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Central Asia Regional Economic Cooperation Program

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24–25 мая 2023 года • Тбилиси, Грузия




The CAREC road safety engineering manuals, crash data, and future national activities in road safety engineering

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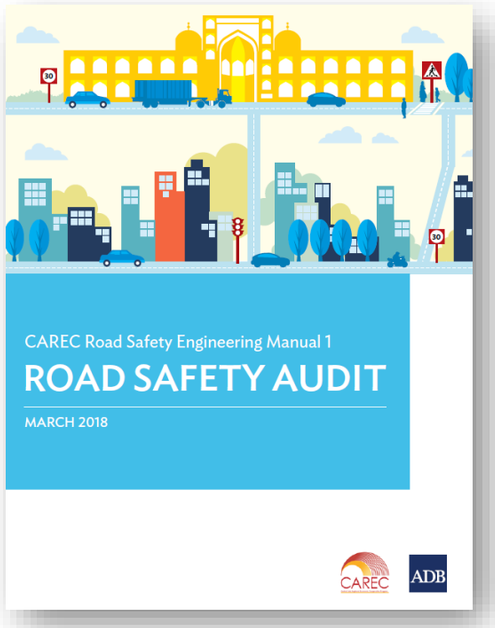
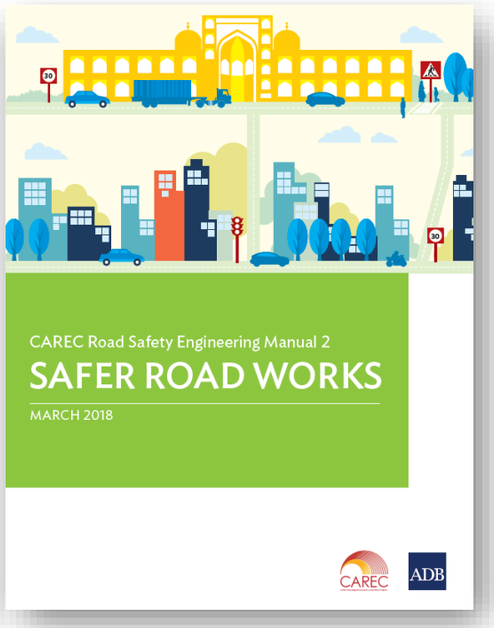
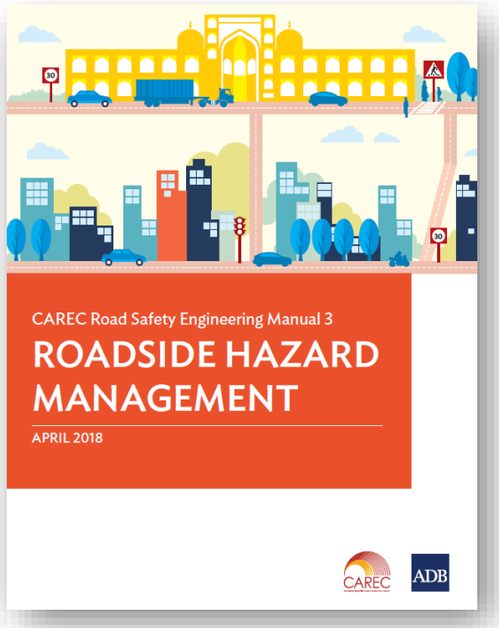
1. The CAREC manuals

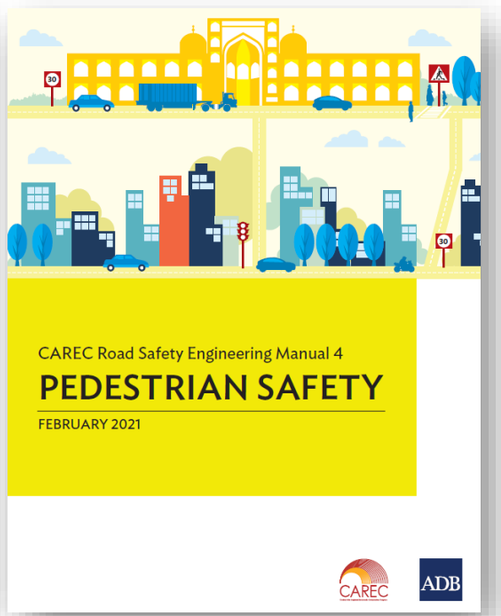
- Manual 1 – Road safety audit – improving safety in road designs
- Manual 2 - Safer road works – protecting road users and workers
- Manual 3 - Roadside hazard management – safety of roadsides
- Manual 4 – Pedestrian safety – helping the largest group of users
- Manual 5 – Star ratings for road safety audit
- Manual 6 – Identifying, investigating and treating blackspots
- Manual 7 – Speed management

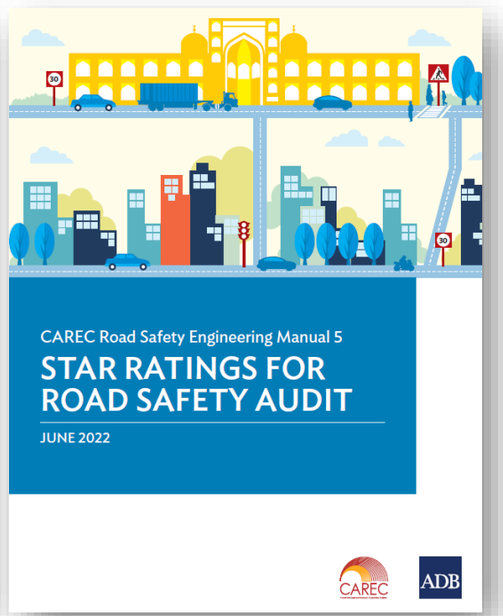
A “walk through” the CAREC road safety engineering manuals











Do you have the 5 CAREC road safety engineering manuals?

They are a useful series to help you make your roads safer.

