

## 3M Innovation Award - 2007

Report back to IPENZ Traffic Management Workshop 4 November 2008  
by George JasonSmith

Sub-heading

## ITE Conference Miami 30 March - 3 April

"New" safety emphasis throughout USA - theme of conference

USA has "made no progress on road safety in the last decade"  
—AASHTO President Peter Rahn

- E.g. Tampa FL, currently 5.95 crashes / 1,000 residents
- Focus is to reduce fatalities & serious injuries
- Target: halve fatalities in 20-yrs
- Requires: reduction of 1,000 fatalities/yr for each of those 20 years
- #1 cause of fatalities = Lane departure
- Make our roads safe campaign
- [www.Makeroadssafe.org](http://www.Makeroadssafe.org)

## ITE Conference, Miami — 30 March to 3 April 2008

"New" safety emphasis throughout USA - theme of conference

USA has "made no progress on road safety in the last decade" — AASHTO President Peter Rahn

- Target: halve fatalities in 20-yrs
- Requires: reduction of 1,000 fatalities/yr for each of those 20 years
- #1 cause of fatalities = Lane departure
- Make our roads safe campaign — [www.Makeroadssafe.org](http://www.Makeroadssafe.org)

## ITE Conference

USA now talks about crashes not accidents

Moving from "Crash Causes" to "Critical Reasons for Crashes"

- E.g. from rear-end crashes to lack of headway — 3 to 5 sec headway desirable
- "Self Organising" roads
- Value of time coupled with congestion is significant cause of driver aggression
- Highway Safety Programmes rather than emphasis on black-spots
- Safety competes with other meaningful effects
- AASHTO Highway Safety Manual to be published 2009

## ITE Conference

Lot of work on pedestrian crashes

Count-down timers on signalised pedestrian crossing places showing 25% pedestrian-crash reduction

- Also helping to reduce red-light running
- Still have very long crossings (6+ lanes)

## ITE Conference

Lot of work on pedestrian crashes

- Take care in transferring results as differences in road rules state/state and USA/NZ are significant

Count-down timers on signalised pedestrian crossing places showing 25% pedestrian-crash reduction

- Also helping to reduce red-light running
- Still have very long crossings (6+ lanes)

ITE Conference

Speed Limits

- California quoted as an example of good practice – speed limits MUST be tied to 85-percentile speeds to be enforceable
- Speed limits have little effect on local road speeds
- Enforcement has little effect on local road speeds
- Incorrect speed limits are ignored by most drivers
- Speed limits do seem to have some effect on State / strategic roads
- Speed Limits must be reasonable:
  - It's not an attitude problem
  - It's not a knowledge problem
  - It's a behaviour problem

ITE Conference

Safety Culture

- Japan – It is dishonourable to put others at risk
- "Your poor driving kills me"
- Lifelong learning:
  - How to behave as a pedestrian – children need to walk!
  - How to behave as a driver
  - When you drive – just drive – stay alive
- I am responsible for my own driving

Behaviour is not culture! What is "Road Safety Culture"? How do we measure it?

Involve cultural anthropologists in changing culture – would you let a c-a design a bridge?

ITE Conference

Pedestrian Safety

- New York, NY – "Walkers are the oxygen of the city" – Reduced asphalt improved traffic
- Different width traffic lanes across roadway
  - | 10-ft next to kerb | 11-ft | 12-ft |

Importance of Safety Champions – see our own SMSs

50,00 public agencies in the US with responsibilities towards road safety

Marrying safety and sustainability

OECD to publish study on achieving aggressive road safety targets

ITE Conference

The four "Es" of road safety

- Engineering
- Education
- Enforcement
- Emergency Services

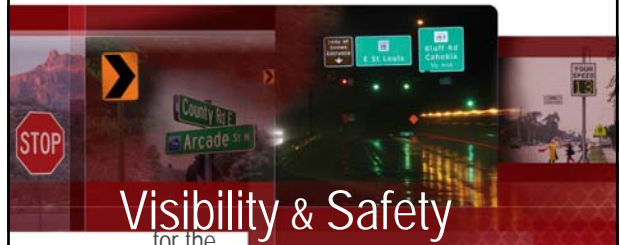
Why do we ignore the fourth one in NZ?

Sub-heading

3M – Saint Paul, Minnesota



Science of Retroreflectivity



Visibility & Safety  
for the  
Life of the Road

### 3M – St Paul

100 scientists in Traffic Safety Research

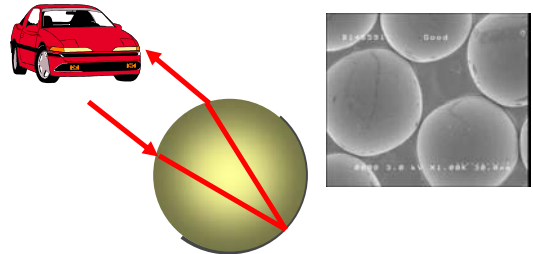
No more Engineering Grade per-se

Changes in headlight design affect total light reflection

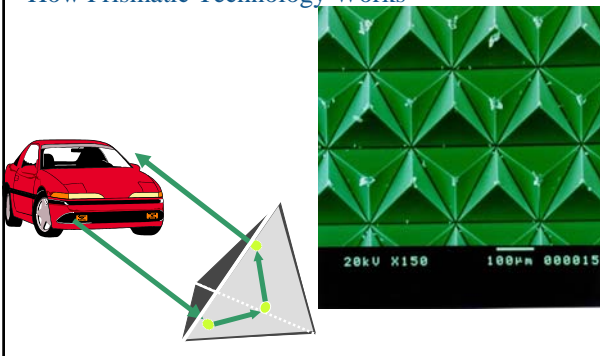
Information is gathered by drivers in range 310m to 60m from sign / object



