

Peter Bergendahl

Senior Director

**International Business&Product
Development**

Trinity Industries Inc.

Trinity Industries, Inc.



EXPANDING OUR HORIZONS
Taking Highway Safety into the 21st
Century!™

Trinity History



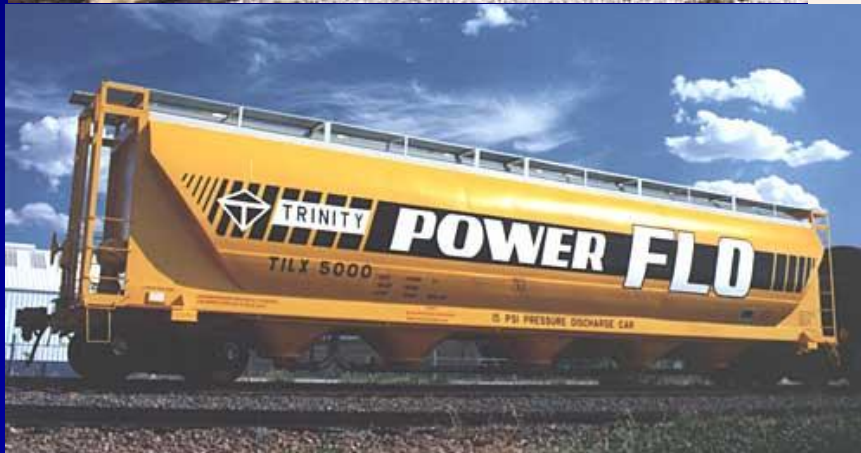
- Trinity was founded on July 1, 1946 and was named for the Trinity River, which runs through Dallas
- Operations were conducted in a mule barn in South Dallas

Company Profile



- Trinity Industries, Inc. is headquartered in Dallas, Texas and is 25,000+ employees strong
- Trinity's common stock is traded on the New York Stock Exchange under the symbol 'TRN'

Railcar Division



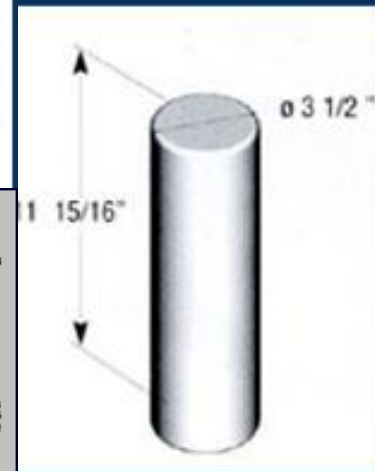
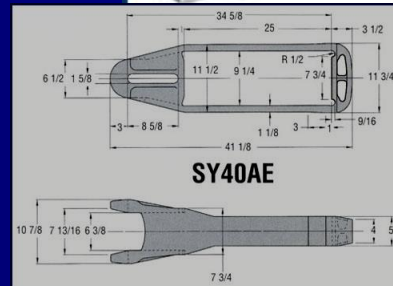
Inland Barge Division



Industrial Products Division



Parts and Services Division



Construction Products Division



Highway Products Group



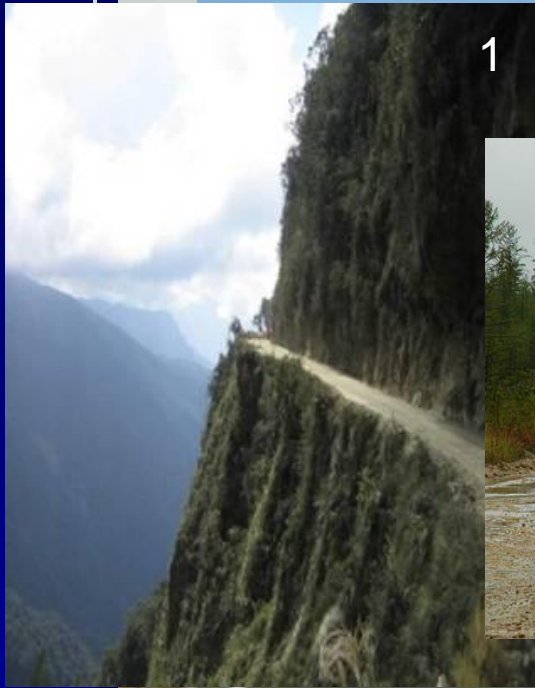
Why do something?



Do Things Right



Which Is The Safest?



Guardian Angel



Accidents

- 1,200,000 persons get killed every year in traffic
- $365 \text{ days} \times 24 \text{ hours} = 8,760 \text{ hours}$
- 137 persons/hour
- Equals to 3 Jumbo jets every day
- In EC every 7th person will be injured

Who, Why, What, Where, When

- Evaluation
- Planning
- Safety
- Installation
- Maintenance
- Economy

Speed kills...

