

Correlation of Roads Hazardous Areas and Traffic Accident Points

R. Župan, S- Frangeš, A.Vinković, E. Kučić

Outline

- (1) Introduction
- (2) Indicators of **road network development**
 - Croatia compared to EU countries
 - Spatial analysis on county level
- (3) Analysis of **traffic accidents** in Croatia
- (4) Methods for defining **hazardous sites** on roads
- (5) Identification of **high-risk spots** on the A6 motorway
- (6) Conclusion



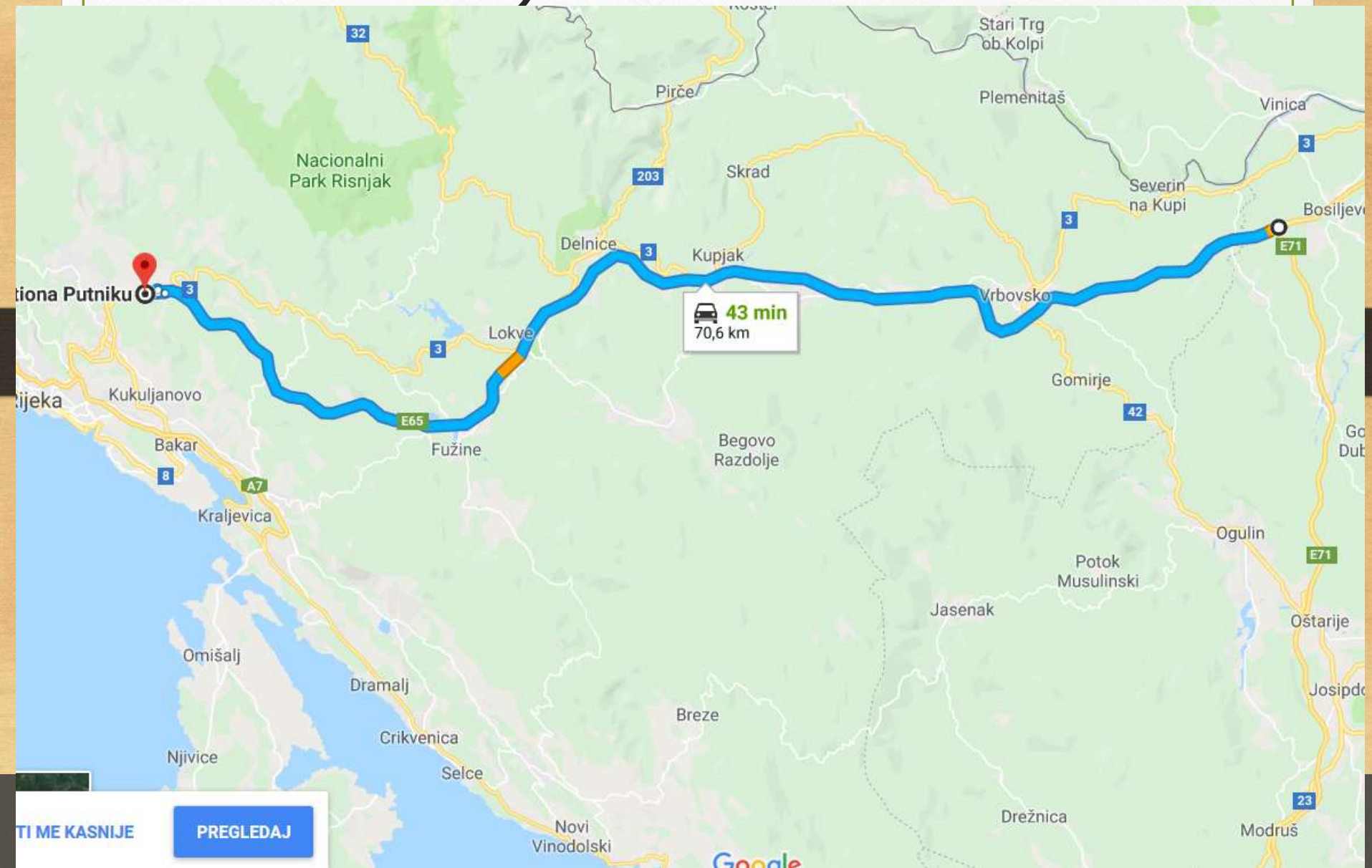
Introduction

- Road traffic is the primary and most developed type of traffic
- Higher motorization → more traffic accidents
- **EuroRAP** (European Road Assessment Programme):
 - producing risk maps
 - for Croatia the A3 motorway was analyzed
- **Research objective:**
 - **spatial distribution** of traffic accidents on the A6 motorway (Bosiljevo 2 - Kikovica)
 - identify **high-risk spots** on this section



