



INTEGRATED
TRAFFIC SOLUTIONS



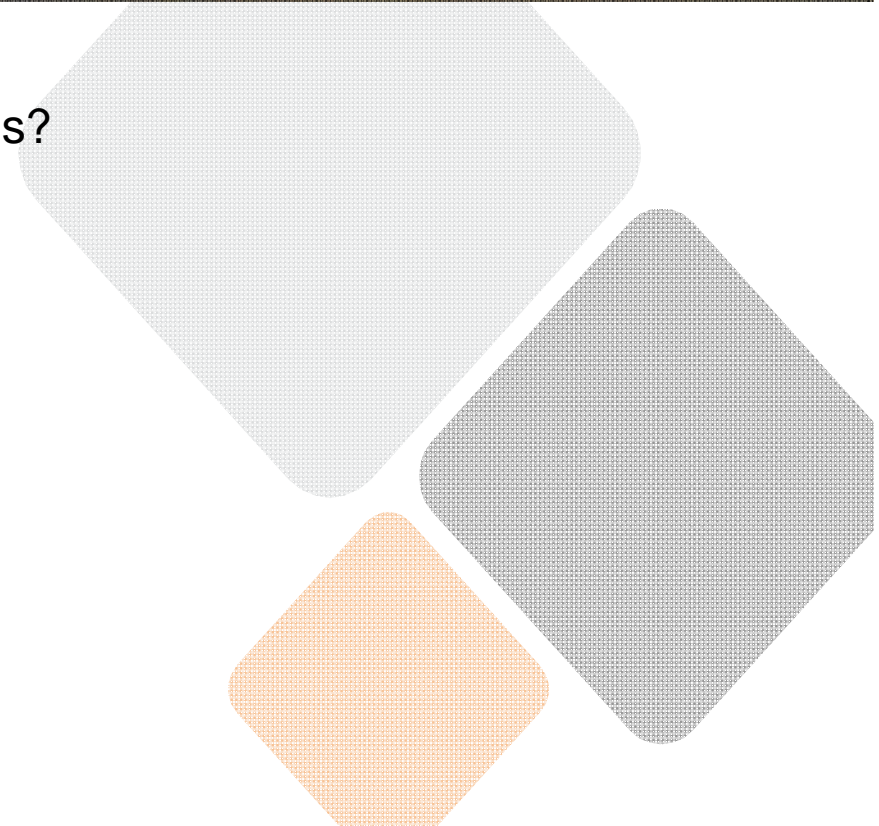
Internally Illuminated Road Studs

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CONTENTS / PRESENTATION OVERVIEW

- What are internally illuminated road studs?
- What types of studs are there?
- What are they used for?
- How are they installed?
- Questions





What are Internally Illuminated studs?

Internally illuminated road studs



Two Types



Solar Powered



'Hardwired' systems



Solar Powered Studs

Components:

- Solar Panel
- Polycarbonate/Metal casing
- Reflective face
- LED outputs
 - These range between 1 and 3 per side for available stud types.
 - The number of LED's can affect output length
- Energy Storage device – eg Nickel Metal Hydride battery

