VISION ZERO & THE SAFE SYSTEM APPROACH IN ROAD SAFETY

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How Canada/BC compares internationally

• Our road crash fatality rate is double that of the world’s best performers

• We are no longer making any progress for pedestrians and cyclists
The current situation

- A system failure
- A major public health problem
FAST FIXES ON THE PATH TO ZERO TRAFFIC FATALITIES

Steps to reduce injuries where cars and people meet

1. Automated enforcement through speed cameras placed at red lights
2. Reduce speed in residential areas to 30km/h
3. At other corners provide six-second advance walk signals to make people more visible. Pedestrian traffic islands reduce the number of lanes a person must cross at any one time.
4. Use the pedestrian scramble at busy corners: signals stop all traffic or all pedestrians. Cars and people never move at the same time.
5. A mere 10 cm of space between the hood edge and the rock-hard engine block can absorb the energy of a collision and save lives
6. Bright lime-yellow markings, including bike lanes, catch drivers’ attention better than black and white
7. Redesign car hoods so that a struck pedestrian falls onto the car rather than the road.
8. Other low-cost measures include channelized traffic flow, better lane markings, rumble strips and anti-skid surfacing on roads
“In every situation a person might fail, the road system should not.”
Why the Safe System Approach? Because countless human factors impact accident rates

Inexperience
Underdeveloped orbitofrontal cortex
Presence of peer passengers
Carelessness
High predisposition for risk
Disregard for others
Pressure to maintain schedules
Cardiovascular conditions
Pulmonary conditions
Diabetes
Hypertension
Psychiatric conditions
Seizures
Visual acuity issues
Compromised visual fields
Visual blind spots
Contrast sensitivity issues
Dementias
Musculoskeletal conditions
Weak Motor skills

Muscle strength & flexibility limitations
Decision errors
Confusion
Turning and pulling-out errors
Left-turn corner cutting
Poor judgement
Overconfidence
Failure to scan the road ahead
Feeling rushed
States of agitation
Following too closely
Sense of entitlement to the roadway
Alcohol
Drugs
Distraction
Fatigue
Not using seat belt
Not wearing helmet
Mechanically unsafe vehicles
Speeding
Current Situation

- Too few levels of protection
- Safety overly dependent on human behaviours

Concept adapted from James Reason and Fred Wegman
The Safe System Approach

• Builds in more levels of protection

• Safety becomes less dependent on human behaviours

Concept adapted from James Reason and Fred Wegman
The four pillars

- Drivers
- Roads
- Vehicles
- The right speed
Example Measures for Cities & Communities…
I’m seven times more likely to die if you hit me at 30mph.

You could save a life.
It’s slower for a reason.

Photo: Lancashire County Council
www.lancashire.gov.uk/20mph
Maximum
40
km/h

Please lower your speed for pedestrians and cyclists

New
Eliminate right-turn slip lanes

Photos: Neil Arason
Leading pedestrian intervals

Photo: www.pedbikeimages.org/ Toole Design Group
Example Measures for Rural Areas...
Speed and crash risk

• A review of the research involving 98 high quality studies containing 460 estimates of the effect on crashes from speed, concluded there is a strong statistical relationship between speed and road safety. When the average mean speed of traffic is reduced, the number of accidents and the severity of injuries will almost always go down (Elvik et al., 2004).
## Set safe speed limits

<table>
<thead>
<tr>
<th>Impact Potential</th>
<th>Safe Maximum Speed</th>
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<tbody>
<tr>
<td>Potential for impact with a pedestrian or cyclist</td>
<td>&lt; 30 km/h</td>
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<tr>
<td>Potential for side-impact collision with another vehicle</td>
<td>50 km/h</td>
</tr>
<tr>
<td>Potential for frontal impacts with another vehicle</td>
<td>70 km/h</td>
</tr>
<tr>
<td>No potential for any of the above collision types</td>
<td>~100 km/h</td>
</tr>
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Adapted from C. Tingvall & N. Haworth (1999), *Vision zero—An ethical approach to safety and mobility.*
Enforce those limits

• Automated speed enforcement is widely deployed in world’s best performing road safety countries (TRB, 2010).

• Study after study reveals their effectiveness (Pilkington & Kinra, 2005; Elvik, 2004; Pérez et al., 2007).
Summing-up
<table>
<thead>
<tr>
<th>Old style thinking</th>
<th>Safe system thinking</th>
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<tbody>
<tr>
<td>The responsibility to prevent crashes, injuries and deaths rests with individuals</td>
<td>The responsibility to prevent crashes, injuries and deaths rests with system designers</td>
</tr>
<tr>
<td>Focuses on what causes accidents</td>
<td>Focuses on what causes safety</td>
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<td>Allows individual errors to kill and harm</td>
<td>It is unethical to allow this</td>
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<td>80 percent of the problem is people and driver error</td>
<td>Most of the solutions involve roads, vehicles and speed management</td>
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<td>Studies the effects of single road safety interventions one at a time</td>
<td>Understands safe systems theory and that road safety interventions work best together or in “bundles”</td>
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<td>Can only justify making improvements based on a “cost-benefit” analysis</td>
<td>Understands the default is to make the road system safe</td>
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<td>Only works on problems that appear big, i.e., problems with large numbers</td>
<td>Addresses all road safety problems even where numbers may appear small</td>
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<td>Waits for crashes and coroner reports to identify problems</td>
<td>Proactively takes action using past data, crash testing, simulations, physics, etc.</td>
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Source: Arason, No Accident: Eliminating Injury and Death on Canadian Roads