



Welcome to: “Elements of road safety engineering workshop”

I would like to thank the CAREC Institute
and the ADB for initiating this workshop,
and all of you for giving your time.





**Road Safety
Engineering – the
bigger picture.**

CAREC

Central Asia Regional Economic Cooperation Program



What can Mongolian
engineers do to make
roads safer for all?

Objectives of this presentation:

- to explain the bigger picture in road safety engineering
- outline the extent of the global road safety problem.
- to discuss the cost of crashes in Mongolia today.
- to show that engineers have a responsibility to reduce crashes and to create safer road infrastructure.

Friend

Foreigner (only English)

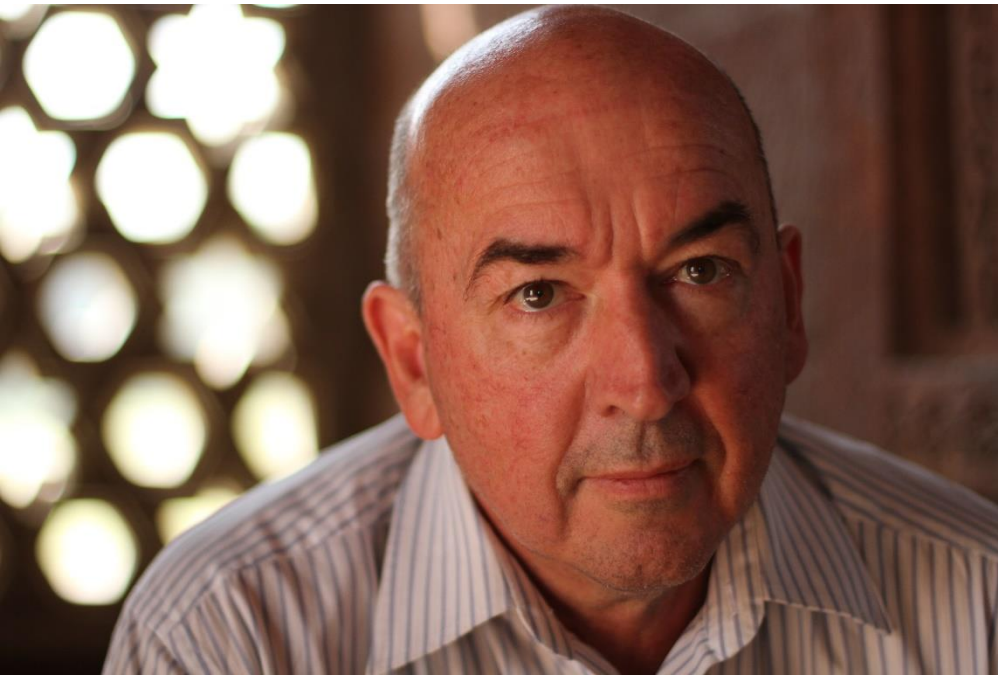
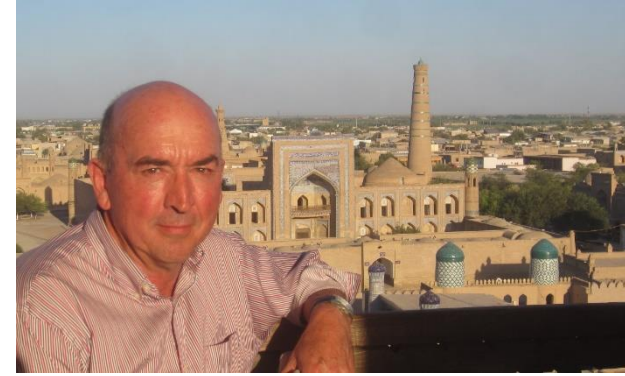
Fellow engineer

I have been to Mongolia three times – summer and winter!!



Phillip Jordan

- 31+ years with VicRoads
- Program Manager, AUSTRROADS Road Safety Audit
- 15 years in consulting
- Traffic and road safety engineering
- 42 countries of work so far.....





© 2007 Geology.com

What is road safety
engineering?