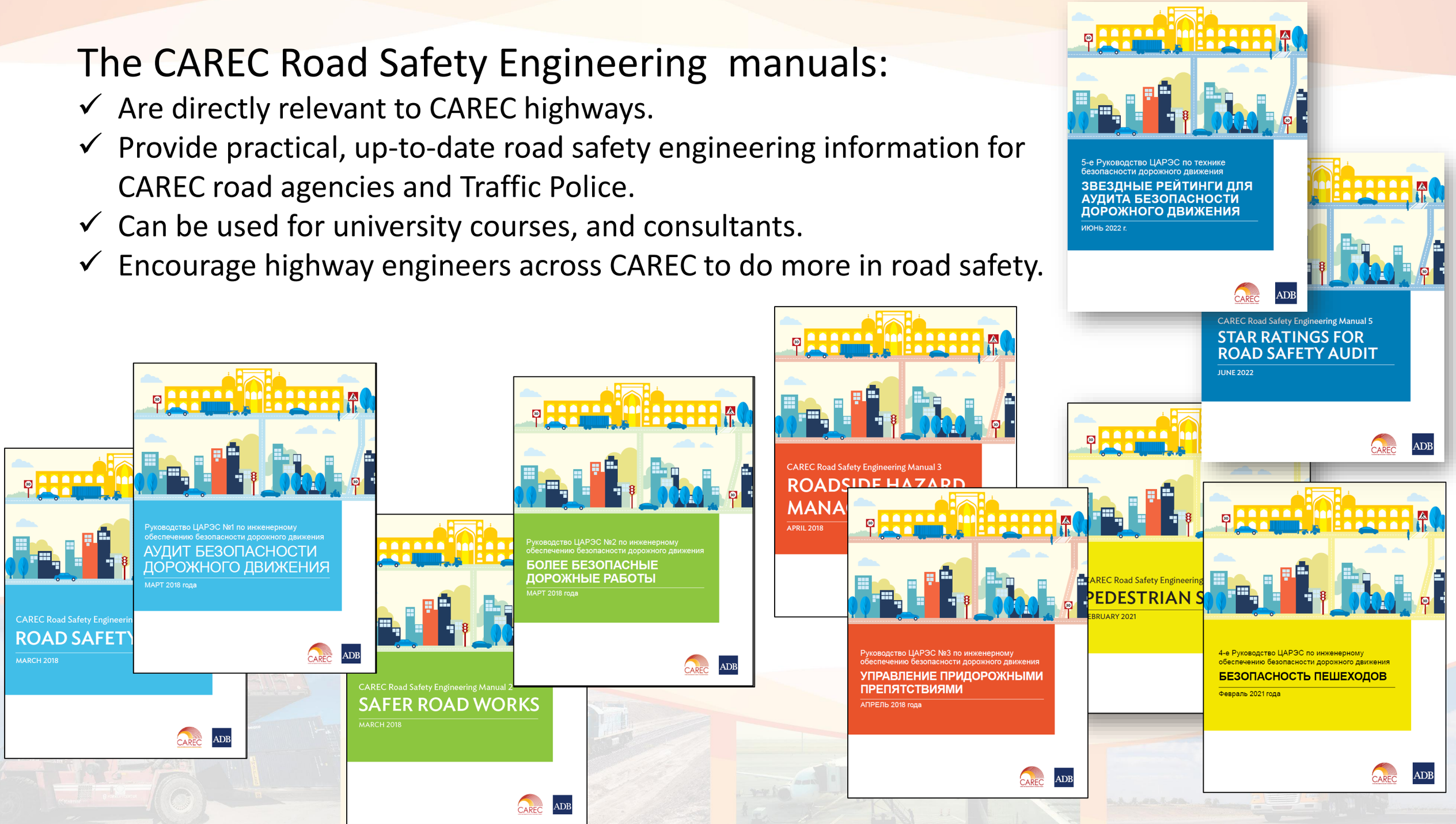
Go to the ADB website

Why were these manuals prepared?

To raise awareness amongst CAREC highway engineers about how to design, construct and manage safer roads for all.

The CAREC Road Safety Engineering manuals:

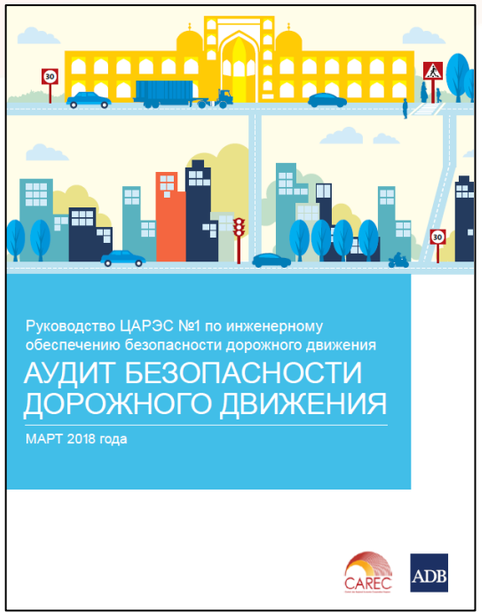
- ✓ Are directly relevant to CAREC highways.
- ✓ Provide practical, up-to-date road safety engineering information for CAREC road agencies and Traffic Police.
- ✓ Can be used for university courses, and consultants.
- ✓ Encourage highway engineers across CAREC to do more in road safety.

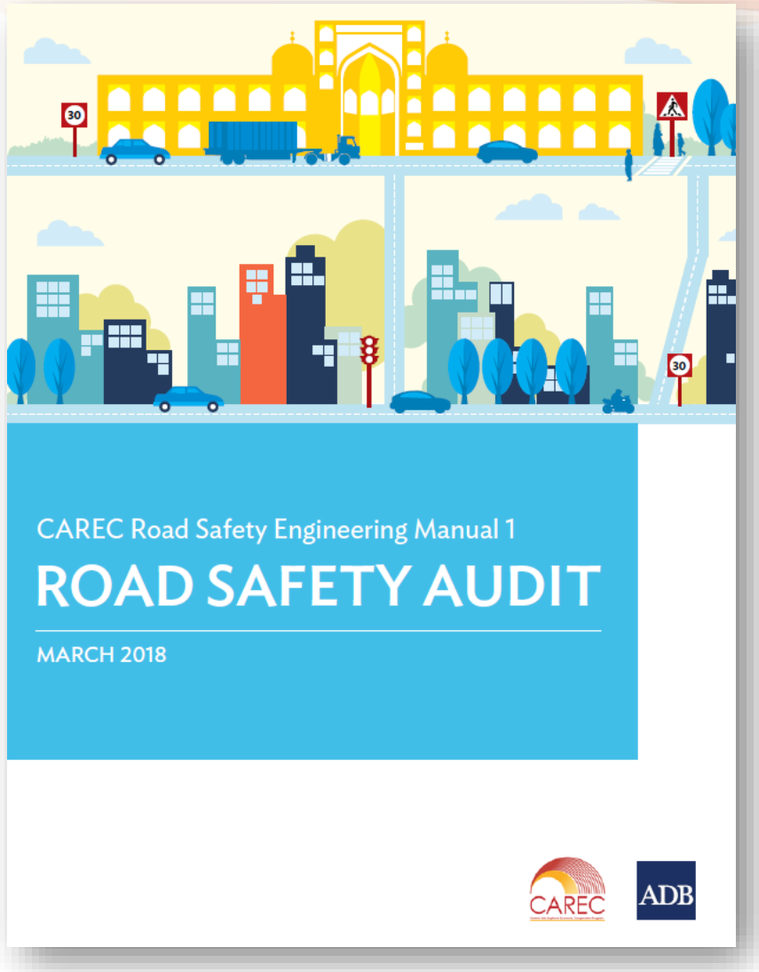


Manual 1 – Road Safety Audit

The road safety audit process is an integral part of the planning, design and construction of roads.

This manual is the focal point for the road safety audit process within the CAREC program.





A road safety audit is “a formal, systematic and detailed examination of a road project by an independent and qualified team of auditors that leads to a report listing the potential safety concerns in the project."