Speed doesn't kill...

Cambridgeshire
Police Road Safety

THINK 

**Speed doesn't kill...
...it is the way you stop that
kills.**

The Sudden Stop



Absorb The Energy

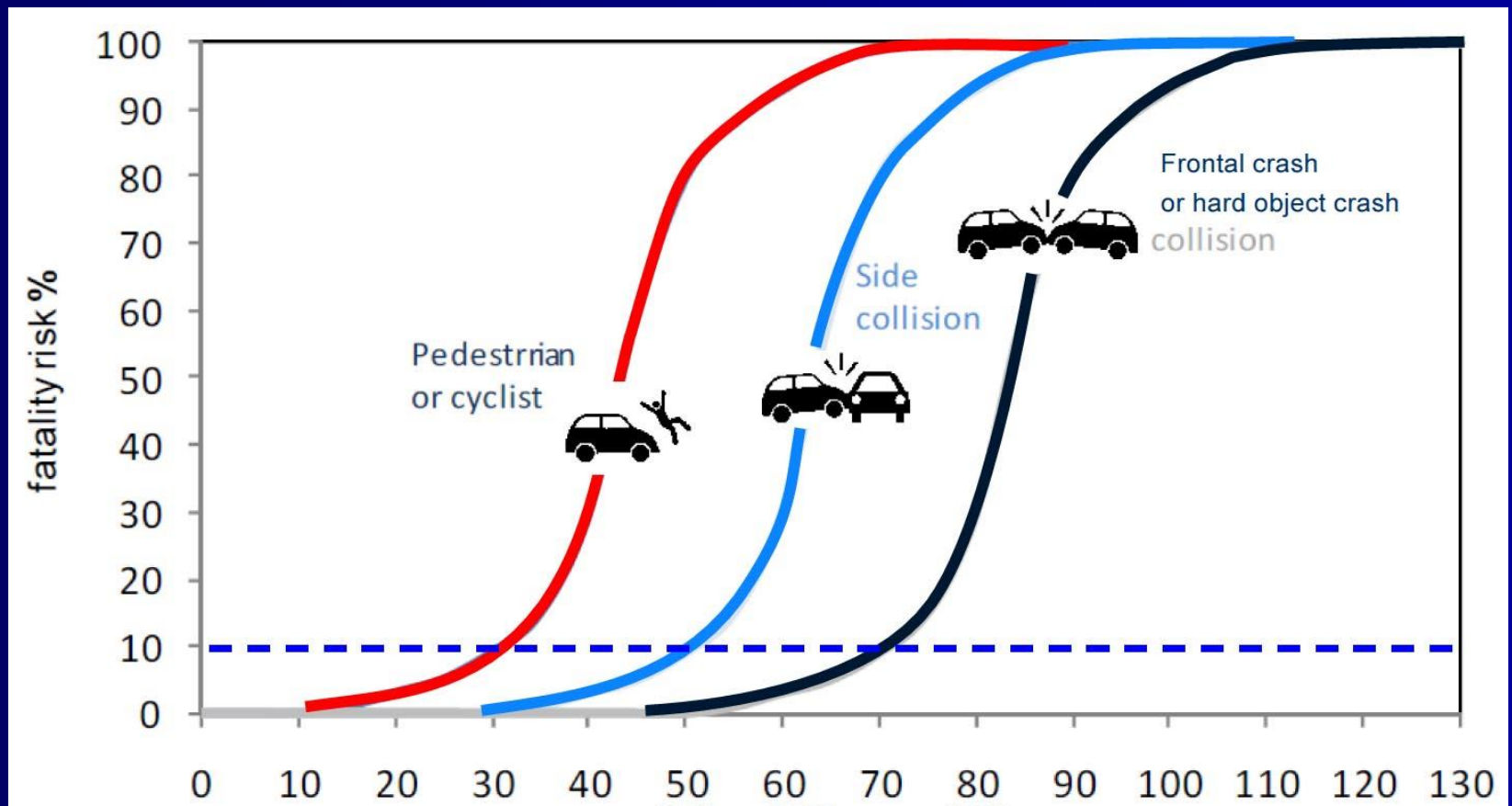
1,500 kg in 110 km/h=700kJ

2,000 kg in 100 km/h=772kJ

2,270 kg in 100 km/h=876kJ

772kJ is like driving your car off a 10 floor building

What Is Survivable?



How To Absorb?

