

# Characteristics of crashes involving older road users

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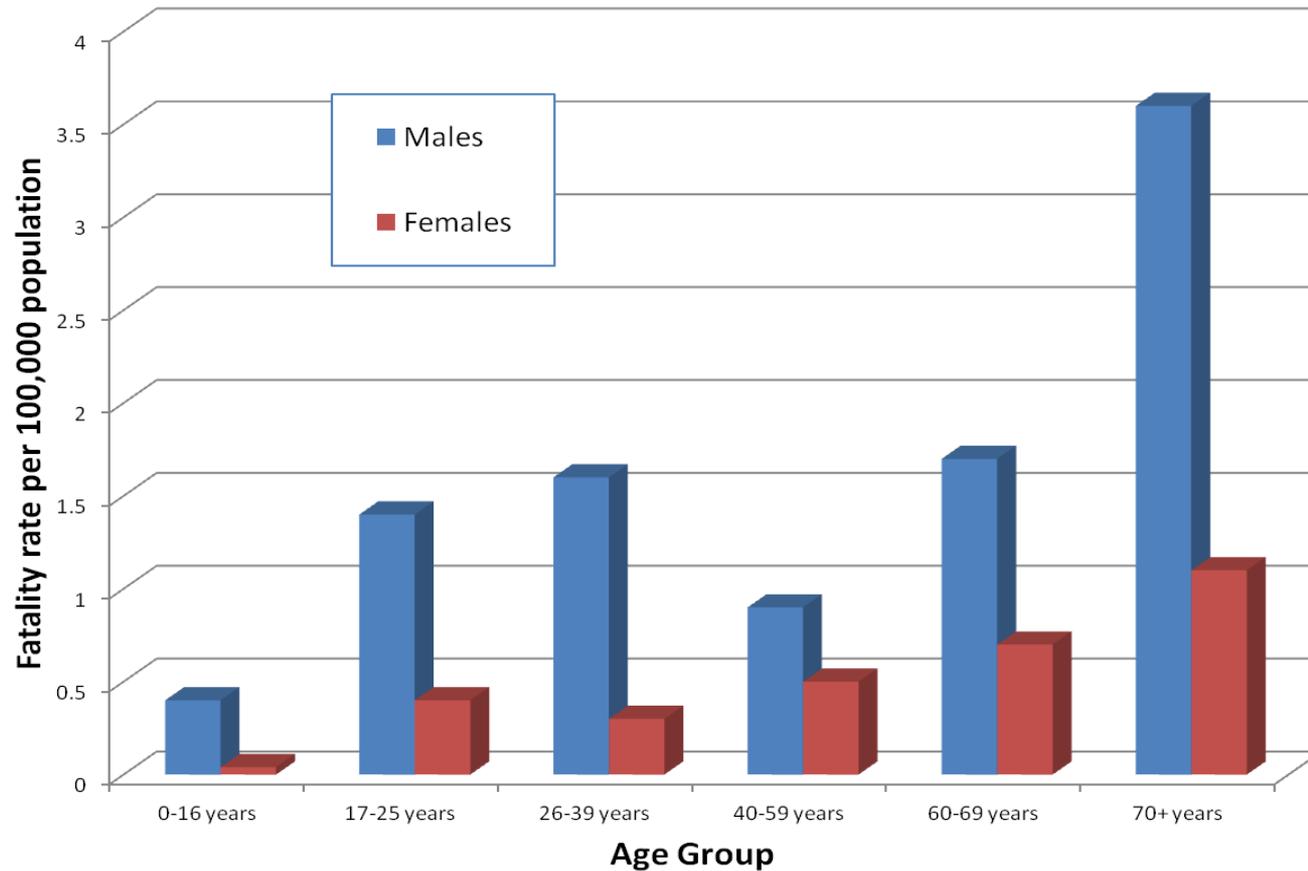
# Population Changes

- Our population is ageing and changing:
  - By 2030, the proportion of Australian adults aged 65 years and over is expected to reach 22 percent and the proportion aged 85 years and over is expected to reach five percent (ABS, 2013).
  - Current and future cohorts are more likely to be: better educated, more affluent, healthier, have longer life expectancies and work for more of their senior years
- Transport needs are also changing:
  - The private motor vehicle is likely to remain the principal mode of transport,
  - They will be more likely be licensed to drive, travel more frequently, travel greater distances, and will have higher expectations with regard to maintaining personal mobility
  - Given promotion of active travel, more will walk, cycle and use public transport