(CAREC 2018)

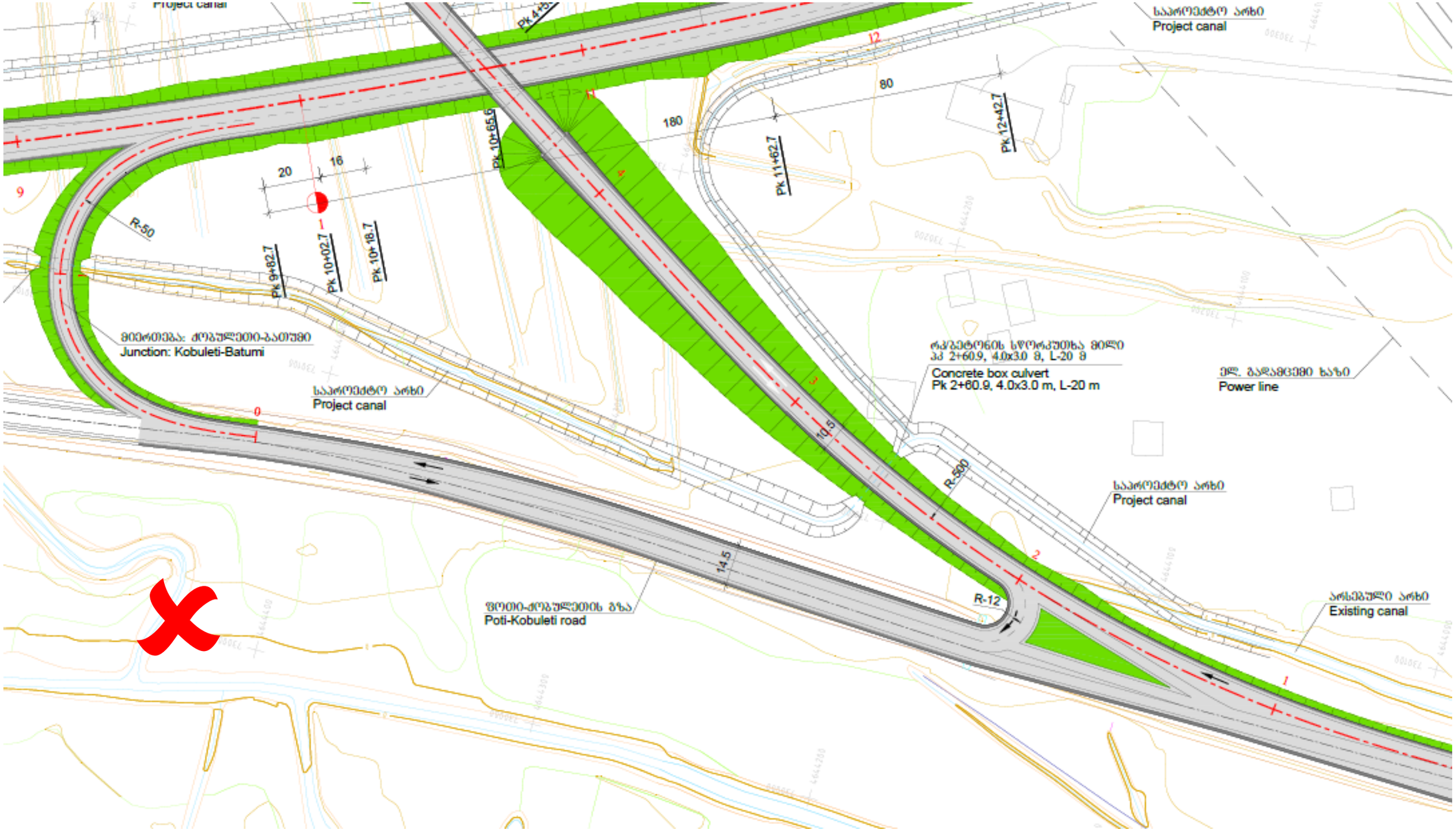
Road safety audit – prevention is better than cure

The stages of audit

- Feasibility
- Preliminary design
- Detailed design
- During construction
- Pre-opening
- Existing road (Road safety inspections)

What road projects should be audited?

- Big projects
- Complex road projects
- Small projects
- Urban projects
- Rural projects
- Pedestrian /motorcycle /bicycle projects
- Projects on high-speed roads, and low speed roads
- Road works

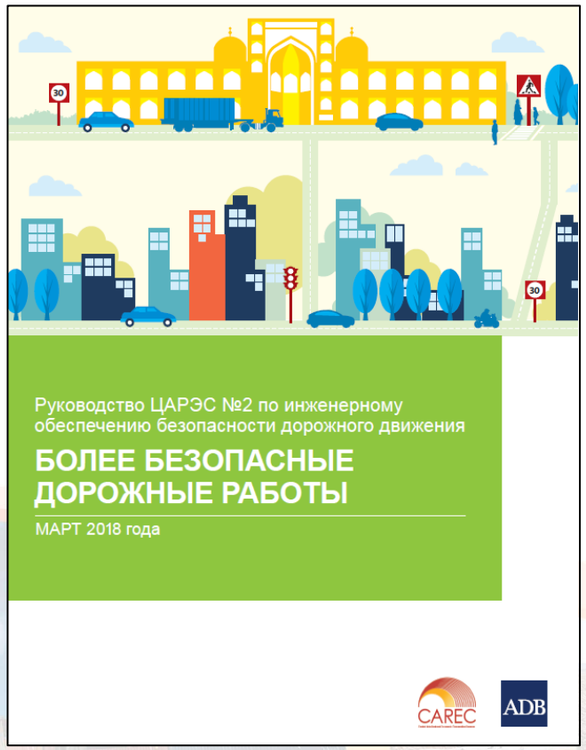

Project canal
საპროექტო არხი
Project canal
Pk 4+55
Pk 10+65.6
Pk 11+62.7
Pk 12+42.7
180
80
20
16
R-50
Pk 9+82.7
Pk 10+02.7
Pk 10+18.7
მიერთება: ქობულეთი-ბათუმი
Junction: Kobuleti-Batumi
საპროექტო არხი
Project canal
რკ/ბეტონის სწორკუთხა მილი
პკ 2+60.9, 4.0x3.0 მ, L-20 მ
Concrete box culvert
Pk 2+60.9, 4.0x3.0 m, L-20 m
ელ. გადამცემი ხაზი
Power line
10.5
R-500
საპროექტო არხი
Project canal
14.5
R-12
ფოთი-ქობულეთის გზა
Poti-Kobuleti road
არსებული არხი
Existing canal

Prevention is better than cure

Manual 2 – Safer Road Works

This manual details good road safety practices for work sites.

It encourages road authorities to include more road safety into the planning, design and operation of work sites.



