Designing Safer Roadsides

What Passive Safety
and
"The Passive Revolution Guidelines"
offer

for SoRSA 16th June 2009

By
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What is passive safety?

- Passive Safety is the use of lighting columns, signposts, camera masts and other street furniture which doesn't kill you or severely injure you when you drive into it.

How do you know if an item of street furniture is passively safe?

- It has been tested to a class in EN 12767

Ferrari v telegraph pole Adelaide

One stupid owner... The Ferrari was being raced through suburban streets Pictures: Newspix/RexFeatures

Another Ferrari in pole position

BY ROSS MCGUINNESS

WE'VE all had the odd prang in our ime, but it'll take more than a quick praypaint job to fix this little beauty. If the owner of this £100,000 Ferrari 60 Modena is smarting at the loss of is pride and joy, at least he and his assenger walked out of the wreckage ith only minor injuries.

Witnesses in Adelaide, Australia, said he driver had 'turned the streets into a acetrack' before the vehicle span out f control and ploughed into a telegraph ole. The crash nearly split the car in wo but the men inside, both in their 0s, survived relatively undamaged.

Parting of the ways: A very expensive heap of scrap

Nobody Died

Post v Car Ireland Dec 2006
1 dead (a 17 year old lad)


Computers
Telephones
ATM's
Printers
Call for full listing
e.e.s
furio

Sheffield about 2002/2003 Car v Signpost
4 Dead Road Signs kill about 40 a year

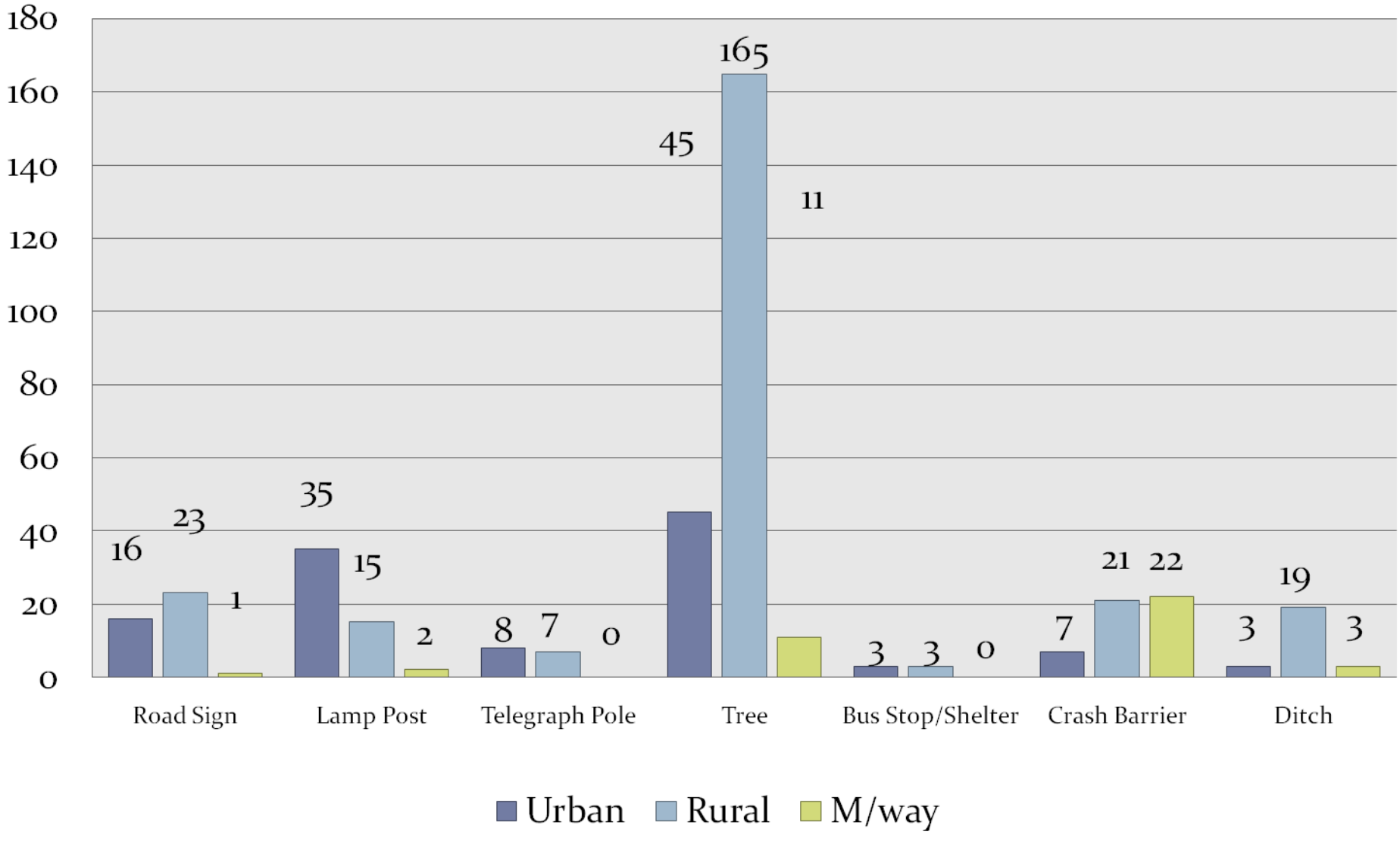
Sign on 250 by 150 rectangular hollow sections close to the carriageway. Speed limit 50 mph