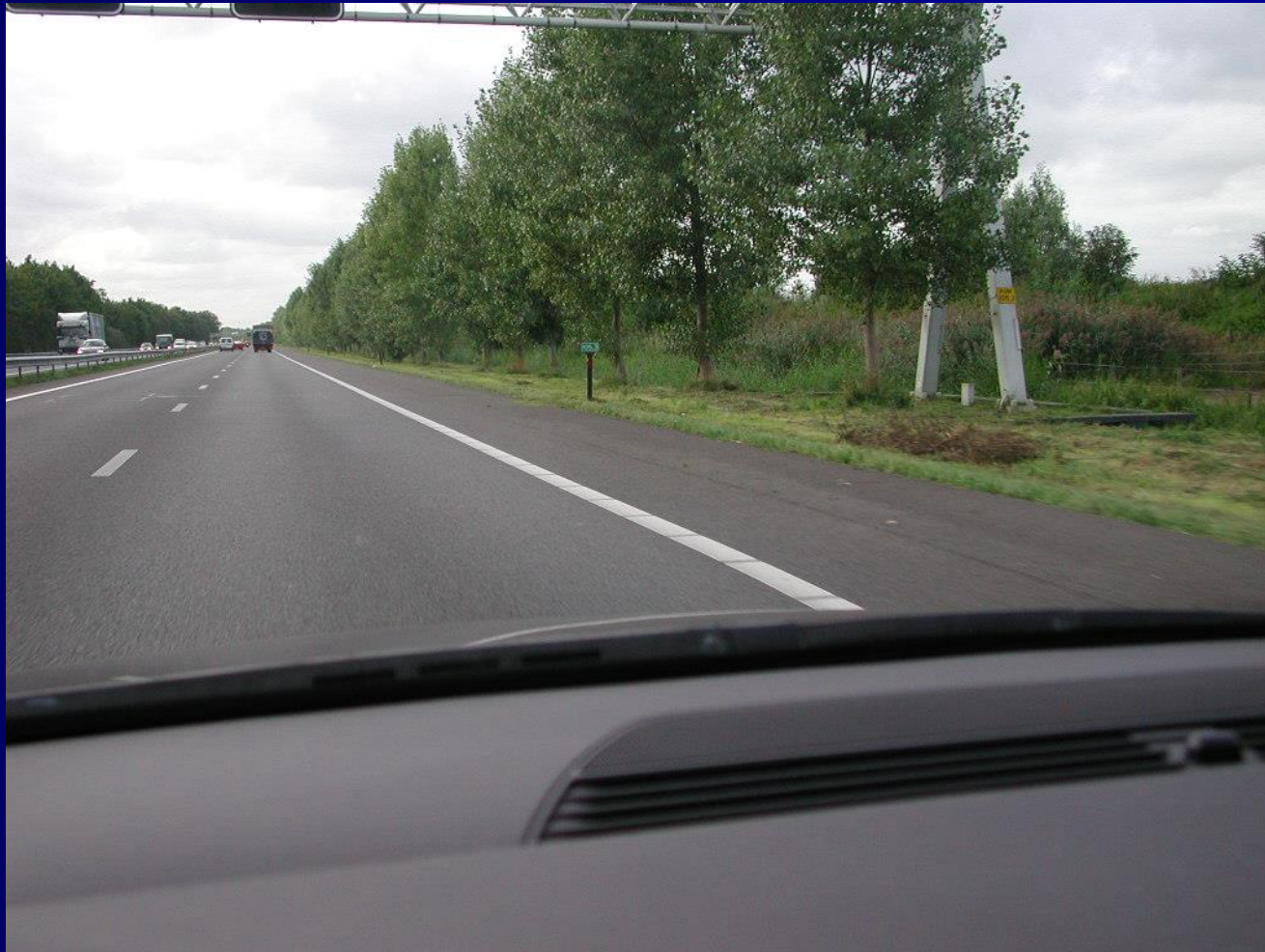
- Deformation
- Cutting
- Compression
- Elasticity
- Friction

Black Spot Management

Identify Rigid Obstacles at the Roadside

Remove

Black Spot Management



Black Spot Management



Black Spot Management



Black Spot Management

Identify Rigid Obstacles at the Roadside

Remove

Make It Breakaway

Black Spot Management



BA-4 / TSCR-700 / TSB2 / SF24-OCT**

3" O-D Smooth Breakaway Pole w/ Street Sign Mount and Octagon Sign Frame

Poles available in the following heights:
11 ft., 12 ft., 14 ft., 16 ft.

