

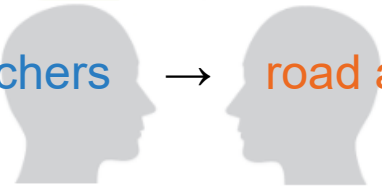


# Are traffic safety decisions based on evidence?

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## Introduction

- Knowledge → decisions (policy, road safety management)
- The best performing countries base their most effective policies on scientific evidence-based knowledge
- Otherwise a risk of not identifying the hazardous locations, treating the critical issues, using effective measures...
- Presented perspective:  researchers → road agencies



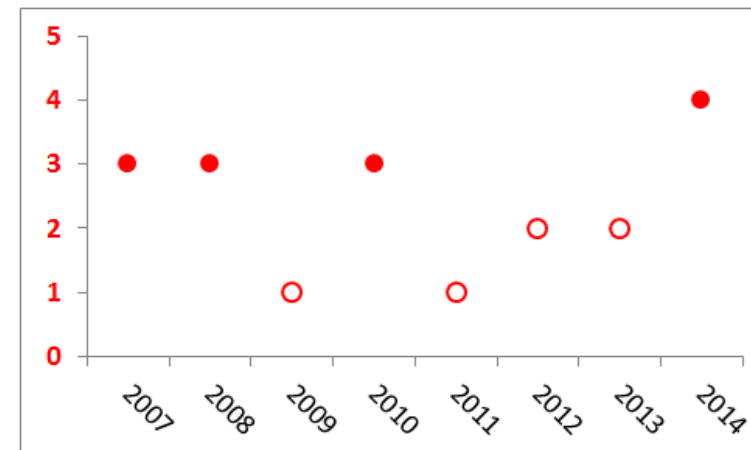
## Examples from the Czech Republic

- Traditional road safety perspective: accident-based
- Limitations: reactive, under-reporting, severity levels...
- Presented use cases:
  1. *Where are the hazardous locations?* (safety screening)
  2. *What are the safety problems?* (descriptive studies)
  3. *Which measure to choose?* (effectiveness studies)



## Use case 1: Safety screening

- Typical black spot approach
- For example: 3 accidents / year = black spot
- But the numbers oscillate around unknown mean
- Long-term mean may be estimated by accident prediction model



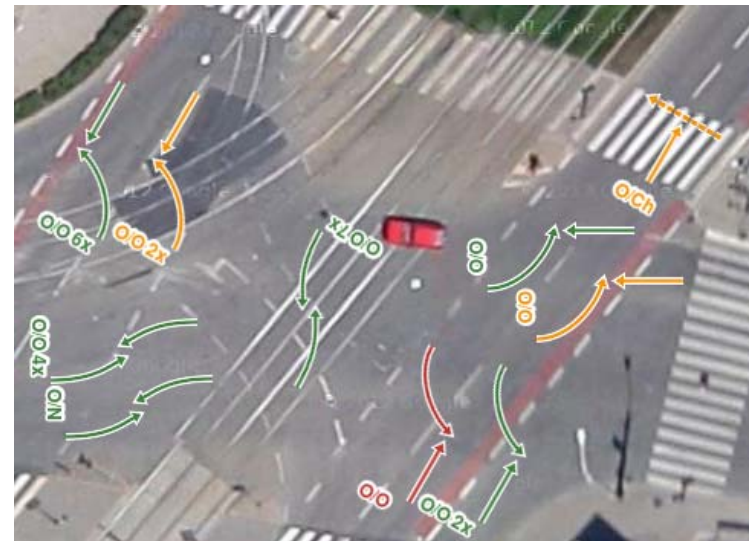
*Application of state-of-the-art approach:*

1. Developing accident prediction models
2. Combining predicted and historic accident frequencies (empirical Bayes approach)
3. Ranking of road segments or intersections



## Use case 2: Descriptive studies

- Selected intersections in Brno
- Identification of issues based on Police-recorded accidents and observed traffic conflicts
- Results of both approaches compared





- Left-turn accidents in > 40% cases
- Conflicts showed similar results



- 1/3 turning accidents, also involving tramways
- Confirmed by conflicts

**6-yr acc. or 4-hr conflicts → comparable numbers and conclusions**



## Use case 3: Effectiveness studies

- Limited accidents → limited experience → decisions ?
- Series of Czech studies in 2000s suggested that traffic signals may not be beneficial for traffic safety
- But: simple before-after studies
- Persaud (1988): controlling for confounding factors!

*TRANSPORTATION RESEARCH RECORD 1185*

### **Do Traffic Signals Affect Safety? Some Methodological Issues**

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### *Application of state-of-the-art approach:*

- ~ 40 signalized intersections in two Czech cities
- Comparison of before/after conditions, controlling for changes of traffic volumes and general trends (separately for 3-leg and 4-leg intersections)
- Result: statistically significant decreases by 17 – 48%
- Comparable to international estimates 15 – 35%



## Conclusions

- Knowledge typically based on accidents only
  - On a network level, accident prediction models increase the quality of safety screening
  - On a site level, traffic conflicts provide better (and quicker) insight
- Effectiveness of potential measures uncertain or unknown
  - Valid before-after estimations should be used



## Are traffic safety decisions based on evidence?

- Traditionally focus on accidents, often not evidence-based
- Alternative solutions shown, adopted by some agencies
- To use knowledge, users need to be informed and...
  - „no action can really be implemented without political will“ (ETSC, 2006)
  - „Commitment from decision makers is decisive!“ (Várhelyi, 2016)





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**Thank you for your attention**

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