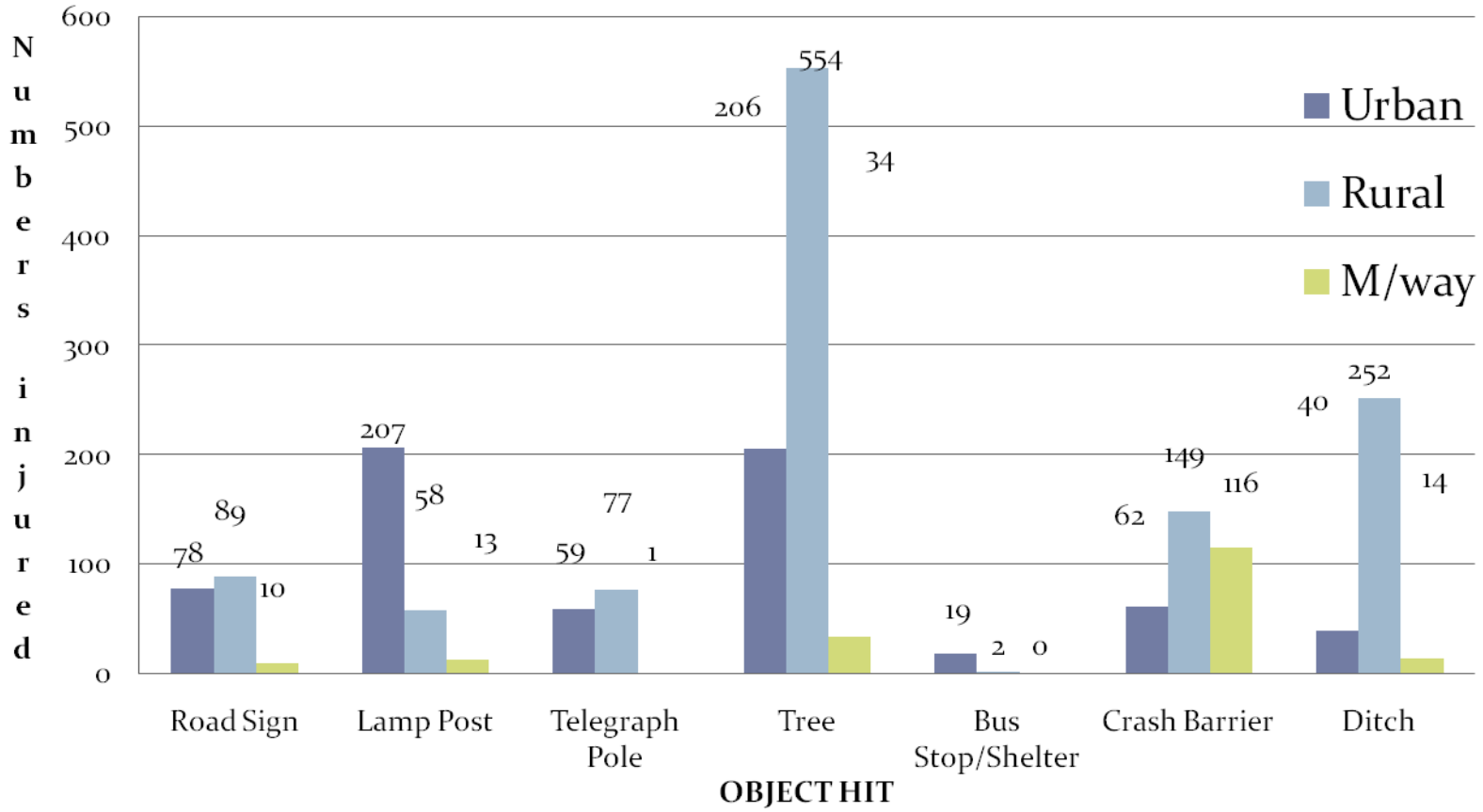
Is this sensible?

