

Vision Zero Engineering with a Focus on Vulnerable Road Users

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What do hope for from the workshop?

1. Confidence that VRUs are worthy of priority attention
2. Clarity about our data needs
3. New insights about risk
4. Ideas for generating solutions for VRUs that are aligned with Safe System principles
5. How to integrate solutions into a broader agenda around liveability
6. Other?

Workshop structure

- 1. Why is it important to prioritize pedestrians, cyclists & motorcyclists?**
 - 2. Problems around VRUs and serious road trauma**
 - 3. Factors affecting VRU risk**
 - 4. Potential solutions using Safe System principles**
- Case study – what would the Whyte Avenue corridor look like to achieve Safe System performance**

1. Why is it important to prioritize pedestrians, cyclists and motorcyclists?

- walking and cycling positively impact our health, environment and the livability of our cities and towns*
- VRUs use sustainable forms of transportation*
- VRUs operate at highly elevated risk because they are (largely) unprotected in traffic and often not seen*



2. The problem of serious road trauma involving VRUs

Pedestrians

- Mid-block crossing
- LT & RT drivers at intersections

Cyclists

- LT drivers at signalized intersections
- RT drivers at signalized intersections

Motorcyclists

- LT collisions at signalized intersections
- Single vehicle

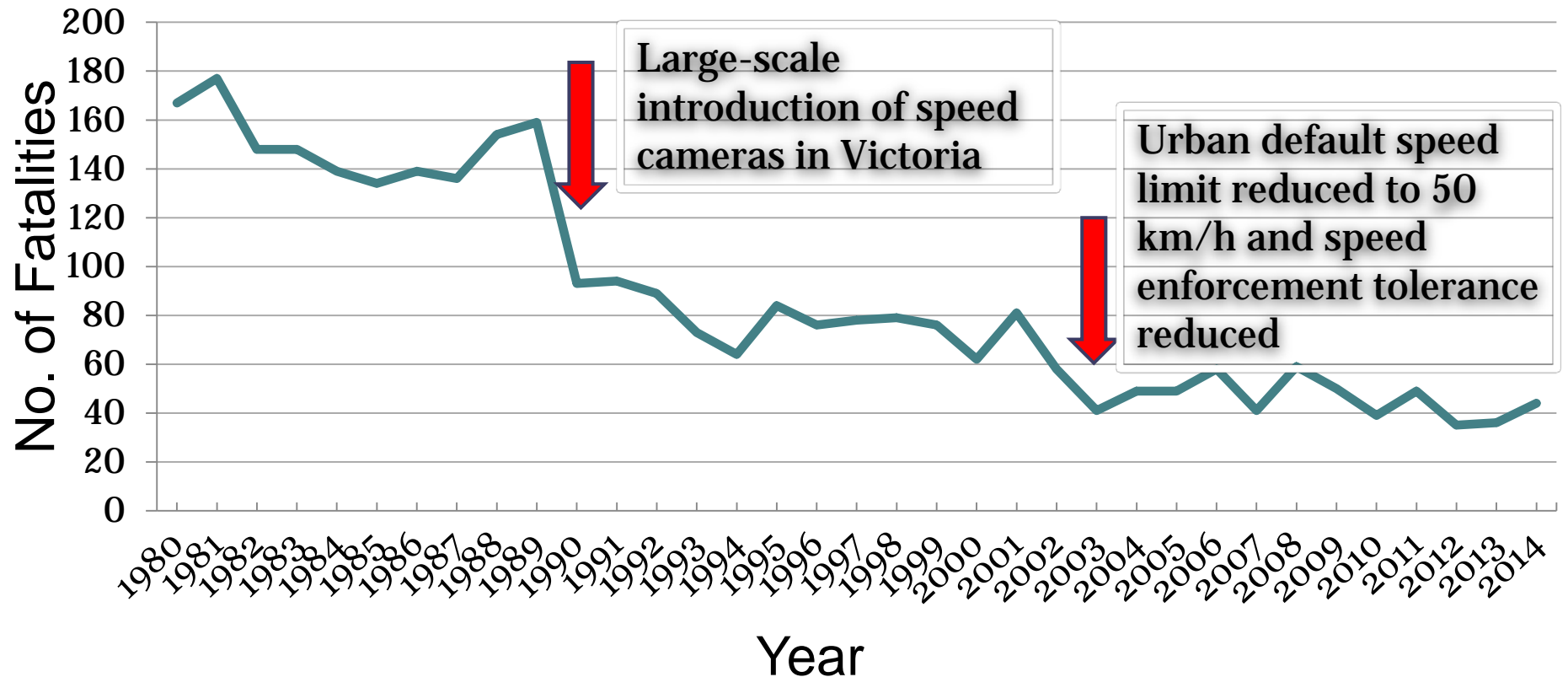
- Case study – collision history at Whyte Avenue corridor

