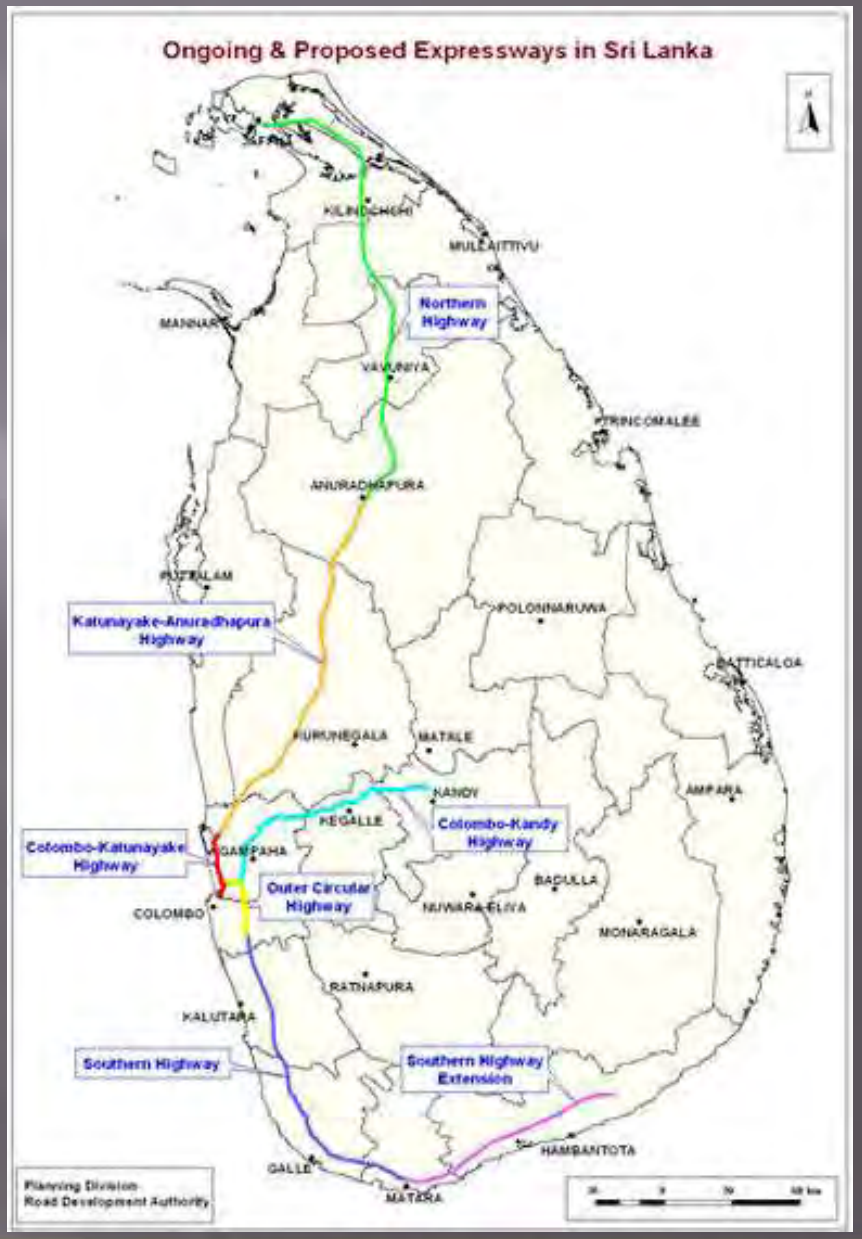
INTERNATIONAL CASE STUDY

SoRSA Conference – 13th-14th June 2011

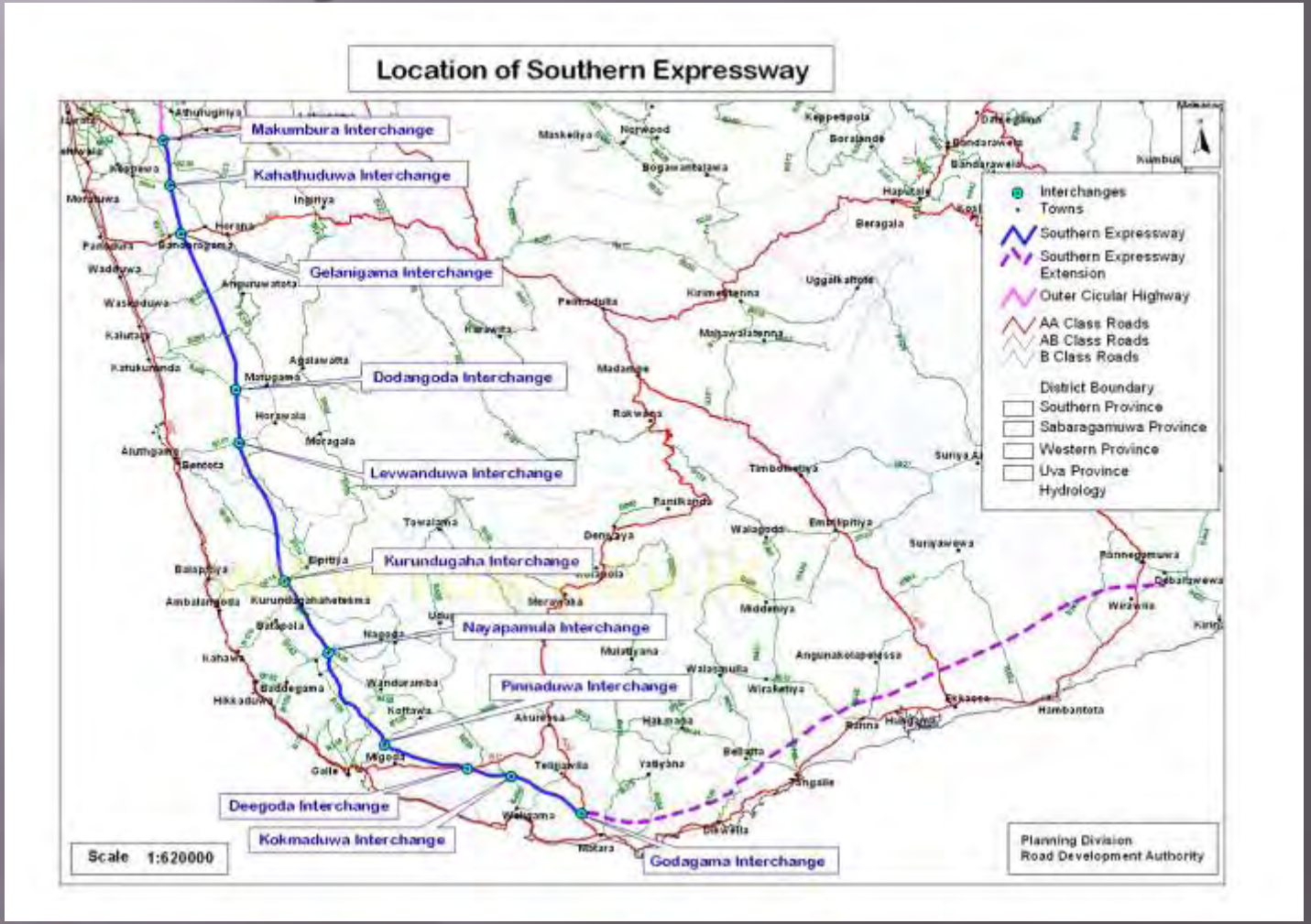
Sri Lanka -

- Third Trip to Sri Lanka
- Project: Southern Expressway connecting roads
- Client: Egis BCEOM
- Supervised by Roads Development Authority
- Funding: Asian Development Bank & Japan Bank for International Cooperation

Programme of Expressways



Southern Expressway – due to open in July 2011



Southern Expressway – due to open in July 2011

Existing A2 coast road: Colombo to Galle and Matara

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Benefits of the Southern Expressway –

- Expected to boost GDP in Southern region by 10%
- Will benefit 3 million people
- Reduce journey time from Colombo to Matara from 4 down to 1½ hours
- Ease congestion in local towns

Locations of connecting roads -

Road No.	Section				Length km
	From	Km	To	Km	
A004	Kirulapona	0+130	Kottawa	12+000	11.87
A024	Matara	0+000	Godagama	4+000	4.00
B084	Vilasithanivasa	0+500	Horana	27+600	27.10
B153	Hikkaduwa	0+000	Baddegama	14+340	14.34
B157	Aluthgama	30+000	Matugama	53+480	23.48
B207	Katukurunda	0+000	Nagoda	2+270	2.27
				Total road length	83.06

