ADB

Road Safety INTERNATIONAL

ASIA PACIFIC ROAD SAFETY OBSERVATORY

"Practical Road Safety Engineering" online workshop

Module 8 – safety on rural roads

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We are coming to the end of the workshop

220+ participants from:

ADB STAFF	MYANMAR
AFGHANISTAN	MICRONESIA
ARMENIA	NEPAL
AZERBAIJAN	PR CHINA
BANGLADESH	PHILIPPINES
BHUTAN	SRI LANKA
CAMBODIA	THAILAND
INDIA	TIMOR-LESTE
KAZAKHSTAN	TONGA
KIRIBATI	TURKMENISTAN
MALAYSIA	VIETNAM

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Successful completion of this workshop requires

- Participation in all eight modules
- Attempted answers to the Poll Quiz questions
- Satisfactory preparation of a hazardous road location report with recommended treatments
- Satisfactory completion of a road safety audit report.

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Wally the Wombat

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Most important "take away" messages

Engineers *are* important in road safety.

Put the ***ROAD*** into road safety!

YOU can save lives by designing, building and managing safer roads.

- Fix blackspots
- Use audits to ensure new designs will be safe
- Remember pedestrians and roadside hazards

Treat road safety as a business.

Look "long term"

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Dear Sir

At one location of Highway Project; Avg. cutting at bottom due to restriction of land is 10.20 m.

Depth of cutting in Rock is 12-15 m (almost vertical or top width up to 15m).

I request to kindly confirm "is it safe or what to do in such condition for new Project". Additionally, the Road is still awaited to allow for public traffic.

I have attached few photograph of the location.

Thanking You,
Prahlad Pandey
India (M.P.)

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It appears that no road safety engineering inputs were given/taken during the initial planning.

Are there roadside hazards? Yes. Its not the height of the cutting, it's the distance from the traffic lane.

Clear zone needed – I estimate 7m (80kmh and 10,000vpd) from edge line. You have maybe 3m?

I fear you will have a substantial "run-off-road" safety problem here when the road opens.

YOUR OPTIONS:

- Construct concrete barrier along base of cutting. Pave out to barrier.
- Make cutting much wider – so wide that barrier is not needed, or at least wide enough to allow 1m+ deflection behind new steel barrier.
- Somehow keep speeds very low – about 40kmh. Unlikely.

- Make sure RSE inputs are firmly made in all future road projects!

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Dear Sir

My question is problem based on budgetary gap between demand and allocation.

LDC,s like Nepal have limited annual budget allocation for road safety program, however it requires much more budget to address the requirement road safety issues. In such situation how the allocated budget can be spent more effectively and efficiently, is there any well established practices to resolve such types of problems?

Thank you.

Shiva Lal Dahal
Senior Divisional Engineer
Ministry of Physical Infrastructures & Transport(MoPIT)
Government of Nepal

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This is a big challenge in *all* countries – and especially LMIC's

- TREAT ROAD SAFETY AS A BUSINESS
- INVEST IN ROAD SAFETY.
- SPEND $1 TO GET MORE THAN $1 IN RETURN
- CREATE A SAFETY CULTURE IN YOUR MINISTRY

LMIC's = cheap labour.
- Why is vegetation allowed to grow over signs and block sight lines.
- Why are white lines NOT maintained? Pot holes NOT filled?
- Traffic signals allowed to rust away?

Then ask what can you do at low cost?

Blackspot investigations and treatments
Road safety audits – change while still a mouse click on the computer.
Pedestrian facilities – kerb extensions, ped refuges. NOT overpasses!

The presentation today on Safety on Rural Roads pulls together some of these messages. Accept ADB safety inputs on your donor funded road designs.

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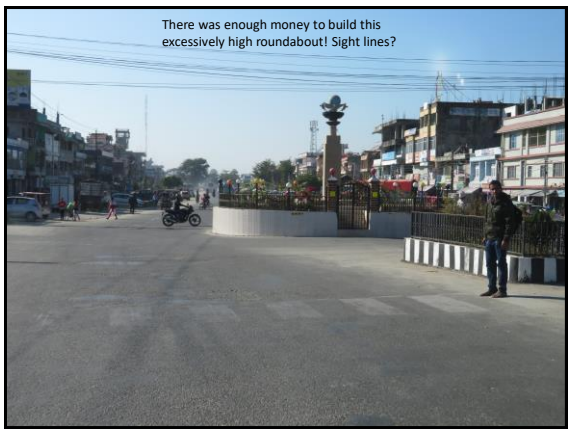

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"Road safety" doesn't happen overnight

It is on going for decades

In 1970 - Victoria (my State) had fatality rates higher (>30) than your rates of today.
Since then our state has achieved world class rates. You can too.

It takes:
- Time.
- Co-operation with stakeholders.
- Resources.
- Some champions (like some of you)

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One question came through from Oliver:

May I cascade the lectures and presentations to my police officers assigned as road safety officers particularly in areas with identified black spots?

Yes – spread the information wide; remember to stay factual.