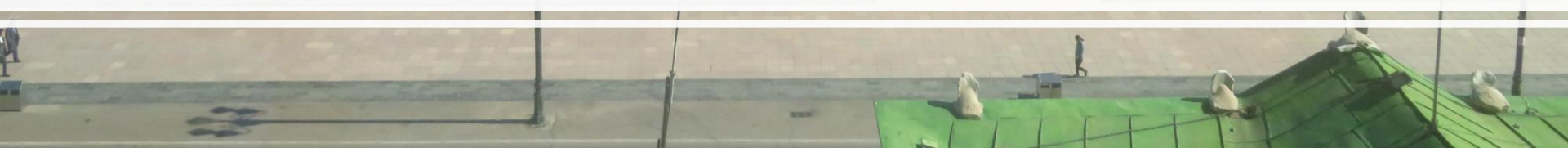


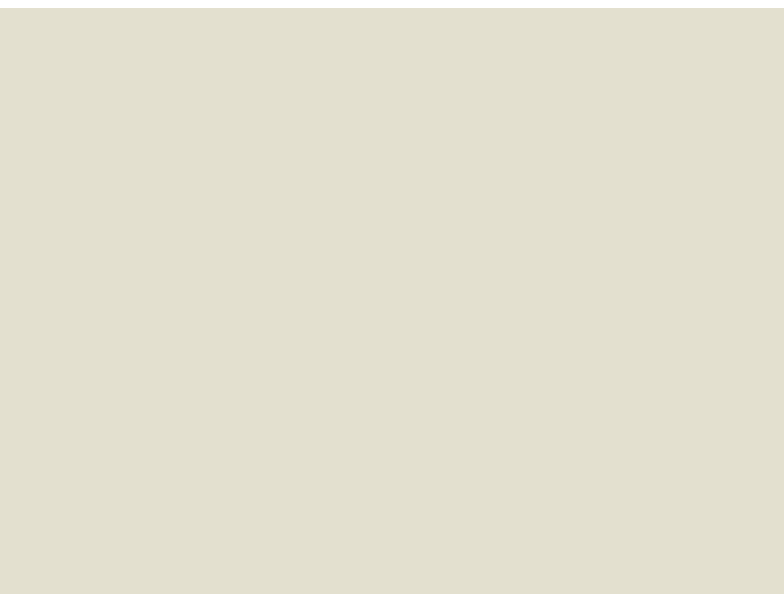
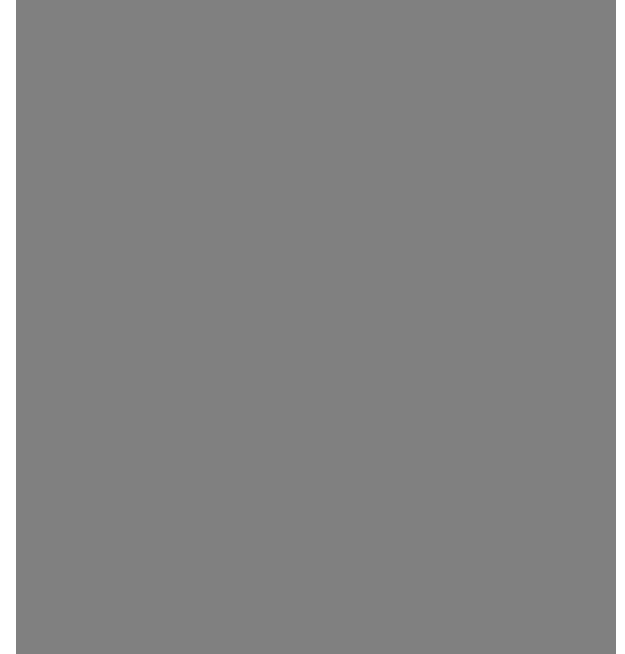
I WISH TO THANK OUR INTERPRETER.....

This workshop would be impossible without an interpreter – and so I would like to express my thanks for your help at this workshop.



It is a great pleasure to be speaking with you (in Ulaanbaatar) from here in Melbourne today





A question for you

How many deaths occur
each year on the roads of
the world?





Global road safety

- The world has a major health problem involving road safety.
- 1,300,000 or more killed each year.
- Millions (up to 50 million) injured.
- Yesterday – we ended the Decade of Action in Road Safety.



