Speed Management, Enforcement and Innovation

Sofia, Bulgaria - 1 June 2022

Vision Zero for the Balkans

Sharing Knowledge, Saving Lives

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Content

- Why speed management?
- Speed management methods
- Infrastructure
- Vehicle technology
- Signage
- Publicity
- Enforcement
- Emerging technologies

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Why is speed so important ?

Do you remember?

$$E_k = \frac{1}{2}mv^2$$

In which the kinetic energy of an object is equal to half the mass multiplied by the *squared speed* of that object.

The impact of speed on our road network

Why is speed important and why do we need speed management?

"A 1% reduction in mean speeds leads to a 2% reduction in injury accidents, a 3% reduction in serious injury accidents and a 4% reduction in deaths."
(Aarts, L. & van Schagen, I. (2006), based on Nilsson (1982)

"It is estimated that speeding contributes to as many as one third of all crashes resulting in death, and is the most important contributory factor to road deaths and serious injuries." (ETSC 2008)

"Across the EU 2100 lives would be saved annually if the average network speed would be reduced by 1 km/h" (ETSC PIN 2019)

Infrastructure adaptation

- Roundabouts
- Speed humps, speed tables, rumble strips

Infrastructure adaptation

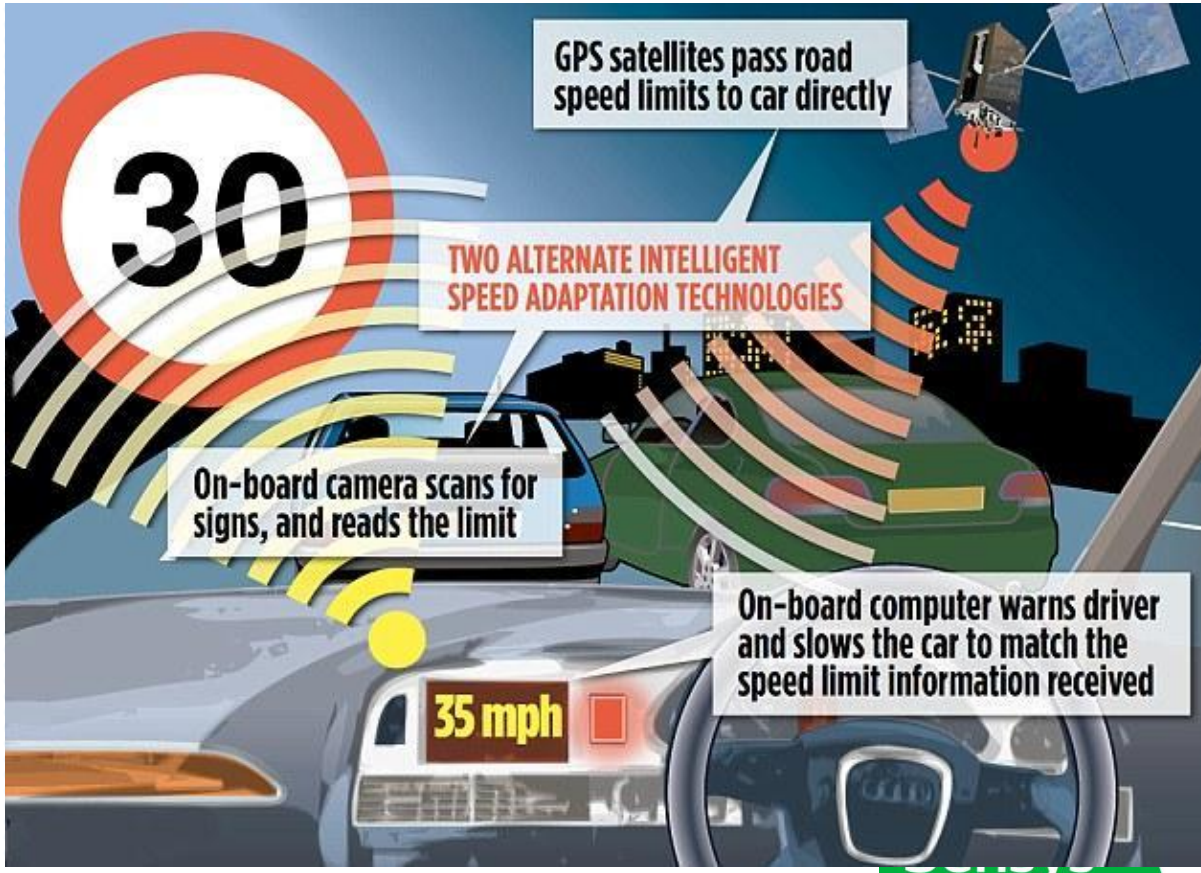
- Gateway treatement
- Road narrowing

Traffic calming measures

Vehicle focus

- Intelligent Speed Adaptation
- Speed sign display
- GPS based speed information