# Older road user fatalities and serious injuries

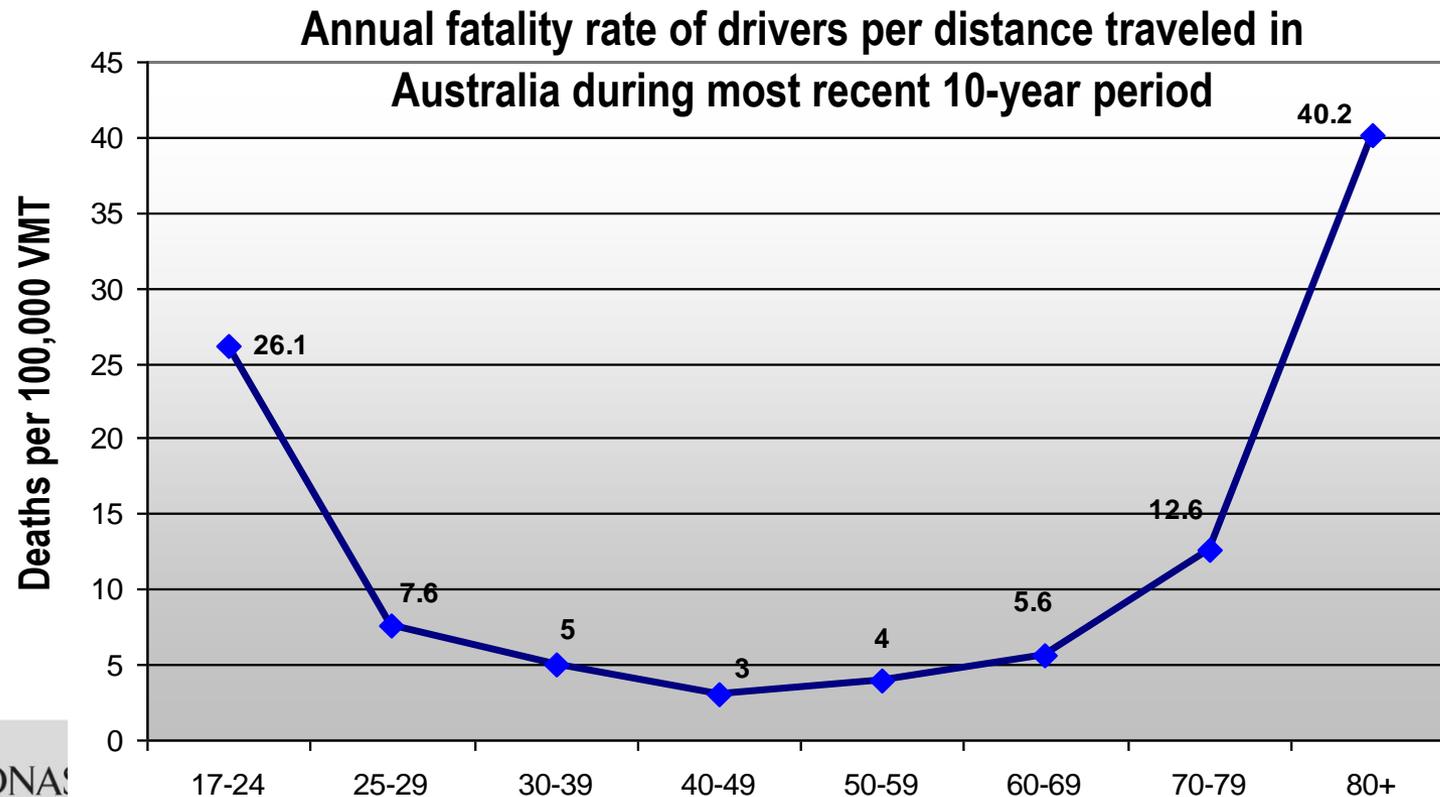
- Over the past five years (2008-2012), on average, 37 people aged 75+ have been killed on Victoria's roads each year.
- In 2013, 45 people aged 75+ were killed on Victorian roads, compared to 35 in 2012.
- In absolute terms, these numbers are small ..... But are on the increase, compared with fatalities involving younger adults.
- The BITRE (2014) recently examined fatality crash data for the period 2004-2013: while the total annual road crash fatalities declined by 24.6 percent, road crash fatalities for older road users (i.e., aged 65 years and older) increased by 8 percent.
- Older adults are more likely to die as a pedestrian than when using any other mode of transportation (Sleet et al., 2010).
  - Older pedestrian fatalities have not significantly decreased over the past decade (BITRE, 2014).
  - In most Australasian jurisdictions, older adults comprise a significant proportion of all pedestrian deaths and serious injuries.
  - For example, in Victoria alone, adults aged 70 years and older made up 37 percent of all-aged pedestrian fatalities during the past five years (TAC, 2014).

