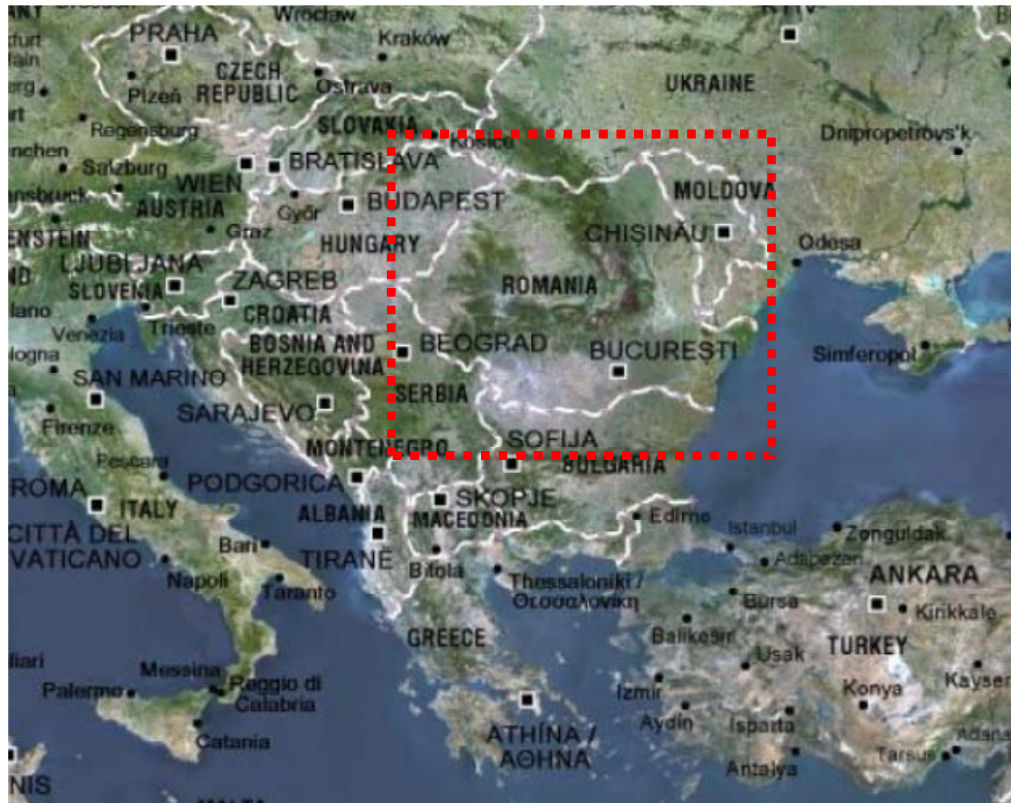




Rijkswaterstaat
*Ministry of Infrastructure and the
Environment*

Cost-benefit analysis
Efficiency of road safety
measures

The Netherlands





Evaluation and assessment of results

1. Cost Effective Road Safety Investments (source CEDR)
2. Cost Effective Road Safety Investments (source Netherlands)
3. Cost Effective Road Safety Investments (source Netherlands)
4. Comparison methods (study Netherlands)

BEFORE:

AFTER:





Evaluation and assessment of results



Conférence Européenne
des Directeurs des Routes
Conference of European
Directors of Roads

Best Practice for Cost-Effective Road Safety Infrastructure Investments





Evaluation and assessment of results

Methodology Flow Chart

- 1. ABOUT COST-EFFECTIVENESS ASSESSMENT OF ROAD SAFETY INVESTMENTS**
- 2. REVIEW OF ROAD SAFETY INVESTMENTS**
- 3. SELECTION OF MOST PROMISING ROAD SAFETY INVESTMENTS**
- 4. IN-DEPTH ANALYSIS OF MOST PROMISING ROAD SAFETY INVESTMENTS**
- 5. PROPOSAL OF BEST PRACTICE**



Evaluation and assessment of results

Content

- Roadside treatments (clear zones, safety barriers)
- Speed limits
- Junctions layout (roundabout, realignment, staggering, channelisation)
- Traffic control at junctions (traffic signs, traffic signals)
- Traffic calming schemes



Evaluation and assessment of results

1.)
2. Cost Effective Road Safety Investments (source Netherlands)
3.)
4.)



