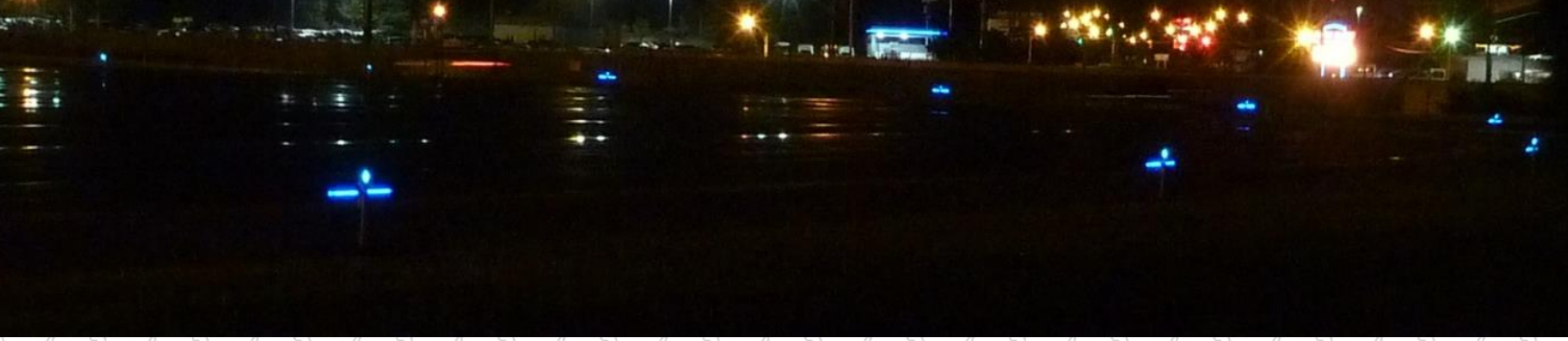


Luminaerospace LLC

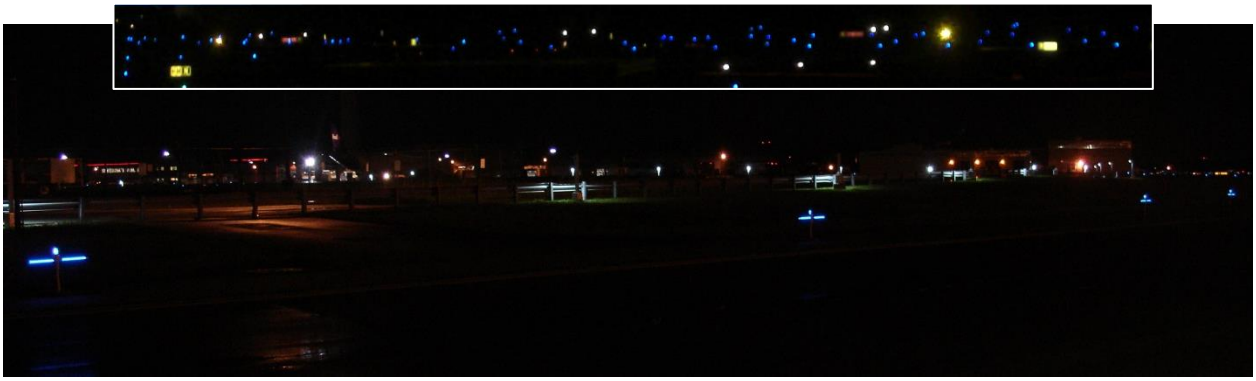
White Paper: Linear Taxiway Lighting

Scott Stauffer, CoFounder, Luminaerospace, LLC
sstauffer@luminaerospace.com

Pavement Edge Light Safety System

A Visual Enhancement to Airfield Lighting using Linear Fixtures

For over 60 years, boundary edge lighting has been limited to single points of illumination. The taxiway Pavement Edge Light Safety System provides a much needed improvement to the traditional "nodes of light" by adding an illuminated horizontal linear bar that is aligned with the pavement edge. Individual nodes of light can become confusing at night, during reduced visibility periods or when approaching the lights from an angle out of alignment with the runway or taxiway. These lights may appear as a "sea" of random lights which fall short of providing adequate visual cues for pilots to safely navigate around the airport. The addition of a linear light source to existing taxiway light fixtures provides information related to both the location and the orientation of the pavement edge, greatly enhancing the visibility of the boundary.