Locations of connecting roads -

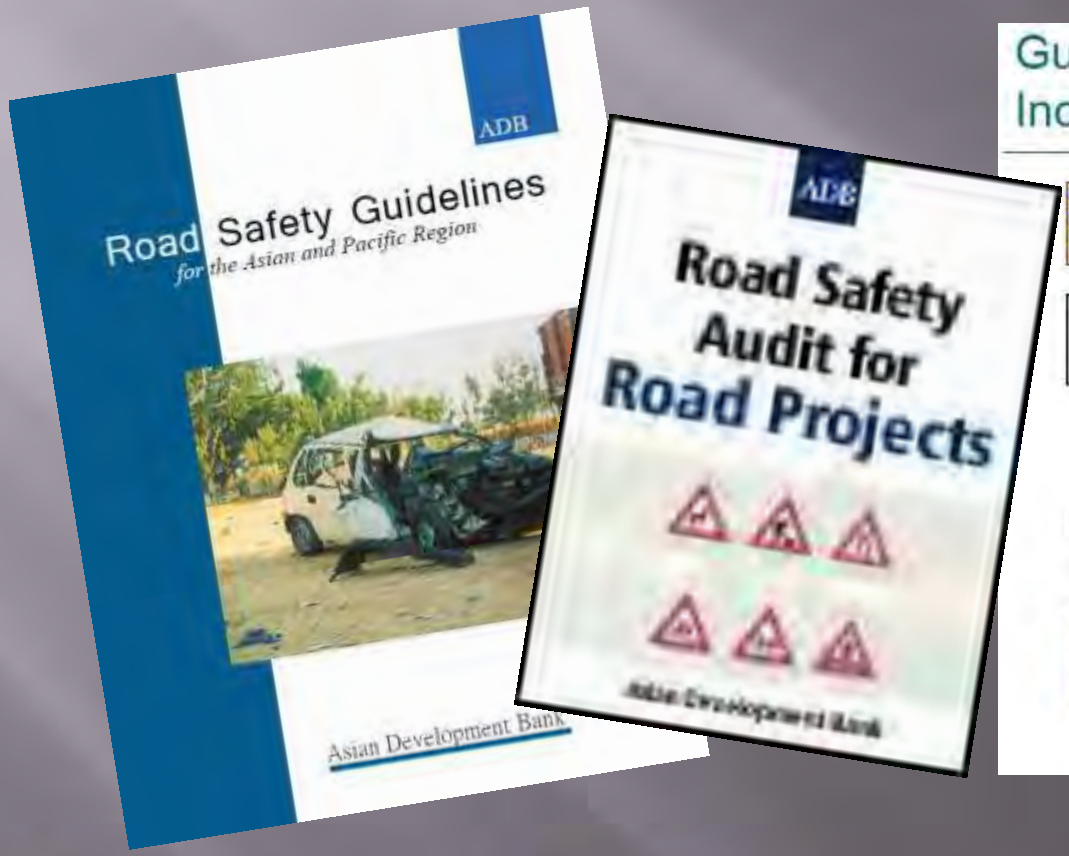
Design problems for connecting roads:-

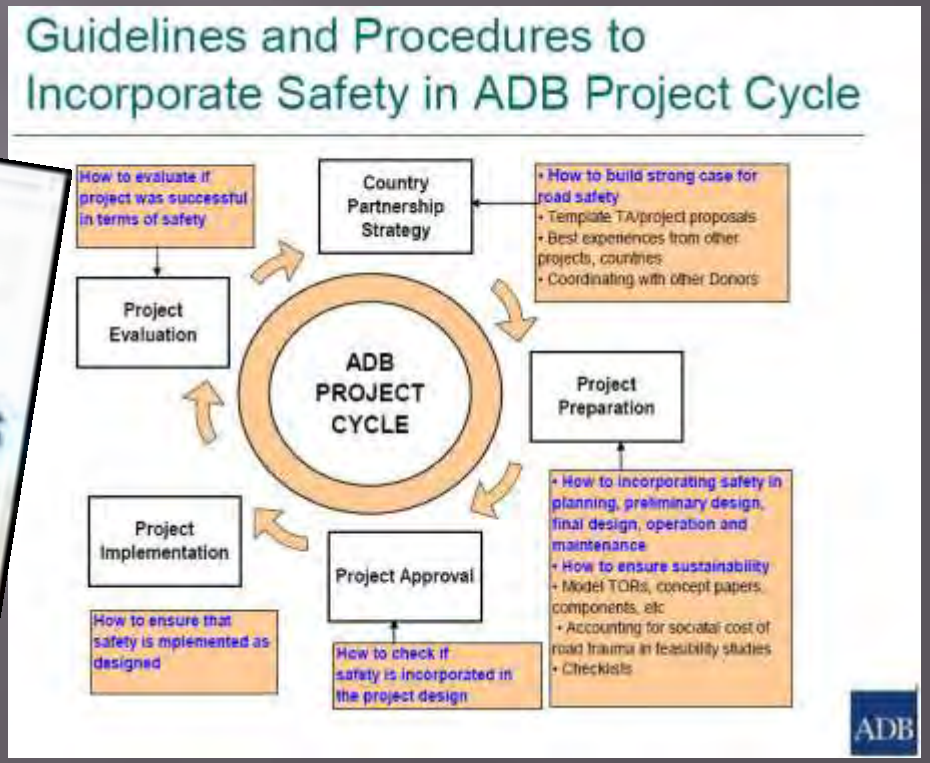
- **Poor ground conditions** - large areas with 8-9m depth of peat
- **Danger of landslides** associated with poor drainage
- **Poor vertical & horizontal alignment of existing roads** – many built by the British (before 1948)

Format of Report -

- Conform to ADB Operational Toolkit
- Combination of Audits at Preliminary and Detailed Design
- Tight time schedule – 6 weeks
- Inadequate preliminary plans – designs 10 years old
- Lack of safety awareness of design team
- Site visits were curtailed due to weather