Get DPWH Field Guide on Treating Blackspots

Look up other documents on blackspots, RSA, roadside hazard management

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Participant	Question
Last week we just touched on the 'Diamond Crossing' (which is new that I come across). If this is a significant component of road safety measures, could this be elaborated more pls?	Donald Sinclair

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Safer ? Maybe. More efficient ? Doubtful

Where diagonal markings exist in Japan:

- All motor vehicles are stopped by red signals
- Pedestrians can cross in any direction
- This adds an additional phase to the signal cycle
- It therefore increase delays for all users – hence NOT really efficient.

BUT – a few seconds additional delay to give pedestrians freedom to take their shortest route can be a positive move when:

- Very large numbers of pedestrians for most of the day
- Compliant drivers and pedestrians
- Good maintenance

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Participant	Question
Hi, could you share us with the following guidelines: -specification of road marking for dry & wet -specification of road sign for urban and rural -road sign for 4-lane and divided highway -standard "Letter Font" for sign Board -standard for Road Surface, skid Co-efficient	Chanbandith Pich

Bangladesh Signs manuals – 2 volumes - added
Australian Standards – expensive – an older edition also added to Workshop Drive

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Participant	Question
How to calculate pedestrian capacity of a central island (say 4 lane 2 way road)?	Lohitha Sedara Senarath

Count number of pedestrians in peak hour.

Assume they may stand for an average of 15 seconds on the refuge (this is a rough estimate based on traffic volumes and gaps)
Allow 1sq.m per pedestrian.
This should give you the area of the refuge.

Example 480 ped/hour = 8 peds per minute = if each one is delayed 15 seconds you will on average need to store 2 peds. You can increase length too!

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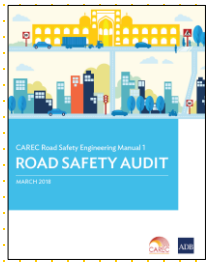
Feedback on your road safety audit homework



- Over 100 reports received. Great work all!
- Enthusiasm to build safety into the drawings of a new road is an essential first step
- Marking is on-going – next week!!

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We wanted you to :

- Look at the drawings – try to imagine the finished road.
- Look for safety concerns in the drawings.
- Ask - how will the future road users use it – safely?
- The photos were a substitute for a site inspection (not a good one!)

- Some participants looked at the existing photos and made recommendations to improve the ***existing*** highway.
- That is ***not*** an audit. The duplication and rehabilitation work is improving the existing highway.

- An auditor looks for safety problems in the ***design.***

- PS It's not easy investigating a RSA without a site visit, and in a country you may never have been to!

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Participants tended to offer one of three types of RSA report:

- They focused on the existing road and made recommendations to improve it. They did not refer to the drawings.
- Wrote a small text book about good road safety engineering principles.
- Made useful safety comments about the signs and line drawings.
- A few made useful comments on geometric issues too.
- This stage (detailed design) is the last time changes can be made easily to the geometry.

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It was very good that participants:

- Worked in teams. Two/ three pairs of eyes are better than one.
- Wrote short, sharp well presented reports.
- Made a risk assessment for each safety concern.
- Considered vulnerable road users (pedestrian, bicyclists).

- I hope you have learnt that:

- Audits take time – far more than a few hours
- Audits take effort, good drawings and full information.
- Audits demand a site visit!
- Auditors are problem finders.

- A copy of the full detailed design RSA report for this case study has been placed on the ADB drive

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There are many different types of rural roads

Expressways
Highways
Secondary roads
Tourist roads
Farm accesses

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And there are many different rural road environments

- Flat
- Undulating
- Hilly
- Mountainous
- Desert
- Coastal
- Jungle
- Farmland

- Divided/undivided roads
- Different speed environments
- Existing roads, rehabilitation and duplication projects, and new road projects

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Safety on rural roads

Rural roads are a large part of ADB programs.

Rural roads are a key responsibility of most road authorities.

They may have poor safety records – often due to high speeds coupled with poor maintenance.

How can I cover "safety" for so many different rural roads?

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Consistency and maintenance are key messages!

I decided to focus on 9 safety issues that tend to be common on most of the rural roads I have worked on.

These are things to look out for in new road proposals! They are "red flags" if any of these appear in any road proposal (especially if ADB is involved!)

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Consistency (no surprises)

Better to provide 3-star consistency along an entire route, than 5-star mixed with 1-star sections!

Always think of our "customers".

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Safety on rural roads

- Cross sections
- Alignments
- U-turns on divided highways
- Speed management
- Delineation
- Bridges
- Villages
- Pedestrians, bus stops, animals
- Arrester beds

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Message 1 – keep cross sections as consistent as possible, and provide wide *paved* shoulders

- Typically shoulders should be minimum 1.5m and *paved.*
- More - if you have many pedestrians, m/c, animals, farm machinery in your rural areas.
- Some people say paved shoulders encourage "rash overtaking". (Police enforcement can address this)
- Some people say pedestrians must be provided with an off-road footpath. (Great but not always possible)
- Both can be true – but in practice paved shoulders 1.5m to 2.5m wide – are a the first and most realistic option.

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Cross sections of many rural roads

- Traffic lanes typically 3.0 – 3.75m wide. Follow national "standards"
- Shoulders typically 1.0 – 3.0m wide
- Paved shoulders are usually too narrow (0.5m wide but up to 3m on highways/expressways)
- Medians – usually too narrow (leaving no width for sheltered turn lanes)

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An ADB funded international highway, with operating speeds around 100kmh, 2.5m shoulders of which only 0.5m is paved. Why?