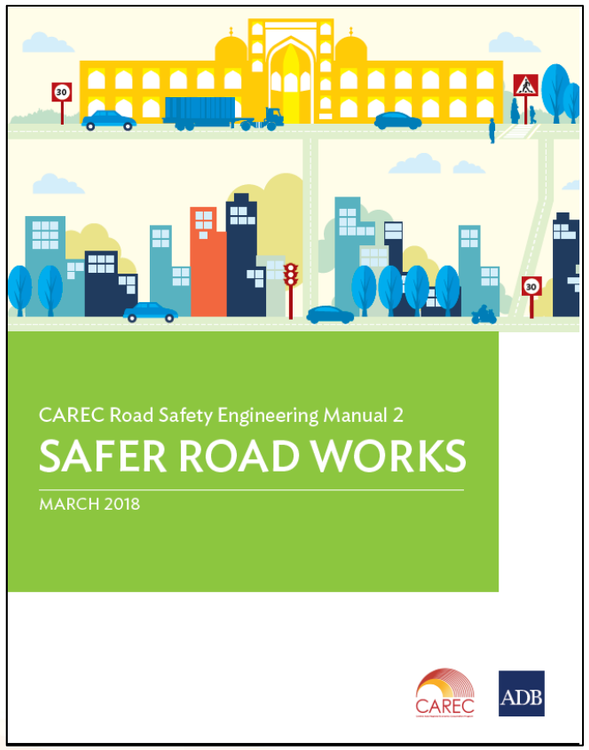



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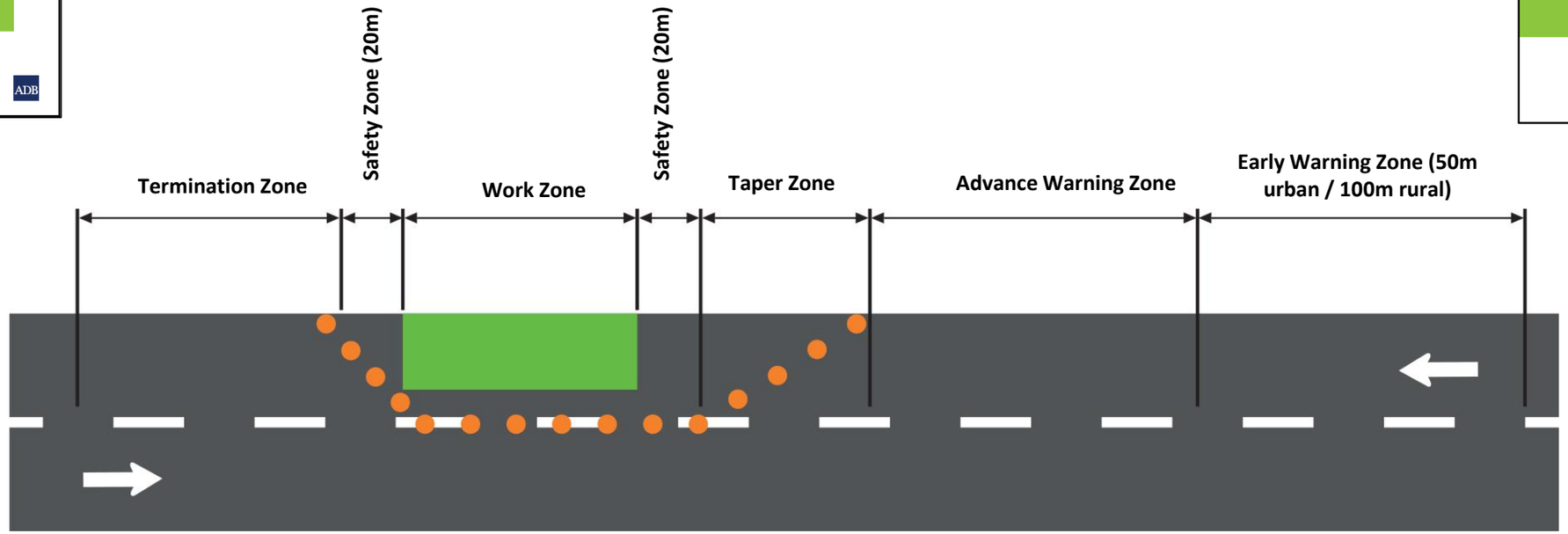
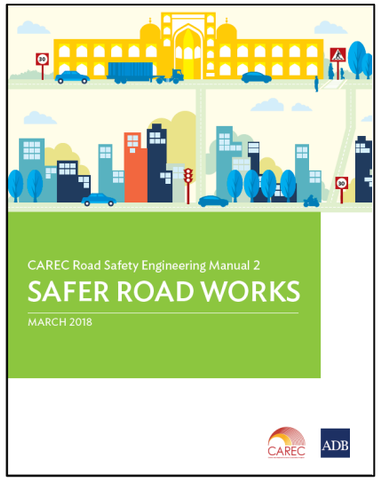
Figure 4 The Six Zone Concept

NOTE: The Figure shows a Traffic Management Plan for one direction of travel only

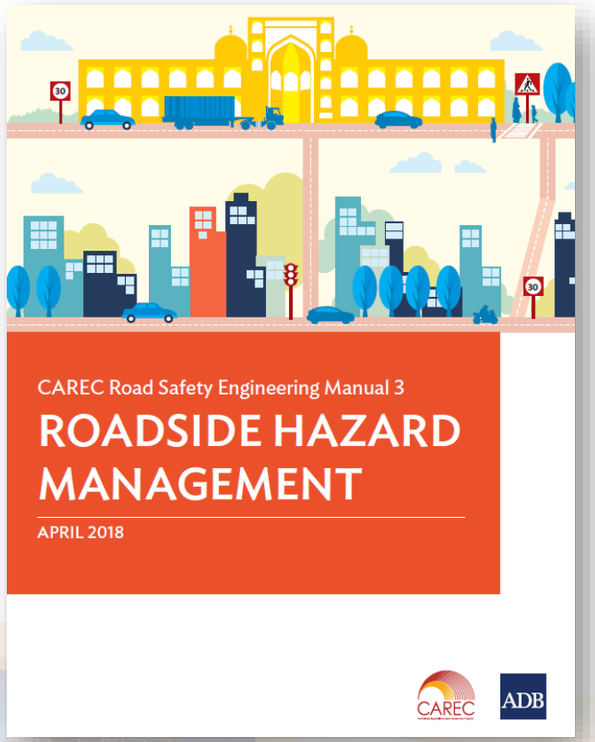




The CAREC Safer Road Works manual encourages the use of the six-zone concept

Manual 3 Roadside hazard management

Too many people die in “run-off-road” crashes – in every country.



Improve highways, and speeds go up. “Run-off-road” crashes increase. Roadside hazard management is needed to minimise this risk.