ADB Road Safety Audit Operational Toolkit





Site Visits were disrupted due to unseasonal weather

Heavy rains and flooding -

Intersections with the Southern Expressway (under construction) -

B084 near Pillyandala

B153 near Badegama

Format of Report –

- **Preamble –** Road Safety Ethos; context; implications of improvements
- **Stage 1/2 Road Safety Audit –** purpose; objectives; procedures; scope; existing environment
- **General Observations –** cross section; horizontal and vertical alignment; signing and road marking; parking; bus stops; speed reduction; village entries; pedestrian facilities; schools, etc; junction layouts;
- **Specific Locations –** on A004, A024, B084, B153, B157 and B207

Format of Report – Preamble

Sri Lanka Statistics – 2328 RTC fatalities in 2008 for a population of 21.3 million and 91,907 km of paved roads and only 2,527,000 motor vehicles (2004).

Sri Lanka - 9.15 fatalities per 10,000 vehs.
Compared to India at 12.7 and UK at 0.7
Sri Lanka - 10.9 fatalities per 100,000 population
Compared to India at 8.4 and UK at 3.8

Motor vehicle registrations are increasing at over 300,000 per annum.

Format of Report –

Stage 1/2 RSA

- Descriptions of what this involves, how it was conducted, who was involved, the sections of highway audited, how the report is structured.
- Brief description of existing environment – mixture of urban, semi-urban and rural
- Existing problems – general and specific
- Existing problems – poor standards in layout, construction, drainage, signing and marking

Format of Report –

A4 through Gangodawila showing how a major highway edge has deteriorated leaving no provision for pedestrians

roadside commercial development on the B207 in Katukurunda

Format of Report – General Observations:

Cross Section –provision for cyclists and pedestrians may be taken over by motor traffic.

Recommendation: must be isolated from carriageway; edge to be strengthened in rural areas.

A section of the A4 entering Pannipitiya where any provision for pedestrians is completely absent. The result is that pedestrians have to walk in the road.

Format of Report – General Observations:

Horizontal and Vertical Alignment

- Minimum curve radius – 215m
- Maximum gradient – 5%
- Crest curve, maximum vertical curvature, K – 30
- Sag (valley) curve, maximum vertical curvature, K - 25

One of a series of bends on the B84 which are clearly below the design speed criteria. Note also the complete absence of marking and signing

Format of Report – General Observations:

Signing, Marking and Road Studs

Problem: Poor standards and infrequently used

Recommendation: Improve standards and increase use

	White	Yellow	Red	Green	Blue
Sri Lanka specification	150	100	25	25	11
3M Diamond grade	225	180	65	28	14

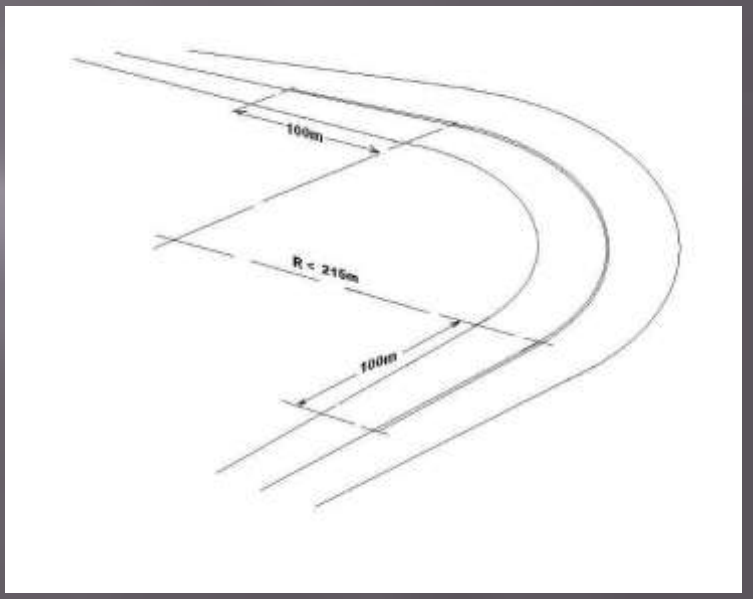
Comparison of different colour retro-reflectivity at 30° Entrance angle and 0.2° Observation angle

Format of Report – General Observations:

Signing, Marking and Road Studs

Application of double line system

Example of UK application

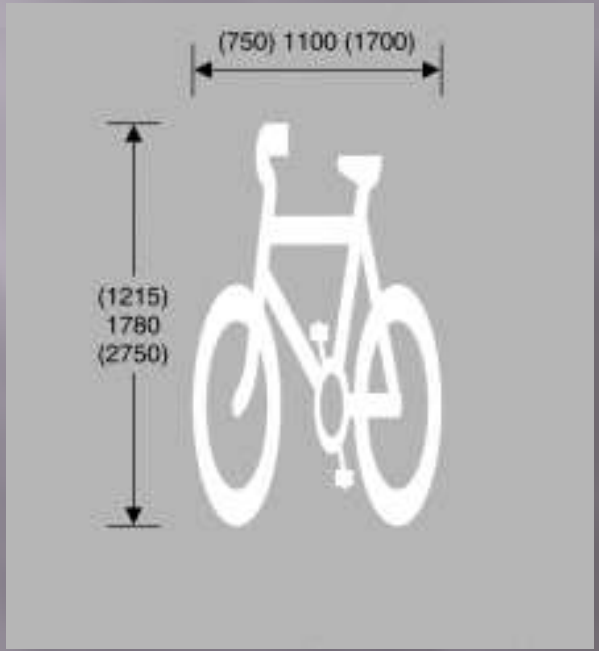


Recommended application in Sri Lank on bends, R<215m

Format of Report – General Observations:

Designating areas of roadway

Recommended use of symbols and lining -



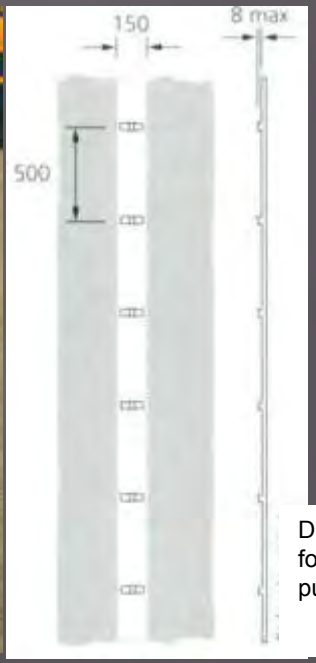


Diagram 1012.3 – for use on all-purpose roads

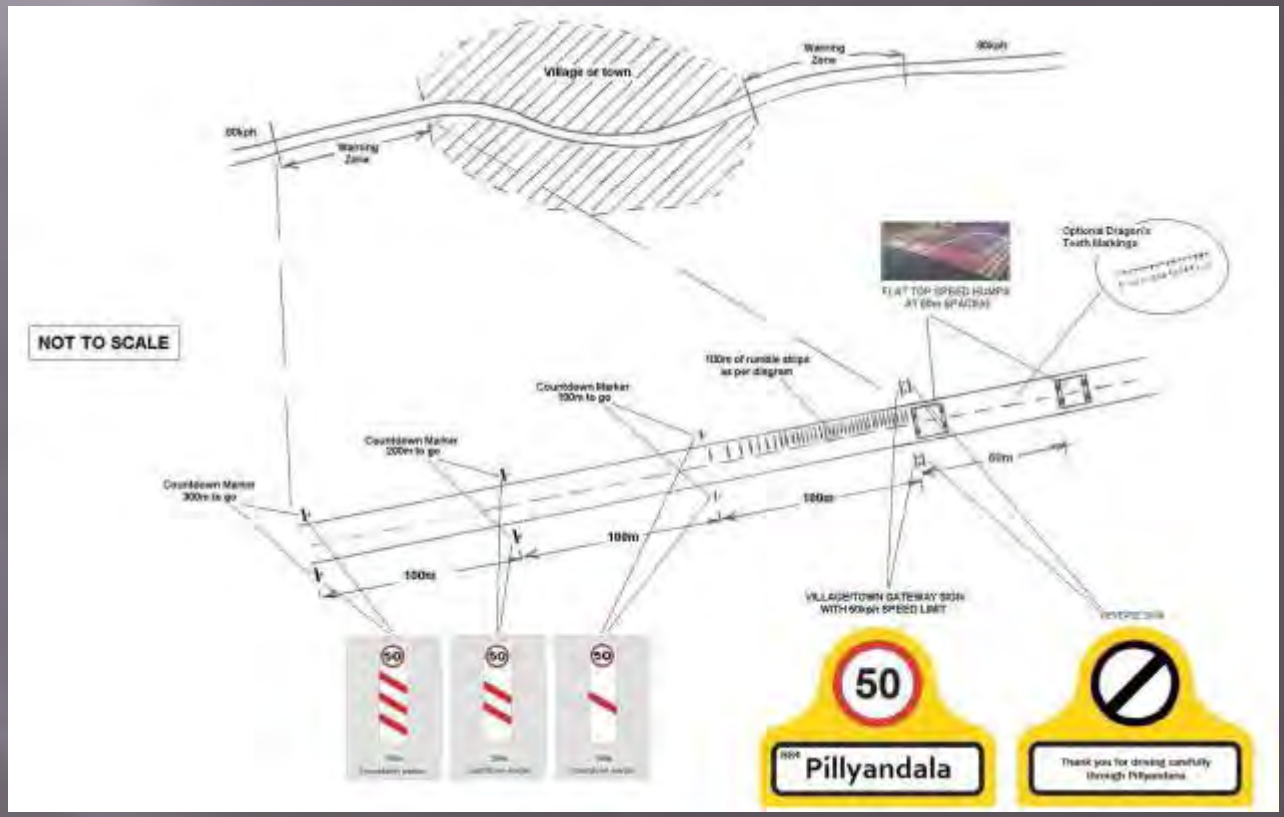
Format of Report – General Observations:

Speed Reduction in Rural Communities

Problem: no current measures; no proposed measures

Recommendation:-

A combination of UK gateway measures, including countdown markers, rumble strips, flat-top humps, speed limit signs with place name signing



Format of Report – General Observations:

Speed Reduction in Rural Communities

Existing problem:-

B157 entry to Matugama – no signs, markings, speed limits or change in cross section

Format of Report – General Observations:

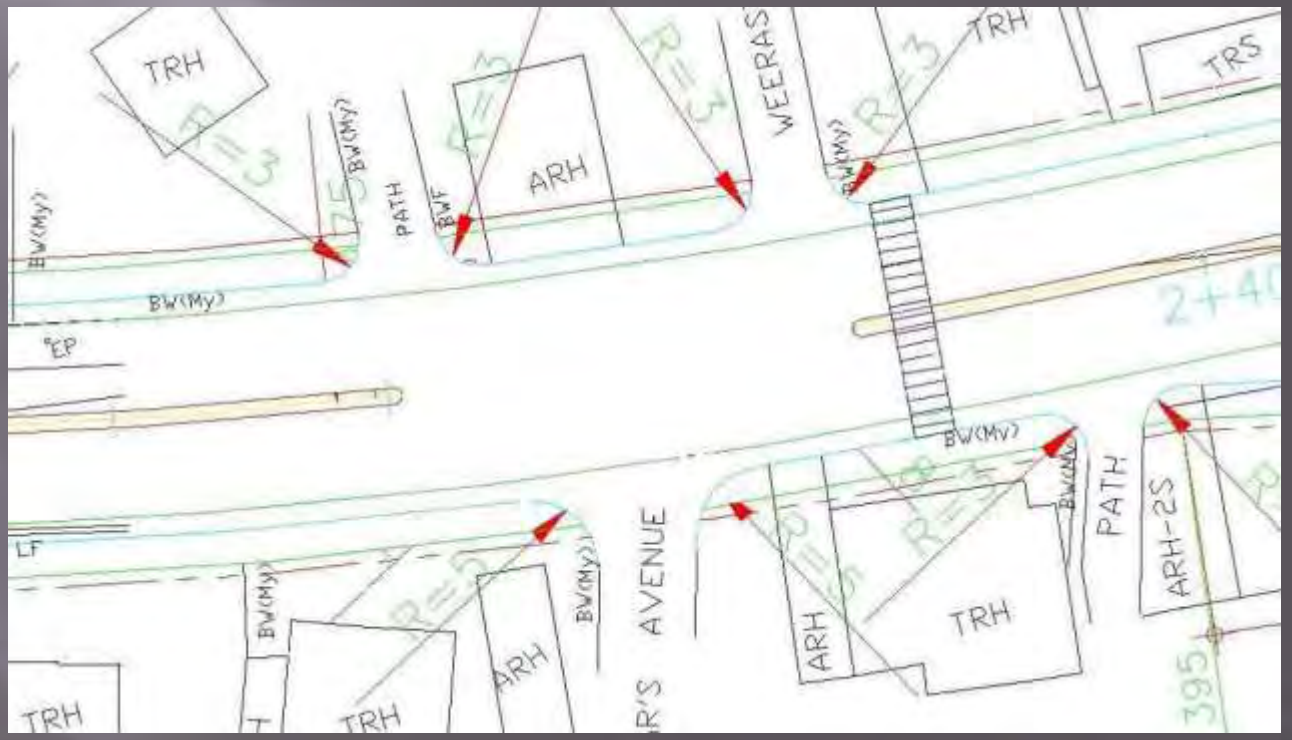
Junction Design

Existing problem: non-existent detail

Recommendation: prepare detailed plans!!

Example 1:

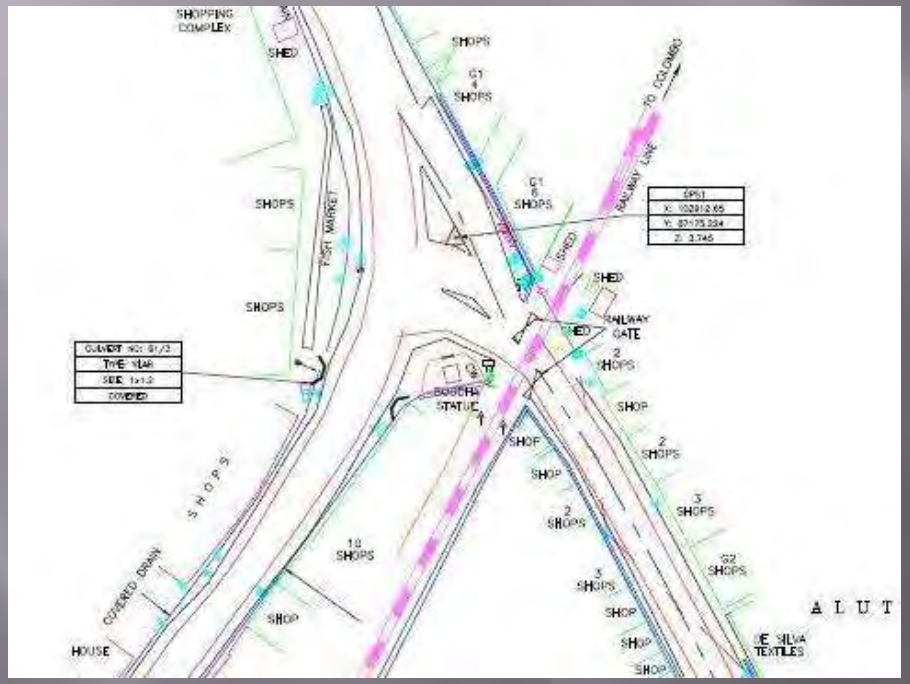
B84 Junction at Km 2+360 with Mudliyar's Avenue

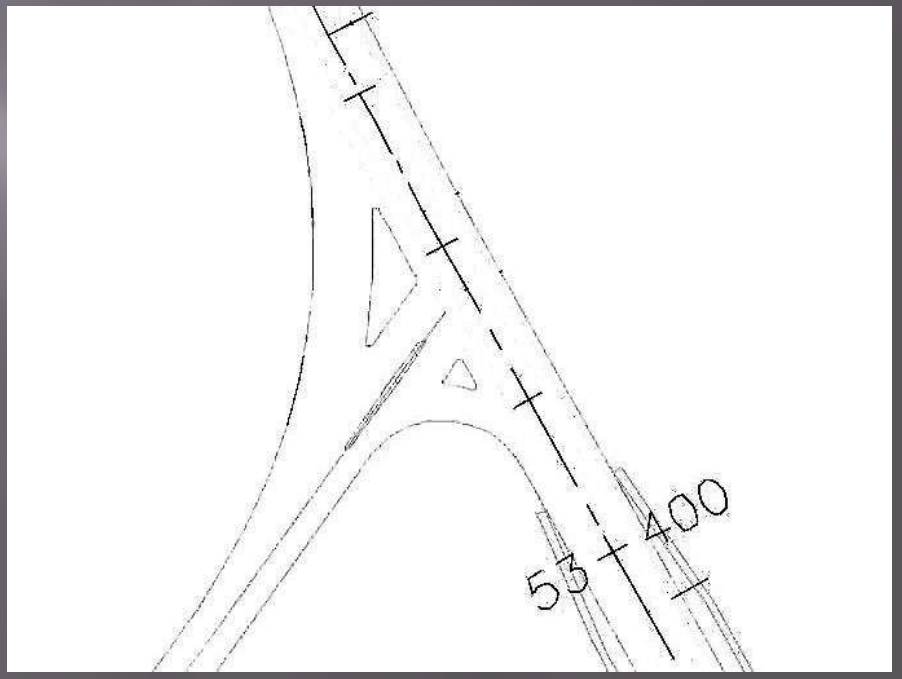


Format of Report – General Observations:

Junction Design

Example 2:





Existing & Proposed layout of the A2 junction with B157

The Developing World:

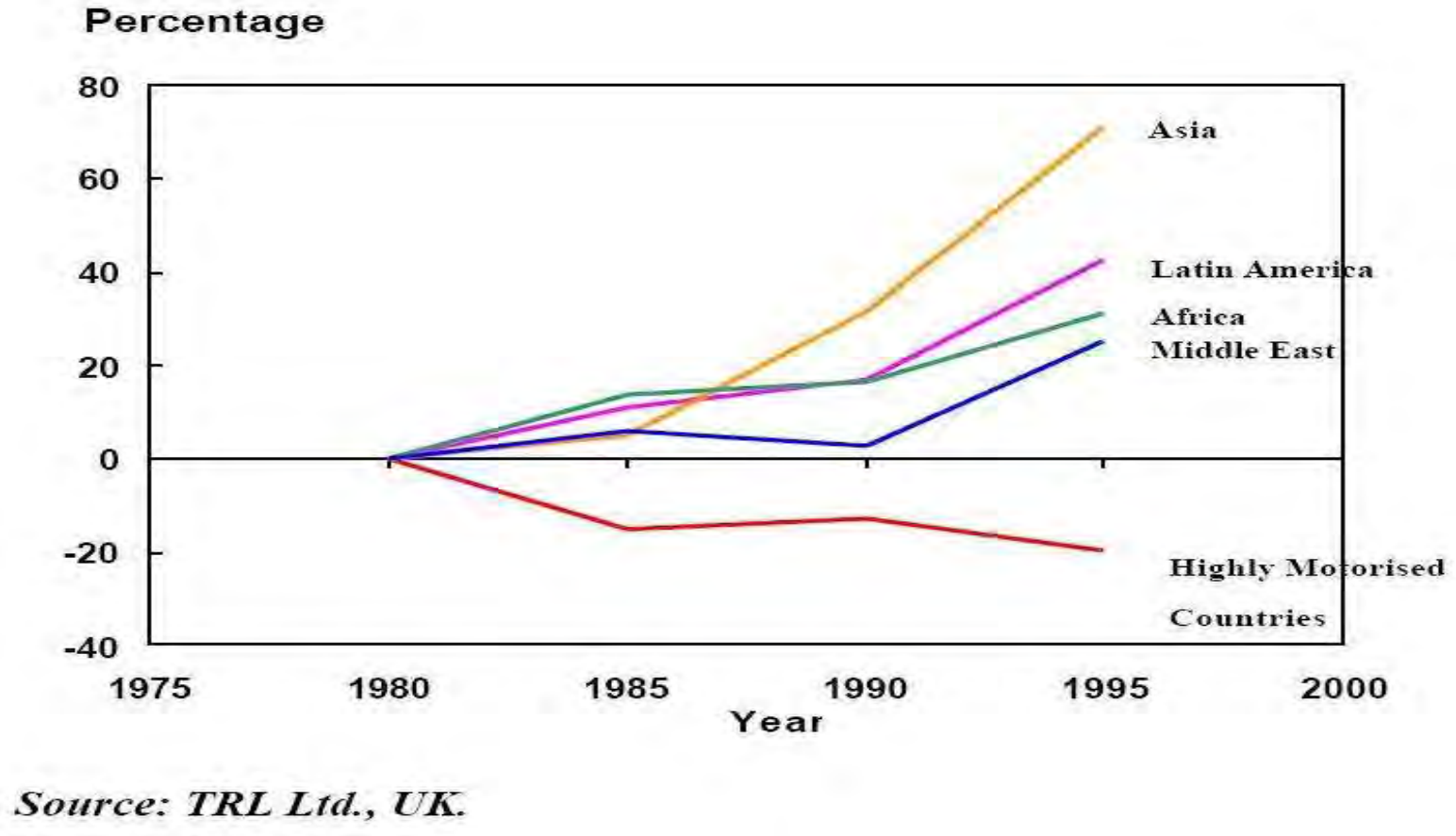
- Globally, a person is killed in a road crash every 30 seconds (>3000/day = 1.2 million/year)
- 50 million are injured every year
- 85% of global road traffic deaths and injuries occur in low- and middle-income countries, i.e. those in developing world
- These countries have only 40% of global traffic
- Vulnerable road users make up the majority – in some countries, pedestrians account for 50% of deaths and casualties

The Developing World:

- Globally some 500 children die each day
- In Africa, more children die from road crashes than HIV/Aids
- In developing world road crash victims account for 30-85% of hospital major trauma admissions
- Annual global cost estimated between $64.5 and $100 billion
- In 15 years time, estimated deaths will rise to 2.4 million, mostly in developing and transitional countries

The Developing World:

Regional Trends in Road Fatalities



Source: TRL Ltd., UK.

Implications of new highway infrastructure in developing countries –

- Road investment will increase exposure to the risk of road traffic deaths and injuries.
- The technical capacity of developing countries to develop and implement effective road safety strategies and programmes is weak.
- **Road Safety Auditing new schemes will help to reduce this increased risk**
- Incumbent on funding organisations to include safety audit as a prerequisite to new schemes

In addition.....

- The effect of urbanisation – by 2015 half the world's population will be urban
- Most of this increase will be in developing countries
- Challenges governments to provide services, infrastructure and social support to create a liveable AND SAFE environment

Developing World Infrastructure Funding Organisations

- World Bank
  - Asian Development Bank
  - Inter-American Bank
- Private banks with Export Credit Agencies
- National Development Agencies

Sri Lanka
Asian Development Bank

- Guidelines for procurement highway projects includes
  - Road Safety Audit – an operational toolkit
  - Environmental Assessment
  - Air Quality
  - Institutional Strengthening
  - Road Safety Guidelines
  - Economic Analysis

Quick summary -

- Developing world in dire need of road safety activity – auditing is one small item
- The biggest problems are cultural differences, lack of institutional capability and political will
- Road Safety Auditing is very basic – fundamental safety engineering
- Two thirds of the world is in desperate need of our experience

Thank you for listening

ANY QUESTIONS?

Lance Fogg
lance@arena-associates.co.uk