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Big drop offs. Hazardous for m/c and small vehicles

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The "slow lane" should end – with line marking and signage

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Safety on rural roads

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Message 2 – keep H and V alignments as consistent as possible, and watch intersection layouts

- Topography and existing road reserve will impose constraints
- Think carefully about the design speed adopted – if it is too low compared with the practical operating speeds then crashes will occur. Especially where long straights occur.
- Look at all the intersections along the route. No Y-junctions!
- Look carefully at locations where medians end.

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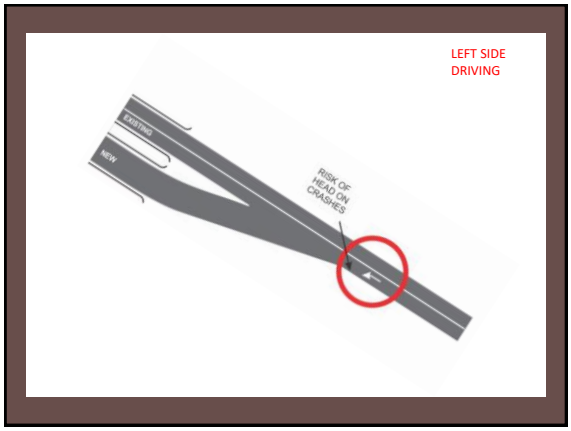

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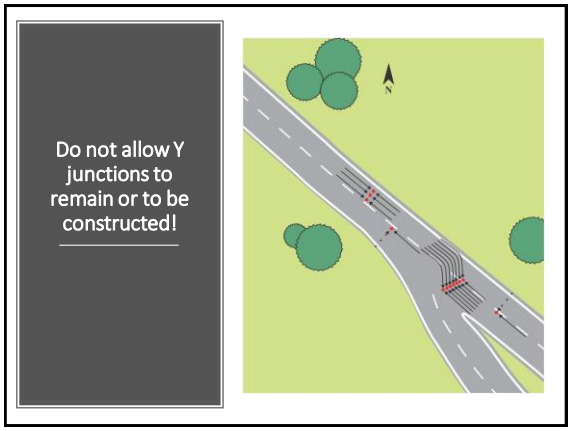

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Y-junctions are dangerous and must be eliminated from our rural (and urban) roads

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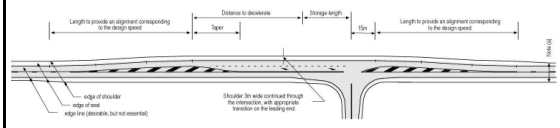
Keep intersections simple – squared – and with space for stationary vehicles to wait while turning



SHELTERED RIGHT TURN LANE

For driving on left side of road

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This is a Y-junction with excessive kerbing. Remove the triangular island, square up this road with the main road and install a long splitter island.

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Safety on rural roads

- Cross sections
- Alignments
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Message 3 – any median needs to be wide enough to provide sheltered turn lanes

- The existing road reserve will impose constraints – there is generally a reluctance to take more land.
- A narrow median (say 1m) will block turns, intersections and U-turns. It may assist as a pedestrian refuge. But it may not be sufficient for signs or lighting, and will increase rear-end collision risk at openings because turns will be made from the "high speed" lane.
- Keep intersections open along the route – except if there will be sight restrictions. Blocking too many intersections with a median, and sending all side road traffic to new U-turns, is fraught with difficulties. Wrong way movements!
- Look carefully at locations where medians end.

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Provide sheltered left (right) turn lanes – especially on high speed roads

These reduce risk of rear end collisions

Gives safe storage area

Need a median that is at least 4m+ wide (prefer more)

Needs sufficient length

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Low risk sheltered turn lane (if maintained and used correctly)

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Safety on rural roads

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Message 4 Gain driver/rider trust. Use regulatory speed restriction signs consistently but NOT for individual curves, crossings, bridges or other locations

- Gain driver respect for the speed management regime in your country.
- Apply signs consistently, and in pairs.
- Maybe 100kmh, or 80kmh on rural road, 40kmh in villages.
- Ensure all hazards and crossings and bridges are adequately signed with warning signs and good delineation.
- Using regulatory signs for a "warning" brings them into disrepute.

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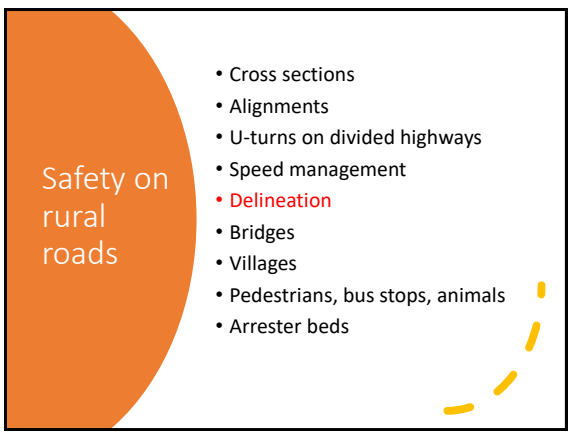

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Message 5 Delineation is essential – and best when it is consistently applied along a route

- Better to have 3 star delineation consistently, than a mix of 1 star and 5 star sections.
- Think of theft, vandalism, natural damage (landslides).
- Discuss and decide if it is better to use more robust (but less forgiving) devices in your country. How many m/c do you have?
- Some countries have many pedestrians and small vehicles in rural areas; some have very few.

