Making Road Infrastructure Safe for Pedestrians: A Framework Based on Systematic Safety Principles

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If we’d improved our road safety as Netherlands did, we’d be saving 20,000 lives per year.
Traffic Safety Programs

- Netherlands: Sustainable Safety (1997)

*Based on a systematic approach to road safety*

- US Cities: Vision Zero
Some Distinguishing Values of Europe’s Vision Zero

Value # 1: **Safe Mobility is a Civil Right**

Meanwhile, the nearest crossing is 0.3 miles away!
Value # 2: The road system owner is responsible for ensuring road safety

*If our road system were treated like any other industry, it would be shut down immediately for gross safety violations*

2011: Mother found guilty of *vehicular homicide* for crossing this street with her son.

1788 Austell Road, Marietta, Georgia (Google Maps)
Update December 22, 2016: Highest Court in NY State finds NY City liable for failing to curb speeding!

Gerritson Ave, Brooklyn, NY, with a road diet applied after a 12-yr old boy was seriously injured by a speeding car. City was held partly liable ($5M).
Value # 3: Traffic safety programs must be proactive, eliminating safety risks before they cause serious injury or death.

Reacting to historic crashes: necessary, but not sufficient

Data collection and analysis: valuable, but no excuse to delay action

A Tremont Street intersection treated after a pedestrian was injured. What about the other intersections just like it?
Value #4: For Vulnerable Road Users, Traffic Casualties Aren’t the Only Measure of Unsafety

Perceived safety matters, too

- Do people feel it’s safe for children to walk to school?
- Will parents let their kids play on the sidewalk?
- Do people feel it’s safe to ride a bike?
Why Do Traffic Injuries Happen?

1. Humans are vulnerable

- Puts a clear 20 mph (30 km/h) target on streets where people “cross anywhere”
- 30 km/h (20 mph) zones
2. Humans make mistakes

<table>
<thead>
<tr>
<th>Why we err</th>
<th>Responding Design Principle</th>
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<tbody>
<tr>
<td>Deliberate (speeding, parking in a crosswalk)</td>
<td>Physical restrictions</td>
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<tr>
<td>Due to complexity and limited perception</td>
<td>Simplify perception / simplify decisions</td>
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<tr>
<td>Whatever the reason ...</td>
<td>Forgivingness</td>
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</tbody>
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- Implications for unsignalized crossings of busy roads ...
Crossing Islands!

Policy in Netherlands, Germany, ... on unsignalized crossings

– Pedestrians should never have to cross more than 2 through lanes at a time

– (Desirable:) only 1 marked lane at a time (Delft)
Other Implications for Unsignalized Crossings

2. 25 mph (40 km/h) target maximum on driving speed
   Driver compliance is reasonable only at speeds of 25 mph or less (Dulaski & Bertulis, TRR, 2014)

3. Avoid multilane roads (road diets) wherever possible
   - Controlling speed
   - Multiple threat
A design paradigm for minor arterials

1+1 lanes

Crossing islands with a chicane effect

While speed limit on this street in Delft is 50 km/h, average speed is 37 and 85-percentile speed is 43 km/h
Application in Delft

• 85-percentile speed reduced from 35 mph to 26 mph
  – Legal speed limit unchanged at 31 mph (50 km/h)
• 2 traffic signals eliminated because crossings were made so safe
  – Less delay for peds and for cars
How it might be applied on Boston’s Dudley Street

- Slow
- Simple
- Forgiving → Systematically safe