

# Reducing accidents by improving roads

## - Demonstration on TARVA evaluation tool

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# How to use safety evaluation tools?

- **To find the dangerous locations:**
  - that need road improvements most urgently
  - where road users should be warned
- **To help in selecting the most appropriate safety measures**
- **To evaluate the safety effects of roads improvements (or building up new roads)**
- **To make cost-benefit analyses of road improvements**
- **To enhance transfer of traffic safety knowledge between countries**

# Estimating safety effects of road improvements

**Accidents after a measure=  
CMF(s) \* Accidents if no measures are implemented**

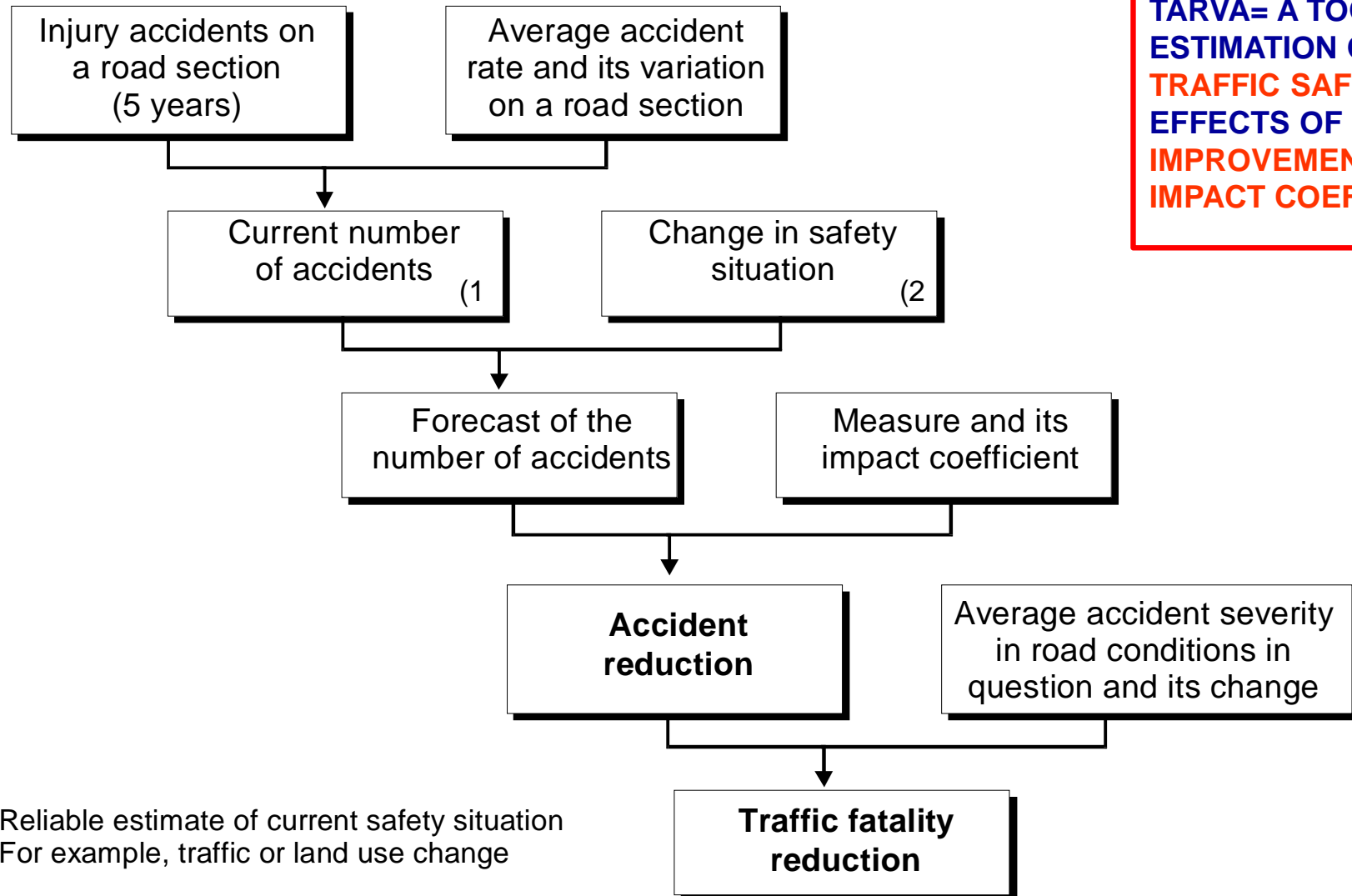
**“CMF” = Crash Modification Function (e.g. 0,9 = 10% reduction).  
Internationally good estimates available.**