Internally illuminated road studs



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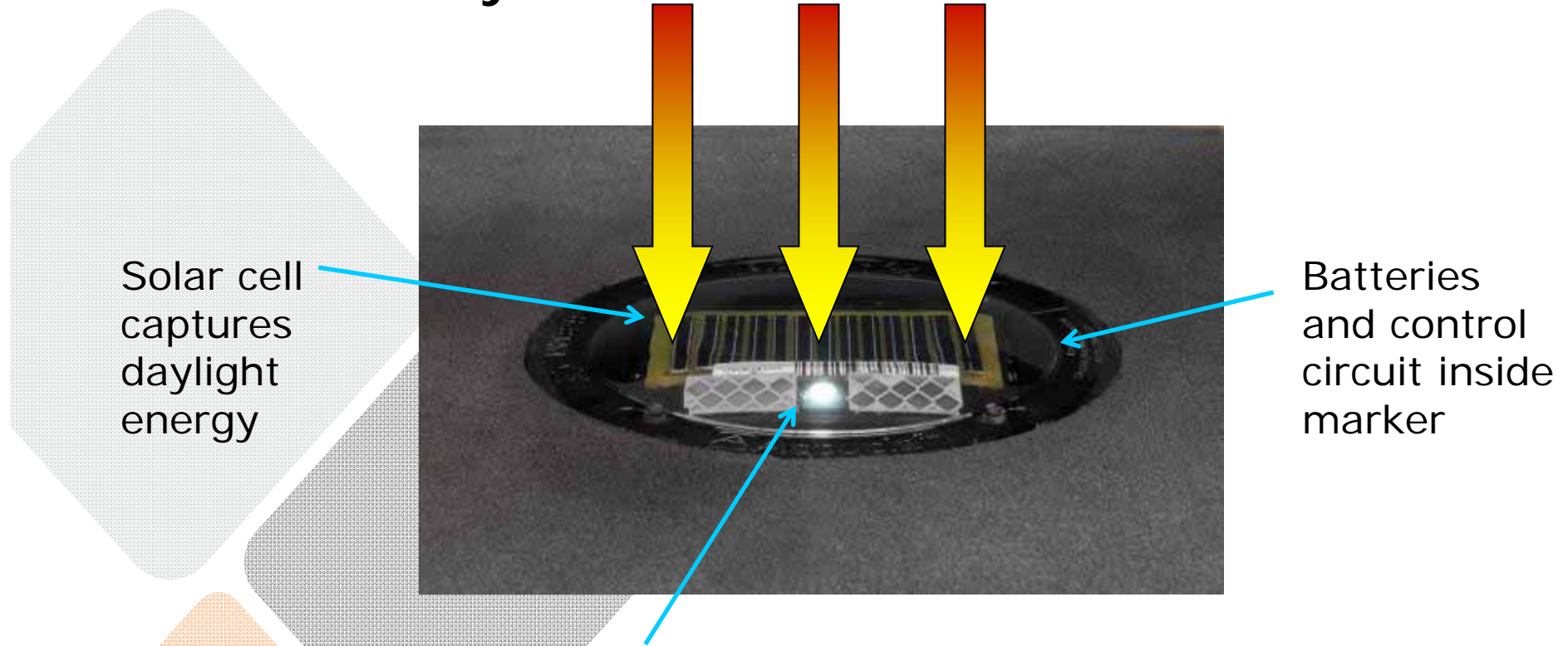


Internally illuminated road studs



Solar Powered Studs

How do they work?



Internally illuminated road studs



Solar Powered Studs

Expected Lifespan – 3to7 years

- Dependant on:
 - Installation location
 - Quality of materials
 - Number of LED's
- Min 1000 on/off cycles as per M/29 spec



Internally illuminated road studs

Solar Powered Studs

Where are they suitable?

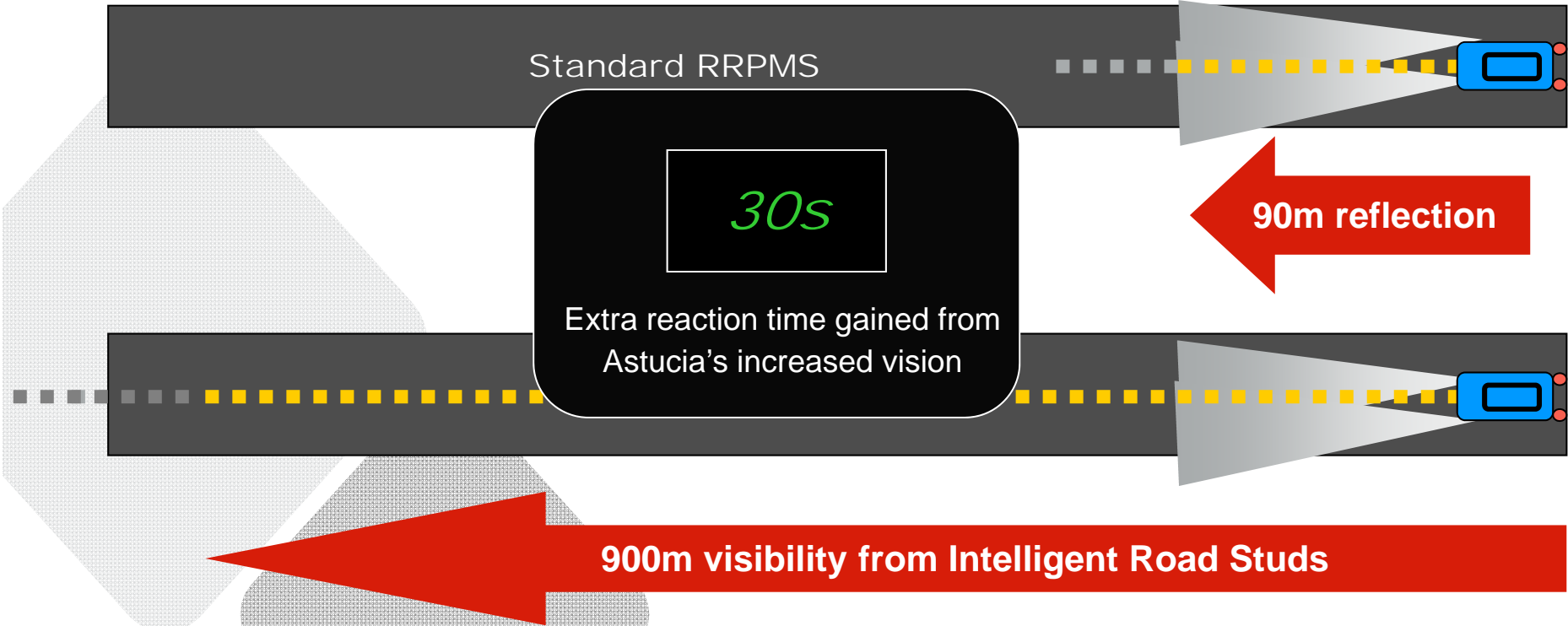
- Areas with poor/no street-lighting
- Dangerous Curves
- Rural Roads
- Bridges / Barriers / Shared Paths
- Poor visibility roads