3. What factors affect VRU collision and injury risk?

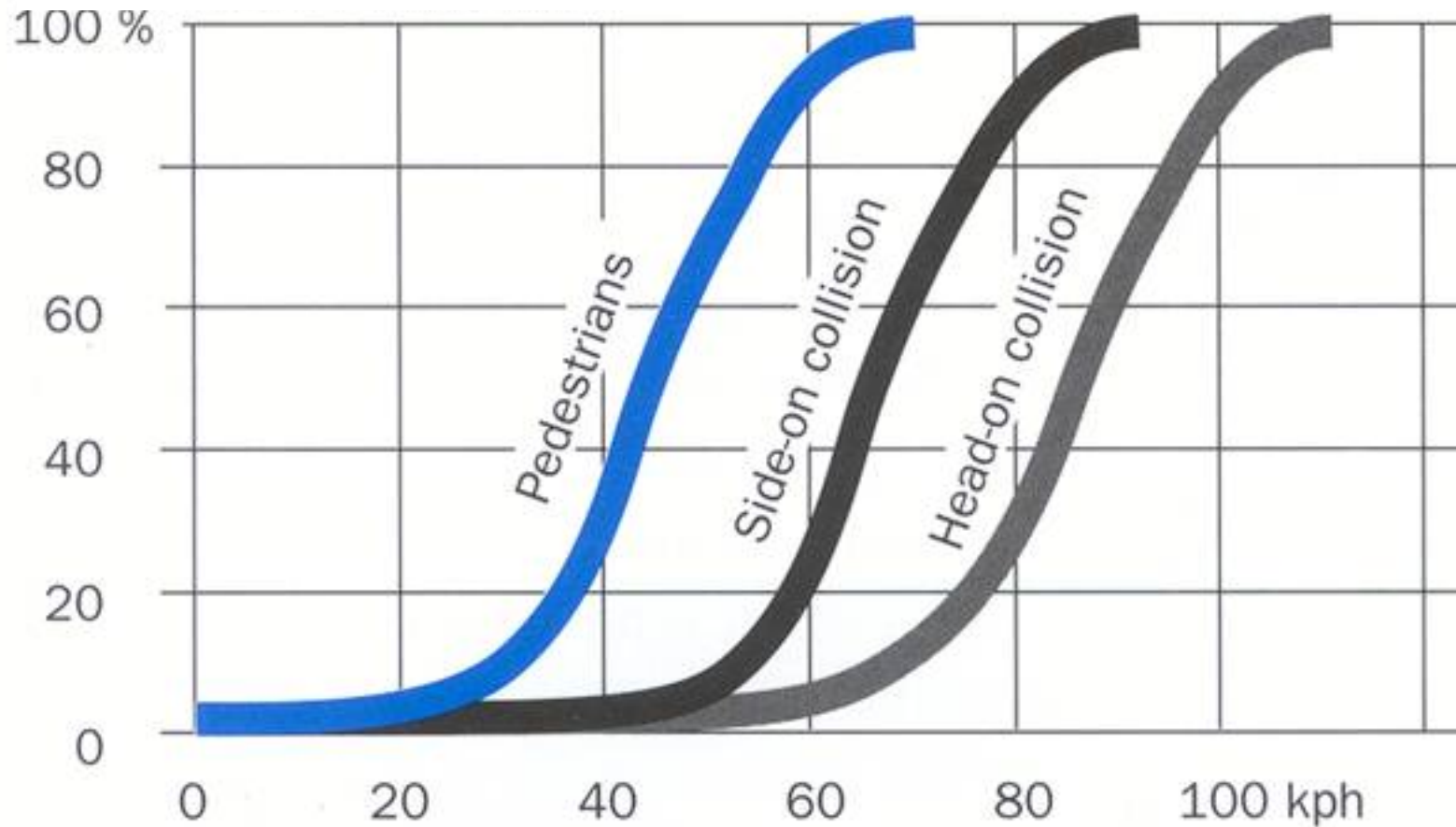
- *Factors impacting collision risk*
 - *exposure, speed, road width, what else?*
- *Factors impacting injury risk*
 - *speed, age, stature, vehicle type, what else?*
- *How do these key risk factors change for different road user types?*

The critical evidence on speed

Pedestrian Fatalities on Victorian Roads (1980-2014)



Risk of being killed as a function of impact speed (SALAR publication)



4. Potential solutions using Safe System principles



Safe
Roads &
Roadside

Safe
Vehicles

Safe Road
Users

Safe
Speeds

Towards a 'Safe System framework'

Protective Layers/SS Pillars	Safe Roads and Roadside	Safe Vehicles	Safe Road Use	Safe Speeds
Human tolerance				
Low-risk energy transfer at impact	<ul style="list-style-type: none"> • Energy absorbing pavements 	<ul style="list-style-type: none"> • Forgiving frontal design of vehicles 	<ul style="list-style-type: none"> • Purchase/use of 'pedestrian-friendly' vehicles 	<ul style="list-style-type: none"> • ≤30 km/h speed limits
Reduction in impact energy	<ul style="list-style-type: none"> • High friction pavements 	<ul style="list-style-type: none"> • AEB/ABS • Vehicle mass • ISA 	<ul style="list-style-type: none"> • Driver speed choice • Effective braking 	<ul style="list-style-type: none"> • ≤30 km/h speed limits
Crash risk per exposure	<ul style="list-style-type: none"> • Traffic signals • Zebras • Speed platforms 	<ul style="list-style-type: none"> • In-vehicle crash avoidance and AEB • ISA 	<ul style="list-style-type: none"> • Pedestrian gap choice • Driver speed choice 	<ul style="list-style-type: none"> • ≤30 km/h speed limits
Exposure	<ul style="list-style-type: none"> • Compatible land uses • Car-free areas and streets • Shared space • Compatible traffic management strategies • Grade-separation 	<ul style="list-style-type: none"> • Vehicle fleet mix 	<ul style="list-style-type: none"> • Use of public transport 	<ul style="list-style-type: none"> • Functional classification of roads

Workshop wrap-up/key learnings

What are the main learnings for protecting VRUs in a Safe System context?

- **Safe roads and roadsides**
- **Safe speeds**
- **Safe vehicles**
- **Safe road use**
- **As a system**