TRL EN 12767 crash test (report on testing available from TRL)
100 kph 114 diameter steel post 5 mm wall thickness
Safe size is 89 mm diameter by 3.2 wall thickness

The Passive Revolution
MIRA Crash Demonstration Day
100 kph Micra into a wide based post

FATALITIES SINGLE VEHICLE ACCIDENTS 2007




SERIOUSLY INJURED SINGLE VEHICLE ACCIDENTS 2007
Numbers injured
600
500
400
300
200
100
0
78
89
10
207
58
13
59
77
1
206
554
34
19
2
0
62
149
116
40
252
14
Urban
Rural
M/way
Road Sign
Lamp Post
Telegraph Pole
Tree
Bus Stop/Shelter
Crash Barrier
Ditch
OBJECT HIT

The most dangerous roadside object?

Trees kill about 250 people a year

What can be done about deaths hitting signposts, lighting columns, traffic light poles, camera masts etc?

We have about 13,000 Lattix signposts and possibly the same number of Jerol signposts in the uk meeting the requirements of EN 12767.They have been steadily installed since about 2004 with the publication of TA89/04.Lattix posts have been hit about 100 times in the UK with no serious injuries. Most are on trunk roads to avoid the cost of safety fencing to TD 19/06 Road Restraint Systems (Design Manual for Roads and Bridges document)
No passively safe street furniture has been recorded as killing or seriously anyone to date in the UK. Norway has installed 30,000 Lattix posts since about 1995 with no fatalities

Passive Safety really works.

What is BSEN 12767:2007?

A Eurocode that contains the detailed protocols to carry out the crash tests to verify if an item is passively safe. These are:

a) Crash tests at 35 kph and a higher speed – typically 100 kph

c) A 900 kg car with known crush characteristics is used

b) ASI and THIV limits must not be exceeded (from 3 dimensional accelerometers)

c) No intrusion into the passenger compartment

Classifications to BS EN 12767:2007

3 speed ratings 100 kph, 70 kph and 50 kph
All ratings need two tests of 35 kph and a higher speed (nearly always 100 kph or 70 kph)

Speed loss in the high speed test decides the classifications:

NE or No Energy – not much speed loss (all signposts are NE)
LE or Low Energy – some speed loss
HE or high energy – significant speed loss – below 70 kph the vehicle will probably be halted (only lighting columns are HE)

There are 3 safety levels 1,2 and 3 with 3 being the safest.
Safety level 4 applies to bollards and non-harmful products

An EN 12767 classification of 100 NE 3 means:

Test speed was 100 kph in high speed test
the vehicle did not slow much in the impact
the measured accelerations put it in the safest class

What is in the BS 12767:2007 National Annex?