# Rates of pedestrian fatalities by age group and gender (Australia, 2014)



# Rates of driver fatalities and serious injuries by age group

- Older drivers represent one of the highest risk categories for crashes involving serious injury and death when we adjust figures for any exposure measure:
  - per age-group in the population
  - per number of licensed drivers
  - per distance travelled

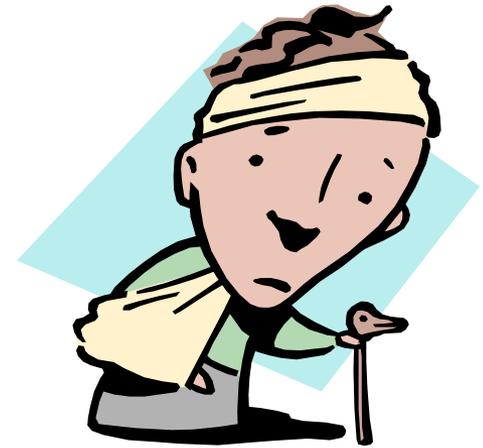


## Interpreting the U-shaped curve

- YES – older drivers are more likely to crash per unit of distance drive
- BUT – the curve DEMONSTRATES heightened casualty crash involvement: it does not EXPLAIN it
- Does not prove that older drivers are unfit to drive

# The role of physical frailty

- Older adults are more frail and are more likely to die or sustain a severe injury than younger adults, given the same crash circumstances
  - Older adults require longer to recover from an injury
  - Of particular concern are chest injuries such as rib fractures, collapsed lungs and ruptured arteries. Older people lack the lung capacity to recover and are dying of chest injuries at markedly higher rates than younger adults in crashes
- From age 80 onwards, about **60% of risk of death from crash involvement is due to frailty** (Li et al 2003)
  - US fatality data shows 80+yo are 13x over-represented compared with 30-59yo of which at least half can be accounted for by frailty
  - The effects of frailty are higher for females (63%), compared with males (57%)