How to Order: example:
BA-4** / TSCR-700 / TSB2 / SF24-OCT-08K
Post / Street Sign Mount / Post Topper / SF24-OCT-Color
0" indicates pole height

BA-4 Breakaway Smooth Pole**
- 3" O-D Smooth Pole
- Made of Extruded Aluminum
- .065 Wall Thickness
- Corner Beveled

TSCR-700 Single Street Sign Mount
- Mounts to any 3" O-D pole
- Can be isolated to hold any size sign blade
- Made of Extruded Aluminum
- Flat Top Sign Mounts feature the precision open-bottom

TSB2 - Cannon Ball Post Topper
- Decorative Post Topper that fits 3" O-D round post
- Made of Cast Aluminum
- 5.5" x 5" wide x 4.5" tall

SF24-OCT Sign Frame
- Fits around 24" Sign Signs
- Has a 1" square edge on all sides
- Made of Cast Aluminum

Finish
- The Finish will be Beached with a premium quality fluoropolymer powdercoat. It is Aesthetically

Installation Instructions for Street Sign Posts

OPTIONAL

1000 LITTLE OAKY ROAD • LITTLETON, CO 80120 • PHONE (770) 337-4762 • FAX (770) 337-4822
www.quickdropproducts.com • customer_service@quickdropproducts.com