Questions for you

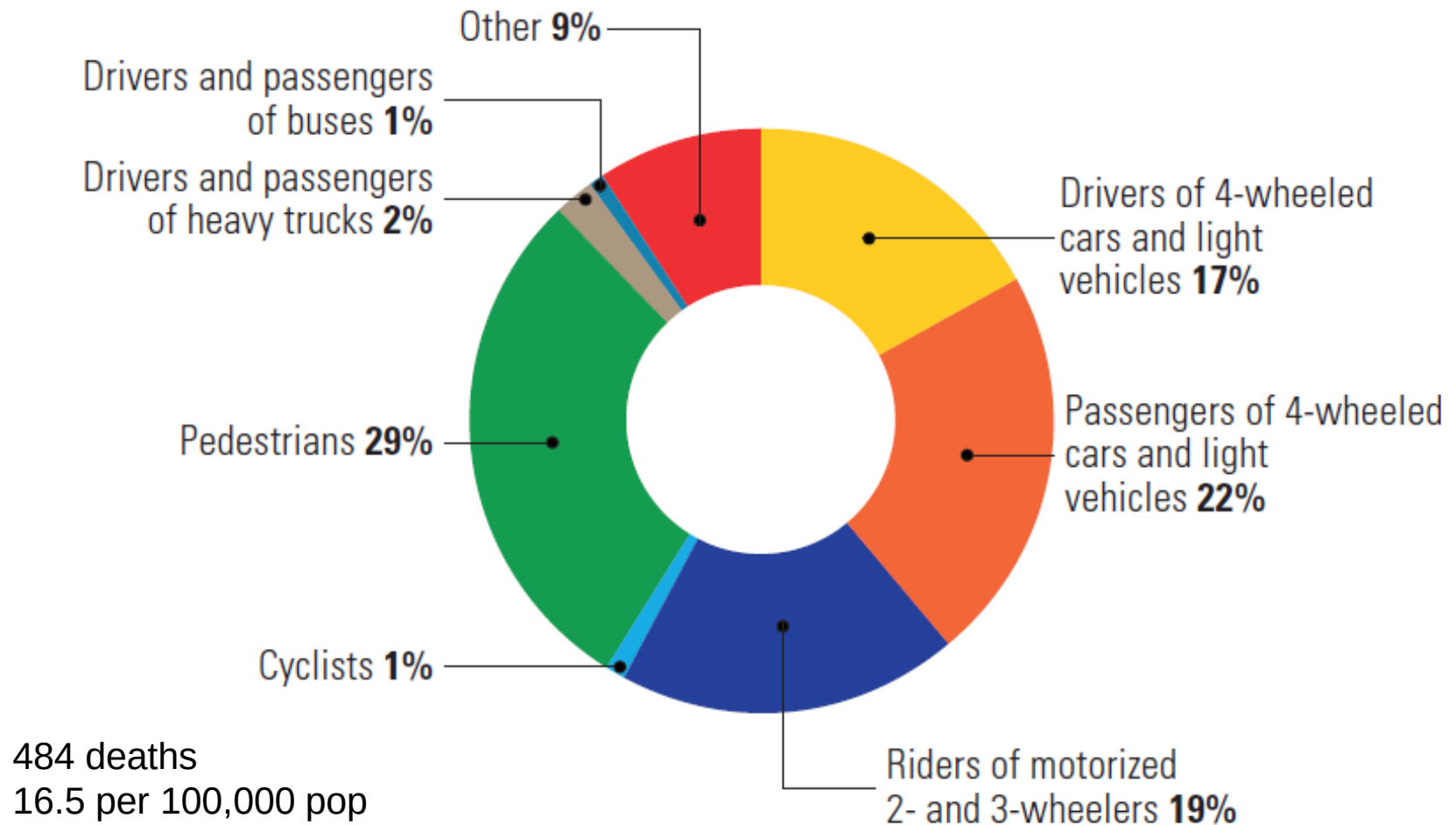
How many deaths occur on the roads of Mongolia each year ?

Where will road safety be in your country in 10 years?

GLOBAL STATUS REPORT ON ROAD SAFETY **2018**



Deaths by road user category



Source: 2016, General Police Department, "Statistics on road traffic injury and violation"