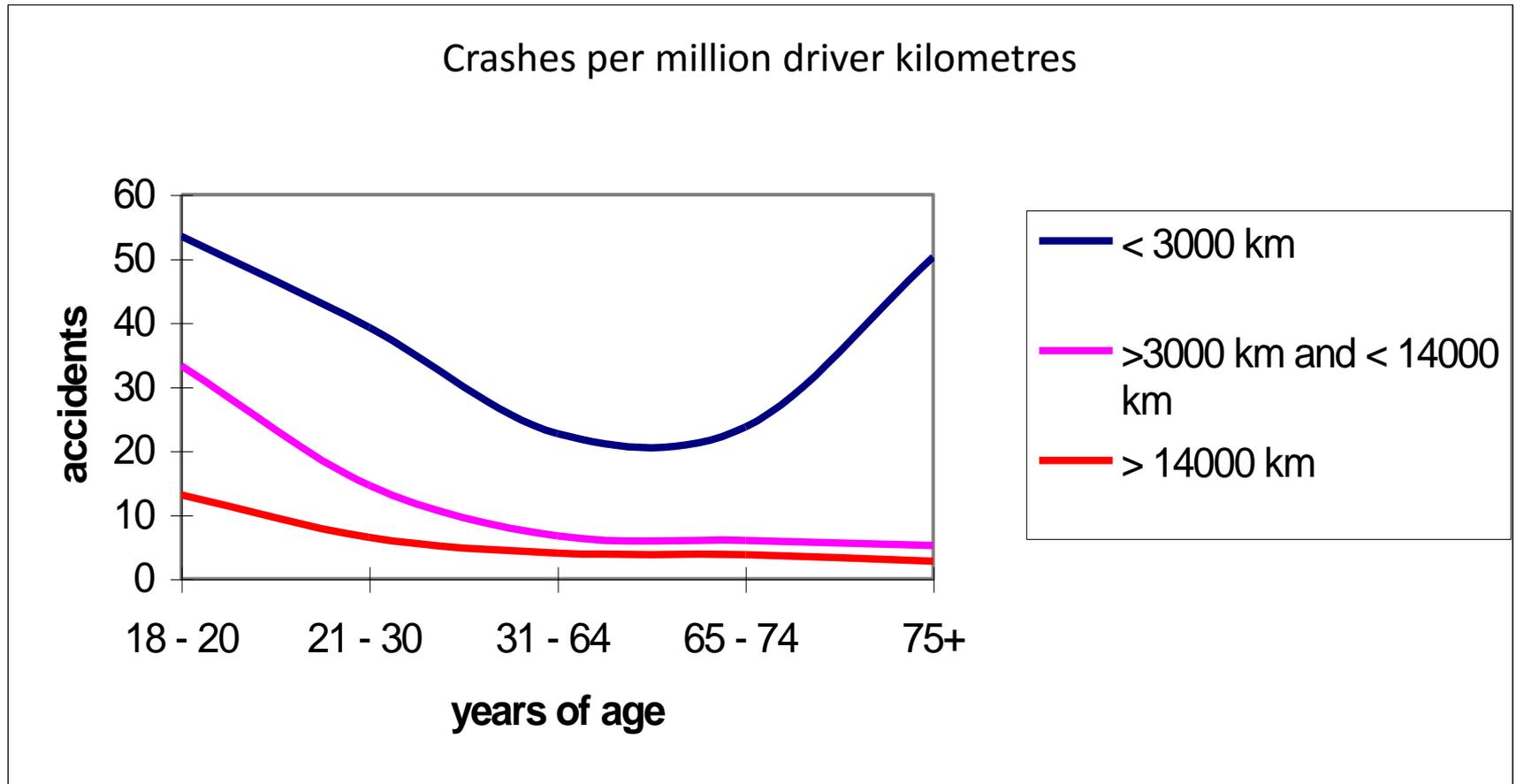


# The role of driving distance

- “ ... Licensing administrators influenced by the exaggerated implied risk of the elderly group when accidents are divided by miles may become more alarmed than is warranted about the safety hazard posed by the increasing numbers of elderly drivers...” (Janke, 1991, p187)
- Older drivers known to drive fewer and shorter trips
- Drivers travelling shorter distances will typically have increased crash rates per kilometre, compared to those driving longer distances... regardless of age

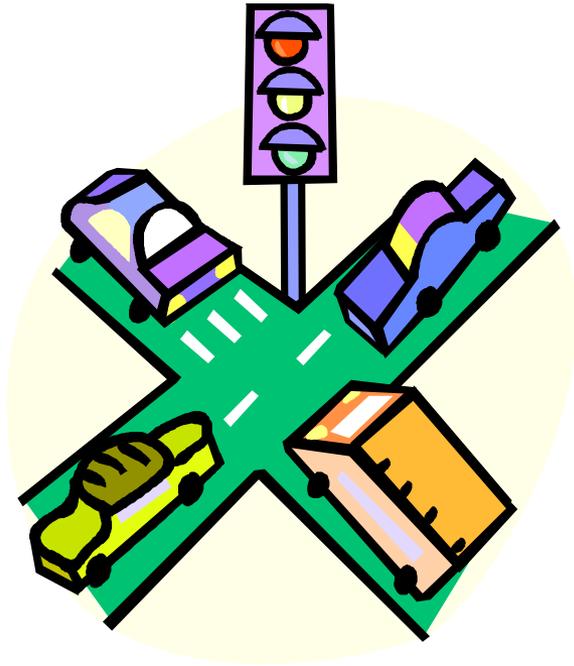


## ....and some empirical evidence



Once adjusting for annual driving distance, as a group, older drivers are as safe or safer than other age groups (Langford, Methorst & Haakamies-Blomqvist, 2006)