Black Spot Management

Identify Rigid Obstacles at the Roadside

Remove

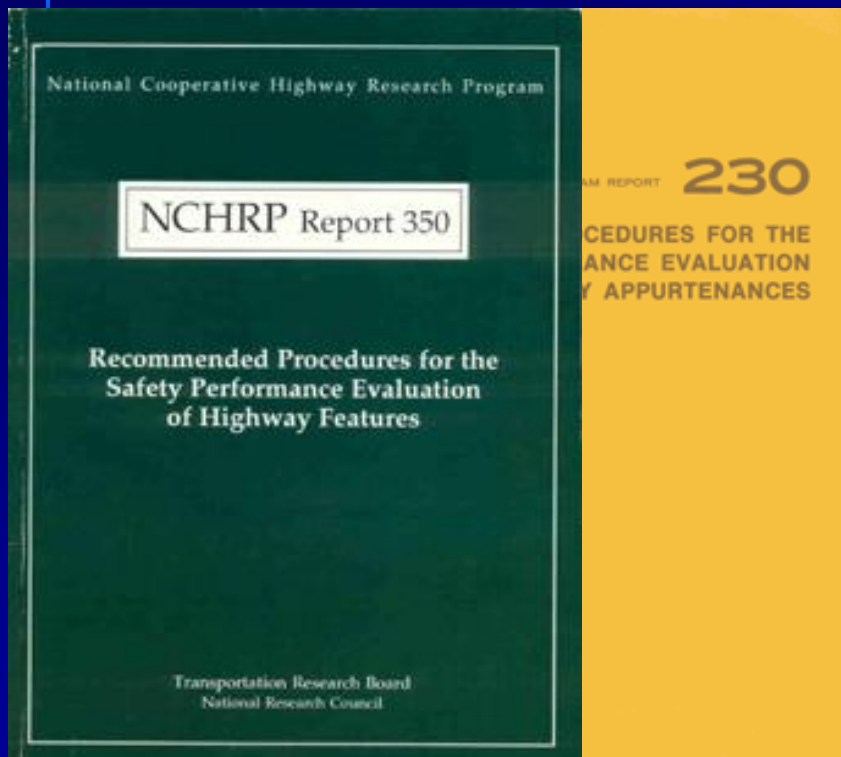
Make It Breakaway

Shield

Black Spot Management



Standards



1993

1980



1998

End Terminals





Crash Cushions



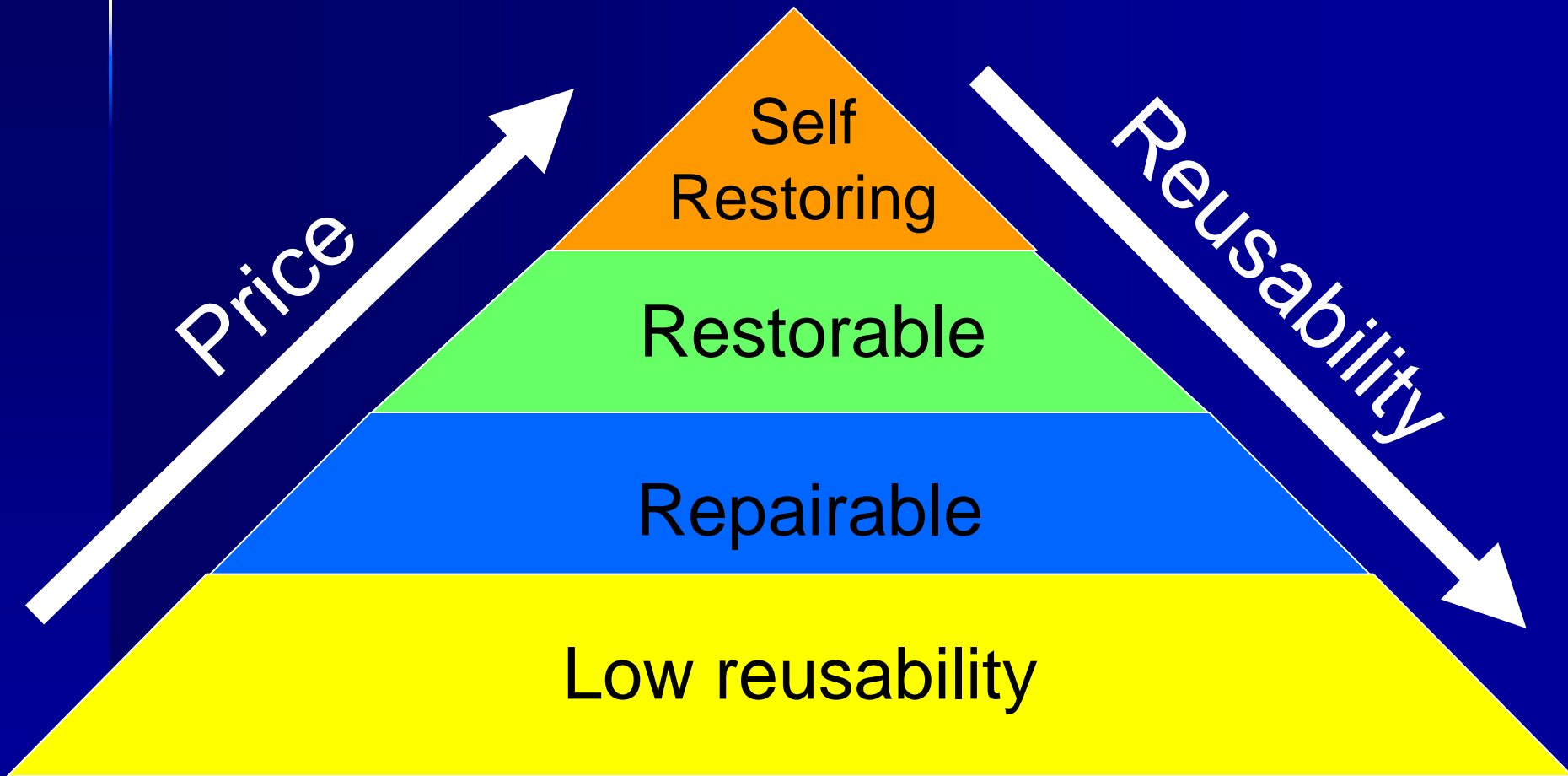
Crash Testing



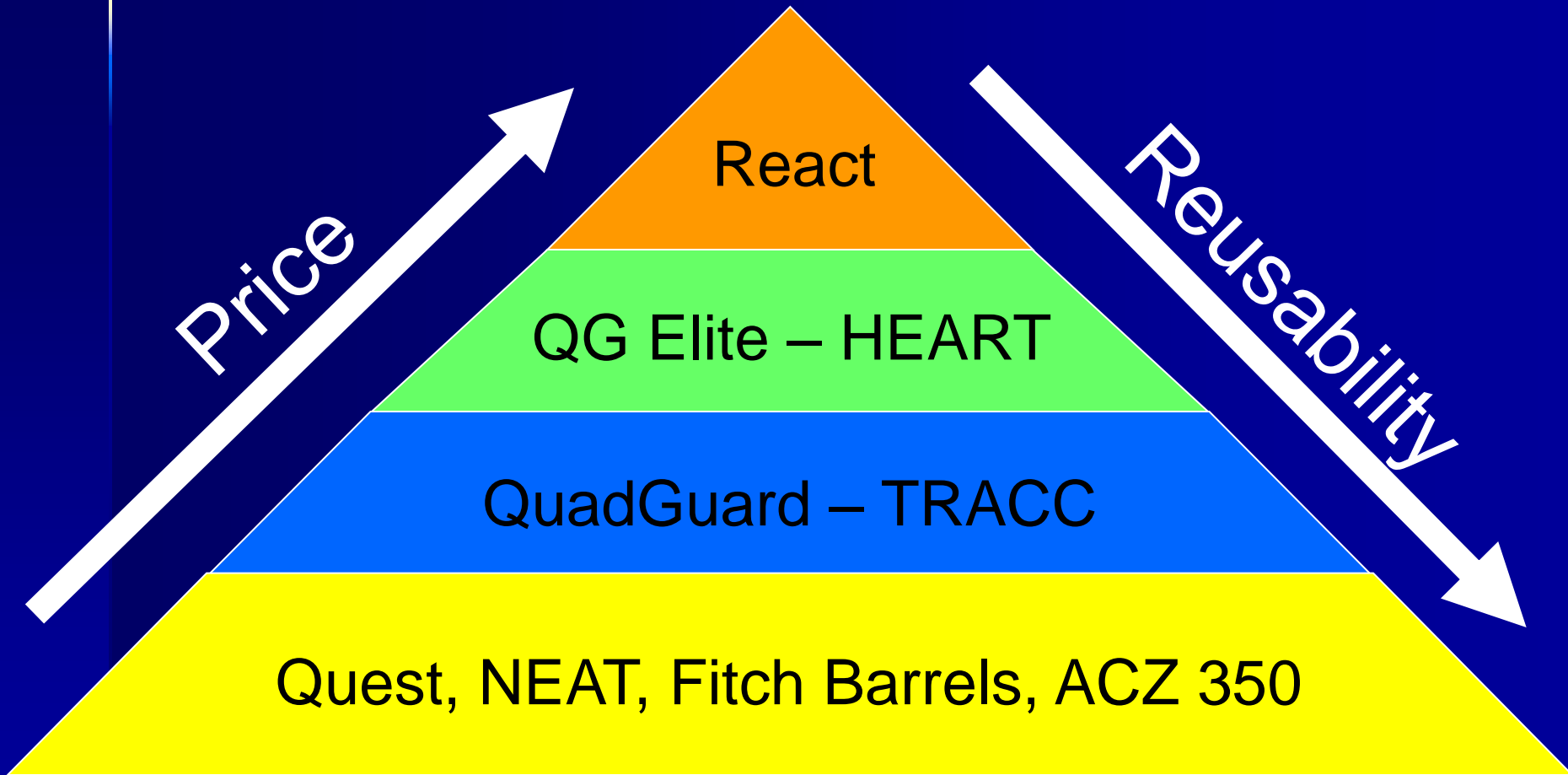
Crash Cushion Range

Self-Restoring	Restorable	Repairable	Low reusability
REACT	QuadGuard™ Elite	QuadGuard™ CEN	Quest™ Quest™ CEN