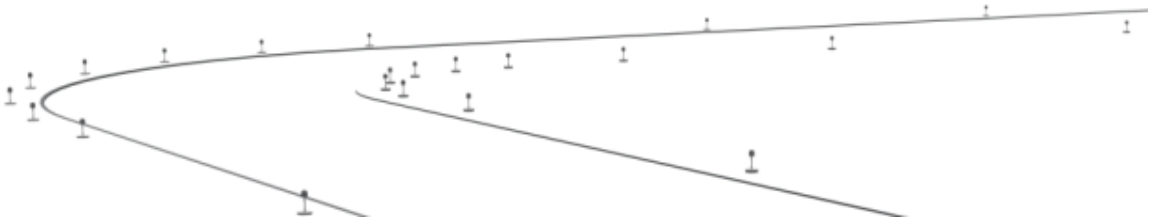
The National Transportation Safety Board has identified situational awareness of pilots about an airport as a main contributor to runway incursions around the world; in 2012, this issue topped the NTSB "Most Wanted" list. The number of incidents, accidents, incursions, and excursions that occur each year would be greatly reduced by improving the ability of pilots to quickly recognize safe runway exit locations and to better recognize the runway/taxiway intersections they are approaching.

Individual points of light have offered a basic foundation for situational awareness. To more effectively represent edge lines, they have been placed much closer together, like the pixels on a video monitor. Research about utilization of line segments on video displays correlates to the positive feedback received from pilots and ground personnel who have viewed linear edge lighting. This same research has also shown that short sequences of discontinuous lines allow the brain to efficiently interpolate line sequences and create a complete representation of an image without using a continuous line. In many cases, the traditional point source lighting has been spaced much closer together than required by specifications; these additional costs can be avoided with linear fixtures.

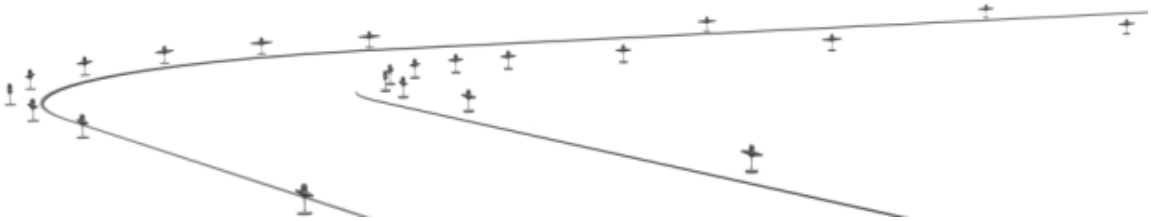
Due to factors such as improved safety, casualty avoidance and project cost savings, several existing lighting manufacturers have begun design and testing to offer linear lighting in the near future. This subtle adaptation of the traditional taxiway light allows the human brain to easily interpolate the actual boundary edge from this additional visual cue.

Luminaerospace, LLC demonstrated this new lighting fixture at Ohio's Cleveland Hopkins Airport (CLE) for over a year, through all weather conditions. The system allows Pilots to intuitively recognize the actual pavement edges at night and/or in inclement weather. Additional enhancements have been made that allow advanced cockpit displays to detect infrared light for heads up displays and night vision goggles. The new lights improve pilot situational awareness even in good weather.

