

REVIEW OF LIGHT-EMITTING LANE DEMARCATIION TECHNOLOGIES



Investigating the potential applications of light-emitting lane demarcation technology.

Western Australia (WA) has a vast rural road network, often with limited access to roadside lighting and clear demarcation. Low visibility may be one of many contributing factors to annual road fatalities, which are higher on regional roads than metropolitan roads. Improving the visibility road marking on the rural road network will improve safety for motorists.

Background

There are several potential benefits associated with the implementation of light-emitting lane demarcation technologies in WA such as reduced cost and improved road safety, particularly on the rural road network. The use of luminescent line and pavement markings, as well as solar-powered road studs and guardrail lights, offer an environmentally friendly, sustainable solution to lighting in areas that are difficult to access with conventional power sources.

Technology

- Luminescent line marking

Evaluation

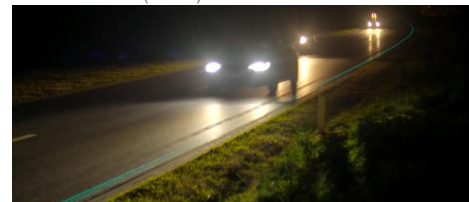
- ✓ Trial based in Netherlands
- ✗ No published data on durability
- ✗ Visibility diminish if in front of vehicle headlights
- ✓ Australian supplier
- ✗ No published data to evaluate compliance
- \$ No published cost information

- Luminescent pavement marking

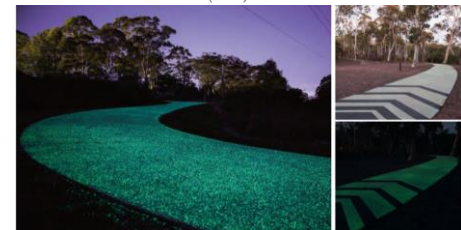
- ✓ Pathway trials only
- ✗ No published data on durability
- ✓ Visibility is high if adequately charged during daylight
- ✓ Australian supplier
- ✗ No published data to evaluate compliance
- \$ Published cost \$83/m² – \$206/m²



Source: BBC (2014)



Source: Moon Deck (n.d)



Source: Houston Chronicle (2016)



Technology

- Solar-powered road studs
- Solar-powered guardrail lights

Evaluation

- ✓ Multiple trials
 - ✗ Inconsistent reports on durability
 - ✓ Superior visibility to conventional road studs
 - ✓ Australian supplier
 - ✗ No published data to evaluate compliance
 - \$ Published cost \$29 (Without retro reflectivity) to \$58 (With retro reflectivity) each
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- ✗ Few trials
 - ✗ No published data on durability
 - ✓ Solar-powered options provided inadequate visibility
 - ✓ Australian supplier
 - ✗ No published data to evaluate compliance
 - \$ Published cost \$45 each



Source: SA Road Studs (n.d).



Source: TRL (2006)



Source: Voight et al. (2008).

Recommendations

It is recommended that Main Roads considers the following:

- Due to the novelty of the luminescent line markings and luminescent pavement surfacings, no further action should be undertaken until these technologies mature.
- Performance trials for solar-powered road studs and solar-powered guardrail lights should be considered to determine if these products fit into current specifications and are able to deliver economic benefits to Main Roads and road users.

References

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SA Road Studs, <<https://www.saroadstuds.co.za/wp-content/uploads/2015/11/Solar-Reflective-Aluminium-Road-stud4.jpg>>.

TRL 2006, *Driver behaviour in response to actively illuminated road studs: a simulator study*, PPR143, Transport Research Laboratory, Wokingham, UK.

Voight, AP, Carson, JL, Tydlacka, J & Gray, LS 2008, *Applications of illuminated, active, in-pavement marker systems: a synthesis of highway practice*, NCHRP synthesis 380, Transportation Research Board, Washington, DC, USA.

