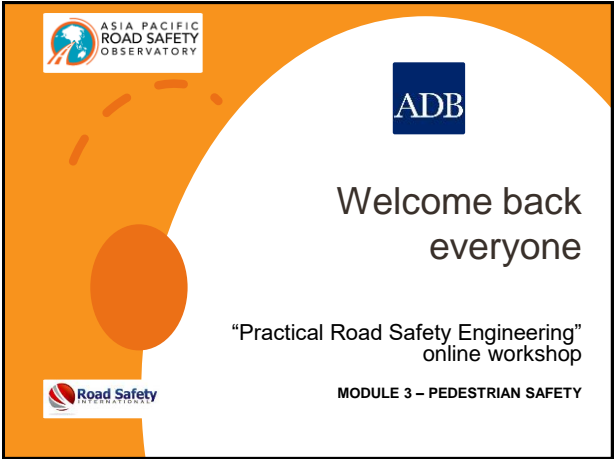




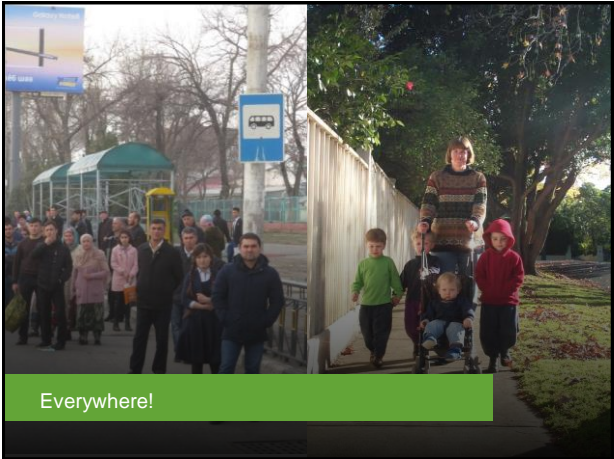
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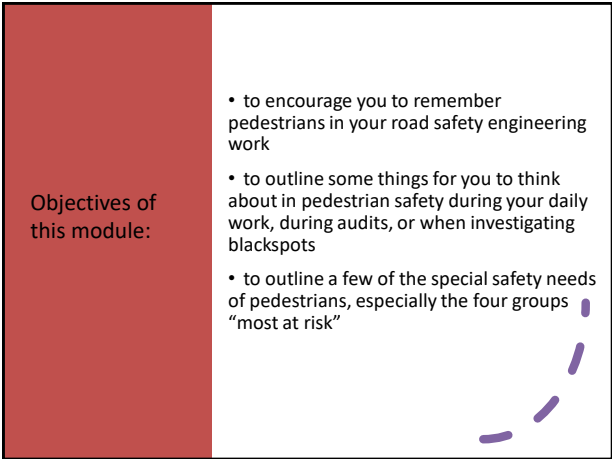
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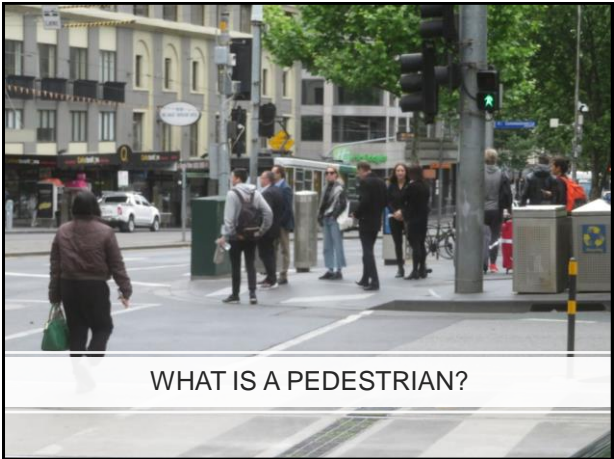
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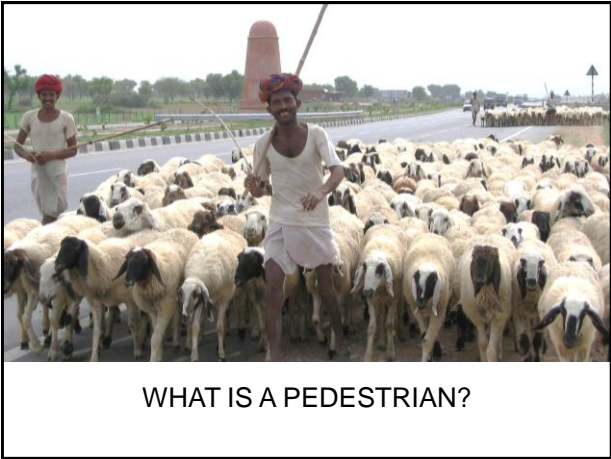
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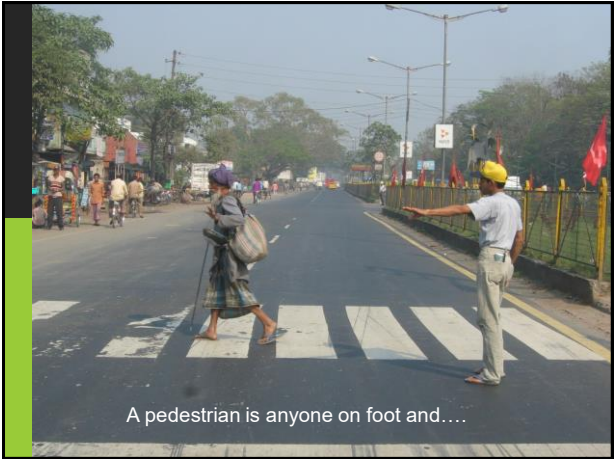
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9



10

18 Who is a pedestrian

A pedestrian includes—

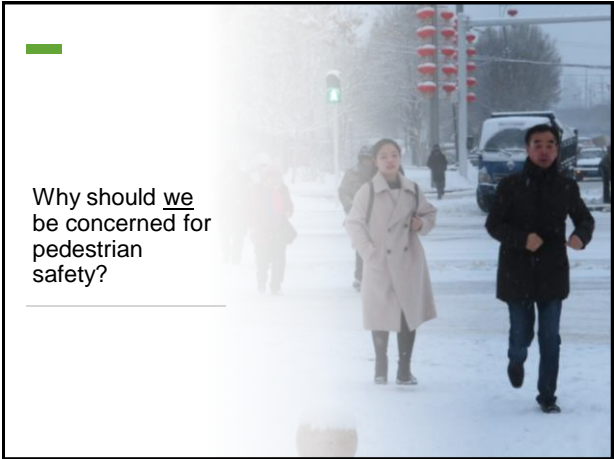
- (a) a person driving a motorised wheelchair that cannot travel at over 10 kilometres per hour (on level ground); and
- (b) a person in a non-motorised wheelchair; and
- (c) a person pushing a motorised or non-motorised wheelchair; and
- (d) a person in or on a wheeled recreational device or wheeled toy; and
- (e) a person travelling on an electric personal transporter.