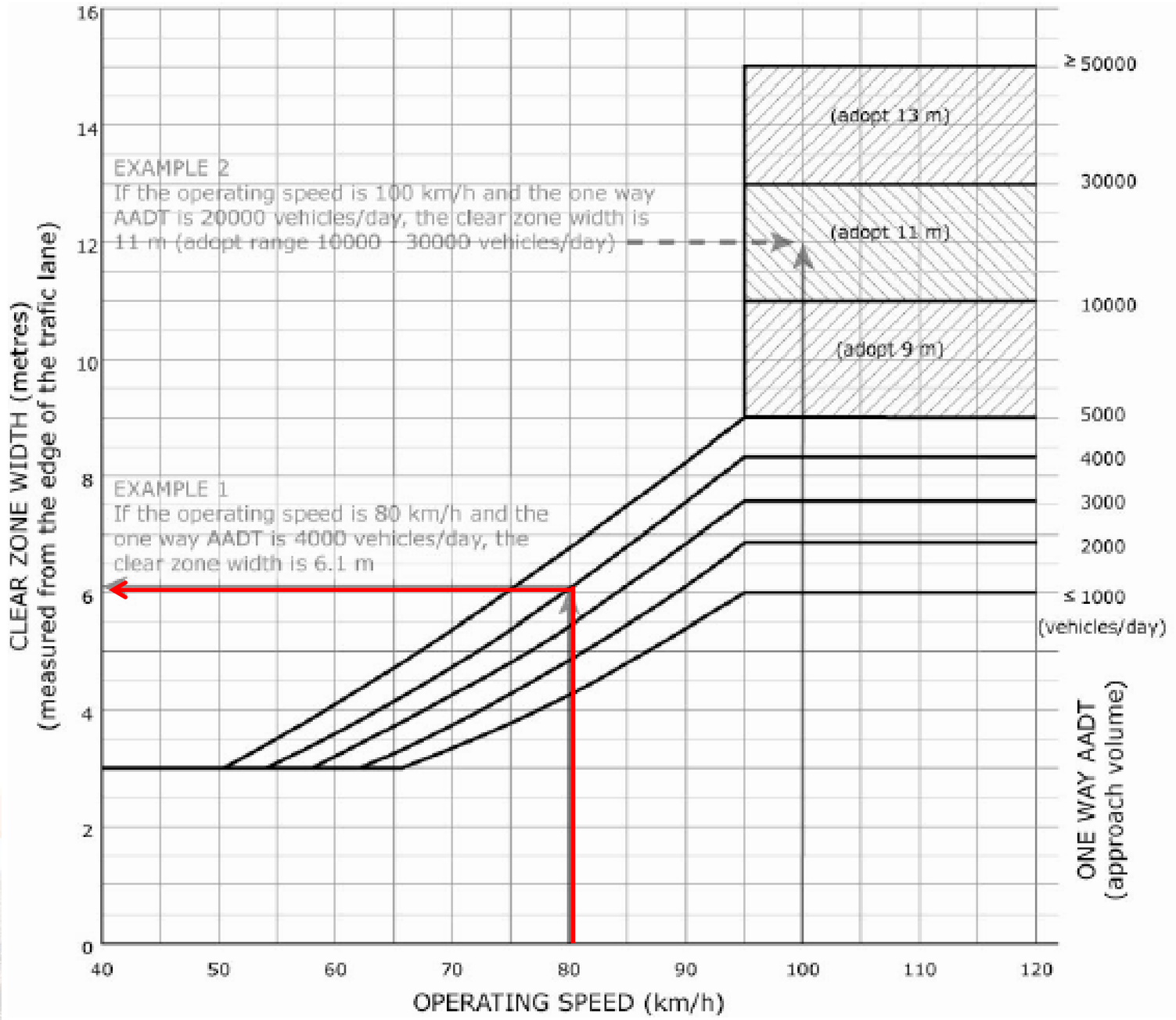
A strategy for Roadside Hazard Management

1. **Keep vehicles on the road**
2. **Provide a forgiving roadside**

i. remove the hazard
ii. relocate the hazard
iii. alter to reduce severity
iv. shield with barriers

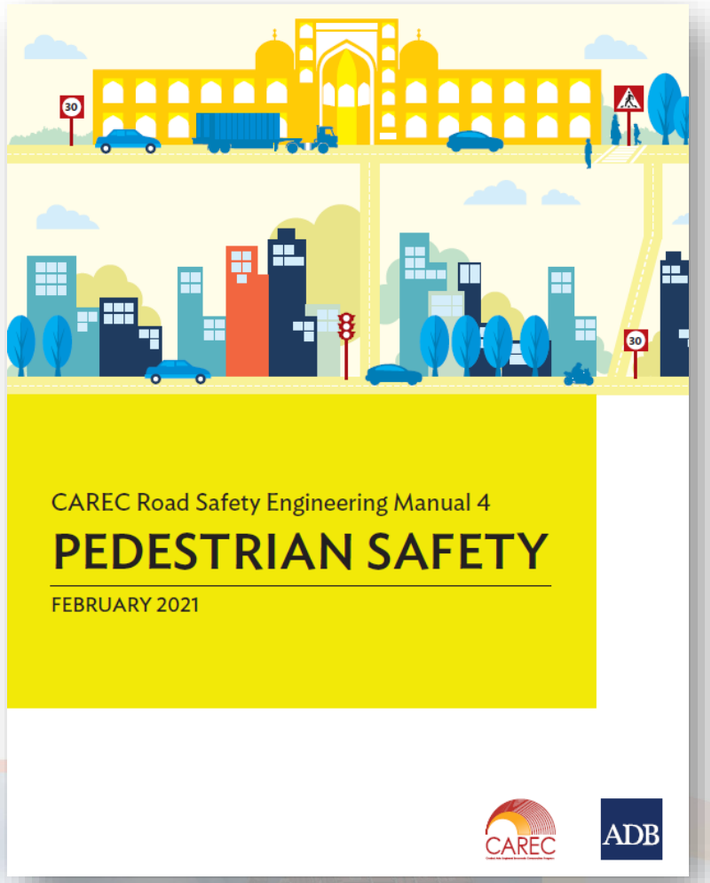
Clear Zone Chart

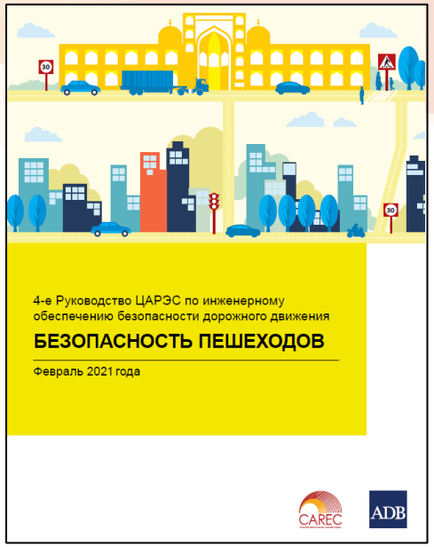
Figure V4.1: Basic Clear Zone Widths on Straights – All Roads




ВАХДАТ
VAHDAT

Manual 4 Pedestrian Safety





Pedestrians are the largest group of road users in every country.

There are three basic pedestrian strategies…

- Segregation – freeways, malls
- Separation – in time or in space
- Integration – where vehicles and pedestrians “share” the road