	HEART	QuadGuard™ II	Fitch Barrel System
		TRACC EuroTracc	NEAT EuroNEAT ACZ 350

Positioning



Positioning



Repairable

QuadGuard™ CEN

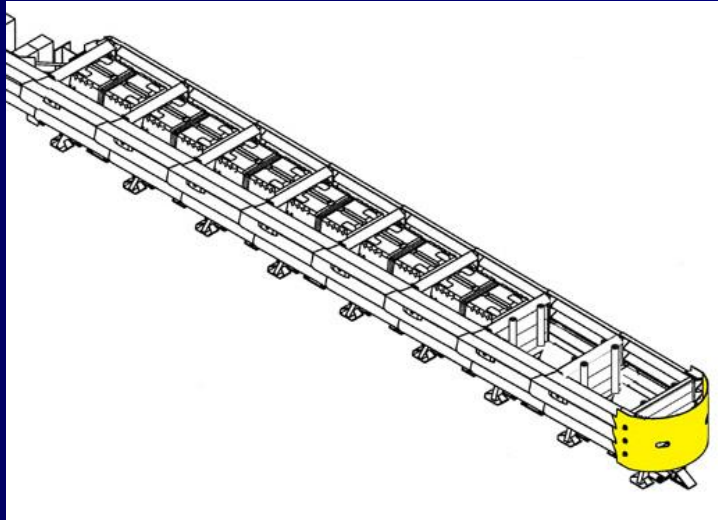
EuroTRACC

QuadGuard CEN

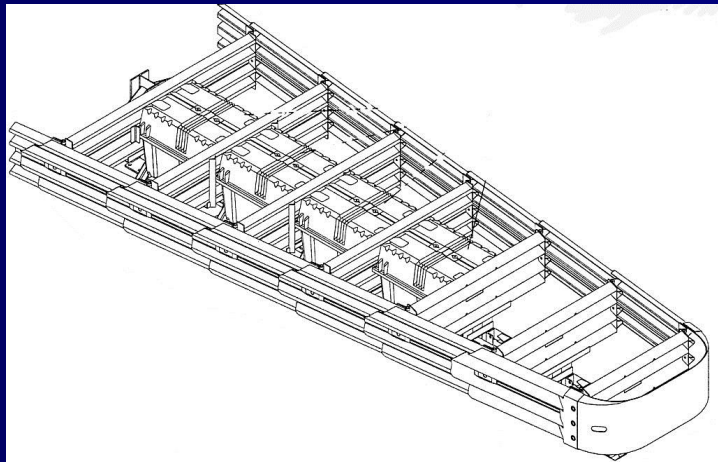


Re-directive, bi-directional highly reusable crash cushion
Available in 5 different widths and 4 lengths
Qualified to 110 km/h, 100 km/h, 80 km/h and 50 km/h
CE Marked