Note

Electric personal transporter, travel on, wheelchair, wheeled recreational device and wheeled toy are defined in the dictionary.

What do your Road Rules say?

11



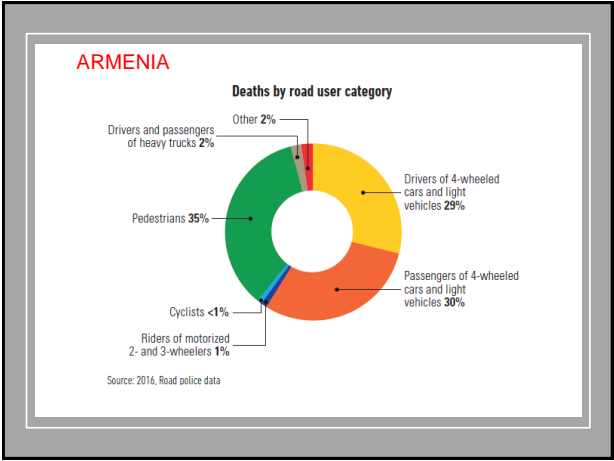
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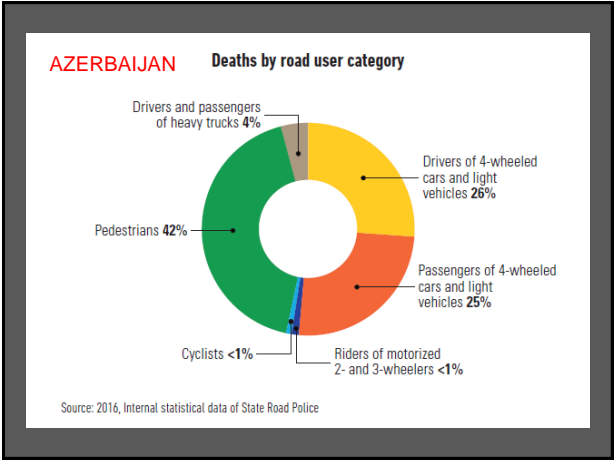
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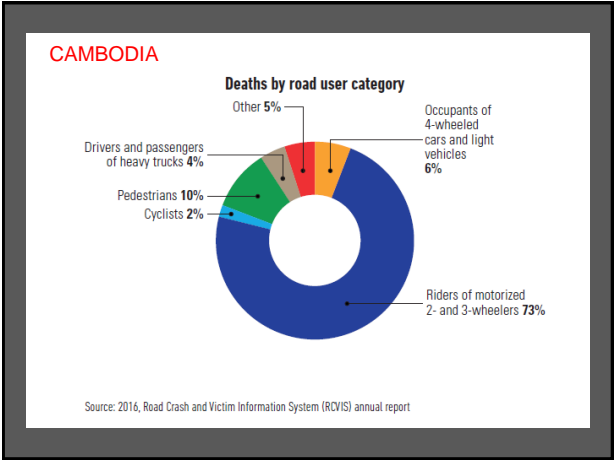
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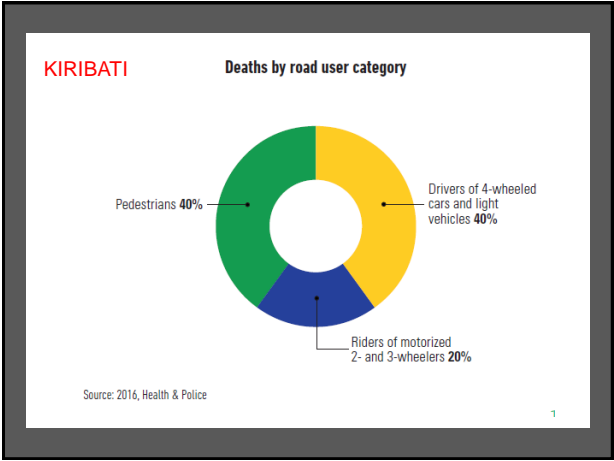
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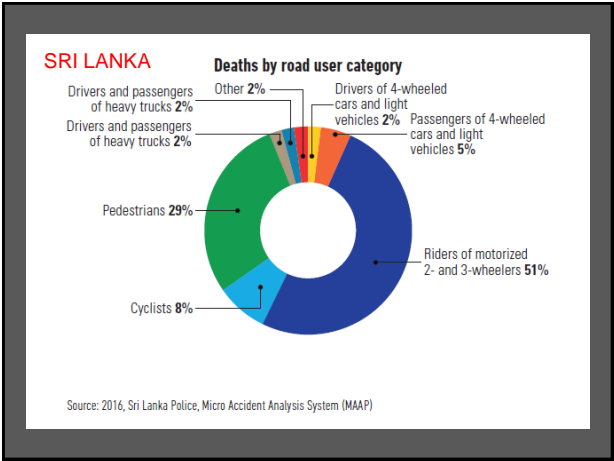
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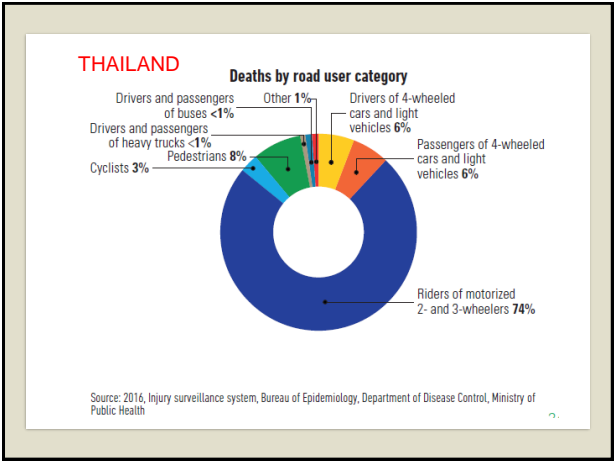
17