Trends in reported road traffic deaths

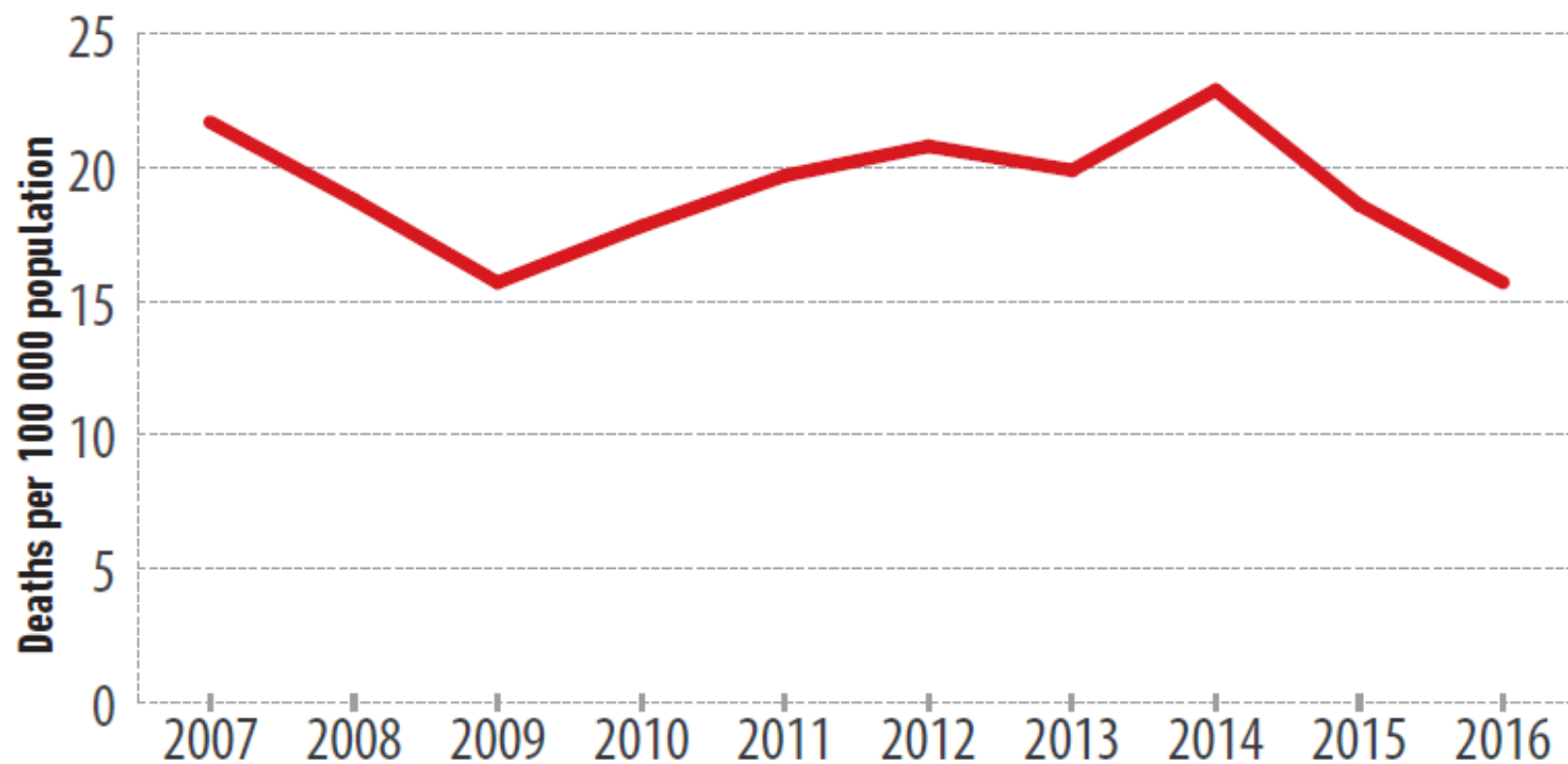
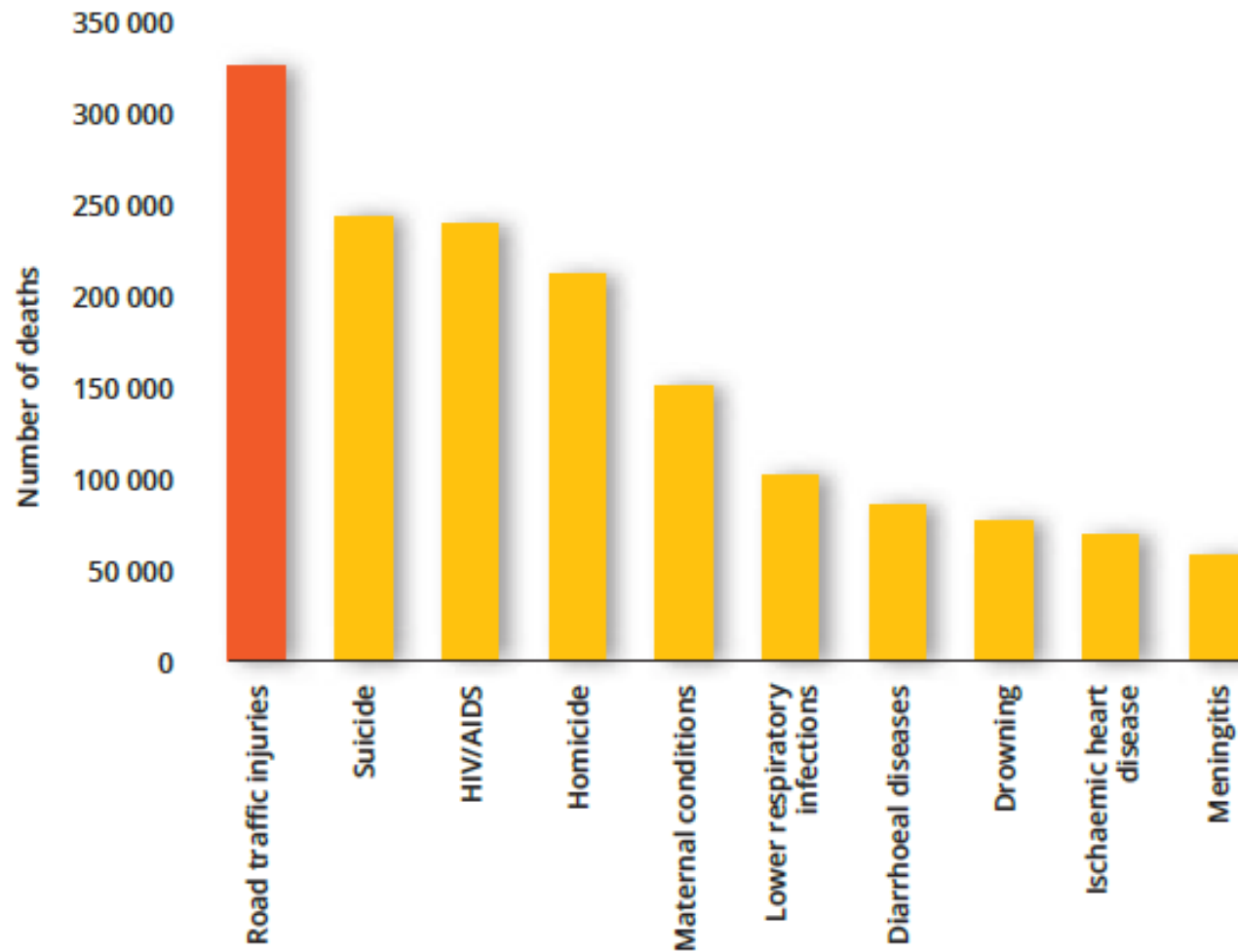