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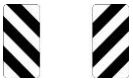
Delineation

- Guide posts

- Raised Reflective Pavement Markers (cats eyes)
- Hazard Markers

- Chevron Alignment Markers (CAMs)

- Reflective Width Markers



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Guideposts

White post 1 metre high, 100 mm wide

- Double sided on a two-way road
- Retro-reflective delineator
- Red on the driving side
- White on the opposite side
- Lateral placement:
  - 150 mm clear of outer edge of shoulder
  - 1.2 to 3.0 m from edge of traffic lane
  - Keep the lateral space consistent

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Chevron Alignment Markers (CAM's)

Keep CAM's for substandard curves only

Only place on outside of curve

Always show CAM's for both directions

Minimum of 3 CAM's in each direction

Drivers should be able to see 3 CAM's at all times

Space them evenly (but avoid driveways, lanes, other obstructions)

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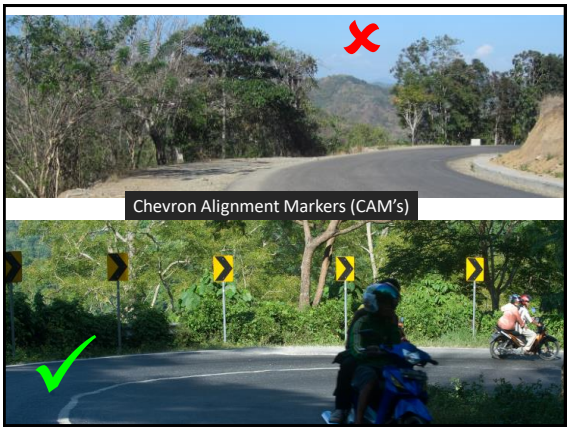

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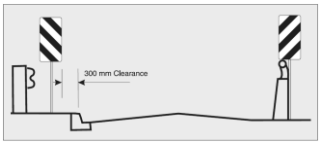
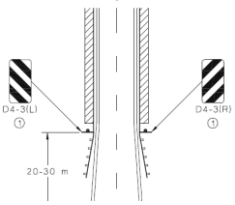
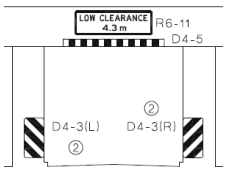
Width Markers

- Culverts
- Bridge piers
- Bridge end posts
- Railway level crossings







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LINE MARKING

- Provides longitudinal and also lateral guidance for drivers/riders
- Guides them along the road, guides them to turn, instructs them where to stop and where NOT to stop
- Best if thermoplastic (not paint)
- Can also be tactile

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Pavement Markings

- Dividing lines (centre lines)
- Lane lines
- Edge lines
- Pavement arrows
- Stripes and chevron markings
- Words
- Symbols

- Materials:
  - Paint
  - Thermoplastic
- Retro-reflective glass beads

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Raised pavement markers


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Safety on rural roads

- Cross sections
- Alignments
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Message 6 Bridges should be "just another part of the road"

- A bridge simply "holds up a road"
- Bridges tend to be more expensive than other sections of road.
- There has been a tendency to save money by making them as narrow as possible.
- Engineers can demonstrate how many $$ less their bridge is. But at what crash cost?
- How will pedestrians and small vehicles safely cross the bridge?
- Some countries have many pedestrians and small vehicles in rural areas; some have very few.

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Message 6 Bridges carry more than just motor vehicles

- We don't want the bridge to collapse, fail!
- After that, we don't want the bridge to become a roadside hazard!
- And we don't want the bridge to be a "squeeze point" for pedestrians, two and three wheelers, or animals.

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Message 6 Take the full shoulder width across new bridges, and provide a protected/separate bridge for pedestrians

- Take a full width shoulder across every new bridge.
- Install adequate safety barrier on all four parapets and secure it.
- Install reflective Width markers to highlight the bridge parapets.
- Ask the best way to help pedestrians and small vehicles safely cross the bridge.
- Is a raised "footpath" safer than nothing? How high does a kerb need to be to be safe? How will rickshaws and m/c access it?

