The role of AI in the mapping of dangerous locations on the road network
ITF reports on Data-Driven Transport Safety and Best Practice for Urban Road Safety

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Safer City Streets
the global traffic safety network for liveable cities

48 cities
Rotterdam’s road safety model

Data on crashes → Algorithm → Predict crashes

Data on roads

Source: municipality of Rotterdam
Rotterdam’s road safety model

Data on crashes → Algorithm → Predict crashes → ‘What if’ analysis

Source: municipality of Rotterdam
300+ variables per road section / junction

**Infrastructure**
- Road design: road width, curvature, max speed, road type, etc.
- Road objects: light poles, traffic bumps, traffic islands, etc.

**Usage/behaviour**
- Traffic intensity, actual speeds driven, **hard braking**, etc.

**Surroundings**
- Demography, vehicle ownership, shops, schools, etc.

**Subjective**
- Reports from citizens

Source: municipality of Rotterdam
Hyden’s safety pyramid

- Fatal crashes
- Injury crashes
- Property damage only crashes

- Serious conflicts
- Slight conflicts
- Potential conflicts
- Undisturbed passages

Hyden (1987)
Paris cyclist hard braking events (GeoVelo)

10.0 % out of 88
Decel = 2.7 m/s²

Google Maps Google Street View
ROAD CONDITIONS MAPPED ACROSS THE CITY

Our road conditions data strongly correlates with visual, on site, inspection - highlighting areas of road roughness which may be detrimental to the experience of cycling in the city.

\CLUSTER MAPS OF ROUGH ROADS

\CORRELATION WITH POTHOLES
Speed mapping and monitoring
Hot spots of speeding events

Top 2% of braking events
Surrogate safety metrics: Key benefits

• **Identify** and **fix** problems before serious harm happens

• **Evaluate** benefits of an intervention within days, not years!
Conclusions

• Automatic data collection is possible through instrumented **floating vehicles** and/or **smartphones** reporting information along the way.

• **Active safety systems** can also be considered among surrogate safety metrics (e.g. ABS, ESP, AEB).

• Conduct research on the **validation** of surrogate safety metrics
Thank you

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