FIGURE 1

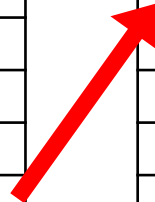
Top ten causes of death among people aged 15–29 years, 2012



Global Road Safety – a challenge for us all

RANK	LEADING CAUSE 2004	%
1	Ischemic heart disease	12.2
2	Cerebrovascular disease	9.7
3	Lower respiratory infections	7.0
4	Chronic obstructive pulmonary disease	5.1
5	Diarrheal diseases	3.6
6	HIV/AIDS	3.5
7	Tuberculosis	2.5
8	Trachea, bronchus, lung cancers	2.3
9	Road traffic injuries	2.2
10	Prematurity and low birth weight	2.0
11	Neonatal infections and other	1.9
12	Diabetes mellitus	1.9
13	Malaria	1.7
14	Hypertensive heart disease	1.7
15	Birth asphyxia and birth trauma	1.5
16	Self-inflicted injuries	1.4
17	Stomach cancer	1.4
18	Cirrhosis of the liver	1.3
19	Nephritis and nephrosis	1.3
20	Colon and rectal cancers	1.1

RANK	LEADING CAUSE 2030	%
1	Ischemic heart disease	12.2
2	Cerebrovascular disease	9.7
3	Chronic obstructive pulmonary disease	7.0
4	Lower respiratory infections	5.1
5	Road traffic injuries	3.6
6	Trachea, bronchus, lung cancers	3.5
7	Diabetes mellitus	2.5
8	Hypertensive heart disease	2.3
9	Stomach cancer	2.2
10	HIV/AIDS	2.0
11	Nephritis and nephrosis	1.9
12	Self-inflicted injuries	1.9
13	Liver cancer	1.7
14	Colon and rectal cancer	1.7
15	Oesophageal cancer	1.5
16	Violence	1.4
17	Alzheimer and other dementias	1.4
18	Cirrhosis of the liver	1.3
19	Breast cancer	1.3
20	Tuberculosis	1.1



Leading causes of mortality 2004 and 2030



MONGOLIA

What does a road crash cost Mongolia?