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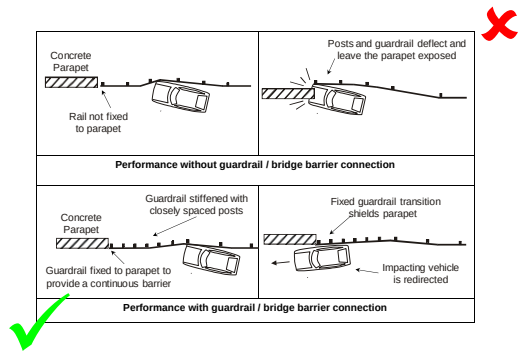

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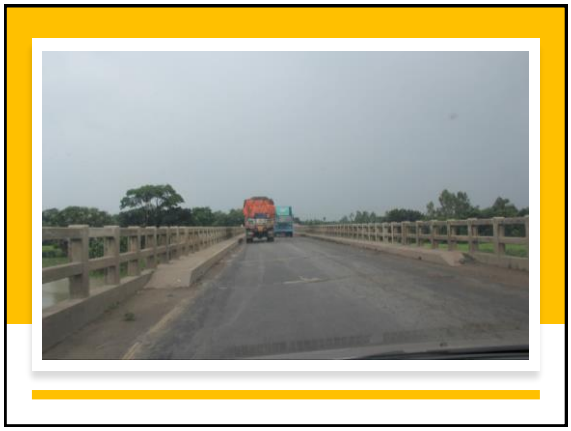

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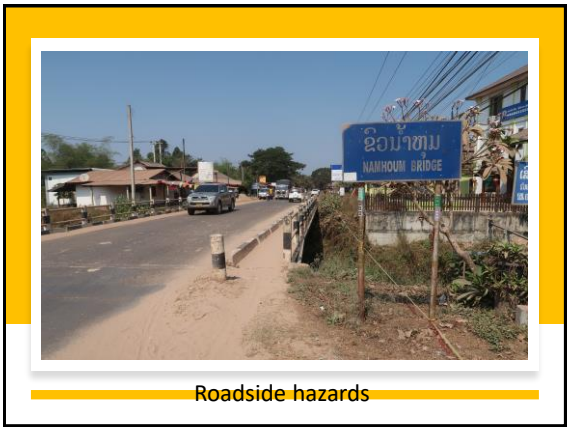

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Bridge improvements:

- Where an existing bridge has concrete kerbing along the deck, seek to remove it (after obtaining structural advice) to maximise the cross-sectional width of the bridge.
- Seal the full width of the bridges to maximise the pavement cross section.
- Install Width Markers on each corner of all bridges.
- Hatch the paved shoulder with thermoplastic hatching for at least 50m on the approach to and departure from each bridge abutment that lies within or close to the edge of the sealed shoulder.

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Safety on rural roads

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Message 7 Traffic calm villages

- Gateway treatments should become "standard".
- Decide a suitable speed limit for the village and post adequate signs.
- Ask - will it be enforced by Police?
- If not – what are your options – road humps work best, followed by roundabouts and chicanes and raised junctions.
- *DO NOT* accept that the villagers must "pay the price" when a rural road is rehabilitated.

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Safety on rural roads

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Message 8 Pedestrians are legitimate users of rural roads

- They walk on/beside most rural roads in most Asian countries day and night
- If we cannot give them a dedicated "off-road" path then we need to offer wide paved shoulders. And no squeeze points (such as culverts, or bridges) as they walk along a road.
- Do NOT use Zebra Crossings (or signals) in rural areas.
- They do not command driver respect in high speed areas.
- Warning signs, good sight lines, medians and lighting are better options.

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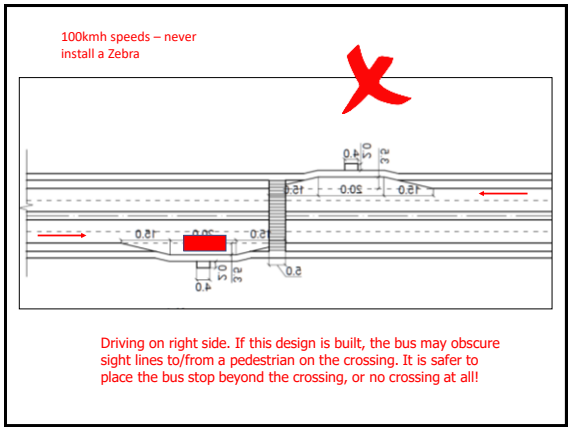

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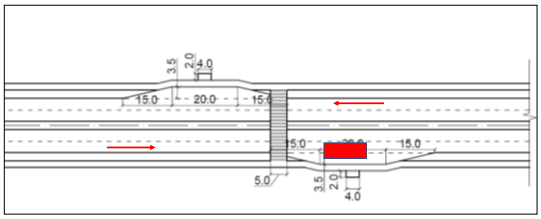
Safer!

100kmh speeds – never install a Zebra even if this design is used!



Driving on right side. With this configuration, the bus will not obscure sight lines to/from a pedestrian on the crossing. Bt still no crossing in high speed zones!

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Safety on rural roads

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On high volume roads in steep terrain, arrester beds can serve a useful safety purpose

Arrester beds can be useful on roads in steep terrain and used by many large vehicles

An arrester bed gives a runaway truck or bus an escape route that can slow it down

Expensive. Use wisely.

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Message 9 In steep terrain, with many trucks and buses, and if brake failures are common, arrester beds may be an option

- These are not common, but they work.
- They can be expensive, and they must be well maintained and no parking must be allowed in them!
- Really good advance signs are essential
- Imagine what a truck or bus driver could be thinking going downhill with failed brakes!