This advises on using passively safe street furniture. The previous advice in TA89/05 in the DMRB has been withdrawn and the NA replaces it.

The Passive Revolution has issued draft guidelines for comment on passive safety for non-trunk roads at its event on 9th March 2009

A Subaru Legacy was crashed at 100kph into a 168mm diameter (100:NE:2) fibre reinforced sign post assembly, provided by Post and Column Ltd, the UK distributor of JEROL posts & columns. The assembly was fitted with an energised circuit and a break away plug and socket disconnection system provided by Poletech Ltd, to demonstrate successful disconnection of a power supply.

A Saab 900 was crashed at 100kph into a 10m Aluminium lighting column (100:NE:1) provided by The Aluminium Lighting Company, the UK distributor of NEDAL columns. The assembly was fitted with an energised circuit and a device provided by Charles Endirect, to demonstrate successful disconnection and interruption of the supply.

A Rover 214 was crashed at 100kph into a 12m Aluminium lighting column (100:LE:3) provided by Marwood Electrical, the UK distributor for SAPA (formerly ALCOA) columns. The assembly was fitted with an energised circuit and a device provided by NAL, to demonstrate successful interruption of the supply.

Stunt Driver Steve Truvelo hits a Lattix Post

140 diameter steel post hit at about 60 mph

KAPU High Energy Lighting Column 100:HE

400 crashes without fatalities or serious injuries in Finland．Most lighting columns in Finland are now passively safe.

History of Passive Safety

1990's Lattix developed in Norway
1995 First Lattix UK Post
2000 EN 12767:2000 Passive safety of support structures for road equipment. Requirements and test methods
2002 Lattix proposed for A34 Silverstone trunk road scheme signing
2004 TA89/04 "Use of passively safe signposts" published in DMRB
2005 TA89/05 Use of passively safe signposts and lighting columns
2008 BS *EN 12767*:2007 Passive safety of support structures for road equipment. Requirements, classification and test methods.
The National Annex to this document supersedes TA89/05

2009 Position

On the roads about 13,000 Lattix signposts and probably a similar number for Jerol signposts on the network (mainly trunk roads)
4 suppliers of passively safe posts
7 suppliers of passively safe lighting columns
3 suppliers of passively safe traffic signal poles
March publication of the "The Passive Revolution Guidelines"

No deaths or serious injuries recorded so far!

Where next for passive safety?

On trunk roads passive safety is already here!

•On trunk roads passive safety is the first choice for new signs and camera masts - it avoids the need for barriers and is a cheaper solution

•Lighting columns on dual carriageways are protected by siting between the barriers in the centre reserve. New verge columns will almost certainly be passively safe (TD19) to avoid the cost of barrier

What do we do about non-trunk roads especially A and B roads?

A roads are only 12% (including trunk A roads) of the network but have 58% of the single vehicle accident deaths

B roads are only 8% of the network but have 20% of the single vehicle accident deaths
Passive safety has a lot to offer on these roads!
The challenge is to inform local highway authorities of the benefits.
New DfT 2010-2020 Targets are out for consultation to reduce road casualties by 30%.
To meet the new targets I believe we need:

“The Passive Revolution Guidelines”

