Pedestrian-friendly road design

Session 2: Keeping them safe/prevention strategies

RACS Trauma Symposium Pedestrians - Staying Safe

Bruce Corben

Wednesday 13 November 2019

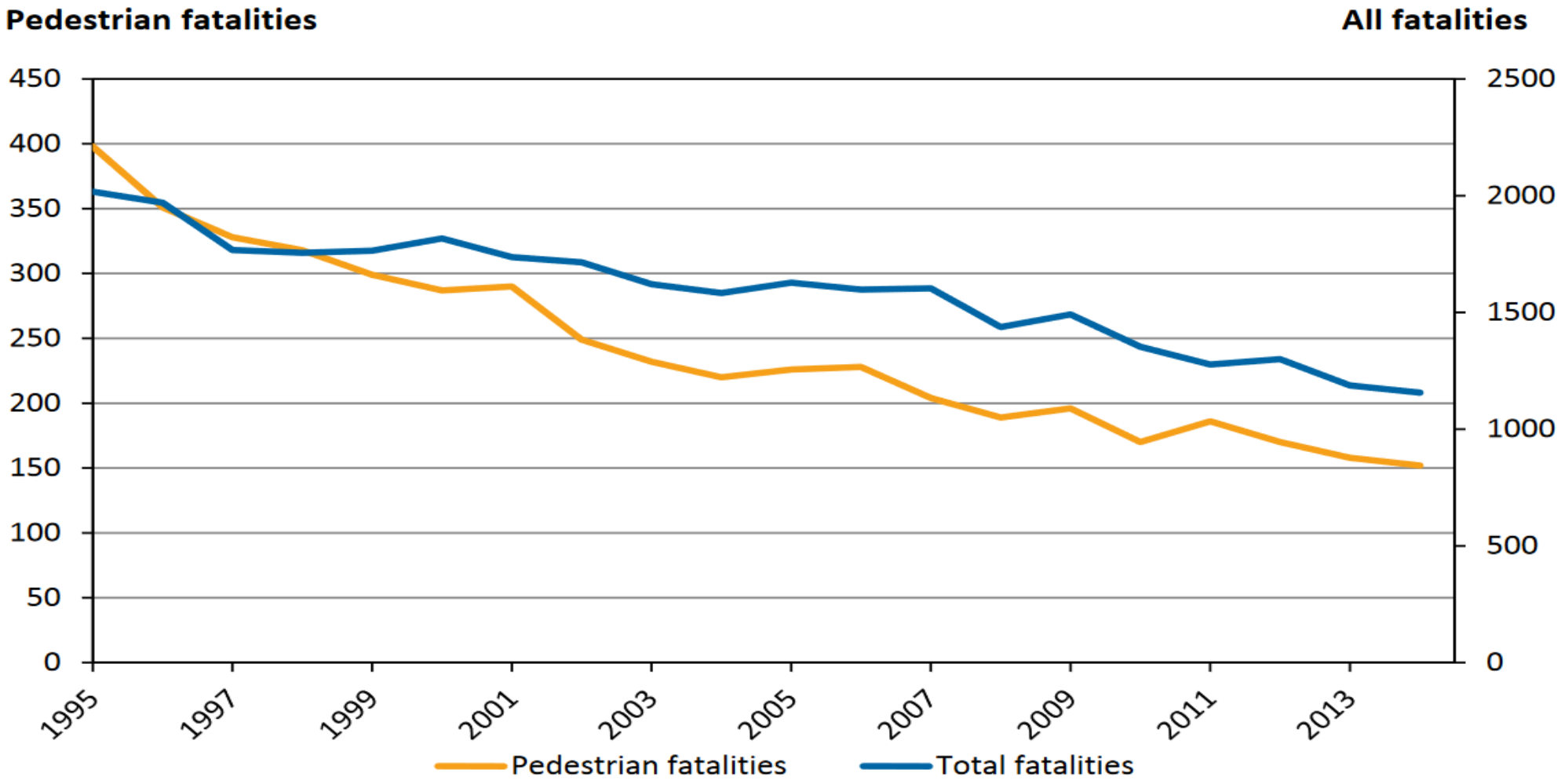
Overview

- Our pedestrian trauma challenge
- What defines pedestrian-friendly design?
- Some examples of risks and solutions
- Emerging challenges