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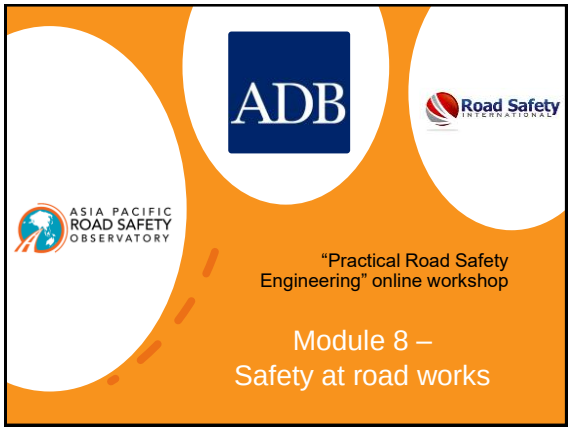

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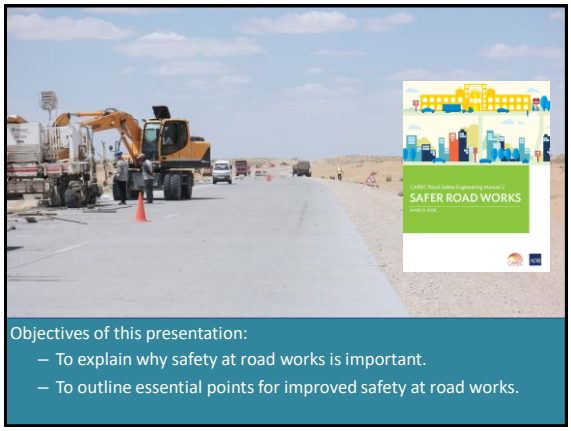

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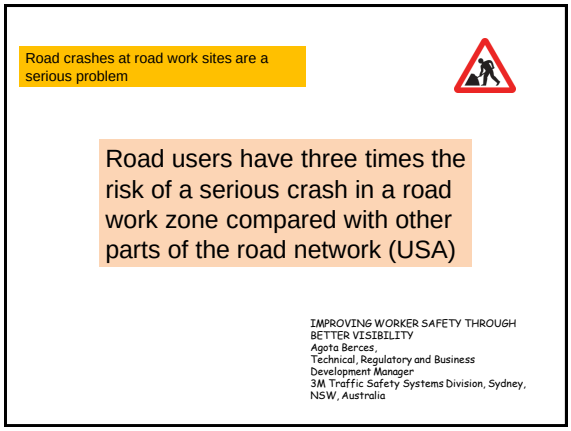

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Road crashes at road work sites are a serious problem

Studies in Finland and Slovenia showed that 'motorists are up to five times as likely to be injured when travelling through a work zone'

IMPROVING WORKER SAFETY THROUGH BETTER VISIBILITY
Agota Berces,
Technical, Regulatory and Business Development Manager
3M Traffic Safety Systems Division, Sydney, NSW, Australia

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Road crashes at road work sites are a serious problem

German research has shown that approximately one quarter of collisions happening on national routes occur at work zones.

IMPROVING WORKER SAFETY THROUGH BETTER VISIBILITY
Agota Berces,
Technical, Regulatory and Business Development Manager
3M Traffic Safety Systems Division, Sydney, NSW, Australia

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Road crashes at road work sites are a serious problem

Research has also identified that road works that take longer and extend over longer distances have lower crash rates as opposed to short term works in short length zones. (SWOV 2010)

IMPROVING WORKER SAFETY THROUGH BETTER VISIBILITY
Agota Berces,
Technical, Regulatory and Business Development Manager
3M Traffic Safety Systems Division, Sydney, NSW, Australia

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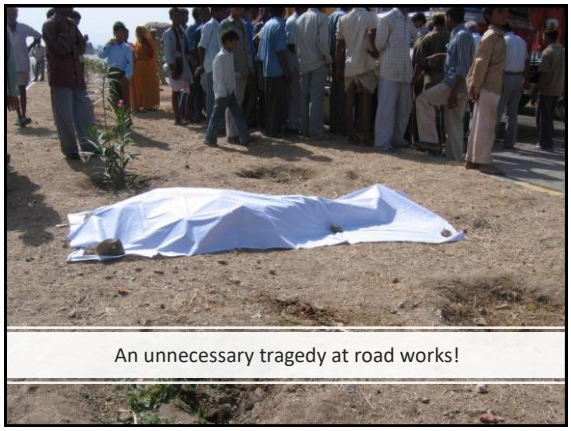

An unnecessary tragedy at road works!

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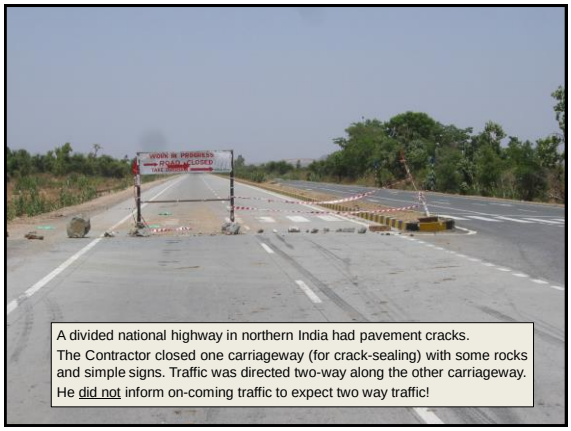

A divided national highway in northern India had pavement cracks.
The Contractor closed one carriageway (for crack-sealing) with some rocks and simple signs. Traffic was directed two-way along the other carriageway.
He did not inform on-coming traffic to expect two way traffic!