The Passive Revolution Guidelines

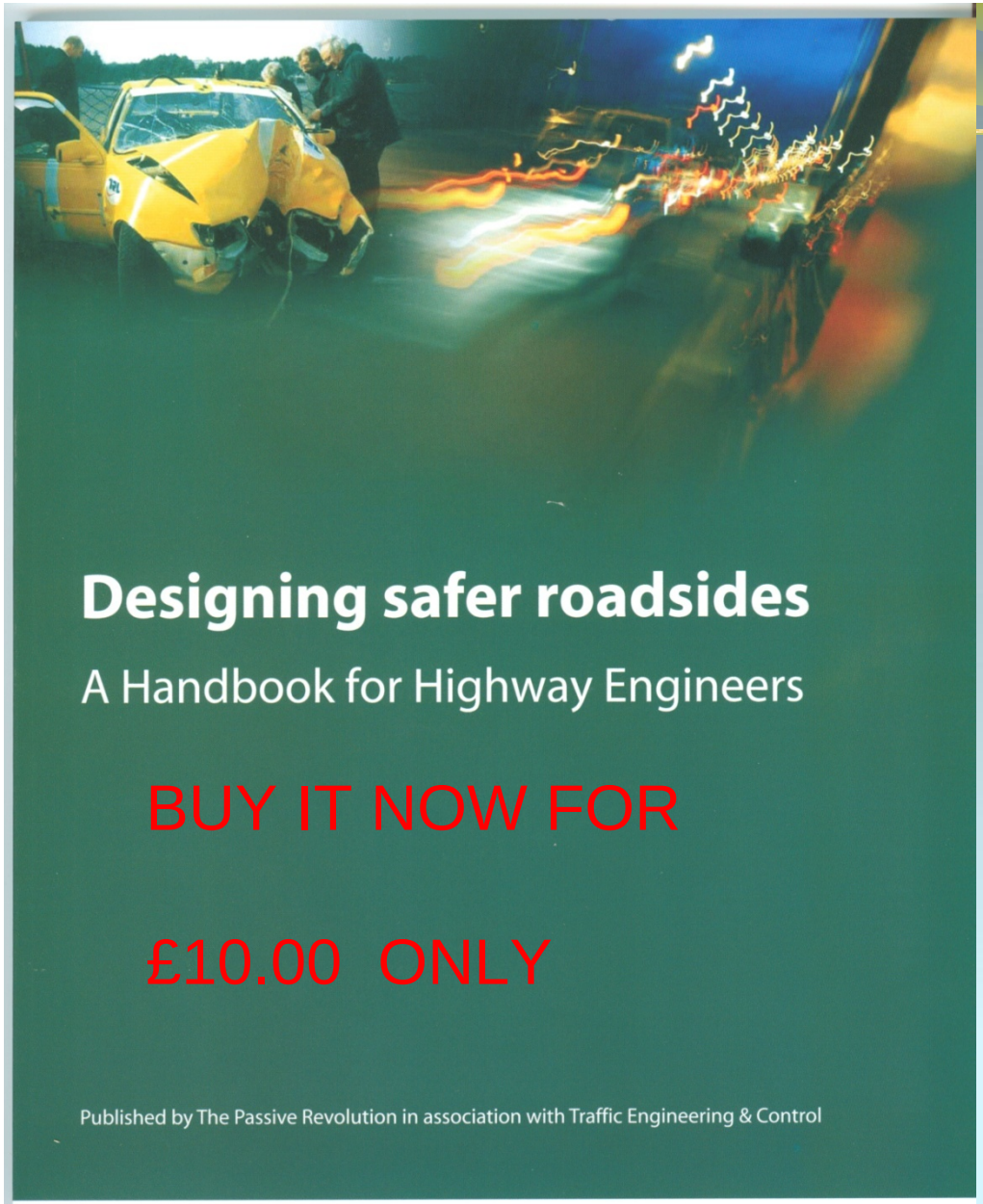
For Specification and Use of Passively Safe Street Furniture for Rural and Urban Roads which are not part of the trunk road system.

- These are downloadable from:

http://www.ukroads.org/thepassiverevolution/

Are a draft for comment (comments needed by 15th September)

The National Annex to EN 12767 is up for revision and will hopefully be brought into accord with the Guidelines (or vice versa).
The Guidelines have a much wider scope than the NA.



Edited by David Milne
29 Chapters
includes:
a)Standards
b)Zero vision from Sweden
c)Manufacturers views on passive safety and their products
d)Use of and design considerations crash cushions, terminals, safety fences and bridge parapets
e)Durham experience with passive safety
f)Eurorap
g)Road death investigation manual
h)Electrical safety

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Many thanks for listening

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