Road crashes cost Mongolia

- The cost of a fatality is estimated 70 x GDP per capita
- GDP per capita in Mongolia: USD\$3,650
- One death costs: USD\$255,500 (say USD\$260,000 today)
- Cost of a serious injury: 0.25 x fatality cost
- A serious injury costs: USD\$65,000

Sources:

McMahon, K. and Dahdah, S. (2008) The True Cost of Road Crashes: Valuing life and the cost of a serious injury. <http://irap.org/library.aspx>; International Monetary Fund, 2013.

Road crashes cost Mongolia

- With 484 fatalities a year.....
- Road fatalities cost Mongolia \$260,000USD x 484

= USD\$125,840,000 per annum

- Injuries cost more again!

Sources:

McMahon, K. and Dahdah, S. (2008) The True Cost of Road Crashes: Valuing life and the cost of a serious injury. <http://irap.org/library.aspx>; International Monetary Fund, 2013.



A GLOBAL PROBLEM



DIFFERENT ROADS, SIMILAR PROBLEMS

A GLOBAL PROBLEM



DIFFERENT ROADS, SIMILAR PROBLEMS

A GLOBAL PROBLEM



DIFFERENT ROADS, SIMILAR PROBLEMS

A GLOBAL PROBLEM



DIFFERENT ROADS, SIMILAR PROBLEMS

A GLOBAL PROBLEM



DIFFERENT ROADS, SIMILAR PROBLEMS

A GLOBAL PROBLEM



DIFFERENT ROADS, SIMILAR PROBLEMS

A GLOBAL PROBLEM



DIFFERENT ROADS, SIMILAR PROBLEMS

Why is your job important for safety?

- Different nations = different roads = different road user mixes.
- Improve the road network – wider, straighter, flatter –
- Many vehicles travel faster – more vehicles run off the road; pedestrians at higher risk.
- Road safety engineering can help
- Safer work sites, treating blackspots, undertaking road safety audits, and roadside hazard management can help.
- They can be applied in any country.
- They need resourcing and co-ordination from a National Road Safety Action Plan
- Experienced trained road safety engineers are essential