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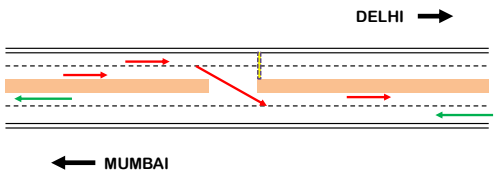
A tragedy waiting to happen……



The NH 76 was a divided highway (2 carriageways). A contractor had closed the Delhi bound carriageway for maintenance (crack sealing).

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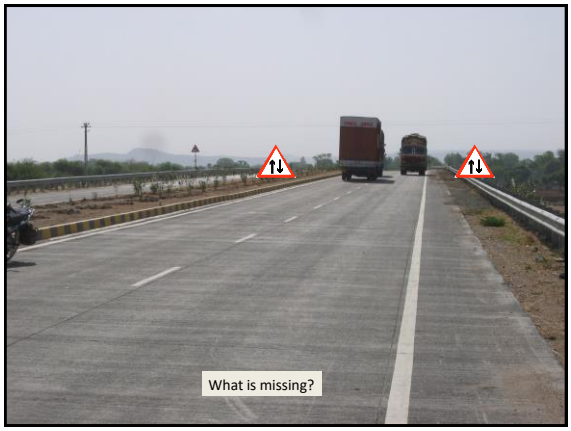

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Could a similar situation exist on one of your highways?

Work sites are planned and managed by engineers.

Any safety concerns at a road work site have been created by engineers!

It is up to engineers to make their work sites safe for workers and road users.

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As a Contractor, or as a Ministry (or PWD) engineer responsible for issuing road construction contracts, and for managing road projects – you have a responsibility to the road users and to the road workers to provide safe work sites.

181

The CAREC manual asks you to remember…..

Road works should not surprise any driver or rider!

Always look at your road works through the eyes of the drivers/riders – not just as an engineer!

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What is a TMP?

A traffic management plan (TMP) shows clearly all the signs, barriers, barricades, and other devices to be installed and maintained at a worksite for the duration of the works. If work has several stages, there should be a TMP developed for each stage expected to last longer than 1 week.

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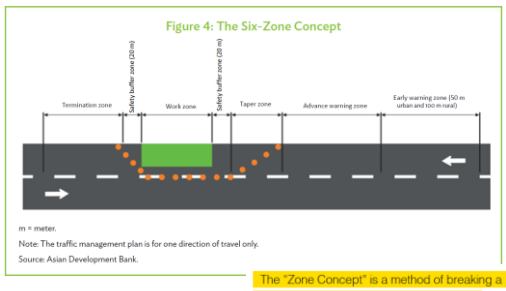
THE SIX ZONE CONCEPT



The "Zone Concept" is a method of breaking a work site down into 6 individual zones.

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The Six Zone Concept

1 Early Warning Zone – the first zone, in which signs are placed to alert approaching drivers/riders of the presence of road works ahead.
2 Advance Warning Zone – alerts drivers/riders of the Work Zone ahead. It uses advance warning signs and regulatory signs to warn users of the Work Zone ahead, and to regulate their behavior.
3 Taper Zone – is used if motorists are required to move from their lane to pass around a Work Zone.
4 Safety Buffer Zone - is a longitudinal safety buffer immediately in advance of, and beside, the work area. At CAREC worksites it is to be at least 20m in length; it is kept free of equipment, materials and workers.
5 Work Zone – is the area in which the works are carried out; it is set aside for workers, equipment and materials.
6 Termination Zone – is the zone where traffic resumes normal operations after passing the Work Zone (the last of the six zones).

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THE LENGTH OF EACH ZONE IS DETERMINED BY THE MAXIMUM OPERATING SPEED ON THE ROAD WHERE WORKS ARE TAKING PLACE.

Refer to the Tables in your CAREC manual

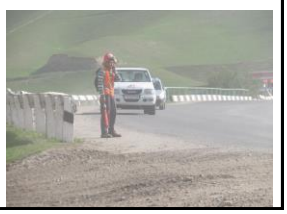

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Table 2: Early Warning Zone Lengths

Speed Zone	Length of Early Warning Zone
Up to 60 km/h	50 m
Above 60 km/h	100 m

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Table 5: Minimum Length of Advance Warning Zones

	Length of Advance Warning Zone (m)	
	Desired Speed at the End of the Advance Warning Zone	
Approach Speed (km/h)	40 km/h	0 km/h (STOP)
50	30	75
60	60	100
70	120	160
80	170	225
90	200	295
100	250	370

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Table 6: Recommended Lengths of Taper (Transition) Zones

Approach Speed Entering the Taper Zone (km/h)	Diverge Taper (m)	Merge Taper (m)
40	50	90
50	50	100
60	60	120
70	70	140
80	80	160
90	90	180
100	100	200

The taper zone length is based on:
- width of lane to be closed is typically 3.5 m,
- diverge taper length is equivalent to 1.0 m lateral shift,
- merge taper length equivalent to 0.5 m lateral shift, and
- use the operating speed of traffic to guide the taper length.