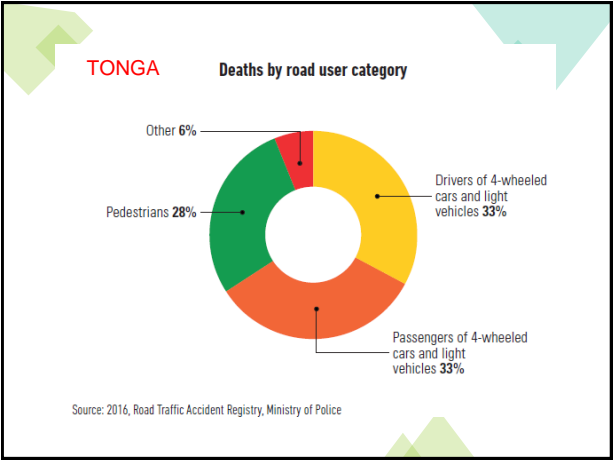
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21



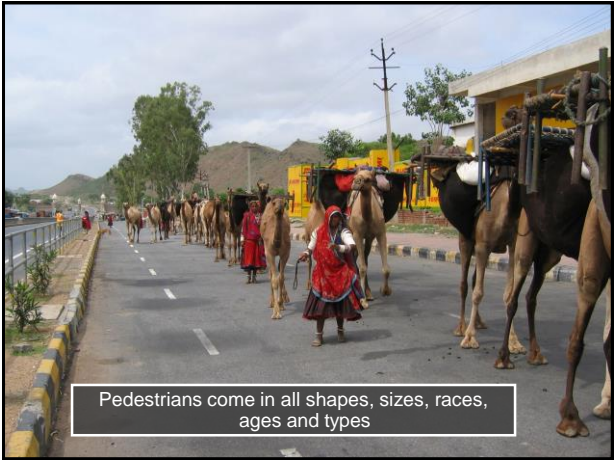
Pedestrians come in all shapes, sizes, races, ages and types

22



Pedestrians come in all shapes, sizes, races, ages and types

23



Pedestrians come in all shapes, sizes, races, ages and types

24



Pedestrians come in all shapes, sizes, races, ages and types

25



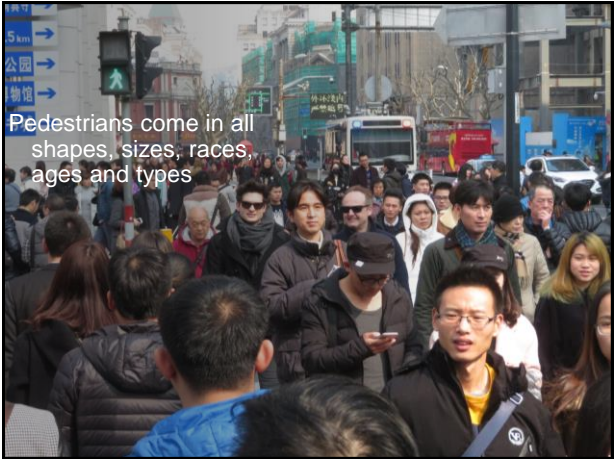
Pedestrians come in all shapes, sizes, races, ages and types

26



Pedestrians come in all shapes, sizes, races, ages and types

27



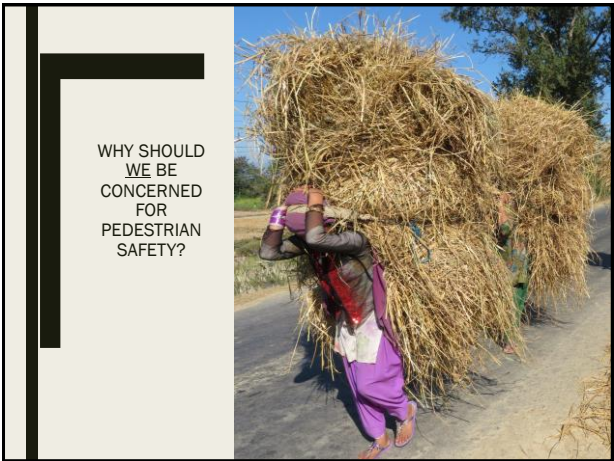
Pedestrians come in all shapes, sizes, races, ages and types

28



PEDESTRIANS COME IN ALL SHAPES, SIZES, RACES, AGES AND TYPES

29



WHY SHOULD WE BE CONCERNED FOR PEDESTRIAN SAFETY?

30



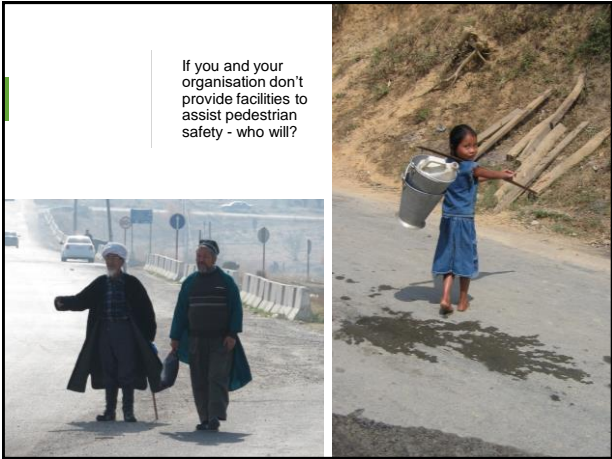
Pedestrians were here first – before the motor vehicle

31

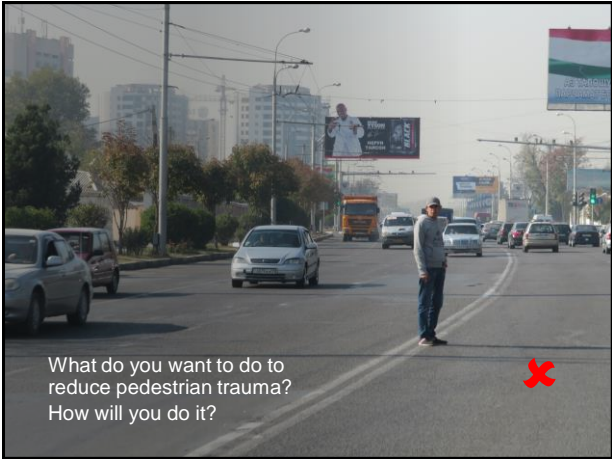
Please show me your pedestrian licence!

