



Copyright of Mr. Bruce Lomasky

Why LEDline® Linear Visual Aids Help Pilots More, Improving Helipad Safety!

Why Use Linear Helipad Visual Aids?

Fact: Linear Visual Aids Give Helipads Dimension. At night, everyone loses their depth perception, however, because of the lit angularity provided by the linear visual aids, their effect is to essentially restore a pilot's lost nighttime depth perception! Point source visual aids, just cannot do this as well.

Whatever the approach angle of the helicopter, the helipad area with linear visual aids is not only easily seen but allows pilots to better judge distances; distance to target; their closing speed; rate of drift, if any; height; rate of decent and many other vectors, all of which, improves pilot / helipad safety.

Point source visual aid lights cannot do this since from the same distances, pilots cannot judge which light is in front of which or is beside the other, unless they are high up, almost above a helipad area. Therefore, point source visual aids lack many of the highly useful visual cues which significantly help pilots in landing a helicopter at night.

Point Source Visual Aides:

- At night, due to everyone's nighttime lack of depth perception, unless one is almost on top of a helipad's point source visual aids, it's difficult for pilots to see the area of a helipad, especially at low approach angles. At such, from distances, with the point source visual aids pilots with low approach angles, see a confusing mix of points of light. Again, because of the depth perception issues, pilots cannot determine which light is in front of which, or which

light is beside another, so there is no easily discernible pattern. For hospital helipads, this is confusion may slow down the helipad target acquisition, which for hospitals needing critically injured patients to be delivered as soon as possible, is an issue.

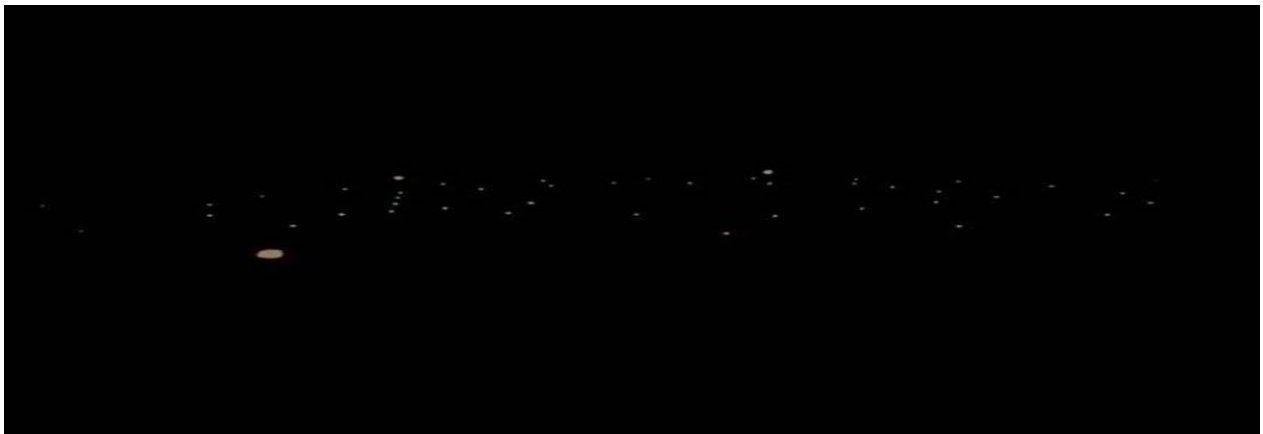
- In addition, in cities with myriads of point source lights, it is often even difficult to pick out the point source helipad landing area visual aids with all the other background point source lights, another possible area for pilot confusion and delay. **Linear lights look different, so are far more easily seen.**

The Differences Illustrated between Point Source and Linear Visual Aids: The picture below is a typically lit point source helipad which was taken immediately adjacent to the helipad. It was darkened to represent nighttime.

Despite the proximity and knowing the helipad is there and how it looks, the point source light pattern is difficult to make out. **Note:** This helipad, unlike most city helipads, has no other point's source lights around further distracting and complicating the issue, yet its pattern is still difficult to make out.

Now imagine, in a moving helicopter, pilots trying to make out what these points lights represent from a distance, which light is in front of which or which light is next to which etc.?

Imagine a pilot unfamiliar with the helipad or its location, trying make out the pattern?



The Same Identical Picture in Daylight with the Same Point Source Visual Aids at the Same Intensity: Add more ambient light to the same identical picture, viewed at the same angle, distance and the point source light pattern emerges. Because of this, it is clearly not the lit visual aid lights that achieves this recognizable pattern, but is due much more the higher ambient daylight and the now visible linear painted lines, that allows one to see the helipad lighting pattern.