The traditional view:



With linear fixtures instead:

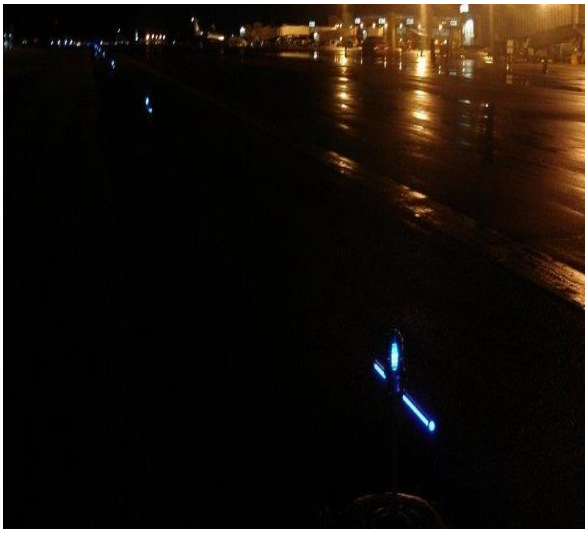


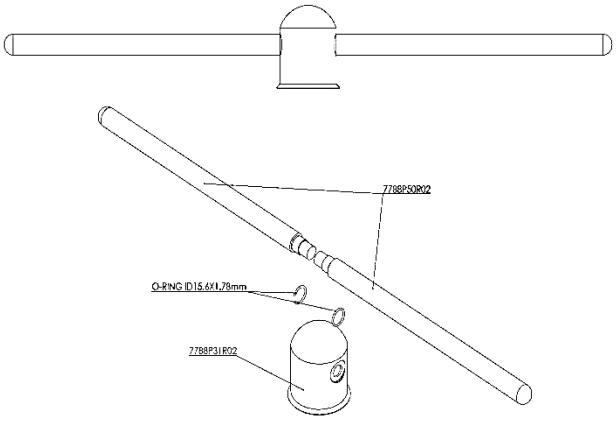
The lighted linear bar uses significantly less energy than the traditional incandescent light incorporating a form factor that decreases accumulation of ice without using heat.

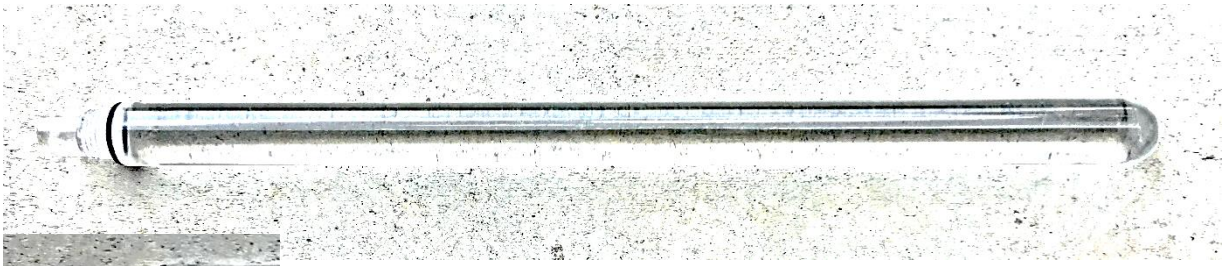
Please provide your feedback quickly and easily through this three-minute survey… (http://surveymonkey.com/s/GQGHP9H). Your willingness to participate may influence the speed at which this improvement is implemented and has the potential to improve operational safety in our industry. Linear lighting is as beneficial to ground operations personnel as it is for pilots; all are invited to provide their input.

Members of Luminaerospace, LLC are comprised of both aviation professionals and experienced passengers who recognized the need for improved boundary recognition. Luminaerospace, LLC was founded in 2010 as an intellectual property holding company for the patents related to elevated linear lighting segments. Patents have been granted in North America, Europe and Asia with additional protection pending in South America. The need for an improved boundary edge light has been recognized by pilots, airport personnel and passengers. The enhancement of this Pavement Edge Light Safety System has been embraced by many in the aviation community.

For this safety improvement to be released, lighting manufacturers will proceed with design of their own versions to be certified by Intertek in accordance with the existing FAA specifications. It is the mission of Luminaerospace, LLC to license this technology to all existing airport lighting manufacturers and to encourage industry wide use of elevated linear lighting.







WWW.LUMINAEROSPACE.COM