# Likely explanation for the mileage bias



Probably multiple factors –

- Type of road network used
  - short trips on urban roads with more conflict points & about 2 times higher crash risk (Janke1991; Hakamies-Blomqvist et al 2002)
- Reduced fitness-to-drive/walk
  - Those who reduce driving/walking are likely to also be those what have difficulty driving/walking

# It's not all older road users who are at risk

- For most: frailty is the major explanation
- For some: the mileage/crash association
  - Location of driving and walking (urban roads)
- For a few: reduced fitness to drive/walk
  - Mainly due to functional impairment
  - Possibly due to a medical condition
  - Possibly due to a lack of awareness of changing skills

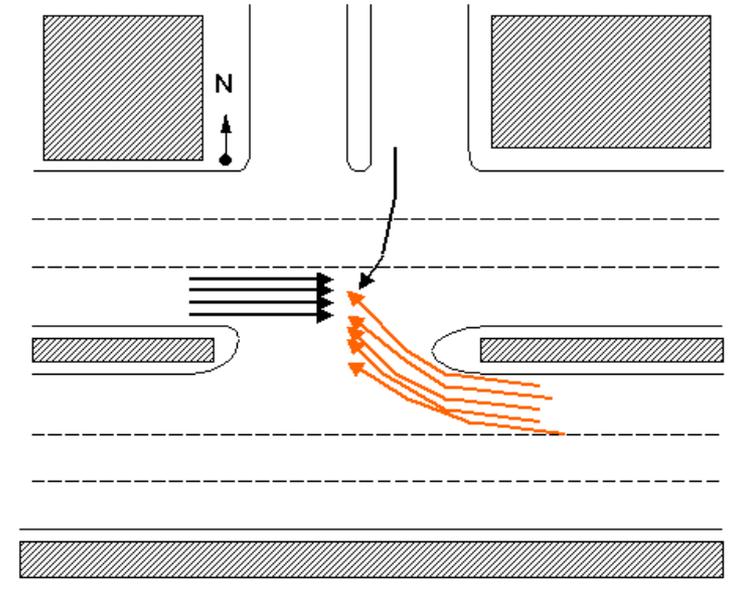
# Older driver/pedestrian crash types

Older Drivers	Older Pedestrians
<p>More likely:</p> <ul style="list-style-type: none"><li>• Multi-vehicle and side impact crashes</li><li>• At intersections (especially at 'stop' and 'give-way' signs)</li><li>• When making right hand turns (without turn phases)</li><li>• Failure to give way</li><li>• Low speed</li><li>• Changing lanes/merging</li></ul>	<p>More likely:</p> <ul style="list-style-type: none"><li>• Oldest old at highest risk</li><li>• Occur close to home and in or near shopping centres</li><li>• Daytime collisions</li><li>• Occur in complex locations (multi-modal arterials, intersections)</li><li>• Difficulty choosing safe gaps in the traffic</li><li>• Non-vehicle injuries (tripping and falling)</li></ul>
<p>Less likely:</p> <ul style="list-style-type: none"><li>• At night</li><li>• Alcohol-related</li><li>• Speed-related</li><li>• Single-vehicle crashes</li></ul>	<p>Less likely:</p> <ul style="list-style-type: none"><li>• At night</li><li>• Alcohol-related</li><li>• Distraction-related</li></ul>

# Suitability of road design for older drivers

- Review of FHWA Older Driver Road Design Handbook
  - Over 90 recommendations
  - Applicability to Australian roads?
  - Workshop – 50 modified recommendations
- Older driver black-spot crash site investigations
  - To identify the role of road design characteristics in Australasian older driver crashes
  - 62 sites in 4 jurisdictions selected
  - Over 400 individual crashes
  - Examined police crash report and crash diagrams for all crashes
  - Sites visit by multi-disciplinary team
  - Assessed the involvement of each recommendation

# Some examples: drivers



# Probable contributing factors

Crashes occurred predominantly at intersections controlled by signals or stop/give-way signs