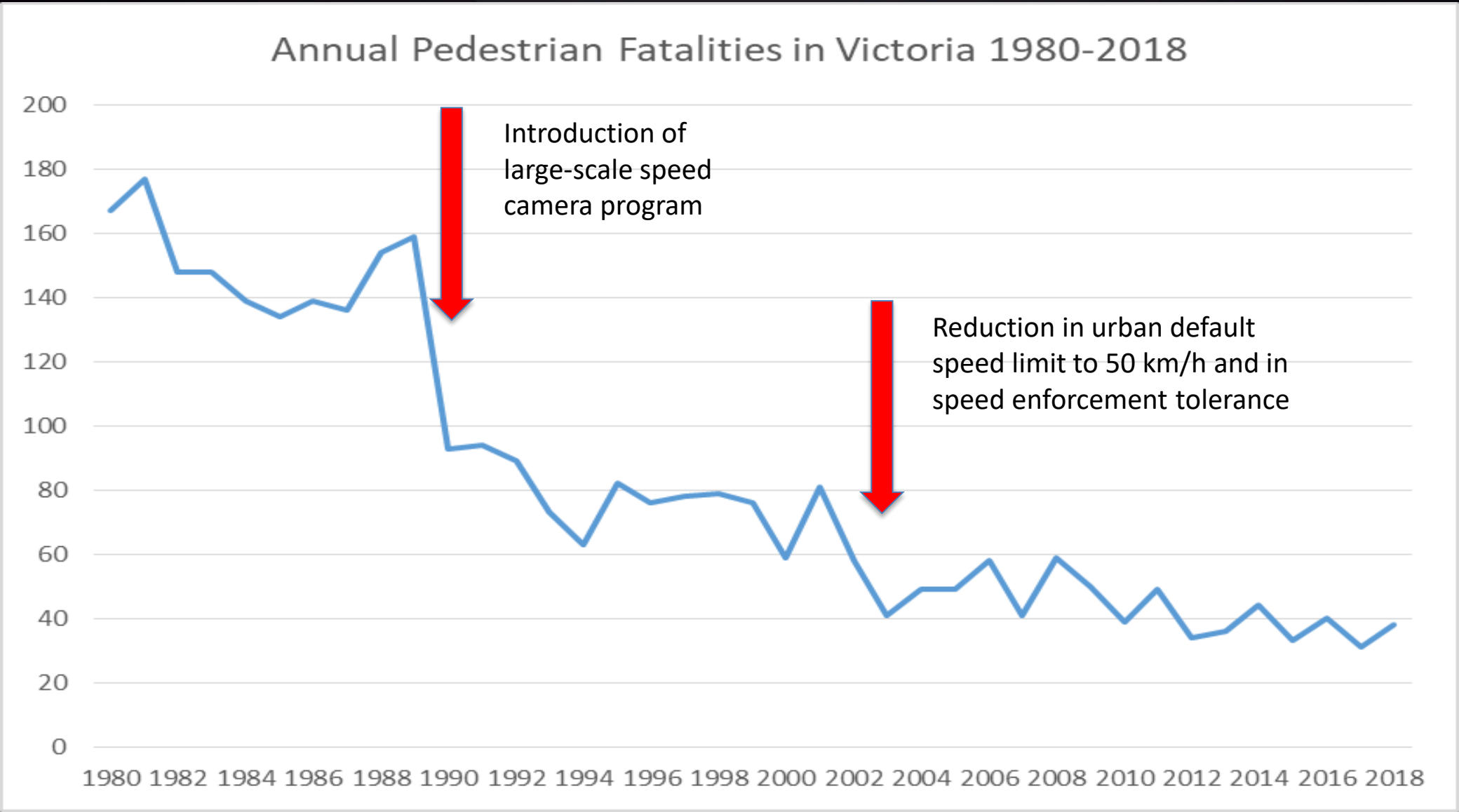
Pedestrian fatalities for Australia (1995-2014)

(Source: BITRE: https://www.bitre.gov.au/publications/2015/files/is_070.pdf)

Figure 3 Annual road fatalities in Australia, pedestrians and total fatalities, 1995-2014



Victoria's pedestrian trauma challenge



The Safe System - energy management and boundary conditions

image: Johan Strandroth

Crash Type		Impact speed
	head on	70 km/h
	side-impact	50 km/h
	side impact with tree	30 km/h
	pedestrian	30 km/h

What defines pedestrian-friendly design?

- Human-centric design recognises the needs, wishes and limitations of being human
- Humans have a fundamental need and desire to move around
- Human limitations affect risk
  - behaviour
  - performance
  - biomechanical tolerance
  - consistency

CORBEN CONSULTING

Humans

- Are motivated by more than just safety
- Make errors and take risks
- Experience performance lapses
  - fatigue
  - mood
  - distraction/inattention
  - health
  - impairment
- Are vulnerable to severe injury when impact energy reaches the threshold for an individual
  - health
  - stature
  - age

CORBEN CONSULTING

Opportunities to manage system energy (1)

1. Exposure
   - pedestrian numbers
   - vehicle numbers
   - time-based measures

2. Crash likelihood
   - vehicles and pedestrians need to cross paths
   - travel speed
   - road width/number of lanes
   - number of directions of travel
   - controls to help pedestrians cross
   - sight lines

CORBEN CONSULTING

Opportunities to manage system energy (2)

3. Injury risk
   - impact speed
   - vehicle type and frontal design
   - physical surroundings

Walk this Way star-rating app

Busy high speed arterials

Busy high speed arterials

Traffic signals

Residential streets without footpaths (50 km/h)

Shopping strips at 50 km/h

Car-free streets

Car-free streets

Car-free streets

Separation: connecting bridges

Low-risk speeds

Wider footpaths

Separation: pedestrianising city centres

Separation: pedestrianising city centres

Tactical urbanism

Shared space

Reallocation of road space

Roundabout with wombat crossings

Plateau intersections

Threshold treatment

Road narrowing

Medians and roundabouts

Medians and roundabout

Safety platforms at traffic signals

Platform signalised cross-walk

Raised signalised intersection

Scramble crossing

Single-lane bus stop

Light rail route

Tram street with platform stops and 10 km/h

Shared space

Shared zone

Speed platform

Wombat crossing

Wombat crossing (with road narrowing and median)

30 km/h speed limits

Local street traffic-calming

Emerging (and emerged) challenges

- A global movement to support walking
- Climate change
- Liveability
- Urban density
- Traffic congestion
- Population health
- Innovative personal mobility devices
- A focus on continuous improvement
- Speed reductions – “we have no plans ….”
- Getting it on the ground
  - funding
  - road design standards

CORBEN CONSULTING

We have an objective way of judging ‘pedestrian-friendliness’

- Exposure to vehicles
- Crash likelihood
- Injury risk given a crash

CORBEN CONSULTING