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TWO TYPES OF TAPER ZONES

DIVERGE

Where traffic moves sideways to the left or right to pass the Work Zone

MERGE

Where two lanes of traffic combine (merge) into one to pass the Work Zone

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WHAT SHOULD THE SPEED LIMIT BE IN YOUR WORK ZONE?

Table 3: Speed Limits at CAREC Road Works Where Workers are on the Road or within 1.5 Meters of Moving Traffic

Speed Limit	Safety Buffer Zone	Road Work Speed Limit
Up to and including 80 km/h	Not applicable	40k m/h
Above 80 km/h	60k m/h	40 km/h

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WHAT SHOULD THE SPEED LIMIT BE IN YOUR WORK ZONE?

Table 4: Speed Limits at CAREC Road Works Where Workers are not Working on the Road nor within 1.5 Meters of Moving Traffic

Speed Limit	Safety Buffer Zone	Road Work Speed Limit
Up to and including 80 km/h	Not applicable	60 km/h
Above 80 km/h	Not applicable	60 km/h

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USE A 40 KM/H SPEED LIMIT THROUGH ALL YOUR CAREC WORK SITES – BUT ONLY WHEN WORKERS ARE ON-SITE AND WITHIN 1.5M OF TRAFFIC

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Figure 13: A Reduction in the Available Road Width but with Sufficient Width for Two-Way Traffic

m = meter.
Note: The traffic management plan is for one direction of travel only.
Source: Asian Development Bank.

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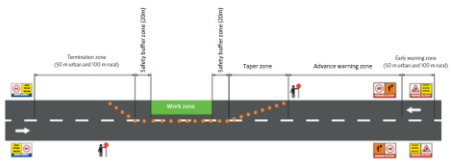
Figure 15: Works on a Two-Way Highway Requiring Closure of One Lane with Traffic Controllers Controlling Remaining Single Lane



m = meter.
Note: The traffic management plan is for one direction of travel only.
Source: Asian Development Bank.

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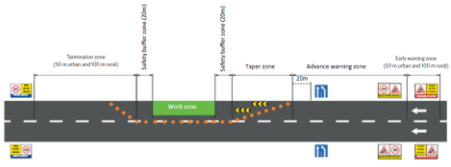
Figure 17: Closure of the Right-Hand Lane of a Multilane Carriageway



m = meter.
Note: The traffic management plan is for one direction of travel only.
Source: Asian Development Bank.

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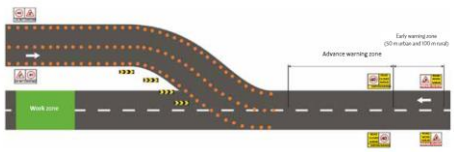
Figure 20: Two-Way Side Track due to a Full Road Closure



m = meter.
Note: The traffic management plan is for one direction of travel only.
Source: Asian Development Bank.

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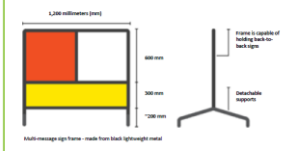
Multi message signs are very useful for road works.

The CAREC manual encourages you to consider these.

Figure 10: Modular Multimessage Frame



Source: Asian Development Bank.

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INSTRUCTIONS FOR TRAFFIC CONTROLLERS

A Traffic Controller is the person on a work site who is responsible for the safety of traffic and pedestrians to pass through the work site safely (and with minimal delay).

The Traffic Controller sets up the TMP zones also.

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Traffic controllers are responsible for:

- Placing the signs in a safe and effective manner
- Placing the cones/ bollard to the correct lengths
- The safety of all motorists and pedestrians who pass though the site
- Assisting the Safety Officer with the safety of all workers on the site

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Instructions for Traffic Controllers

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ROAD SIGNS

Signs at road work sites should comply with the 6C's of good signage.

Good signage is essential for safety through the work site.

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REQUIREMENT	SIGN REQUIREMENT	CONTRACTOR TO ENSURE
Conspicuous	Each sign shall be able to be readily seen.	That all signs can be seen by approaching drivers and/or riders. This requires all signs to be reflective, and in good condition, and located suitably.
Clear	Each sign shall be clear and easy to read.	All signs are to be kept in good, clean condition.
Comprehensible	Each sign shall be easy to understand	All signs used comply with national standards.
Credible	Each sign shall be reasonable and believable by road users	No sign shall be used that does not show a credible (believable) message.
Consistent	The same sign shall be used for the same situation at all road works across the country	That standard signs only are used at road work sites so drivers/riders can quickly understand the message.
Correct	The sign shall be the correct sign for that situation – some warning signs appear the same but have quite different meanings.	That only correct signs are used. Near enough is not good enough. Do not use "any" sign if the correct one is missing. Rather, get a correct one and install it.

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Most important "take away" messages

Engineers *are* important in road safety.

Put the ***ROAD*** into road safety!

YOU can save lives by designing, building and managing safer roads.

- Fix blackspots
- Use audits to ensure new designs will be safe
- Remember pedestrians and roadside hazards

Treat road safety as a business.

Look "long term"

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You can save lives

Remember to put yourself into the shoes of your road users. You can make your roads safer for all.

The world needs more road safety engineers

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