QuadGuard CEN



The QuadGuard™ CEN can shield hazards from 61cm to 2.3m wide

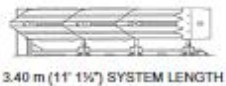


QuadGuard CEN

Available in 5 widths for each of the 4 speed levels, 20 models in total

50 km/h level

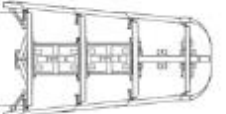
(3-bay systems)



610 (24") MODEL NO. QI2403



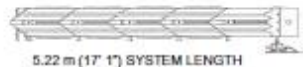
915 (36") MODEL NO. QI3603



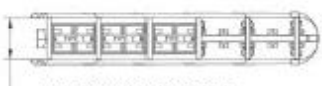
2286 (90") MODEL NO. QI9003

80 km/h level

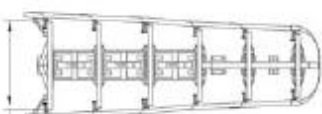
(5-bay systems)



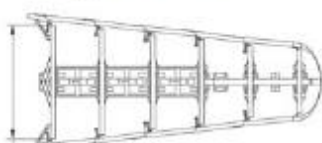
610 (24") MODEL NO. QI2405



915 (36") MODEL NO. QI3605



1753 (60") MODEL NO. QI6005



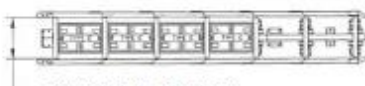
2286 (90") MODEL NO. QI9005

100 km/h level

(6-bay systems)



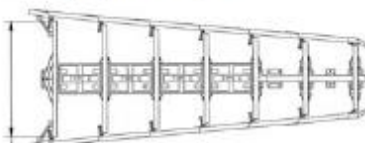
610 (24") MODEL NO. QI2406



915 (36") MODEL NO. QI3606



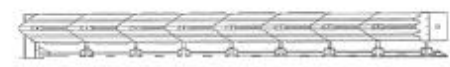
1753 (60") MODEL NO. QI6006



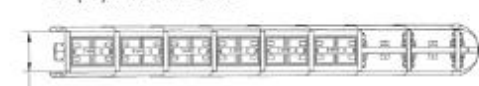
2286 (90") MODEL NO. QI9006

110 km/h level

(8-bay systems)



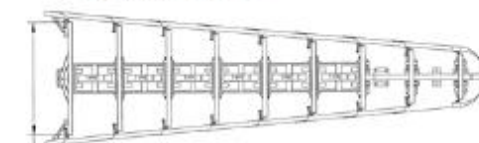
610 (24") MODEL NO. QI2408



915 (36") MODEL NO. QI3608



1753 (60") MODEL NO. QI6008



2286 (90") MODEL NO. QI9008

QuadGuard CEN



QuadGuard CEN



EuroTRACC



Re-directive, bi-directional highly reusable crash cushion
Available in 2 different widths and 3 lengths
Qualified to 110 km/h, 100 km/h and 80 km/h
CE Marked

EuroTRACC



Low Reusability

Quest™ CEN

Fitch Universal
Module System

EuroNEAT

Quest CEN



Re-directive, bi-directional crash cushion
Available in 2 widths (1 width only for Europe) and 2 lengths
Qualified to EN 1317-3 to 110 km/h, 100 km/h and 80 km/h
Qualified to NCHRP 350 to TL-2 (70 km/h) and TL-3 (100 km/h)
CE Marked

Fitch



Non re-directive, uni-directional sand barrel array crash cushion
Available in multiple width arrays
Qualified to 100 km/h
Ideal for shielding wide hazards in low frequency impact areas
In process of receiving CE Certification

Euro NEAT



Non re-directive crash cushion, can be used in temporary locations
Qualified to 80 km/h
Easily installed in less than 15 minutes