**“Accidents if no measures are implemented” = a prediction that  
needs to be done nationally.**

**Accident history alone is very bad prediction of the accidents if  
no measures are implemented.**

**Best practice prediction: combining accident model and  
accident history estimates using Empirical Bayesian method.**

# Evaluation of safety effects of road improvements



## Results from the safety evaluation tool, TARVA

- **Accidents if no measures are implemented: injury accidents, fatalities**
- **Safety situation after the measures**
- **Safety effects of each measure and measures all together**
- **Costs of the road improvements**
- **Effectiveness of each measure and measures all together**

## Different versions of TARVA

- **All Finnish public roads**
  - **about 72 000 km, in Finnish language**
- **Significant Lithuanian roads**
  - **about 21 000 km, in English/Lithuanian languages**
- **All highway-rail level crossings on Finnish state rails**
  - **about 3 000 level crossings, in Finnish/English languages**
- **E18 (in Russia road M10), St. Petersburg–Finnish border and St. Petersburg–Ogonki–Pargalova–Tolokonnikova (A122)**
  - **a demo on about 85 km to be demonstrated now**

## **Building up a short demo, Tarva RU**

- **Review of the available road, traffic and accident data**
- **Building up the database – homogenous road sections**
- **Simple injury accident and fatality (killed people) models, (mileage, road, speed limit)**
- **Accident model and accident history estimates combined using statistical methods**
- **Translation of key phrases**
- **Demonstration/Test use**

# Accident numbers and risks on demo roads

Road	Section length, km	Number of accidents in 2009–2011			
		Injury accidents		Fatalities	
		Vehicle	Ped+Bic <sup>(1)</sup>	Vehicle	Ped+Bic <sup>(1)</sup>
M10	71,9	173	23	68	14
A122	13,0	126	16	33	7
Total	84,8	299	39	101	21

Road	Mileage, million km/year	Accident risk per vehicle mileage <sup>(2)</sup>			
		Injury accidents		Fatalities	
		Vehicle	Ped+Bic <sup>(1)</sup>	Vehicle	Ped+Bic <sup>(1)</sup>
M10	656	8,8	1,2	3,5	0,7
A122	132	31,7	4,0	8,3	1,8
Total	788	12,6	1,6	4,3	0,9

(1) Pedestrian and bicycle accidents

(2) Accidents or killed people/100 million vehicle kilometres



# Rough safety comparison between countries

Country	Accident risk per vehicle mileage <sup>(2)</sup>			
	Injury accidents		Fatalities	
	Vehicle	Ped+Bic <sup>(1)</sup>	Vehicle	Ped+Bic <sup>(1)</sup>
Russia	12,6	1,6	4,3	0,9
Lithuania	8,2	2,7	1,9	0,7
Finland	4,4	0,2	1,0	0,1

(1) Pedestrian and bicycle accidents

(2) Accidents or killed people/100 million vehicle kilometres

## Demonstration on Tarva RU

- Only two road sections, 85 km
- Simple models, accidents in 2009–2011
- Safety measures and their impact coefficients as in Lithuanian Tarva, Tarva LT

A link to the Tarva RU demo:

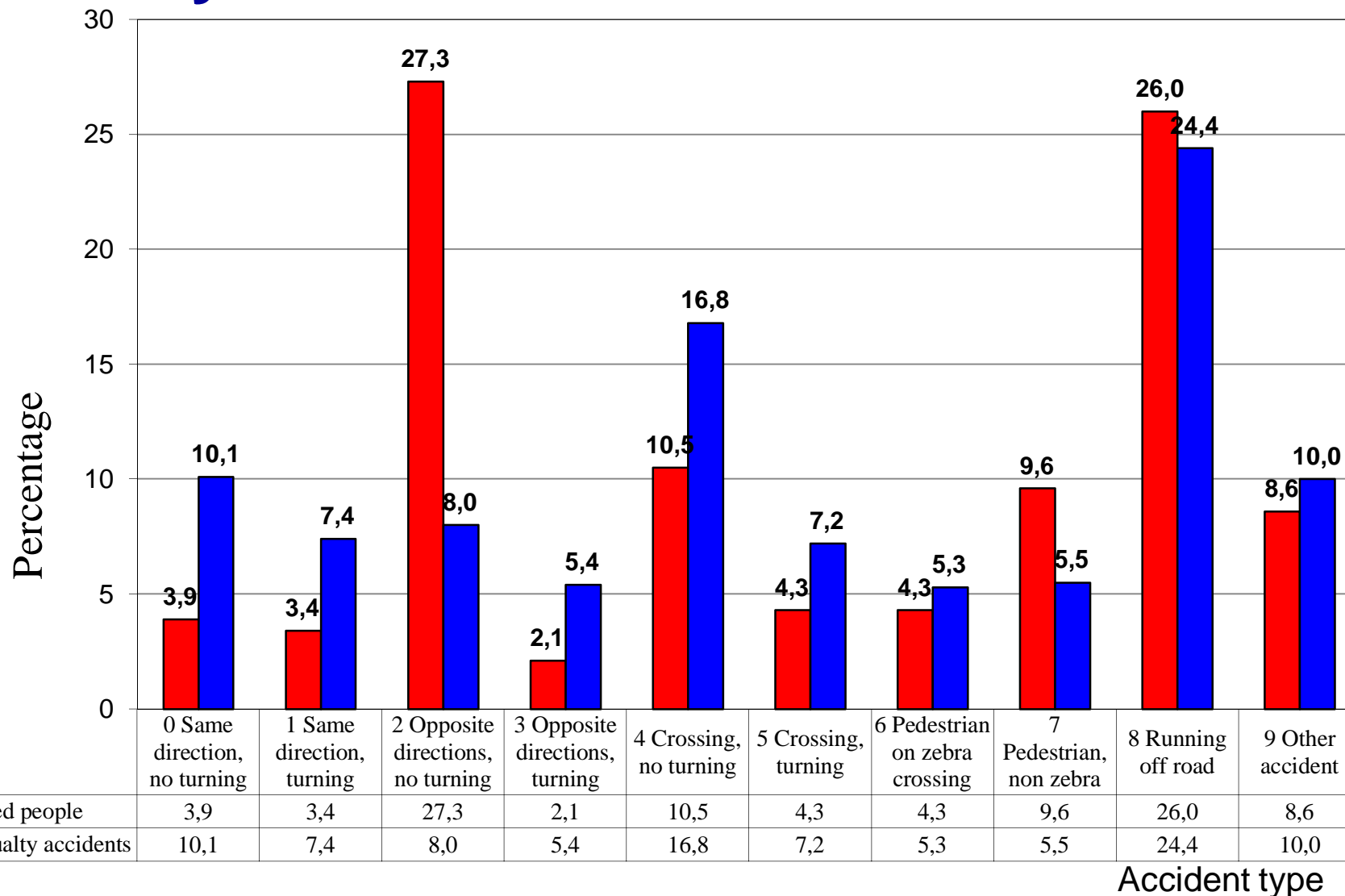
<http://tarvaru.myapp.info/tarvadb/tarva/tarva.html>

- Also an accident database analysis tool ONHA is available

A link to the ONHA (Finnish or Lithuanian data):

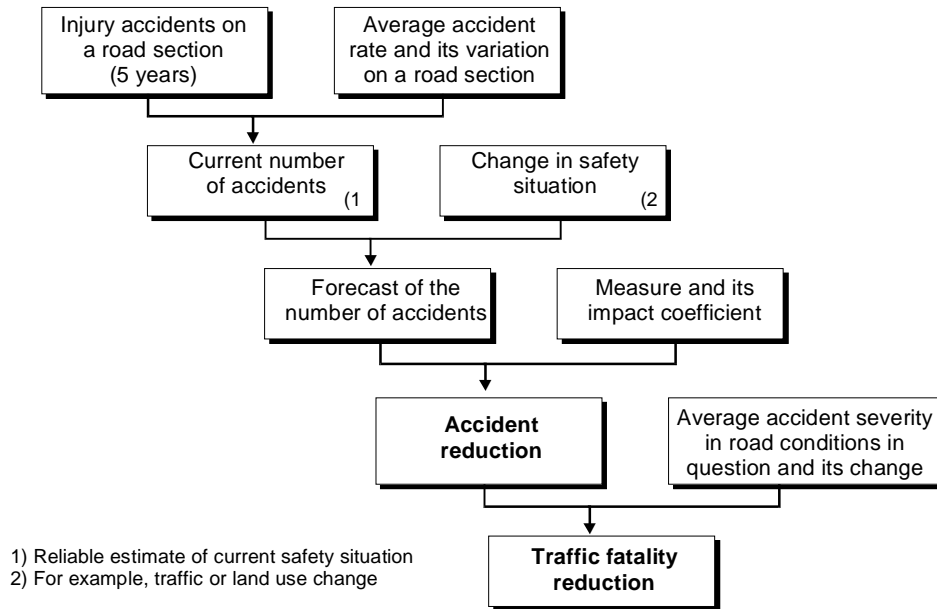
<http://onha.myapp.info/onha2/onha-client/OnhaClient.html>

# An example: Accident type distribution of casualty accidents and fatalities in 1991–2012



# Thank you!

## Questions?



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