- Pedestrians are the largest group of road users (globally)
- No pedestrian licence needed
- Very mobile
- All ages
- Very vulnerable - serious injuries if struck
- 15 - 50% of road fatalities (depending on city, country)
- About 400,000 pedestrians killed on the roads (globally) per annum
- More than 1000 every day!

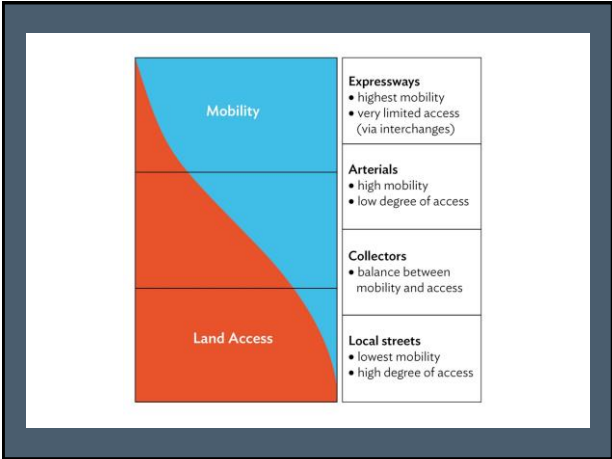
36



37



38



39

What facilities do we have at our disposal to help pedestrians?

	Overpass	Pedestrian Operated Signals	Pedestrian Crossing (with flashing lights)	Pedestrian Crossing (without flashing lights)	Flagged School Crossing	Pedestrian Refuge
Primary Arterial	○	●	X	X	○ +	○
Secondary Arterial	○	●	○	X	○	○
Collector	X	○	○	○	●	●
Local Road	+	+	○ =	○ =	○	○

● Most likely to be appropriate
○ May be an appropriate treatment
X Inappropriate treatment
+ Pedestrian devices should not be needed
+ Flagged school crossings are sometimes used on low volume primary arterials especially in rural areas
= Pedestrian crossings (zebra crossings) may be appropriate in a local shopping centre

40



41

Four special groups of pedestrians need your assistance:


- senior citizens - 19% of pedestrian fatalities are over 65 years
- young - 20% of pedestrian fatalities are aged 4-12 years
- intoxicated - 43% of nighttime pedestrian fatalities ≥ 0.15% BAC
- the disabled

42




SENIORS - 19%
OF PEDESTRIAN
FATALITIES ARE
OVER 65 YEARS



43



young - 20% of
pedestrian fatalities
are aged 4-12 years



44

The intoxicated

- 43% of adult male pedestrian fatalities ≥ 0.15% BAC in Victoria



(3 times the limit for drivers in Australia)

45

HOW SAFE ARE
THE DISABLED
IN YOUR
COUNTRY?



46

Seniors...
tend to be struck more
at nighttime,
on arterials/collectors,
and more seriously
injured than younger
pedestrians

Street lighting – adequate?

PUFFIN Crossings?

Kerb ramps, kerb
extensions?

Pedestrian refuge?

47

Child
pedestrians...
tend to be struck after
school, in
local streets,
not at crossings, and
less seriously injured
than elderly

Speed management?

Parking creating visibility
problems?

Fencing outside schools?

Adult supervision?

48

Intoxicated pedestrians
tend to be males who are struck at nighttime, on arterial roads

Street lighting – adequate?

Parking creating visibility problems?


Fencing needed outside hotels?

Will a refuge help?

49

Disabled pedestrians – three main groups

Mobility impaired
Wheeled
Sensory impaired



50

Disabled pedestrians – there are three groups.....

Mobility impaired


Wheeled

Sensory impaired

51

Mobility impaired pedestrians

People who may, or may not, need a walking stick, or a frame, or a supporting person – or they may simply move slowly, sometimes with a limp



A clear width of 1000 mm is adequate for people with ambulant disabilities.

Signals – is it a PUFFIN?

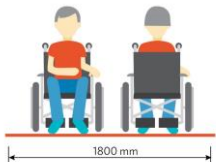
Have kerb ramps been provided on all corners/medians?

Can kerb extensions be built?

Can a wide refuge be provided?

52

Wheeled pedestrians



To allow wheelchairs to pass comfortably, a clear width of 1800 mm is required

At signals – is it a PUFFIN?

Have kerb ramps been provided on all corners/medians?


Can kerb extensions be built?

Can a wide refuge be provided?

53

Sensory impaired pedestrians

Visually impaired (not always totally blind), hearing impaired, maybe both



At signals – are audio-tactiles fitted?

Have kerb ramps been provided on all corners/medians?

Can kerb extensions be built?

Are DDA tiles in place? Correct?

54

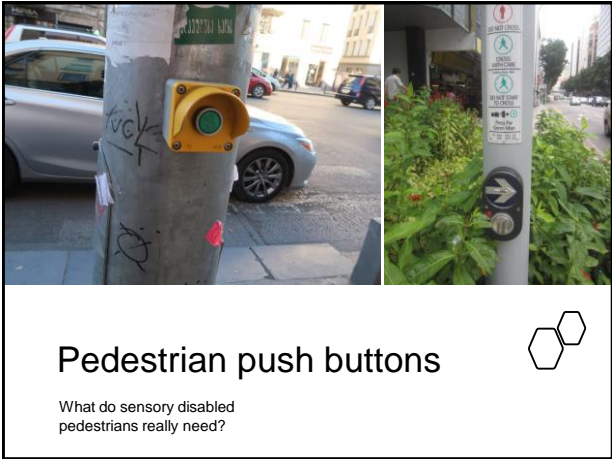


55



Are tactiles like this really necessary?
Do they upset wheeled pedestrians?