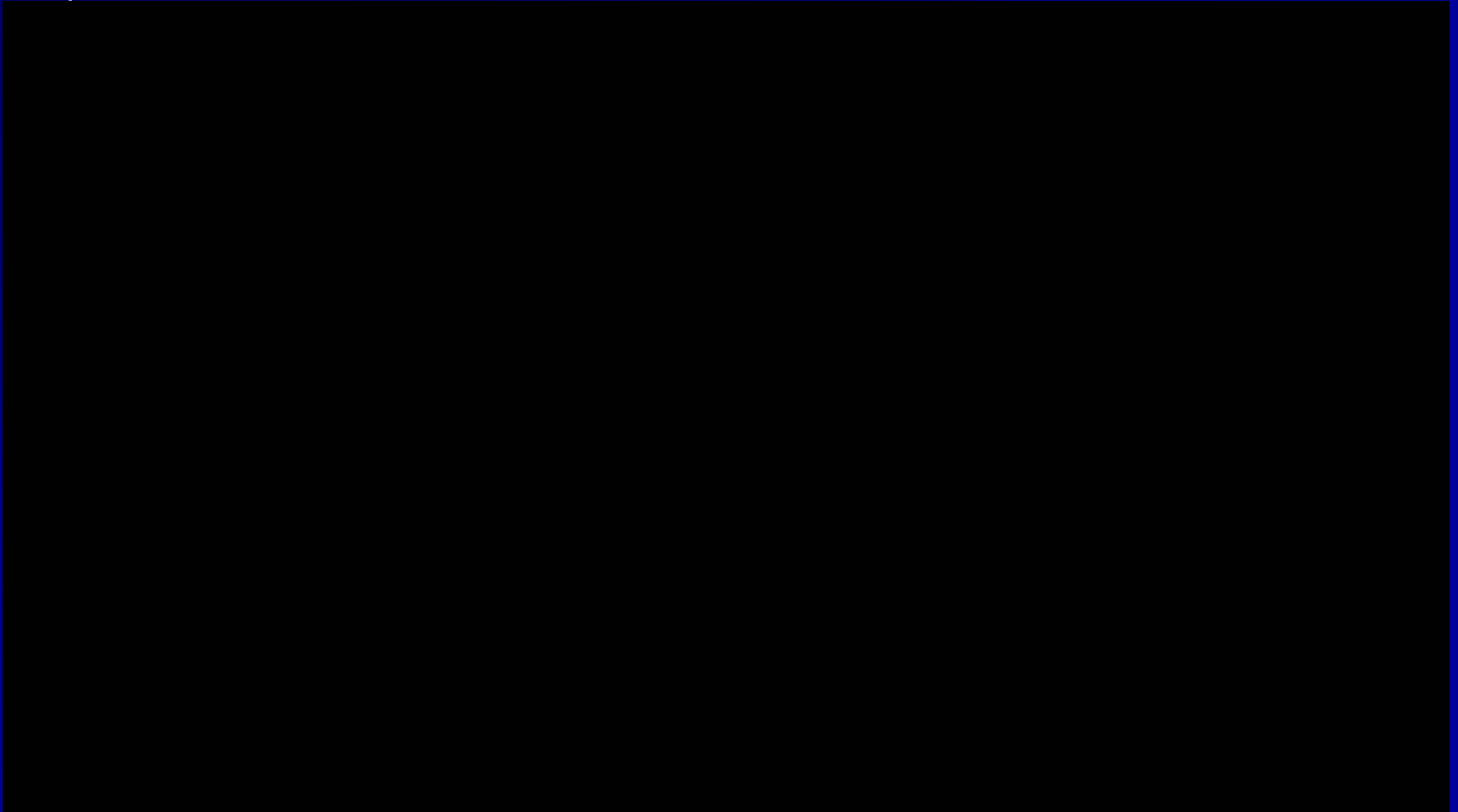
Comparison Chart-Europe

Tested for Europe to EN 1317-3								
Crash Cushion	Re-directive	Bi-directional	Speed level	Widths	Length	ASI	CE Marked	Reparability
QuadGuard™ CEN (20 models)	Yes	Yes	110 km/h	5 widths (61cm to 2.3m)	7.97m	B	Yes	Up to 95% reusable. Quick, on-site repair possible.
			100 km/h	5 widths (61cm to 2.3m)	6.13m			
			80 km/h	5 widths (61cm to 2.3m)	5.22m			
			50 km/h	5 widths (61cm to 2.3m)	3.4m			
EuroTracc 110	Yes	Yes	110 km/h	1 width (61 cm)	7.95m	A	Yes	Up to 98% reusable. Usually replace unit and repair offsite.
EuroTracc 80			80 km/h	1 width (61m)	5.0m	A	Yes	
EuroTracc 80-4			80 km/h	1 width (61 cm)	4.0m	A	Yes	
EuroTracc 110 Wide			110 km/h	1 width (2.4m)	7.95m	B	Yes	
EuroTracc 80 Wide			80 km/h	1 width (2.4m)	5.0m	B	Yes	
Quest™ CEN (3 models)	Yes	Yes	110 km/h	1 width (61cm)	7.22m	B	Yes	Usually replace complete unit.
			100 km/h		7.22m			
			80 km/h		5.36m			
Fitch Barrel System	No	No	100 km/h	Array approx. 2.0m	10.4m	A	In process	Replace barrels
EuroNeat	No	No	80 km/h	1 width (60cm)	3.0m	B	No	Replace unit

Accident in Chile de Santiago



Accident in Estonia



Questions?