# EVIDENCE – VEHICLE SPEED

<table>
<thead>
<tr>
<th>Impact velocity, km/h</th>
<th>Estimated risk for different road users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Injury, belted car drivers</td>
</tr>
<tr>
<td>30</td>
<td>0.04</td>
</tr>
<tr>
<td>50</td>
<td>0.10</td>
</tr>
<tr>
<td>80</td>
<td>0.42</td>
</tr>
<tr>
<td>100</td>
<td>0.80</td>
</tr>
<tr>
<td>120</td>
<td>1.00</td>
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</tbody>
</table>
Probability of pedestrian fatality by impact speed

Speed limits
Residential and business areas: 30 km/h
Urban arteries: 40-50 km/h
Relationship of speed with braking distance for a typical car with braking distance

![Graph showing the relationship between speed and braking distance. The graph has two axes: Distance in meters on the x-axis and Speed in km/h on the y-axis. There are multiple curves indicating different speeds, with the highest speed marked as 77 km/h and the braking distance for this speed being approximately 70 meters. The graph also includes a smiley face indicating a positive outcome.]
Field of Vision at 30 km/h

5% death  65% injured  30% uninjured
Field of Vision at 50 km/h

45% death  50% injured  5% uninjured
Field of Vision at 65 km/h

85% death

15% injured
Dependence between proportional speed and fatality changes

Proportion change in fatalities as function of proportion speed change

\[ P_f = \frac{P_{f|a,c} \times P_{a|c} \times P_c}{P_{f|a,c}} \]

\[ P_{f|a,c} = f \left( \frac{1}{2} m \cdot v^2 \right) \]

\[ P_{a|c} = f [v] \text{ (braking distance)} \]

\[ P_c = f [v_{\text{dev}}] \text{ (overtaking, rear end)} \]

\[ E = mv^2 \]

\[ D = \frac{V^2}{2a} \]

\[ P_f = \left[ 1 + P_v \right]^4 - 1 \]

1% increase in average speed can increase fatalities by 3-4%

Netherlands policies regarding speed

<table>
<thead>
<tr>
<th>Safe speed (km/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads with possible conflicts between cars and unprotected road users</td>
</tr>
<tr>
<td>Intersections with possible lateral conflicts between cars</td>
</tr>
<tr>
<td>Roads with possible head-on conflicts between cars</td>
</tr>
<tr>
<td>Roads where head-on and side conflicts with other road users are impossible</td>
</tr>
</tbody>
</table>
Policies regarding speed

on trunk roads:
- on road sections: 80 km/h;
- at dangerous locations: 70 km/h;

on motorways:
- on road sections: 100, 80 km/h;

on other rural roads:
- on road sections: 60, 30 km/h;
- at traffic lights: 70 km/h;
- at dangerous locations: 60, 50 km/h.
Policies regarding speed

- Besides infrastructural measures, police surveillance an important instrument for reducing the number of speed limit offenders.
- As long as the speeding problem has not been infrastructurally solved, police surveillance remains necessary.
- Surveillance is often regarded as a reactive/repressive measure, but it is of course primarily meant to prevent dangerous behaviour and thus also to prevent speeding.
- Large scale surveillance is an excellent method for short term success.
- If we want to achieve long lasting effects we need long lasting surveillance activities.
Design changes very effective
Legislation effective when violation easy to detect
Stricter punishment not as effective as perception of being caught
Severe punishment and laws reduce enforcement by police officials and conviction rates in courts
Community action can help in coordination and implementation of all effective countermeasures
Traffic Calming Goals

- Increase quality of life
- Incorporate preferences of people using the area along the street
- Create safe and attractive streets
- Reduce negative effects of motor vehicles
- Promote pedestrian, cycle and transit use
Traffic Calming Objectives

- Slow speeds
- Reduce frequency and severity of collisions
- Increase safety for non-motorized users of the street
- Reduce need for police enforcement
- Enhance street environment
- Increase access for all modes
- Reduce cut-through motor vehicle travel
Traffic Calming Toolbox

- Speed Humps
- Raised Intersections
- Raised/Textured Crosswalks
- Median Barriers
- Neckdowns
- Chicanes
- Closures
- Semi & Diagonal Diverters
- Corner Radii

- Parking
- Roundabouts
- Traffic Circles
- Edge Treatment
- Streetscaping
- Transition Zones
- Land Treatments
- Enforcement
Planning and designing for NMT increases road safety

widths of cycle tracks and lanes
Pedestrian crossings raised 10 cm above road level

“speed humps were associated with a 53% to 60% reduction in the odds of injury or death among children struck by an automobile in their neighborhood”

American Journal of Public Health, April 2004
Safe Pedestrian Crossings

‘S’ TYPE HUMP

SPEED CUSHIONS
Pedestrian refuge

ROUNDABOUT
Planning and designing for NMT increases road safety