56



Pedestrian push buttons

What do sensory disabled pedestrians really need?



57



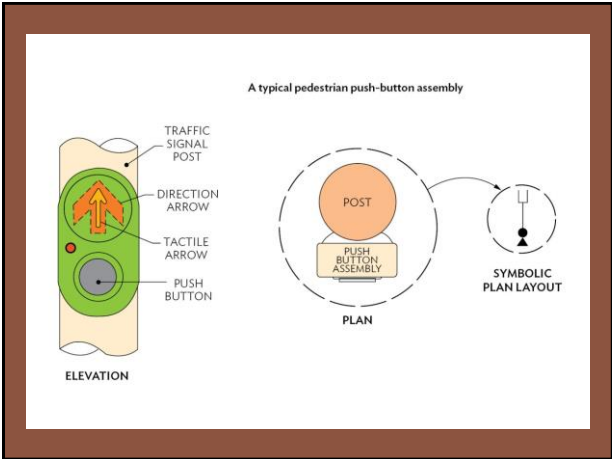
The visually impaired need "audio" to find and use the signals. Other pedestrians want a call record indicator, and a simple button to press. Blind/deaf pedestrians welcome a tactile arrow.

58



- Large push button
- Call record light
- Audio and tactile
- Arrow orientated to the crossing
- Consistent placement, height, orientation

59

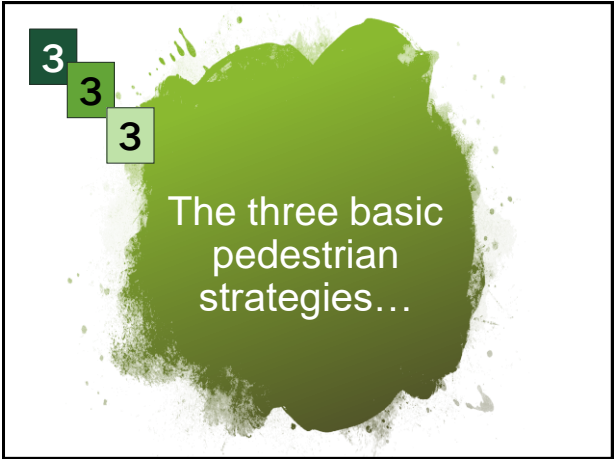


60



ELDERLY CITIZENS IN SINGAPORE CAN "TAP" THEIR PUBLIC TRANSPORT CARD TO INCREASE THEIR WALK TIME

61



The three basic pedestrian strategies...

62



Segregation
Separation
Integration

63



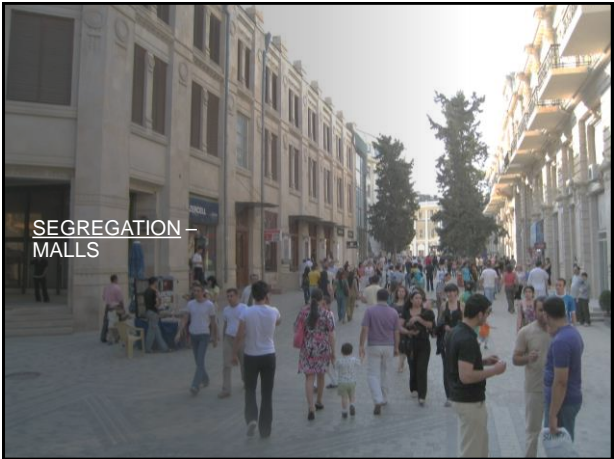
SEGREGATION – EXPRESSWAYS

64



SEGREGATION – EXPRESSWAYS ?

65

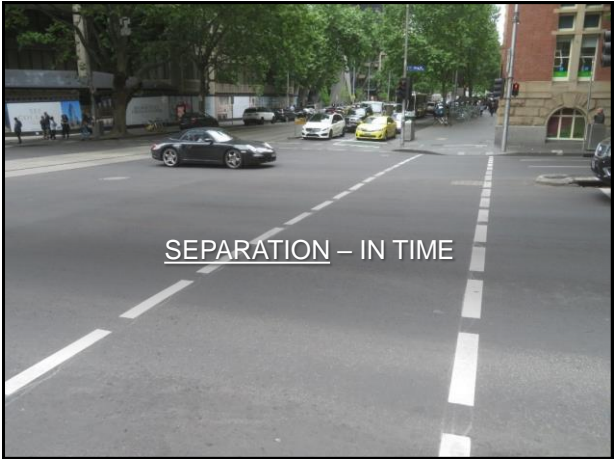


SEGREGATION – MALLS

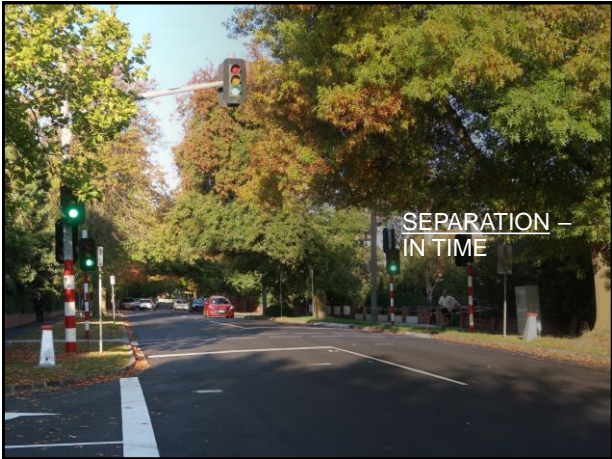
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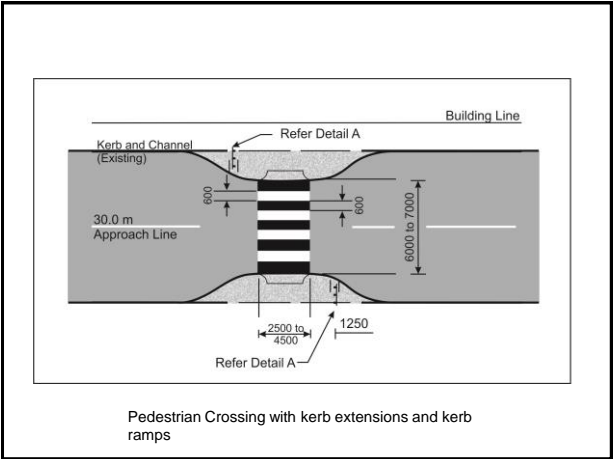
74