Segregation – expressways

Segregation – malls

Separation – in space

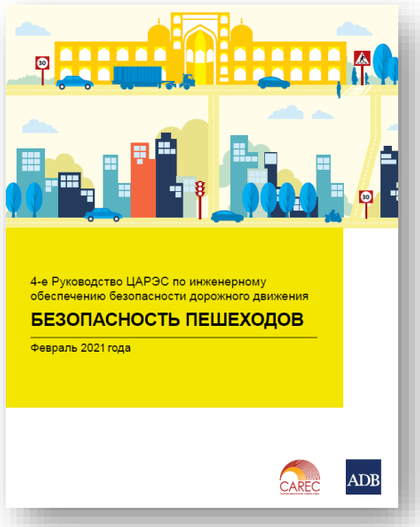
Separation – in time

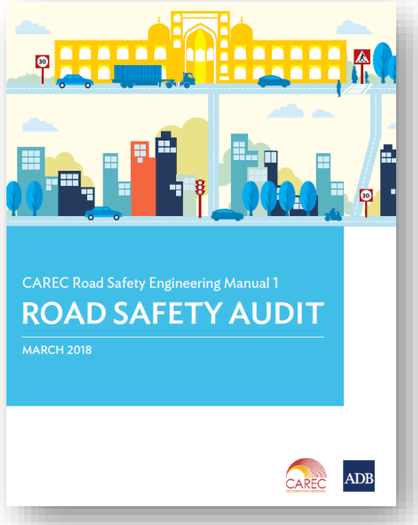
Separation – in time

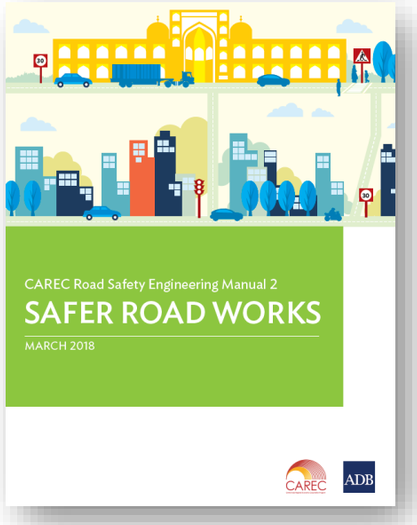

INTEGRATION

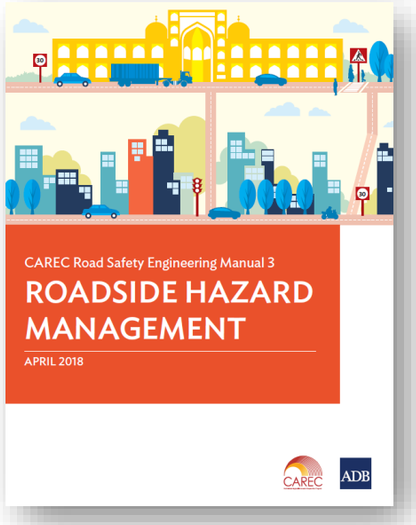
Manual 5: SR4RSA

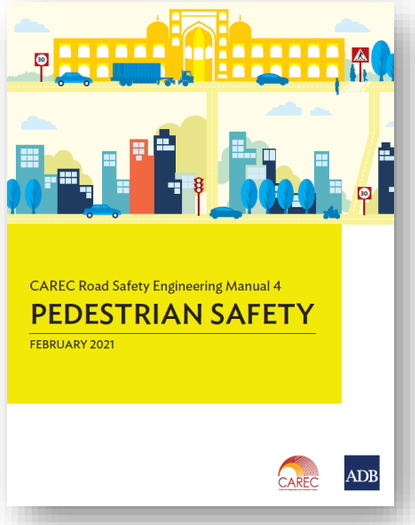
- International Road Assessment Programme Methodology
- Why Link Road Safety Audits and the International Road Assessment Programme Methodology?
- Safety Performance Targets
- When Should SR4RSA Be Used?
- Integrating the International Road Assessment Programme Methodology with audits

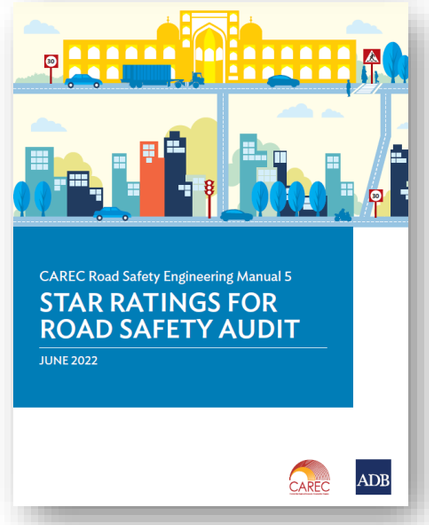












Two more CAREC Road Safety Engineering manuals are being prepared:

- Investigating blackspots
- Speed management

CAREC Manual 6

Investigating and treating blackspots

What is a blackspot?

A blackspot is a road location which has a high number of casualty crashes.

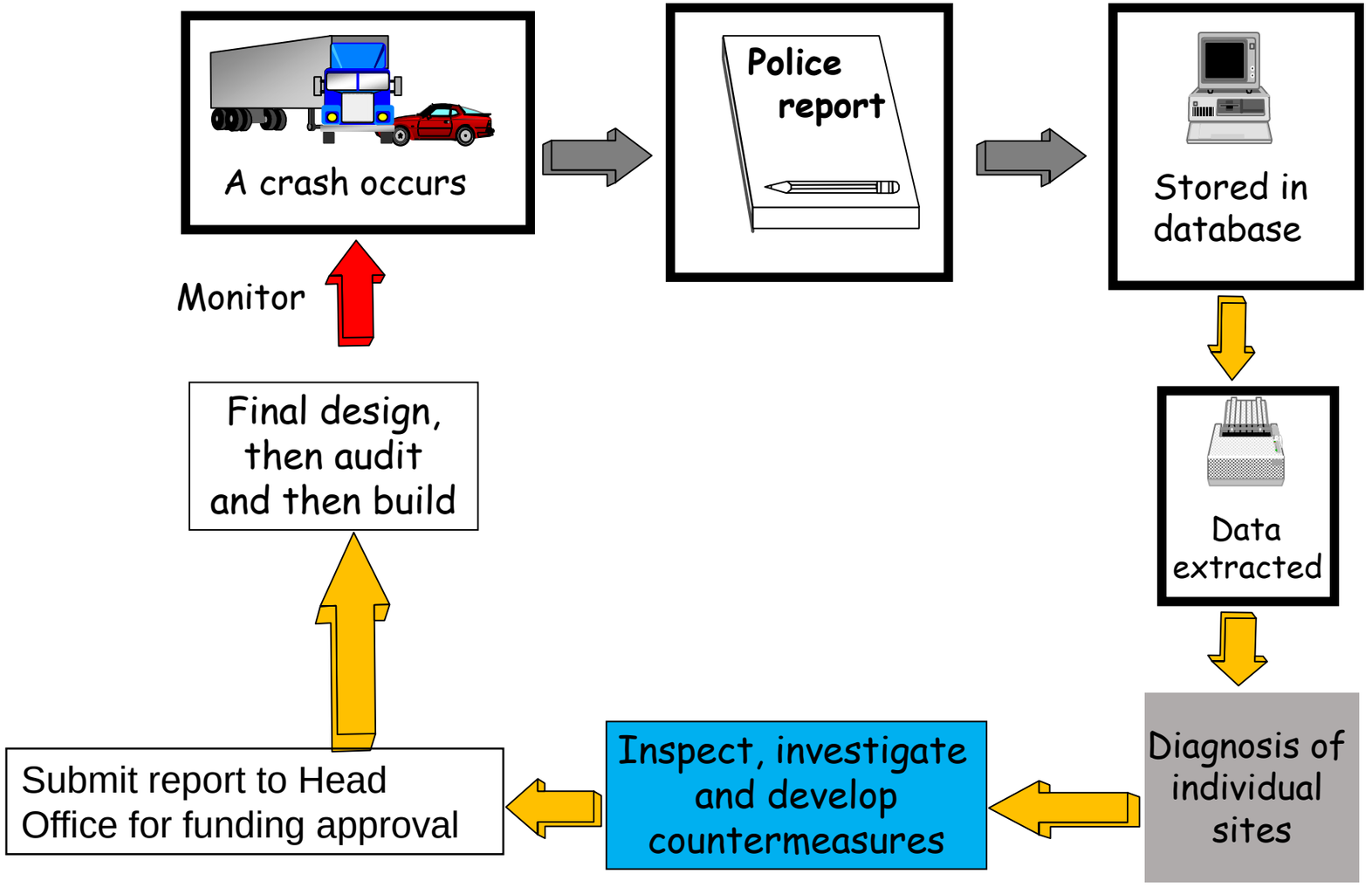
It may be:

- An individual site (such as an intersection, or a curve)
- A length of road (urban or rural)
- An area of a road network (such as a local traffic area)
- Locations with a common hazardous feature (such as Y-junctions) and/or a common crash type (such as young pedestrians).
- We treat these with mass action treatments

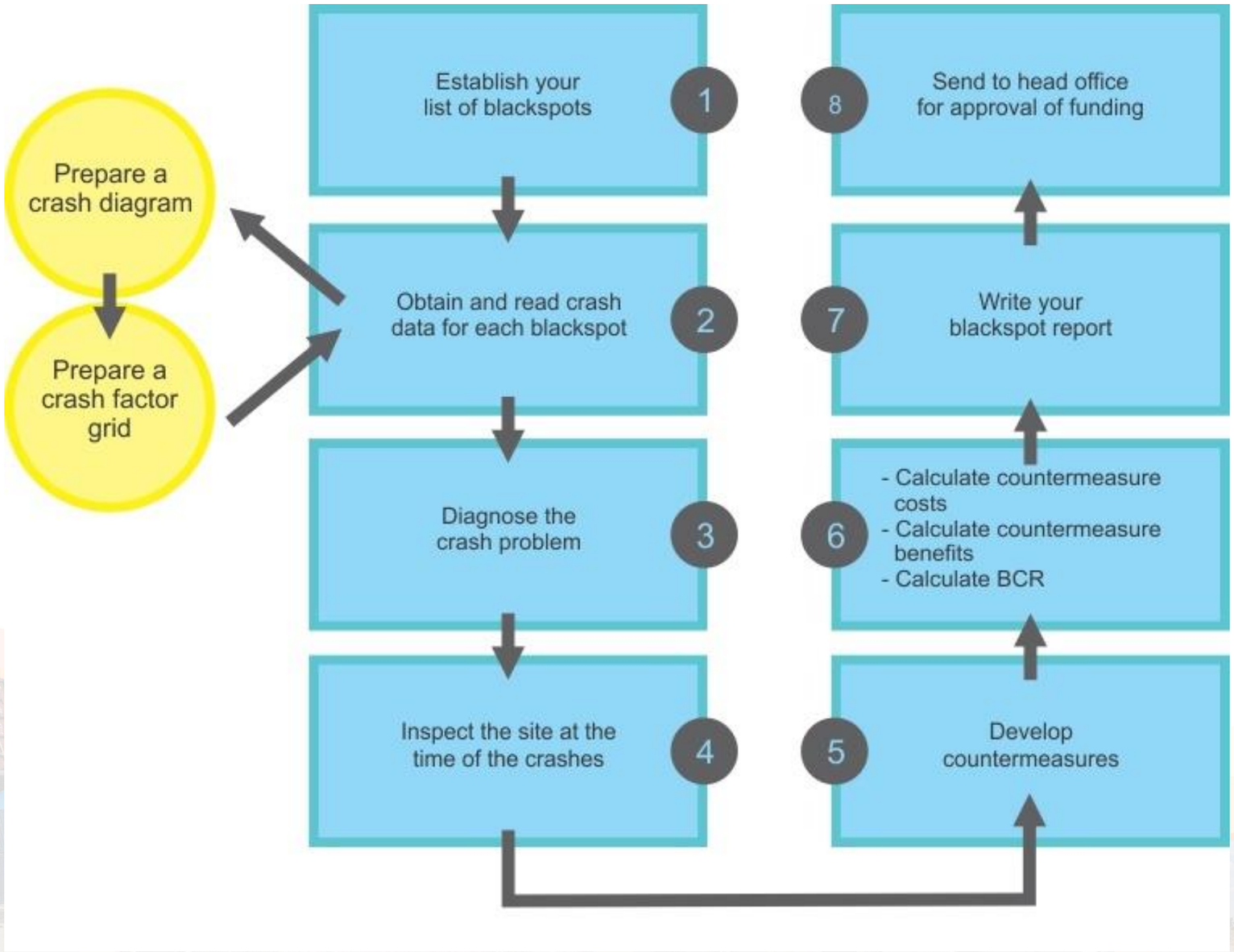
Manual 6 recommends a blackspot is a location with an agreed number of casualty crashes in the last 3 years

12 casualty crashes in 3 years is suggested, but the number is for each national road authority to decide.

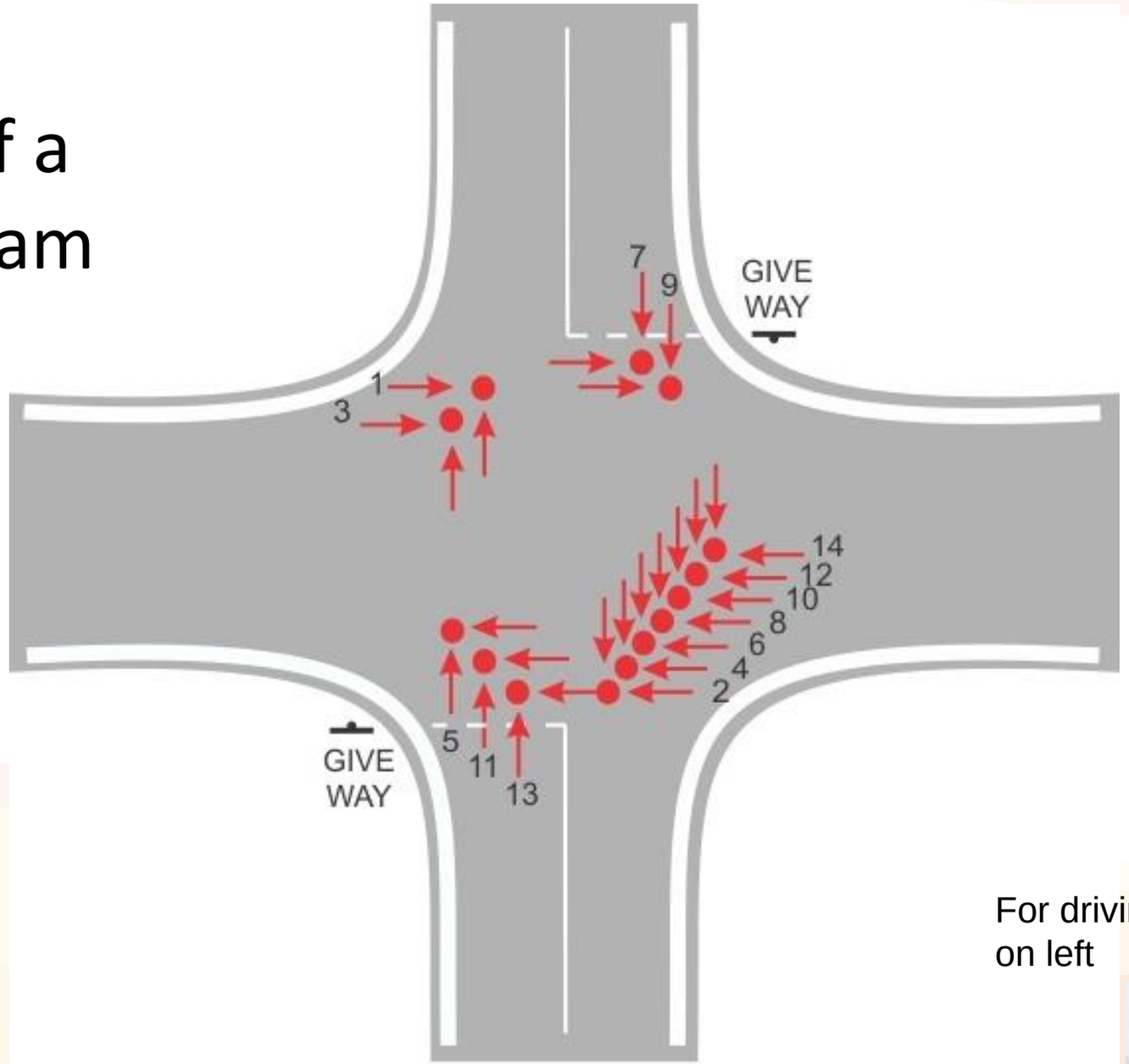
The “blackspot process”