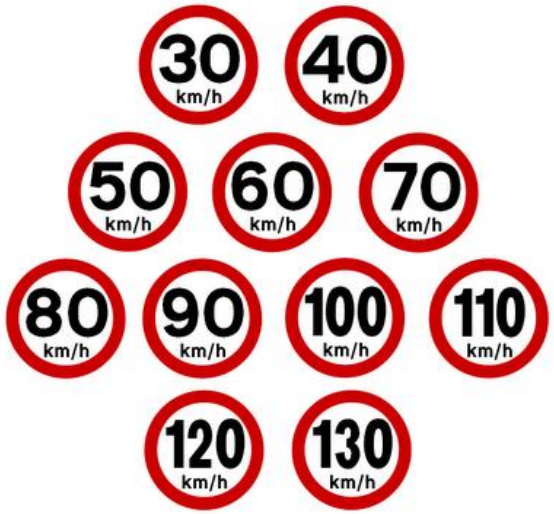
But also safety camera location info!



Traffic calming measures

Speed regime focus

- Legal issue
- Criteria for choosing speed regime
- Signage
- Infrastructure tells speed regime
- Simplicity



Traffic calming measures

Education focus

- Education
- Driver training
- Re-training programmes
- Publicity campaigns

Enforcement focus

Manual v. automated enforcement

- Instant confrontation with police and fine
- Visible to others
- Driver addressed
- Labour intensive, thus costly
- Limited in intensity, time and location
- Road safety requires ubiquitous and 24/7/365 approach
- Use valuable police resources for ‘non-automatable’ enforcement tasks

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Enforcement focus

Automated enforcement

- Speed camera location info often undermines enforcement: kangaroo effect
- High support for red-light/speed cameras
- Focus on section control or average speed enforcement
- Discreet unmarked in-vehicle enforcement
- Aim for a high chance of subjective apprehension

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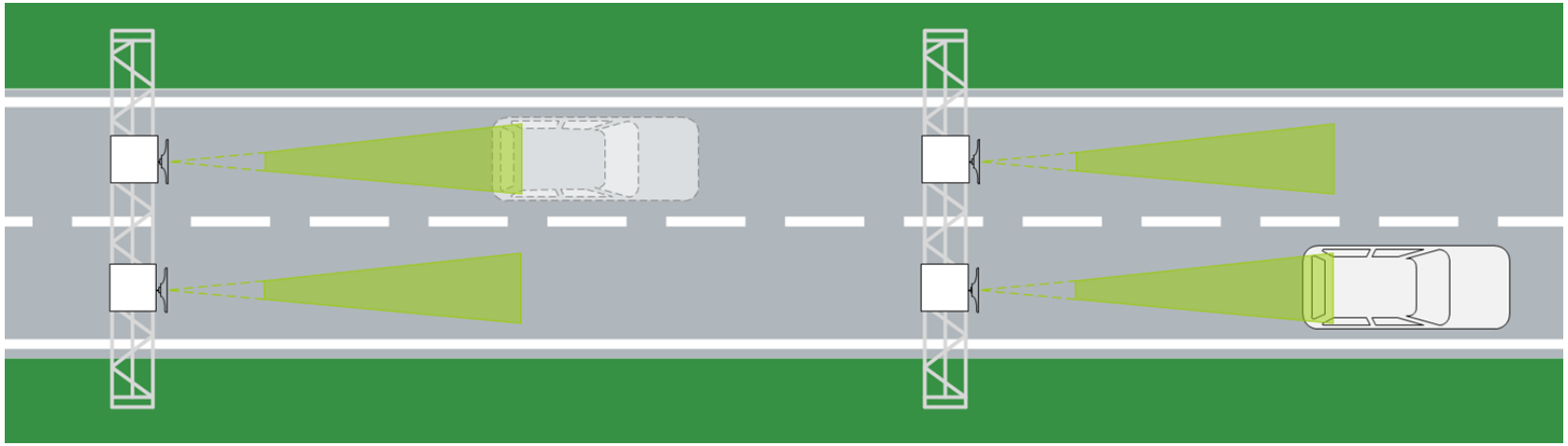
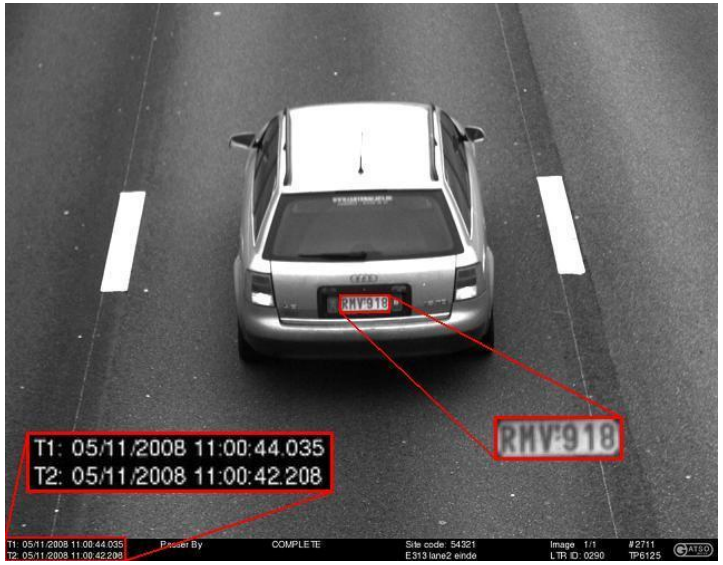
Average speed cameras