Evaluation and assessment of results

2. Cost Effective Road Safety Investments (source Netherlands)


Information						cost effectiveness			
code	Dir	Road nr	Km of	To km	Measure	realisation costs 1st year + contribution others + maintenance	Number serious injuries 2005-2009	Reduction Number serious injuries 2005-2009	Benefit cost ratio 2005-2009
NN3-1	NN	33	58,8	59,4	Matrix signs + crash cushion	€ 255.850	0,4	0,1	2,7
NN3-2	NN	33	51,9	52,5	Matrix signs + crash cushion	€ 190.400	0,8	0,3	7,8
NN3-3	NN	7	153,8	153,9	Guardrail	€ 41.650	0,2	0,1	11,0
NN3-4	NN	7	155,6	155,0	Guardrail	€ 89.250	0,2	0,1	5,1
NN2-5	NN	7	229,3	229,9	Construction roundabout (2x)	€ 1.000.000	0,4	0,3	1,9
ON3-1	ON	15(N18)	227,1	227,7	Construction intersection	€ 339.150	0,2	0,1	1,7
ON3-2	ON	15(N18)	224,8	225,4	Construction intersection	€ 279.650	0,2	0,1	2,0
ON3-3	ON	15(N18)	221,1	221,7	Traffic lights reconstrction intersection	€ 458.150	0,4	0,2	2,0
ON3-4	ON	15(N18)	217,7	218,3	Traffic lights reconstrction intersection	€ 458.150	0,6	0,4	3,0
ON3-5	ON	36	25,4	26,0	Realisation Traffic lights	€ 600.950	1,6	0,8	5,0
ON3-6	ON	36	8,7	9,0	Improving guidance	€ 101.150	0,6	0,1	6,8
UT3-2	UT	27	97,0	99,0	Reflectors on guardrail	€ 130.900	0,8	0,2	7,0
NH2-1	NH	9	78,7	79,2	Extra left-turning lane	€ 386.750	1,2	0,5	7,4
ZH3-1	ZH	44	11,5	12,5	File warning system	€ 208.250	0,4	0,3	4,3



Evaluation and assessment of results

1.)
2.)
3. Cost Effective Road Safety Investments (source Netherlands)
4.)

Evaluation and assessment of results

Measure	Average number serious injuries before reconstruction measure per year	Average number serious injuries after reconstruction measure per year	Average number of fatalities before reconstruction measure per year	Average number of fatalities after reconstruction measure per year
 Apply EHK delineation	7	10,67	1,33	1,17
Apply green median Through road	0,50	1,33	0,50	0
Apply centre line marking (reg Through road)	0	0	0	0
Apply centre line marking EHK (Access road)	0	0	0	0
Apply edge line EHK (Distributor urban)	3	0	1	0
Apply edge line EHK (Distributor rural)	1,67	1	0,33	0
Apply centre line marking	0,33	1,67	0,33	0
GOW, Verwijderen doorgetrokken asstreep indien aanwezig en doorgestrokken kantstreep Aanbrengen onderbroken kantstreep en dubbel asstreep indien geen middenberm aanwezig	0	0	0	0
Distributor Apply continious edge line	5,67	1	0,67	0
Distributor Apply broken edge line and double continious centre line	5,33	3	1	0,33
Apply broken edge line and double continious centre line	10,17	3,67	1,50	0
(blank)	0	1	0	0
Totaal	33,67	23,33	6,67	1,50





Evaluation and assessment of results

1.)
2.)
3.)
4. Comparison methods (study Netherlands)



Overview

Main differences between:

- Cost-benefit analysis,
- cost-effectiveness
- "limited cost-benefit analysis"

Aspect	CBA	CEA	'limited CBA'
Goal	Determining welfare effects of investments for investment decision	Determining welfare effects of investments for measure selection	Determine costs and benefits ratio
Kind of effects	Multiple quantitative and qualitative effects	Single indicator	Single indicator
Method	Monetizing costs and multiple effects	Costs relating to effect	Monetizing costs and singular effect
Evaluation perspective	Ex ante	Ex post	Ex ante
Source	As many site specific, both costs and effects	Statistical aggregate perceptions of costs and effects of similar measures	As many site specific, both costs and effects
Calculation method	Summon, income less expenses	Quotient, unit cost effect	Summon, income less expenses
Checkpoint	0	Reference value, generally accepted standard for effective measure	Reference value, to be determined (not necessarily a positive balance)
Assessment	Favourable score with positive balance	Favourable score if lower than reference value	Favourable score if higher than reference value