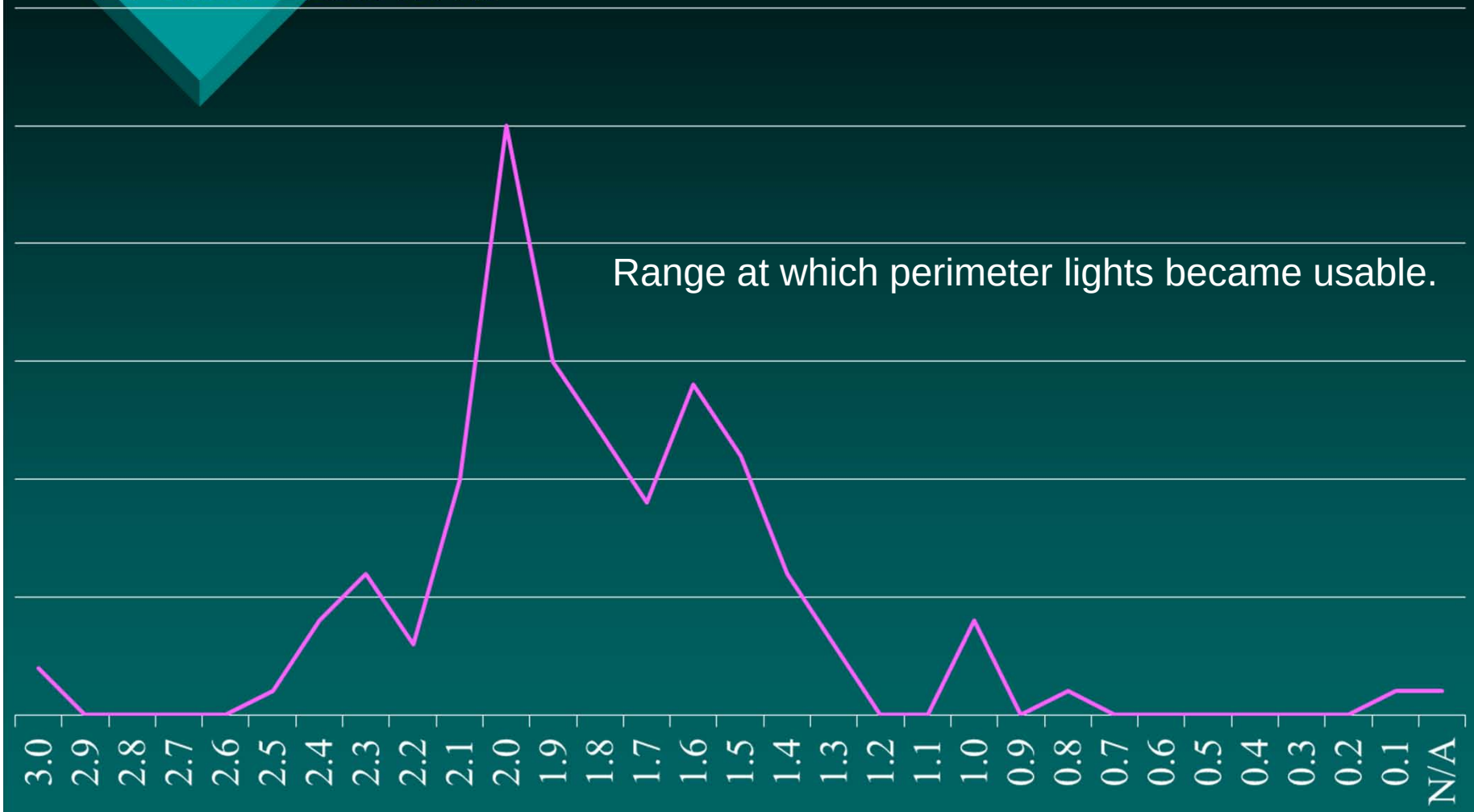
Data Results



Data Results

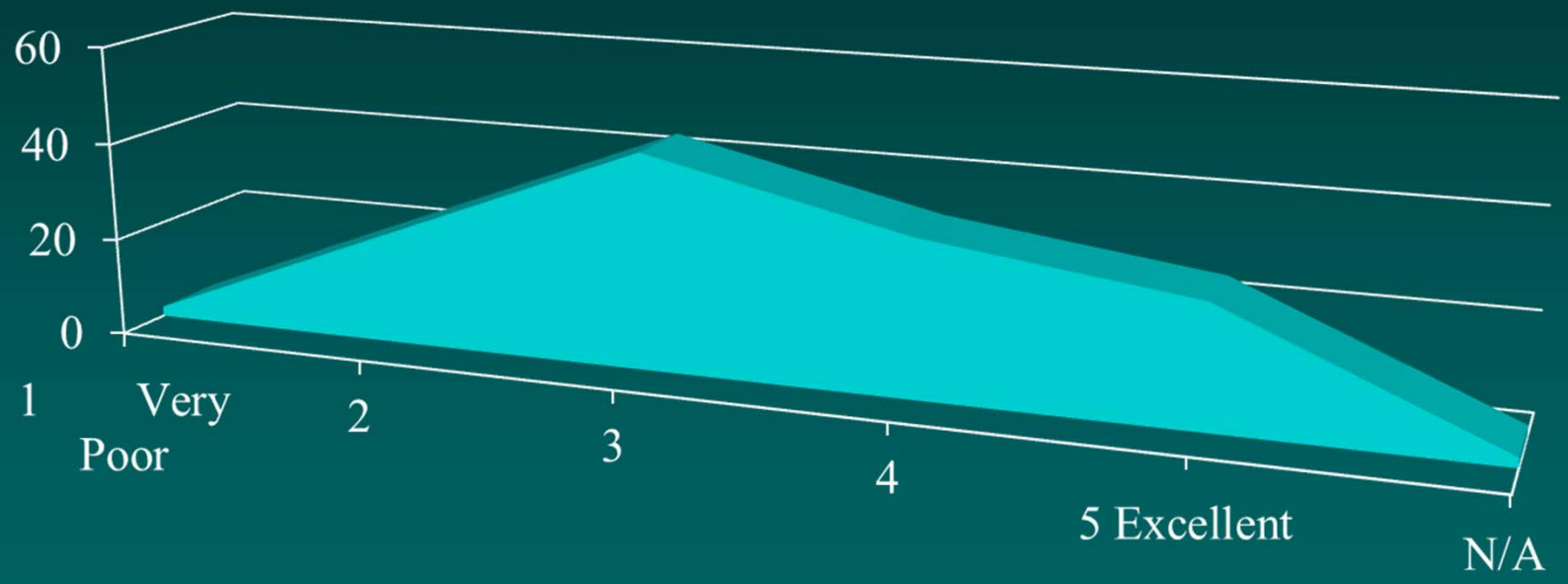
Indicate what precipitation best describes what you experienced when using the heliport perimeter lighting.

Data Results



Data Results

Assign a rating from 1 - 5 (1 = very poor, 5 = excellent) rating of the 'appearance of green' of the perimeter lights



Gilbert Hospital

Here you can see the current lighting system installed.

Gilbert Hospital is approachable from 270 degrees.

Testing Protocol

- 1 & 3 Degree Approaches
- Over-flights giving minimum angle through 90 degrees.