The blackspot investigation stage



An example of a Collision Diagram



For driving on left

An example of a Crash Factor Matrix

Accident Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date: day: month	1307	0409	1912	0806	0307	0711	3012	2702	0305	2407	1804	2105	1406	2008
Date: year	96	96	96	97	97	97	97	98	98	98	99	99	99	99
Day of week	Sat	Wed	Thu	Sun	Thu	Fri	Tue	Fri	Sun	Fri	Sun	Fri	Mon	Fri
Time of day	1700	1855	1530	1900	1345	2145	1900	1220	1800	2000	1845	1610	1735	1855
Severity	3	3	2	3	2	4	3	3	4	2	3	2	2	3
Light conditions														
Road Conditions	W	W	D	D	D	D	D	D	D	D	D	D	W	D
DCA Code	101	101	101	101	101	101	101	101	101	101	101	101	101	101
Object 1	Car	Car	Car	Car	Car	Car	Car	Car	Car	Car	Car	Car	Van	Car
Object 2	Car	Car	Truck	Car	Car	Car	Car	Truck	Car	Car	Car	Car	Car	Car
Object 3					Car			Car			Car			
Direction 1	N	S	N	S	N	S	S	S	S	S	N	S	N	S
Direction 2 (& 3)	E	W	E	W	W,E	W	E	W,N	E	W	W,E	W	W	W
Other														

Engineers need good crash data!

2. Crash data

- How accurate and reliable is crash data in your country?
- Is it shared with stakeholders?
- Do your engineers appreciate how valuable crash data is to their work?
- What improvements are needed?
- Is your data good enough to initiate a national blackspot program?

When a crash happens, the police attend, and gather crash data ……

Date/time/location/directions

Names/addresses/ages/gender of all involved

Alcohol/drugs

Vehicle types/registration

Injury levels

Other information to prosecute the offender.

Best international practice is when Police record the crashes, store the crash data in a database, and share it with government stakeholders

ENGINEERS NEED *GOOD* CRASH DATA

Engineers need to know:

- Where and when the crash happened (accurately)
- The type of road user involved (direction, type)
- Conditions at the time – rain, wind, fog, snow, sun

ENGINEERS NEED *GOOD* CRASH DATA

Engineers do not need:

- Names, addresses of people involved
- Vehicle registration details
- Police prosecution information (alcohol, speed, drugs)

Police investigate a serious crash in detail.

But engineers look for patterns in the crashes at a site.

Is anything stopping access to good crash data in your country?

How can this be addressed?

3. Future national activities in road safety engineering

What can your government and ADB do *together* in road safety engineering to effectively reduce road trauma?

What is needed to produce safer roads for CAREC?

What is needed to move CAREC forward in road safety?

What are your priorities in road safety engineering?

Will they receive national support, funding and action.

How can ADB assist?

Here are some ideas....

1. The Safe System
2. A national blackspot program
3. Road safety audits
4. Safer road works
5. Safer roadsides
6. Pedestrians
7. Revised national standards

1 THE SAFE SYSTEM

What is known of the Safe System?

It can change attitudes.

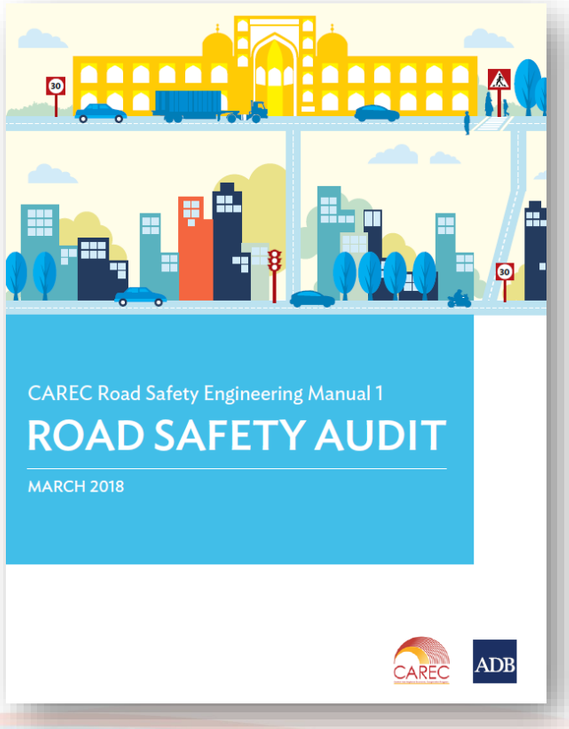
How can we get it moving?

2 A national blackspot program

How do you identify hazardous locations?

Do you have an annual blackspot program?

Do you have enough experienced road safety engineers to run an annual blackspot program?



3 Road Safety Audits

Who can do audits; do you have any auditors?

Can you embed audits into every large project?

Training? Policies?

4. Safer roadsides

Is your MoT working to improve roadside safety?

5 Safer road works

Safer road works is an emerging road safety issue.

More is needed to make CAREC road works safer.

What can we do together?

6. Pedestrians

40% of lives lost on CAREC roads are pedestrians.

Low-cost civil works (ramps, kerb extensions) can help.

7 Revised national standards and practices

- Delineation
- Bridge cross sections
- U-turns

Here are some low-cost initiatives that should become CAREC-wide “standards”

Chevron alignment markers

Tactile edge lines

Tactile edge lines


Bridge cross sections
30т

✗


Bridge cross sections

Standard layouts for U-turns

Summary:

1. Develop/expand the Road Safety Sections in your MoT.
2. Capacity building in road safety engineering – especially in blackspots and audits.
3. Widespread distribution of the CAREC Road Safety Engineering manuals.
4. Embed the road safety audit process into your design process.

5. An annual program of low-cost civil works for pedestrians.
6. Upgrade national standards and regulations.
7. Begin an annual Blackspot removal program.
8. Share crash data (from Police).
9. Introduce mass actions - delineate rural highways, remove Y-junctions, traffic calm villages, tactile edge lines, reflective guideposts, and chevron alignment markers for national routes.

CAREC needs more road safety engineers.

ADB can help.

Your questions are welcome.