***Gap selection (76% sites)***

Complexity (50% sites)

High speeds (40%)

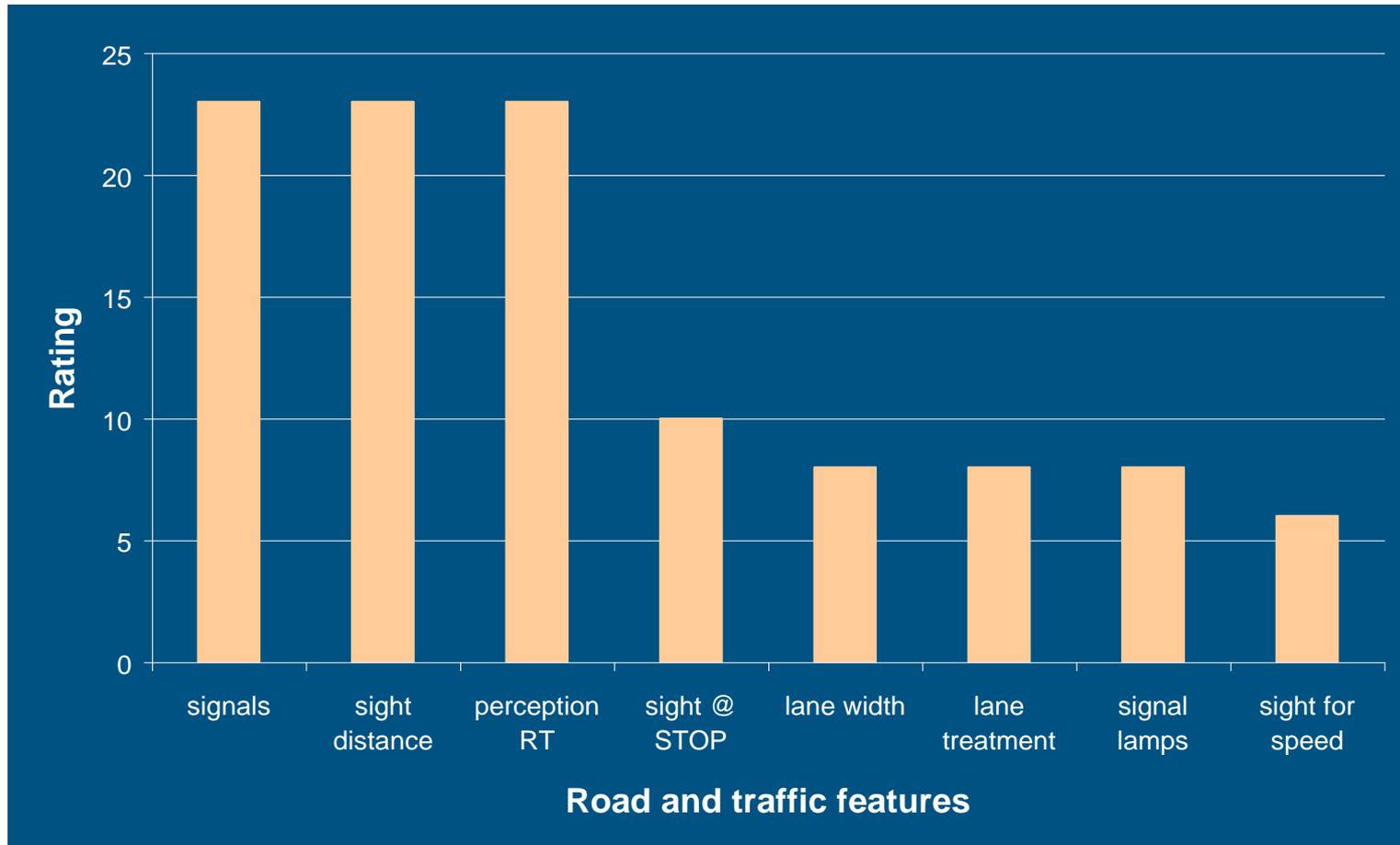
High traffic volumes (40%)

Restricted sight distance (34%)

Inadequate definition (8%)

Inappropriate pavement markings (8%)

# Top ranked road design features associated with crashes



# Some examples: Pedestrians



Thank you!!

Questions?

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