(3) A **pedestrian crossing** is an area of a road—

- (a) at a place with white stripes on the road surface that—
 - (i) run lengthwise along the road; and
 - (ii) are of approximately the same length; and
 - (iii) are approximately parallel to each other; and
 - (iv) are in a row that extends completely, or partly, across the road;
- and
- (b) with or without either or both of the following—
 - (i) a *pedestrian crossing sign*;
 - (ii) alternating flashing twin yellow lights.

What do your Road Rules specify?

75



76



77



78

Maintenance of all facilities is important.....

- To comply with Road Rules
- To alert approaching drivers/riders
- To show that engineers/authorities respect the needs of their customers (the road users)
- Plus – placing a crossing on top of a road hump increases safety for the pedestrians A LOT!
- This offers a 73% reduction in pedestrian collisions

79

Crossings on humps are "safety enhanced"

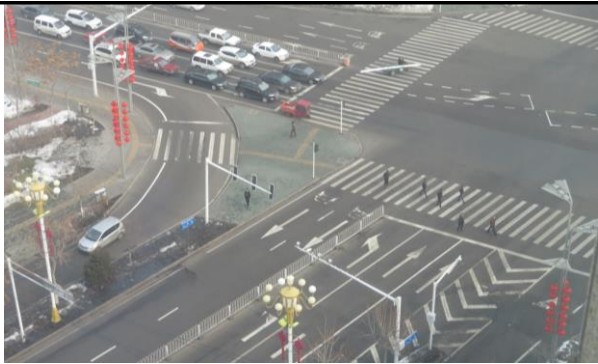


80

Crossings on humps are "safety enhanced"



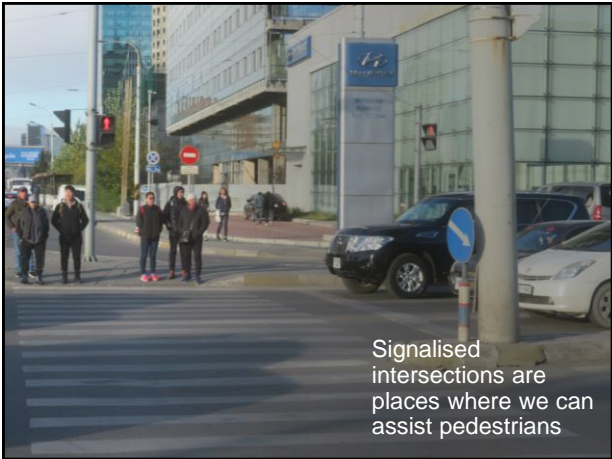
81



Signalised intersections offer scope to assist pedestrians

82

Signalised intersections are places where we can assist pedestrians



83

Signal hardware

- Provide pedestrian displays
- Provide audio tactile pedestrian push buttons – so they can call up their phase even with no motor vehicles present
- Ensure all conflicting drivers CAN see the pedestrians (clear away all obstructions)

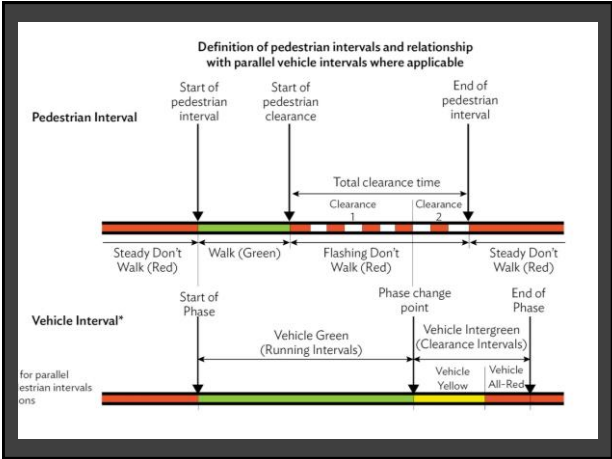
Signal phasing and software

- Generally run pedestrians with parallel traffic
- Give adequate clearance time – based on road width and a walking speed of about 1.5m/sec.
- Consider an early start for the pedestrians if there is a lot of turning traffic
- Audio-tactile devices - benefit disabled pedestrians
- NEVER run a pedestrian phase across a turn arrow

Civil works

- Kerb ramps and DDA tiles
- Obvious and clear pedestrian paths
- All-weather footpaths leading to/from the intersection
- Kerb extensions
- Street lighting
- No obstructions along footpaths

84



85



86



87

Pelican Crossings

WHEN FLASHING GIVE WAY TO PEDESTRIANS

What is a Pelican Crossing?

Pelican Crossing

If the crossing goes straight across the road (even when there is a central refuge) treat it as a single crossing

If the crossing is staggered treat it as two separate crossings.

Flashing Amber Phase

88

Puffin Crossings

Do you have any?

89

What does PUFFIN stand for?