Motorway A6 (Bosiljevo II- Kikovica) or E65

Google Maps



Road network development indicators

- Quantitative attributes of road network development:
 - SPATIAL
 - density
 - DEMOGRAPHICAL
 - density

$$Gp = \frac{D \times 100}{P}$$

$$Gd = \frac{D \times 10000}{S}$$

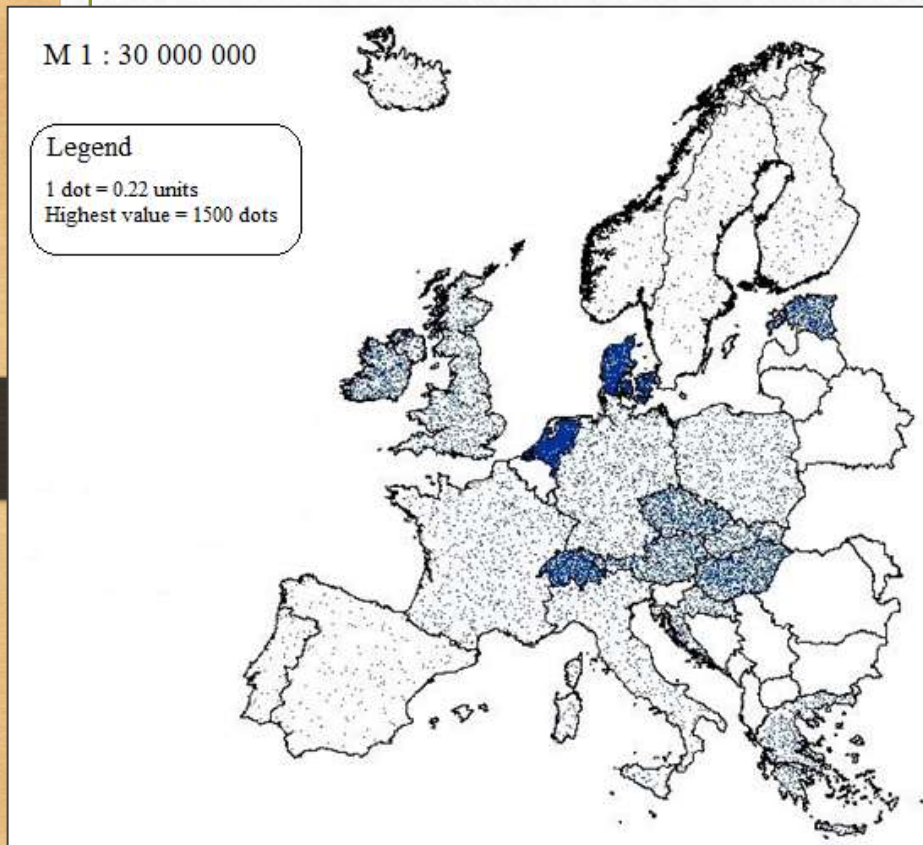
D – road network length in kilometers

P – area in square kilometers

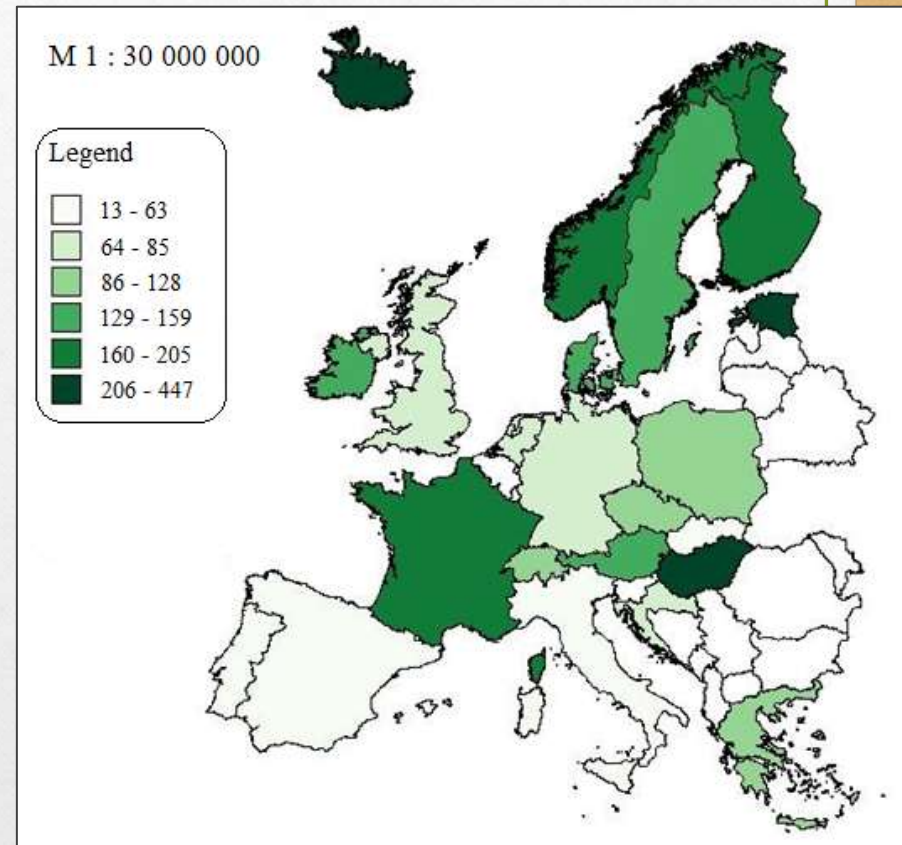
S – number of inhabitants



Croatia compared to other EU countries

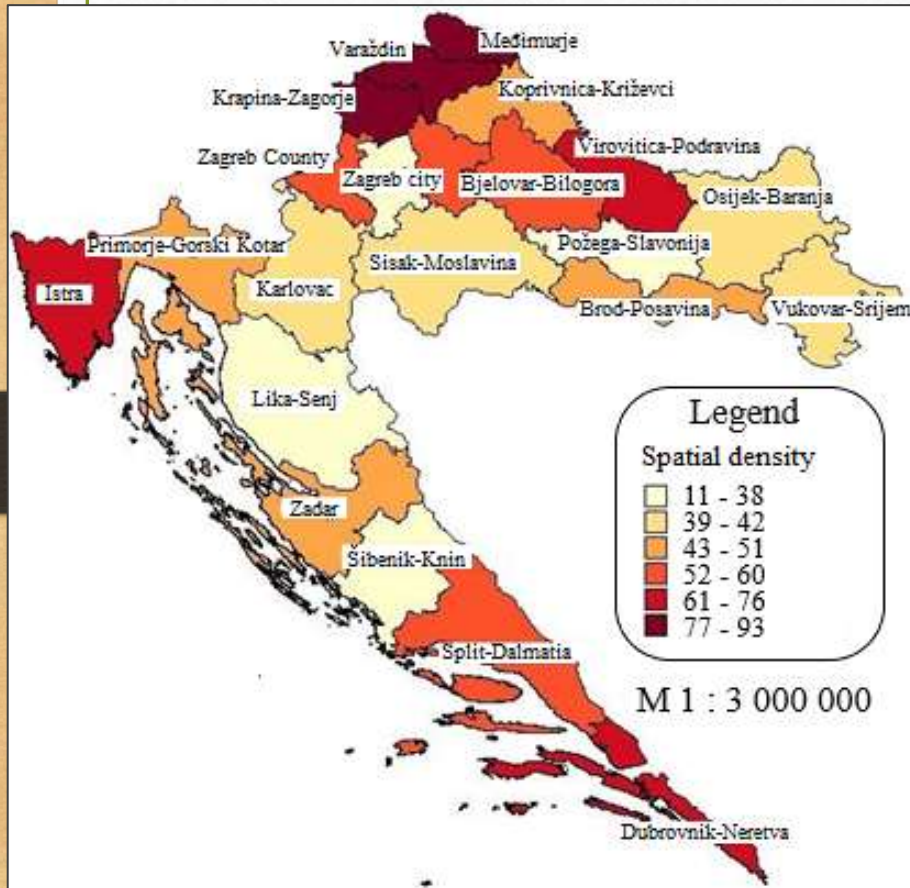


- Spatial density

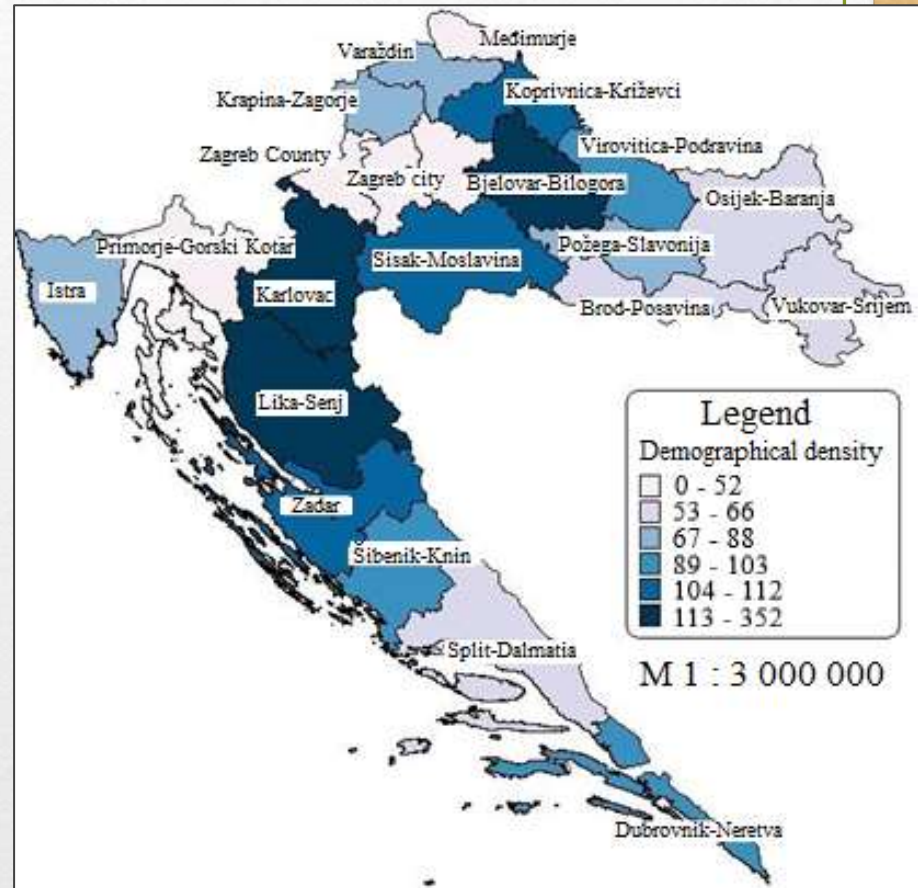


- Demographical density

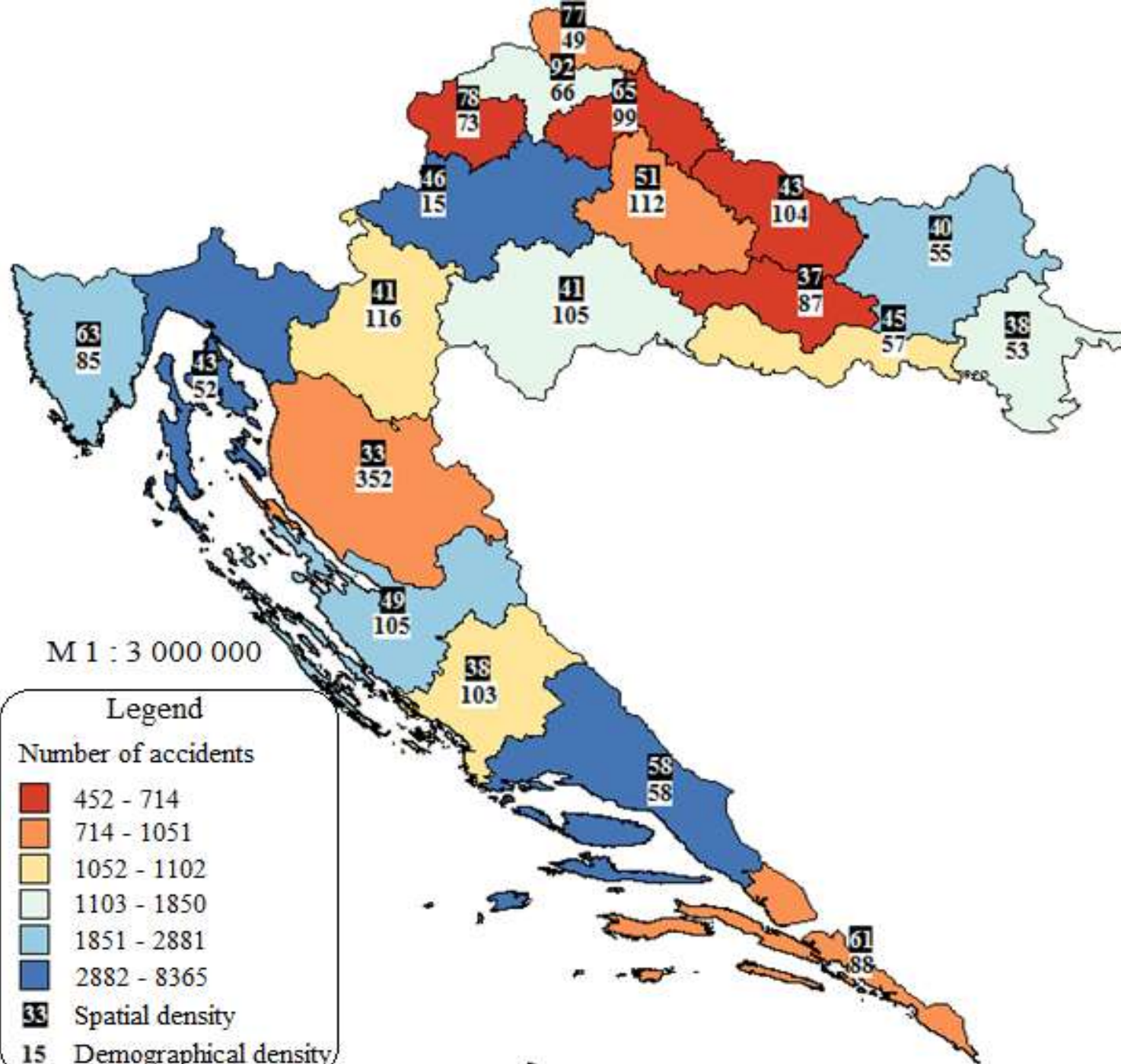