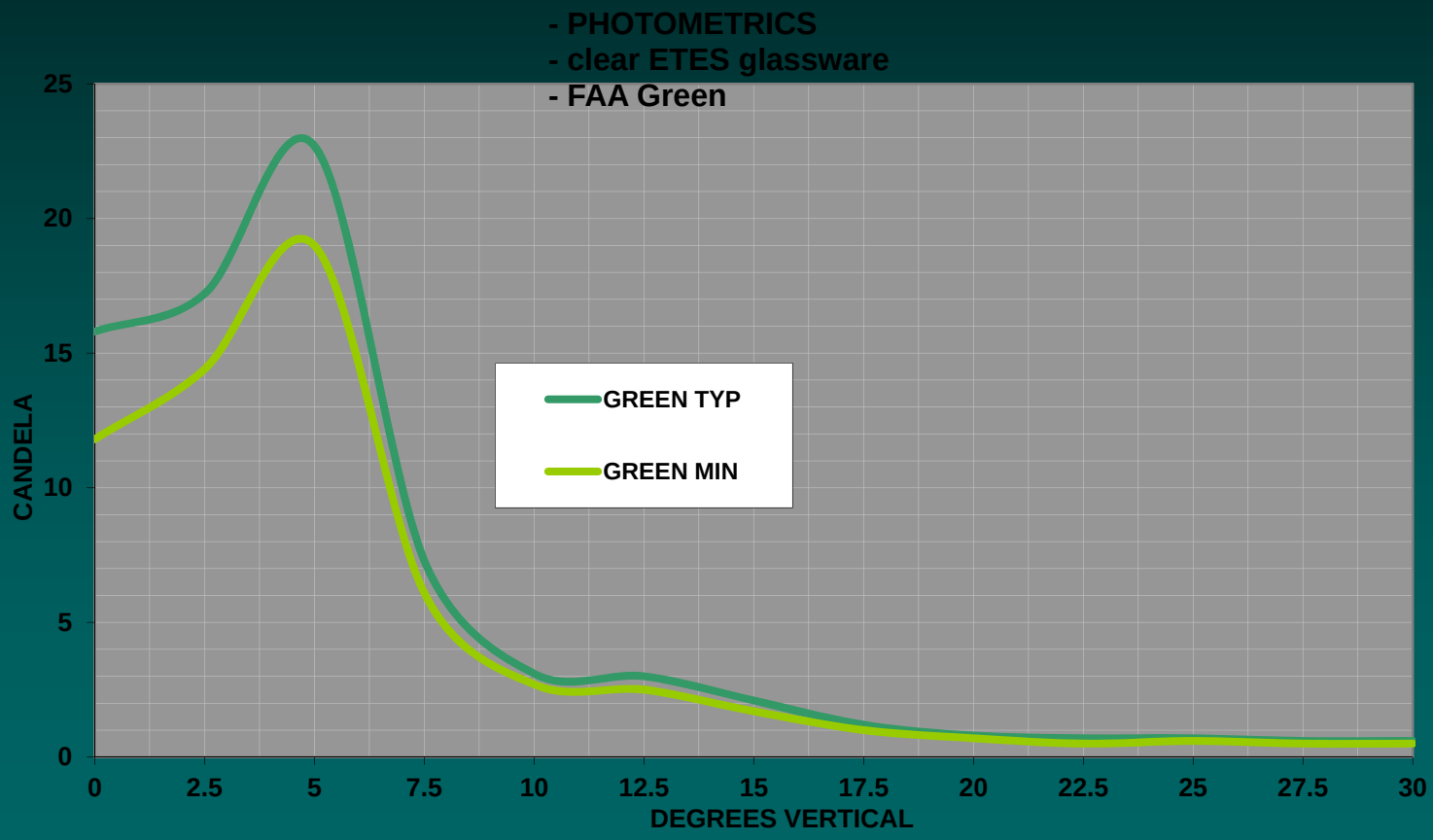
Results

- At one degree, helipad was identified at an average of 0.8 miles.
- At 15 degrees, helipad was identified at an average of 2.0 miles.

Results

- High Altitude Flights
  - One statute mile AGL - 22 degrees, 2.7 statute miles
  - Two statute miles AGL – 31 degrees, 3.9 statute miles
- Pilots kept visual contact through 90 degrees

Fixture under Test
Intensity Data – Manufacturer A–120v



Perimeter Lighting Intensity Recommendations

Color	0 to 10 degrees		10 to 90 degrees
	Minimum	Minimum Average Intensity	Minimum
Green	10	15	5

Perimeter Lighting Intensity Recommendations

- In accordance with the photometric requirements in FAA AC No: 150/5345-46D "SPECIFICATION FOR RUNWAY AND TAXIWAY LIGHT FIXTURES" the:

- The average measured intensity may not be more than three times the specified average intensity. For fixtures with a minimum but no average intensity requirement, the measured minimum may be no more than three times the specified minimum intensity.


Maricopa Medical Center
12/11/2010

Questions?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12/11/2010