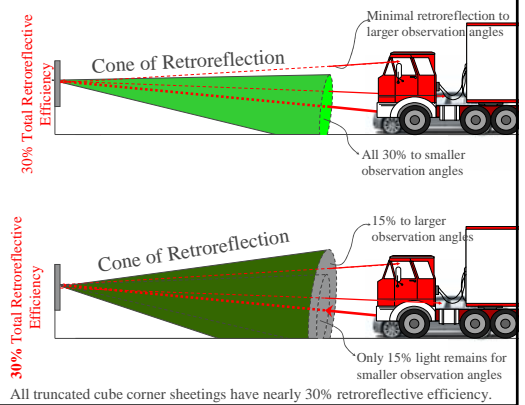
### How the Technology Works Glass Bead Technology



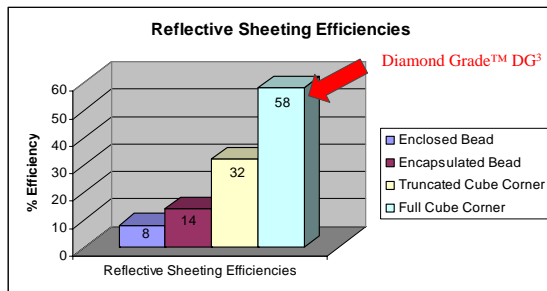
### How Prismatic Technology Works



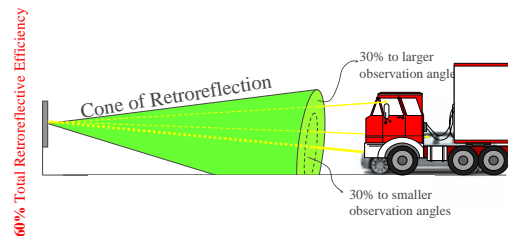
### Retroreflective Efficiency



### Full-Cube Sheeting Retroreflective Efficiency



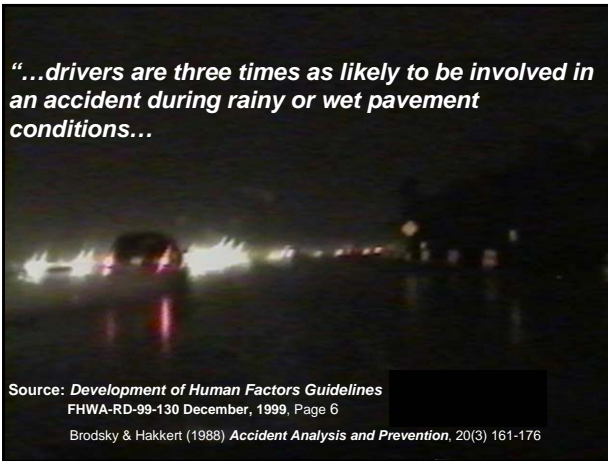
### Retroreflective Efficiency



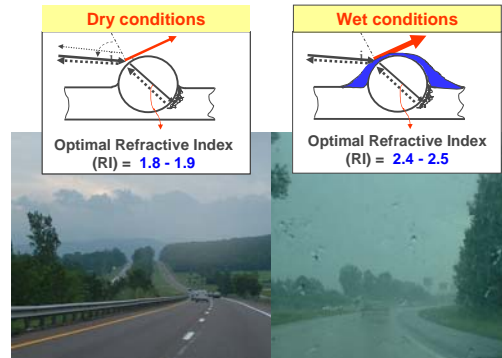
Increasing the overall total retroreflective efficiency ensures serving the greatest segment of nighttime vehicle and driver population.

**"...drivers are three times as likely to be involved in an accident during rainy or wet pavement conditions..."**

Source: *Development of Human Factors Guidelines*  
 FHWA-RD-99-130 December, 1999, Page 6  
 Brodsky & Hakkert (1988) *Accident Analysis and Prevention*, 20(3) 161-176



For performance in all weather,  
 one type of bead can't do it all!



But even large beads lose reflectivity covered with water. 3M wet elements maintain retroreflectivity



### 3M - St Paul

Tape milled into surface

Snow-ploughable RRPMS

3M have weathering data from around the globe that allows them to predict the life of their signs

### Other Observations from the trip

Advance road names signs are great!

Lack of "Town Name" signs is not

Warning distances in feet

- "Next Exit 1500-ft"
- big numbers hard to comprehend

Courteous drivers

Canada "50km/h = 30mph" sign but still with USA style speed limit signs



### Thank you



In the USA

- Fuat Aktan,
- James Ritchie,
- John Tobin and
- Geri Ritchie

In NZ

- Alan Parker and
- especially Storm Robinson - Sales Engineer for the South Island