I am from Victoria, Australia

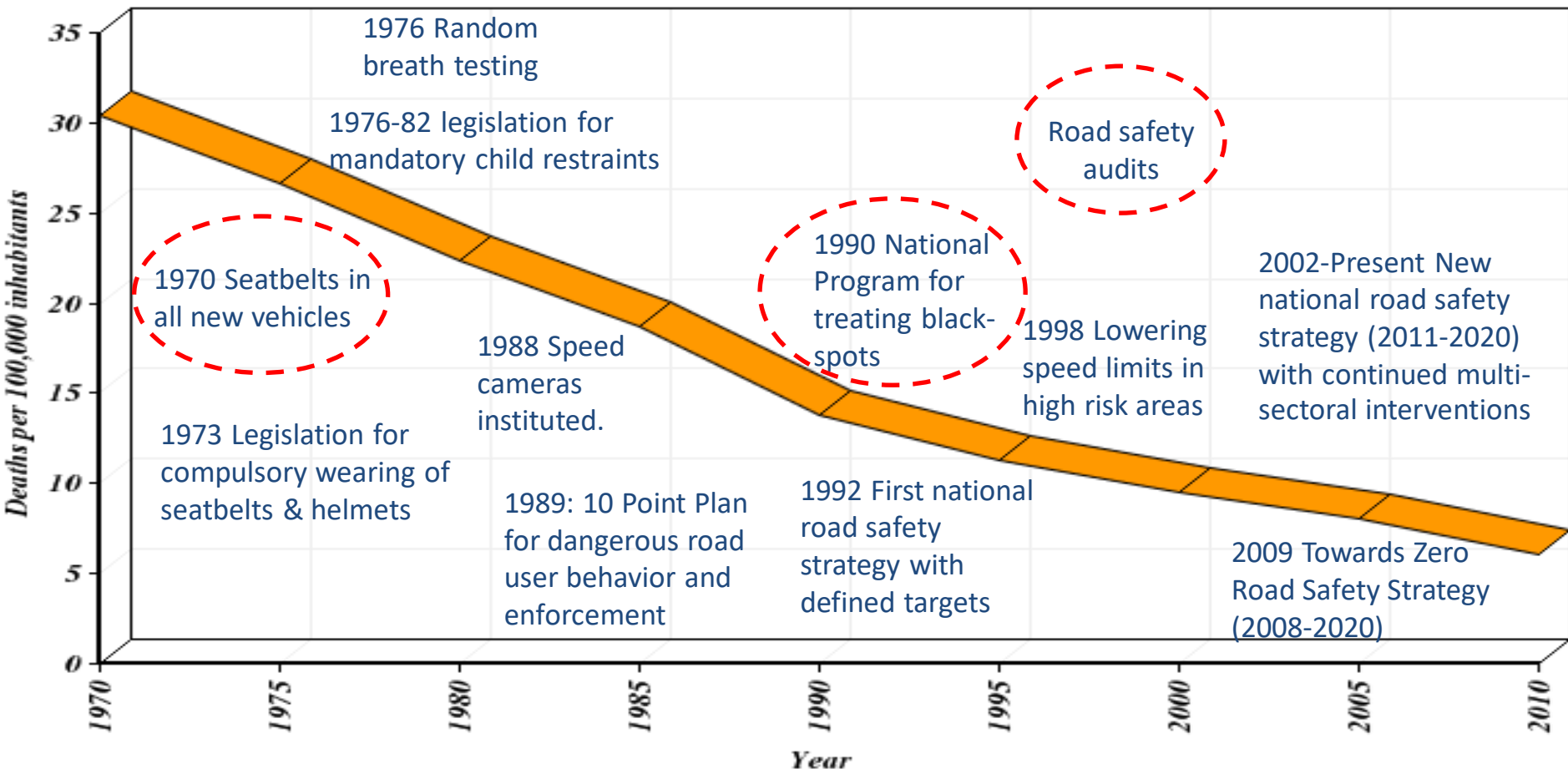
1970

- Terrible road crash record
- Drink driving common
- Speeding common
- Poor highways
- No freeways
- **1061 deaths**
- **> 20 deaths/100,000 pop.**
- **Like Mongolia today!**

2018

- Lowest number of lives lost – ever
- One of the lowest fatality rates in the world
- Seat belt law – a world first!
- Random BAC testing
- Strong enforcement
- Safer roads – many rural highways and freeways
- **214 deaths**
- **4 deaths / 100,000 pop.**

Victoria had a poor road safety record in 1960's and 1970's.
With effective Policies, good planning and practical interventions,
Victoria is now a world leader





Road safety engineering is one profession that has an important role to play in road safety. It can “break the chain of events” Police, teachers, researchers, doctors and others also have important roles in road safety.

A road crash is the end result of a chain of events...

To break a chain, we need to remove one “link”.
Where do we start?

Let's look at a “typical” chain of events.....





A 35-year-old male is the driver of this truck. His boss allows him to drive it home to his village on weekends - he maintains it.

The chain of events.....

Chain of events continued...

- He spends a whole (frustrating) weekend repairing it.
- The brakes were very worn. He replaces the discs.
- He finishes late Sunday – much later than expected.
- Friends drop around – just as he finishes.
- They relax, chat, drink, and eat until very late.
- He does not get much sleep.



Chain of events.....

- Monday morning – cold, but he must start early at a building site in the city.
- Little sleep, no breakfast, late for work.
- Drives the truck on a National Highway towards work.