Spatial analysis on county level



Spatial density



• Demographical density



Methods for defining hazardous sites on roads

- (1) numerical, (2) statistical, (3) based on traffic accident prediction
- methodology for identifying a hazardous site in Croatia:
 - 12 or more traffic accidents with injured persons occurred on this location in the past three years
 - 15 or more traffic accidents regardless of the consequences were recorded on this location in the past three years
 - 3 or more equivalent traffic accidents occurred on this location in the past three years with the same group of participants, driving in the same direction and on the same conflict surface



Identification of high-risk spots

- A6 connects Croatian inland with north coast (goes through Gorski Kotar)
- A6 motorway section from **Bosiljevo 2** to **Kikovica** was analyzed
- **71.5 km** length, **7** junctions
- additional data:
 - traffic density
 - technical characteristics and categorization of road sections
 - accident location and consequences
- **Result → 11** identified high-risk spots



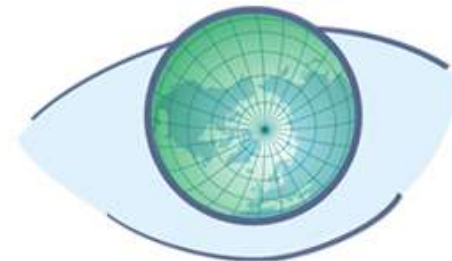
Identification of high-risk spots



Conclusions

- smaller population and longest road network have higher values for demographical density and show higher correlation with the number of traffic accidents
- higher populated counties, with a higher number of licensed vehicles and drivers, have a smaller demographical density and more traffic accidents
- spatial density has low correlation with the number of traffic accidents
- number of traffic accidents on a given area depends more on population than on road network length.
- additional data needed to identify hazardous sites on roads
- identification and remediation of hazardous sites demands that we consider more factors than just repeated traffic accidents





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Thank you for your attention!

QUESTIONS?

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