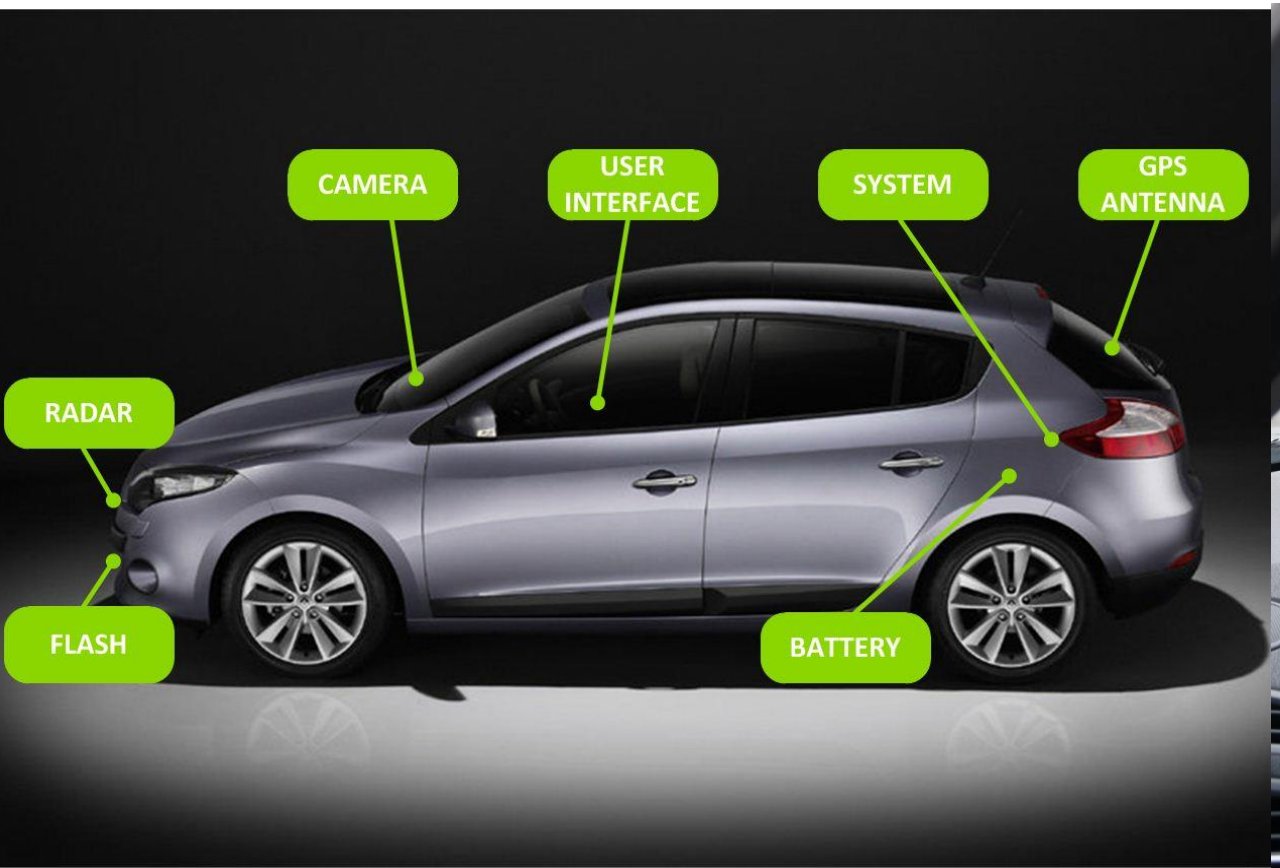
- Principle entry – exit, time over distance
- Not speed but time is measured
- Highly effective
- Formerly only on motorways, now also in urban areas and secondary roads