Pedestrian User-Friendly Intelligent Crossing

90



Toucan Crossings

91



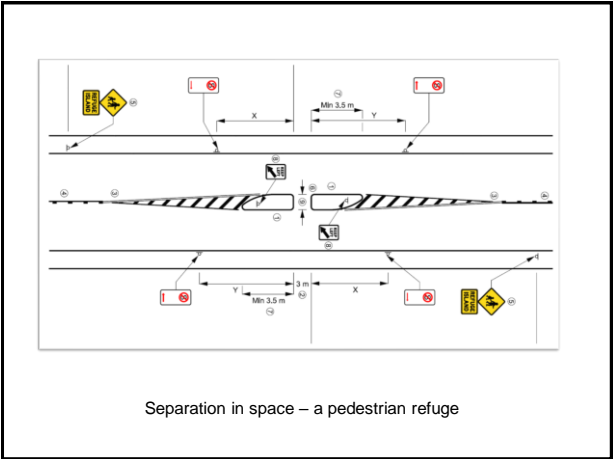
SEPARATION –
IN SPACE

92



SEPARATION
– IN
SPACE

93



Separation in space – a pedestrian refuge

94



Separation in space – a pedestrian refuge (in a side street where it prevents vehicles "cutting the corner", thus assisting pedestrian certainty)

95



Separation in space

Kerb extension

96



97



98

Separation in space (grade separation)

- Do pedestrians like grade separation – as much as engineers do?
- Most will use it if they can access it and it saves them distance.
- USA research (Zegeer 1993) showed:
 - 95% of pedestrians will use grade separation if there is no loss of travel time compared with walking across the road (at grade)
 - almost nobody will use them if it will take 50% longer (or more).
- Of the two alternatives, people usually prefer an overpass.
- But the disabled need assistance too.
- If you *must* have a subway, design one with a straight through view (for personnel safety)
- Some subways include shops – to encourage people. More people = safer overall.

99

Go back to your road hierarchy

Expressways – always grade separate

Arterials – examine all options

Collectors – separation in space, Zebra Crossings if narrow, PUFFINS if busy.

Local streets – traffic calming and small civil works

Mobility

Land Access

Expressways

- highest mobility
- very limited access (via interchanges)

Arterials

- high mobility
- low degree of access

Collectors

- balance between mobility and access

Local streets


- lowest mobility
- high degree of access

100

101

102

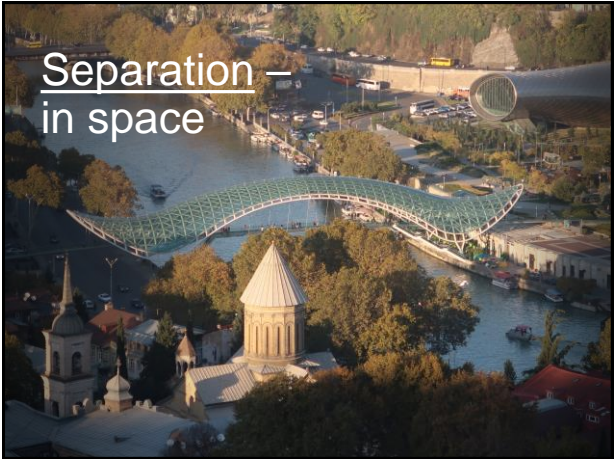
ROAD SAFETY INTERNATIONAL

Road Safety
INTERNATIONAL

PHILLIP JORDAN



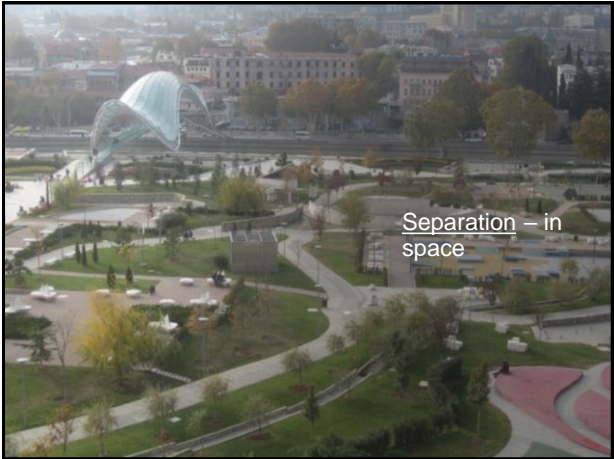
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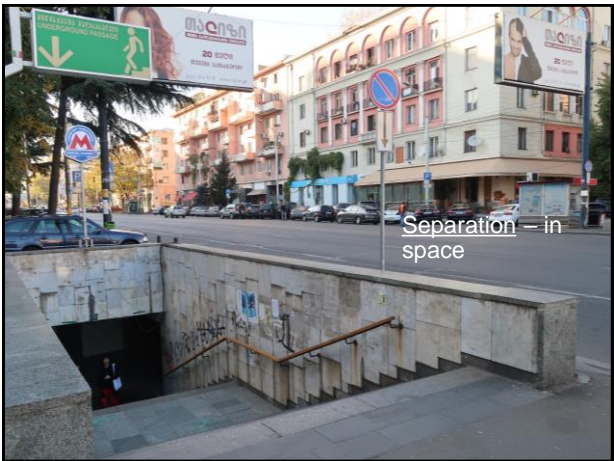


114



115

Separation – in space



116

Separation – in space



117



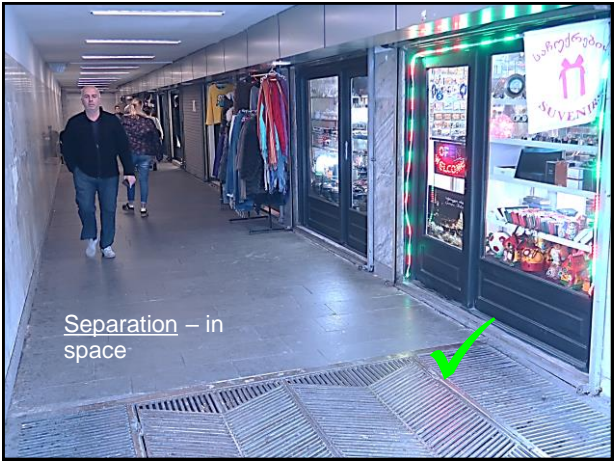
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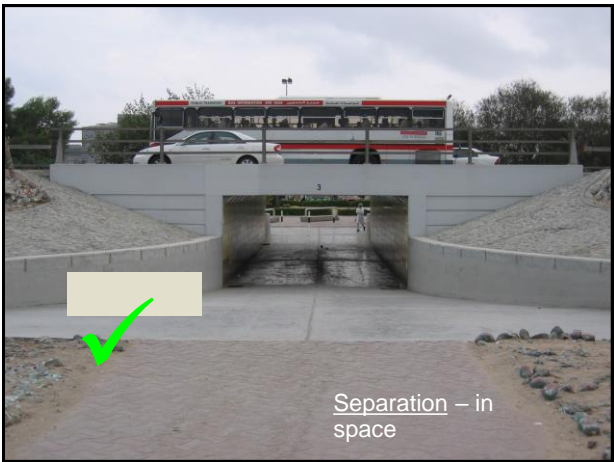
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122