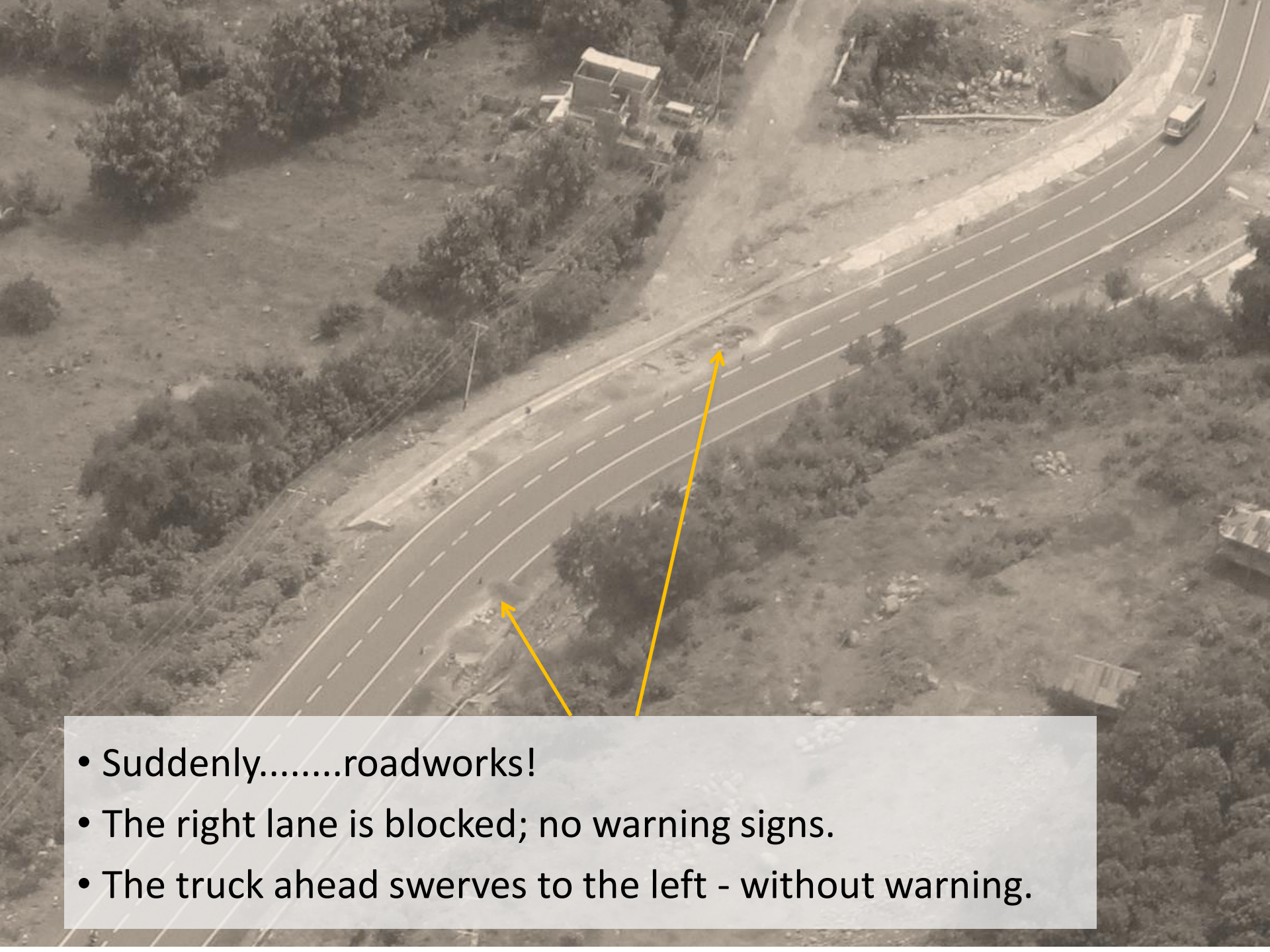
- There is frost; the highway pavement is slippery.
- It has unsealed shoulders; he travels fast.

He drives closer and closer to the truck ahead of him – eager to overtake. That truck is not well maintained; it has broken rear lights.





Our truck driver knows there is an overtaking lane ahead – he accelerates so he can overtake the truck.



- Suddenly.....roadworks!
- The right lane is blocked; no warning signs.
- The truck ahead swerves to the left - without warning.



- To avoid a “side swipe” our driver swerves his truck left.
- At that instant a bus is passing in the other direction.
- There is a deep drain along the roadside here.

- Our truck driver brakes hard – but the new brakes “grab”. His truck slides.
- It side swipes the other truck – forcing it into the drain where it tips over.
- Our truck careers across the highway, directly into the bus, still at speed.





Our truck driver and two bus passengers are killed. The other truck driver is seriously injured along with 10 bus passengers.



What “caused”
this crash?

And what could our profession
have done to prevent it – or
minimise its effects?

Possible “causes”

- His frustrating weekend?
- His drinking? His lack of sleep?
- Excessive speed?
- His impatience and inattention?
- The new brakes of his truck?
- The broken rear lights of the other truck?
- The frost/ice?
- No advanced warning of the roadworks?
- Materials being stored on the road?
- The lack of sealed shoulders?
- The deep roadside drain?
- The absence of line marking?

Break one “link” and the chain will collapse.

Engineers could have:

- ✓ Stored materials away from the road.
- ✓ Inspected the road work site; ensured good warning signs.
- ✓ Removed/covered the deep drain.
- ✓ Paved the shoulders.
- ✓ Maintained line marking

Throughout this workshop we will have presentations on road safety audit, on blackspot programs, on low cost ways to reduce roadside hazards and to improve pedestrian safety, and safer road works.

We are keen to help you to move your country, and the CAREC Region, forward in safety.



CAREC roads can be
made safer for all





Engineers can
save lives on
CAREC roads
(and globally)





THANK YOU – YOUR QUESTIONS ARE WELCOME