ERASER
Evaluations to Realise a common Approach to Self-explaining European Roads

13th January 2012
Stockholm
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• Dissemination (WP5)
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“Traffic systems having self-explaining properties are designed in such a way that they are in line with the expectations of the road users. The [...] "Self-Explaining Road" (SER) is a traffic environment which elicits safe behaviour simply by its design.”

- Expectations on speed (safe, limit), lay-out, other road user types and behaviour
- Necessary, helpful, but not ‘self-enforcing’
- Categorisation, e.g. flow, distributor, access
- Homogeneity within, heterogeneity between categories
- Few countries have actually applied a SER approach (Denmark, Germany, Netherlands)
What makes a road self-explaining?

• Relevant features tested:
  – Road and lane width
  – Openness of the road environment
  – Number of lanes
  – Median treatment (separation)

• Test in:
  – Austria (48), Germany (49), Netherlands (101), England (49), Ireland (28), Sweden (32)
  – 24 pictures of rural roads, different widths per country
**Matrix of stimuli; analysis plan**

<table>
<thead>
<tr>
<th>Separation</th>
<th>Width</th>
<th>Environment</th>
<th>2+2</th>
<th>2+1</th>
<th>1+2</th>
<th>1+1</th>
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<tbody>
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</table>

“Purple” analysis design, focusing on 2+x roads versus 1+2 roads

“Blue” analysis design, focusing on 1+2 roads versus 1+1 roads. (Separation = Double White Line).

“Green” analysis design, focusing on 1+1 roads
Please have a look at the picture below:

1. If there was no speed limit, how fast would you drive on the road section shown? Please feel free to enter your speed as an unrounded number (e.g. “62” or “44”).

   Speed: [ ] mph

2. What speed limit do you think would be safe here?

   [Please choose]
   - 20
   - 30
   - 40
   - 60
   - 70
   - no speed limit

   Next
Narrow condition
Open/2+x

Wide condition
Open/2+x
Results: Environment & road width (1+1)

Driving speed (km/h)

Environment

Open

Closed

Wide

Narrow

94,540

91,270

85,736

83,755

Environment & road width (1+1)

Final conference Stockholm

13th January 2012
Results: separation & country (1+1)

Driving Speed (km/h)

- Austria
- Germany
- the Netherlands
- Great Britain
- Ireland
- Sweden

Separation

Double white line

Intermittent middle marking

Final conference
Stockholm
13th January 2012
Results: lanes & country
Video analysis in Sweden

- Camera’s on 2 intersections
- Effect of limit change (100 => 80)
- Comparison between stated speeds and actual speeds
Effect 100 - 80

Final conference
Stockholm
13th January 2012
Conclusions on relevant features

- Wider roads, higher speeds (moderate effect)
- Open environment, higher speeds (large effect)
- Nr. lanes & separation, different per country
- Nice overlap between stated and actual speeds on 2 roads
- Just lowering the limit gives a moderate speed decrease
- Results feed into WP3/4 tool
Safe speeds and credible limits

- Tool for road authorities (demonstrated this afternoon)
- Is the limit safe and credible?
- If not, how can it be improved?
- Are the suggested measures cost-effective
- Usability tested at CEDR meeting Bonn 6th October 2011
Both 50 km/h. Both safe? Both credible?
100km/h or 120km/h? Which one?
### Types of infrastructure and traffic

<table>
<thead>
<tr>
<th>Types of infrastructure and traffic</th>
<th>Maximum safe travel speed (km/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locations with possible conflicts between cars and pedestrians</td>
<td>30 (20 mph)</td>
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<tr>
<td>Intersections with possible side collisions between cars</td>
<td>50 (30 mph)</td>
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<tr>
<td>Roads with possible frontal collisions between cars</td>
<td>70 (40 mph)</td>
</tr>
<tr>
<td>Roads with no possibility of side or frontal collisions (only collision with structures)</td>
<td>&gt;100 (&gt; 60 mph)</td>
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Credibility features

- **Decelerators:**
  - Dense road environment
  - Narrow roads
  - Short road stretches
  - Physical speed reducers
  - Low quality road surface

- **Accelerators:**
  - Open road environment
  - Wide road
  - Straight road stretches
  - High quality road surface
Summary of ERASER tool

Assessment:

- Safe speed
- Credible speed limit

Options:
- Adapt speed limit
- Adapt road design & environment (list of features)
- Effects and costs/km

Priority

List of:
- Accelerators
- Neutral elements
- Decelerators
- Reference to ERA-NET SPACE-project

Additional general comment:
- Look at driving speeds, enforcement and communication
Example 1: A595 in Cumbria
Results
The speed limit of your road= 60 km/h (40 mph)
The calculated safe speed limit=40 km/h (25 mph)
The speed limit is credible

Evaluation details
The speed limit is higher than the current safe system standards allow for.
You might decrease the speed limit to 40 km/h (25 mph).
Effectiveness: 5-10%
Cost indication: low

Alternatively, you might adapt the failing design elements of the road, which are:

- Access restriction recommended for vulnerable road users.
  Effectiveness: 0-25%
  Cost indication: medium-high

- Obstacle free zone should be > 2.5m or safety barrier.
  Effectiveness: 20-75%
  Cost indication/km: low-medium

- Shoulders should be present and well paved, or be unpaved for more than 1m.
  Effectiveness:
  Cost indication/km:

- Level junctions should have speed reducing measures (e.g. plateaus).
  Effectiveness: 30-70%
  Cost indication/km: low-high
Credibility

Decelerators

- The road is smaller than 4.5m

Credible road features

- No access restrictions
- No separation of driving directions
- Dense or semi-open road environment
- Straight stretch of road is shorter than 180m

Accelerators

- No physical speed reducers at (all) junctions

When available, speed data can be a useful additional source of information. Be aware that speed is influenced by more factors than road design alone. More information about measures that can be taken, can be found in this document of the SPACE-project.

Urgency

The urgency of taking action on your road is: moderate
Usability and functionality check

- CEDR, Bonn: 18 participants, 16 countries
- Introduction and presentation of ERASER and tool
- Questionnaire: 8 responses
- Agreement on usefulness of this type of tool
- Content with basis and style of the tool
- Suggestions differ, some want more detail, others less
Advanced versions of tool...

- Example of tool in NL:
  - GIS-based tool
  - Database of road network
  - Attractive user-interface
Dissemination

• Website:  www.kfv.at/eraser
• Leaflet
• 4 factsheets
• List of relevant congresses and journals
• Presentations and articles to follow
• So far:
  – CEDR Bonn Oct 2011
  – Central and Eastern European countrioes (CEE) Budapest Oct 2011
  – Experts meeting Vienna Oct 2011
Added value of ERASER

- Tool that works and is useful!
- General European SER features:
  - Width
  - Environment
- Country specific SER features:
  - Median treatment
  - Number of lanes
Thank you for your attention

www.eranetroad.org

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