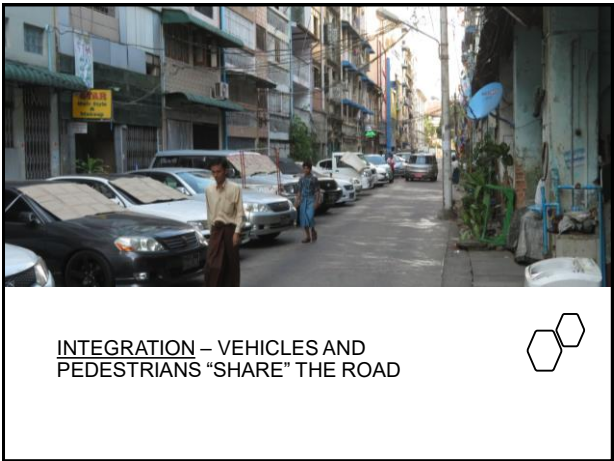
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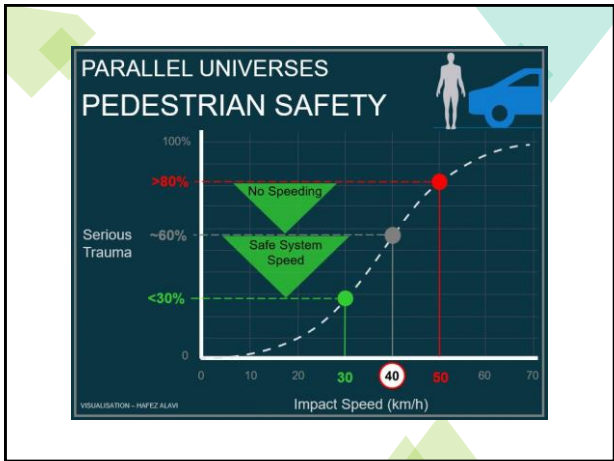
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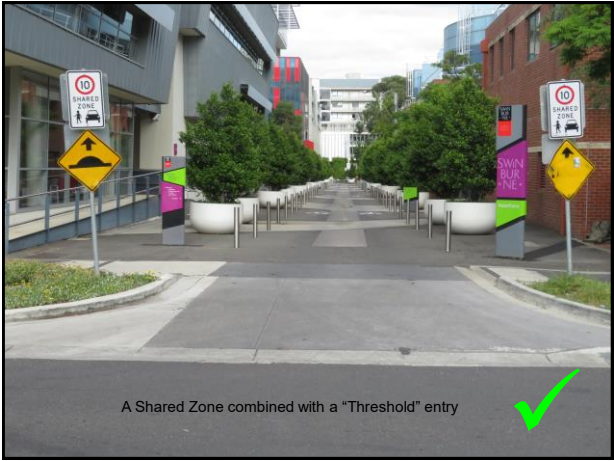
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127



128



A Shared Zone combined with a "Threshold" entry

129



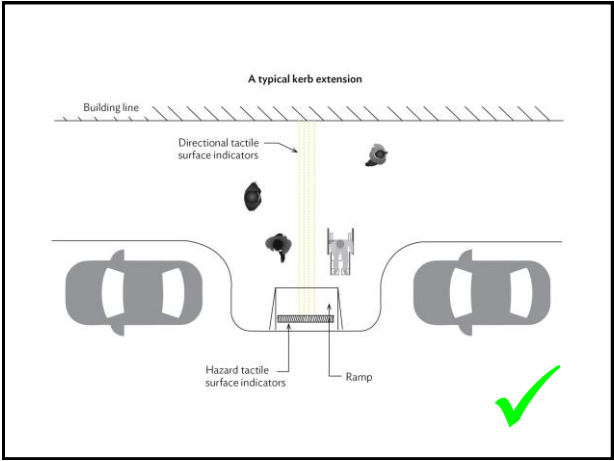
Small scale civil works – a "Threshold"

130



Small scale civil works – kerb ramps

131



A typical kerb extension

132



Small scale civil works

133



134



135



136



137



138



139





Are countdown signals good for pedestrians?
Are they safe?

141

Always visit the site and put yourself *in the shoes of the pedestrian!*

- Will they be able to safely cross the road?
- Will they be able to safely walk along the road?
- Will there be a complete "path" for them?
- Will it be obvious? Continuous?
- Are signals proposed for pedestrians? Disabled?
- Have you considered especially the four groups of high-risk pedestrians?




143




Provide clear flat footpaths for pedestrians to use.
Why are these bollards here?

144



Whether auditing or doing blackspot work, always ask yourself – will this contribute to the safety needs of pedestrians

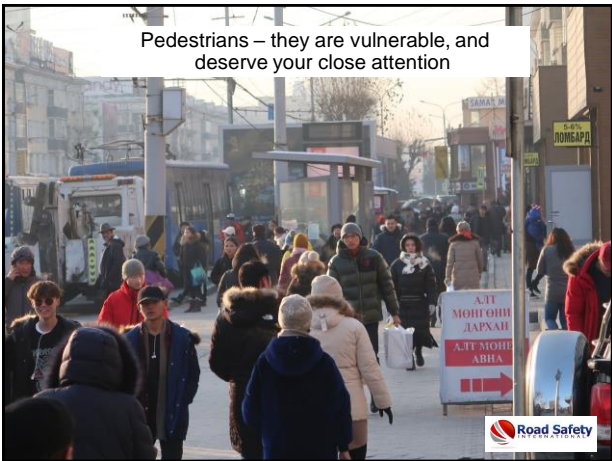
145




Direction signs for pedestrians

146

Pedestrians – they are vulnerable, and deserve your close attention





147