Internally illuminated road studs



* Diagrams not to scale - for illustration only



A4226 – Barry, South Wales



- 72% reduction in night time accidents reported by Vale of Glamorgan Council since installation, compared with previous 3 years

A4226 – Barry, South Wales



- The proven safety benefits of the scheme has been recognised by being winner of the “Road Marking Project of the Year” in the prestigious 2008 Highways Excellence Awards

A143 – Haddiscoe, Norfolk



- Norfolk CC advised: the overall accident frequency has reduced from 7.3 per year to 2.3 whilst the severity ratio has reduced from 36% to zero



R66 – South Africa

- In the 12 months following the installation there were no night time accidents, previously 88 serious accidents claimed 27 lives in seven months



Solar Powered Studs

How do you install them?

- Surface mounted Studs
 - 'Aim' Stud approx 30m up the road to the middle of the lane
 - Install using conventional RRPM techniques and adhesive
 - In theft-prone areas (urban installations) use a stronger epoxy such as Megapoxy Gungrade 36



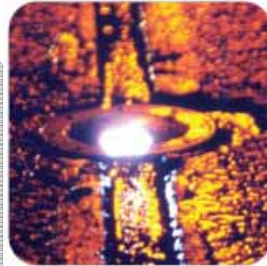
Criteria – M/29 Specification

- **Must meet M12 specs (size/colour/etc)**
- **Must be 1P68 rated**
- **Min full 7 nights activation with no solar input**
- **Min 1000 on/off cycles (approx 3 years)**

Internally illuminated road studs

'Hardwired' studs

A more site specific installation with powered cables between the studs



Internally illuminated road studs



Hardwired studs

How do they work?

- Two types
 - Hardwired studs – a power and control cable between each stud (Eg; Astucia)
 - Inductive Power – Cable in the road under a row of studs that can be activated by placing on top of the cable (Eg; 3iii studs)

Internally illuminated road studs



Hardwired studs

Hardwired studs – a power and control cable between each stud (Eg; Astucia)

- Flush mounted – 1 tonne point load
- Requires Power source
- Can be controlled – flash, time sequence etc



Internally illuminated road studs



Hardwired studs

Inductive powered studs – An inductive cable that is run in sawcut and the studs are placed on top (Eg; 3iii smartstuds)

- Surface mounted
- Requires Power source and control box
- Can be controlled – colour/flash/intensity



Hardwired Studs

Differences to Solar Studs

- **Up to 14 LED's in each stud head, in each direction**
 - MUCH brighter
 - Can be used during Day hours as well
- **Can be multicoloured / switch colours**
 - Eg: Green normally, Red after an input
- **Can be externally triggered**
 - Pedestrian pad / Road loop / Video detection





Hardwired Studs

Where are they suitable for installation?

- Pedestrian crossings
- Dual right turns at signalised intersections
- Lane control
- Airports
- Dangerous intersections needing active controls

Internally illuminated road studs



Hardwired Studs

How do you install them?

- A lot more site-specific
- Trained crew for installation for each type
- Typically carried out by the supplier
- Requires Sawcutting and/or Coring





Criteria – No Specification Yet

- **As yet there is no spec for the Hardwired studs**
- **Each installation evaluated individually**



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