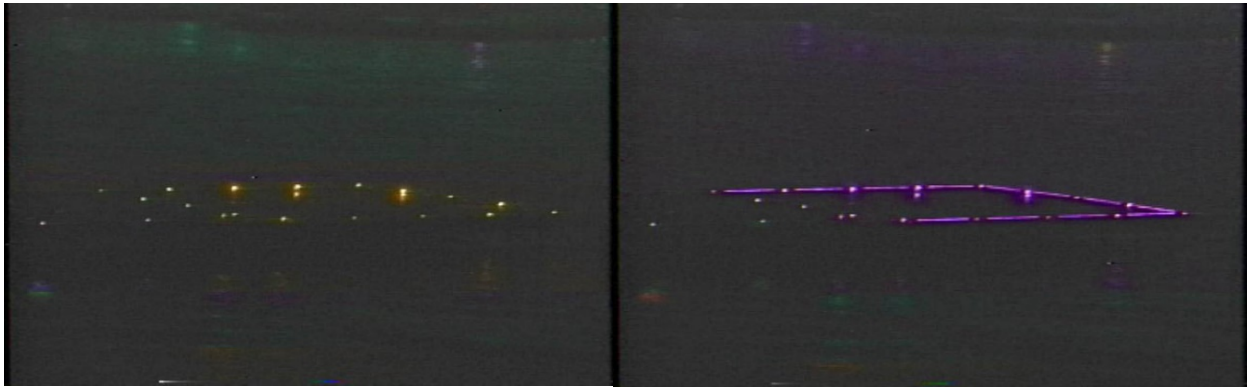
To be helpful to pilots; any helipad visual aids, lit or not, must be able to provide pilots with clear, non-confusing views of the helipad area, regardless of ambient light or approach angle height.



Another example; from the FAA / Port Authority New York and New Jersey (PANYNJ) Downtown Manhattan Helipad Trial using identical before and after same angle nighttime pictures; Copyright Port Authority New York and New Jersey.

Downtown Manhattan Helipad Before.
With only the FAA point source visual aids

Downtown Manhattan Helipad After.
With FAA point sources and linear LEDline®



It is clear that the above “before” picture, has a confusion of point sources. Even knowing what one is looking at, one is not completely certain of the helipad landing area. The “after” picture with the addition of the linear LEDline®, makes it much easier and more certain that one is viewing the helipad landing area.

Note: These are still pictures, from a distance on the ground. As such everything is steady so the visual aids are not moving around. Pilots, viewing these from the air, with their helicopter moving around in the air would make the point source visual aids far more difficult to identify.



From the Video of the Downtown Manhattan Helipad during FAA and PANYNJ trial.

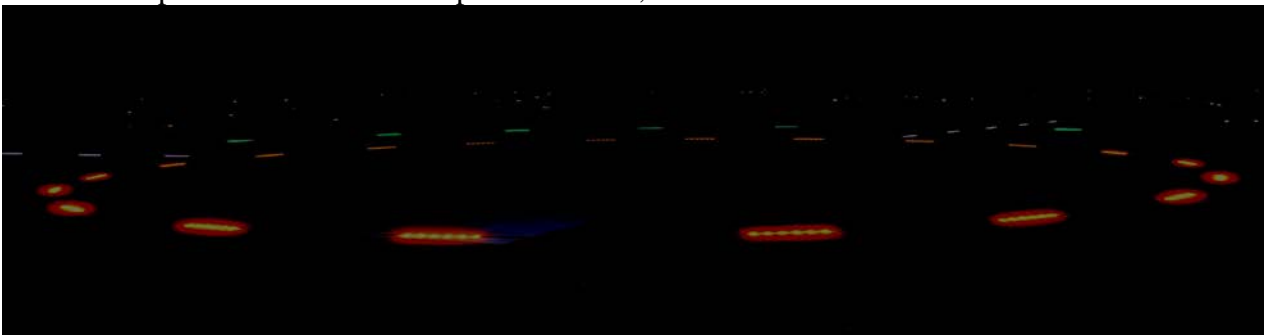
Please Note: A video of this FAA trial can be found at www.ledline.net under the helipad section. The video documents both standard FAA point source visual aids vs. linear visual aids on the same helipad. **Directly comparing the two visual aids, clearly demonstrates why linear visual aids, at all approach angles, are better and so why the pilot's ratings there were so favourable.** The Downtown Manhattan Helipad, FAA / (PANYNJ) Linear Helipad Trials, published by the FAA Nov 1999 (DOT/FAA/ND-99/1) is public and still available.

Note: The FAA document includes the very favourable pilot survey reports raw data, as well as a (PANYNJ) letter on how much better were the linear visual aids.

Linear LEDline® Visual Aids:

- With linear lights, even at low approach angles, nighttime or daytime, because of the linearity and the various lit linear angles the sections make, there is no confusion, pilots clearly see the helipad's visual aid pattern and the helipad's defined area.
- In addition, in cities where there are millions of similar point source lights competing for attention with point source visual aids, linear helipad visual aids look different, so are far more easily seen.

A darkened picture of Kilmore Hospital Australia, with linear LEDline® visual aids



Here it is clearly the lit linear visual aids that make the difference, clearly differentiating the helipad area despite the low viewing angle.

The same identical Kilmore Hospital Australia picture with more ambient light.



Please Note: It is clearly the lit linear LEDline® rather than the increased ambient light that makes the difference of clearly differentiating the helipad area, despite the low viewing angle.

Other Linear Helipads:

The picture below is from a helipad in Connecticut, USA using LEDline®. The helipad is used by the local hospital as a nighttime Emergency Medical Services (EMS) helipad, hence the lit “H” and lit aiming circle. Such linear visual aids provide dimension at night and clearly mark the touch down area. Here, the linear dimensionality provide all the vector guidance, allowing EMS pilots to land more gently, which is especially important when carrying injured patients.

The darkened picture;



Copyright of Mr. Bruce Lomasky.

The same picture with more ambient light. For viewing pilots they receive the same guidance.



Copyright of Mr. Bruce Lomasky, the picture and video of the USA helipad can be found on our web site www.ledline.net under the Helipad section, or is on YouTube™ at <https://youtu.be/9Q3vCXEab2o>

As can be seen from the video;

- **Even approaching or hovering directly over the helipad, because the lights block the vertical 90° degree light emissions, there is no glare from LEDline® linear lights to distract pilots.**
- Again, from distances, compared to point sources, linear lights much better define the helipad area at **all approach angles**. This means that at night, from distances, a helipad's dimensions can be easily seen, at even low approach angles. As such, pilots can judge;
 1. distance to target;
 2. closing speed;
 3. drift (if any);
 4. height;
 5. rate of decent;
 6. and many other vectors, all of which improves pilot / helipad safety.

Therefore, **LEDline® linear visual aids improve the safety of the helipad by allowing pilots to view the helipad area from a whole variety of approach angles.**



The touch down area with the lit aiming circle and lit “H”, both important for hospital helipads, as it allows pilots to land more gently, which is important for critically ill or injured patients.

Note: A Pdf drawing of the helipad here is available and demonstrates how each of the induction powered visual aid elements; the lit “H”; the Aiming Circle; the TLOF; and the FATO can all be individually adjusted as to any desired intensity.

Linear LED LEDline® for Helipads:

LEDline® comes in two different completely sealed, submersible, omni-directional types;

- a LEDlineHB™ with embedded 6 LEDs, with or without the optics and silvered spot preventing light emission at the 90 ° vertical position.
- or a much brighter (daylight visible) LEDlineSunHB™ with embedded 12 LEDs, with or without the optics and silvered spot preventing light emission at the 90 ° vertical position.

All LEDline® components are submersible. They;

- are very tough, (please see the video of LEDline being struck with a pointed steel brick hammer at a trade show www.ledline.net),
- are powerful, with the individual LEDs embedded into a solid plastic matrix which comes in standard two ft. (610mm) lengths. (**Note:** If desired, custom longer lengths can be made),
- can be added together to create any desired length of visual aid, so are easily installed in whatever length one wants and can even create in-pavement signage and numbers,
- have non-contact induction power pick up connectors, eliminating the usual weakest link in all electrical systems, “the electrical connection”,
- can have optics embedded in with the LEDs to prevent light emission at the vertical 90° degree, preventing pilot glare whilst hovering to land,
- are submersible, the LEDs, their circuits and their non-contact (no hard wiring) induction connectors are all submersible and are resistant to de-icing pad chemicals,

- have, for ease of any service, an aluminium Mounting Plate which is fixed into the pavement and which in turn, locks the LEDline® flush into the pavement, so the lights are snow plough able,
- are energy efficient and **melt snow without having any other heating elements**, other than the LEDs,

As with the hospital helipads in Australia, the UK, and the enclosed USA helipad pictures and video, all clearly demonstrate how linear visual aids much better define the helipad area, allowing pilots to judge; distance to target; closing speed; drift (if any) height; rate of decent and many other vectors, all of which improves pilot / helipad safety.

Nick Hutchins Oct 2017