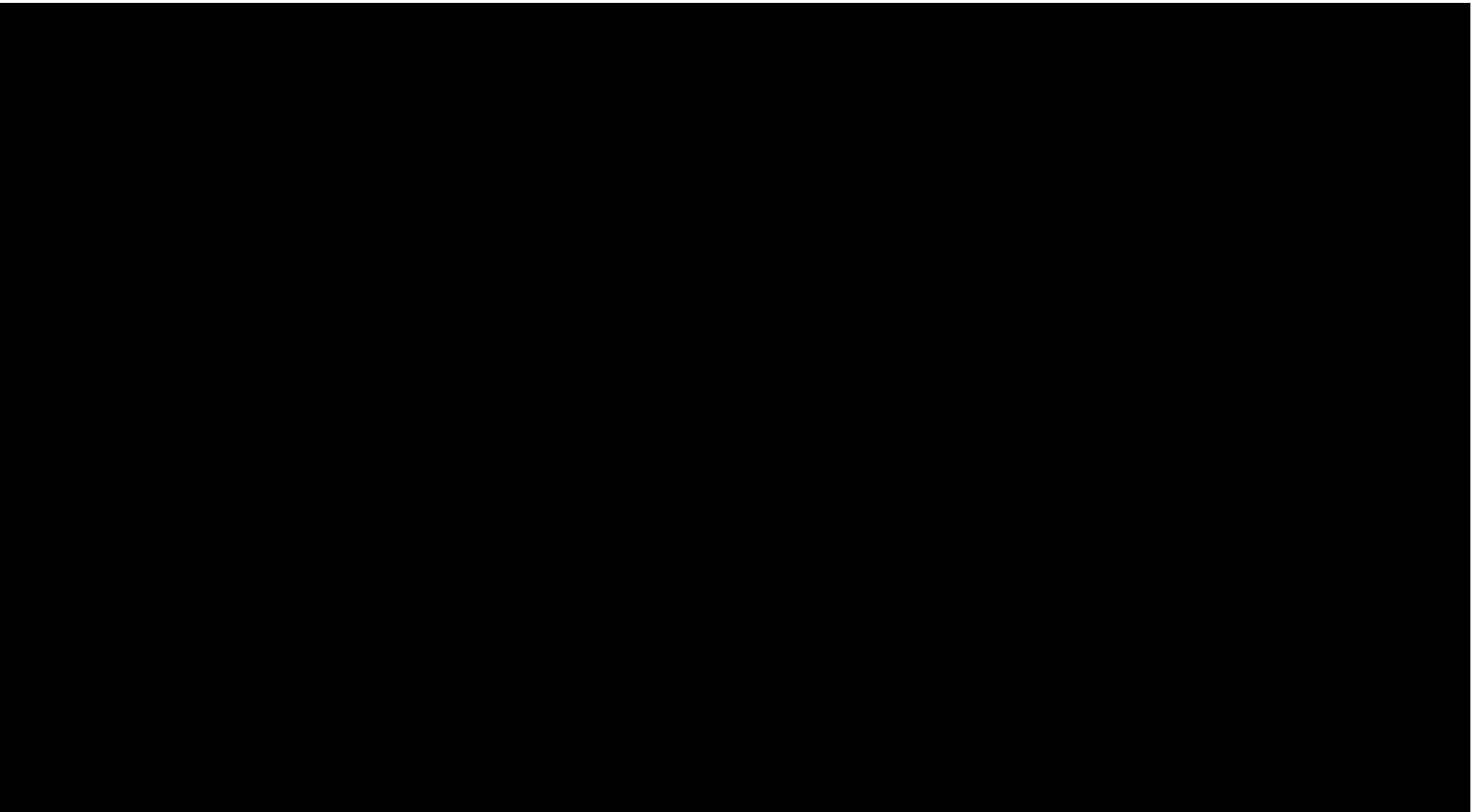


In-vehicle system

- mobile and stationary speed enforcement by police



In-vehicle enforcement video 1 also on YouTube:



In-vehicle enforcement video 2

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BRANDWEER
IVECO

Enforcement focus

Distracted driving technology

- AI based
- Addressing a serious ‘new’ road safety issue
- Update you legal framework
- More AI enforcement related technologies on the market
- Seatbelts, illegal turns, blocking the box, etc.

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Algorithm

Image enhancement → **Driver detection** → **Hand detection** → **Classification**

- » Local contrast
- » Whole image
- » Driver crop
- » Hand
- » Hand with phone

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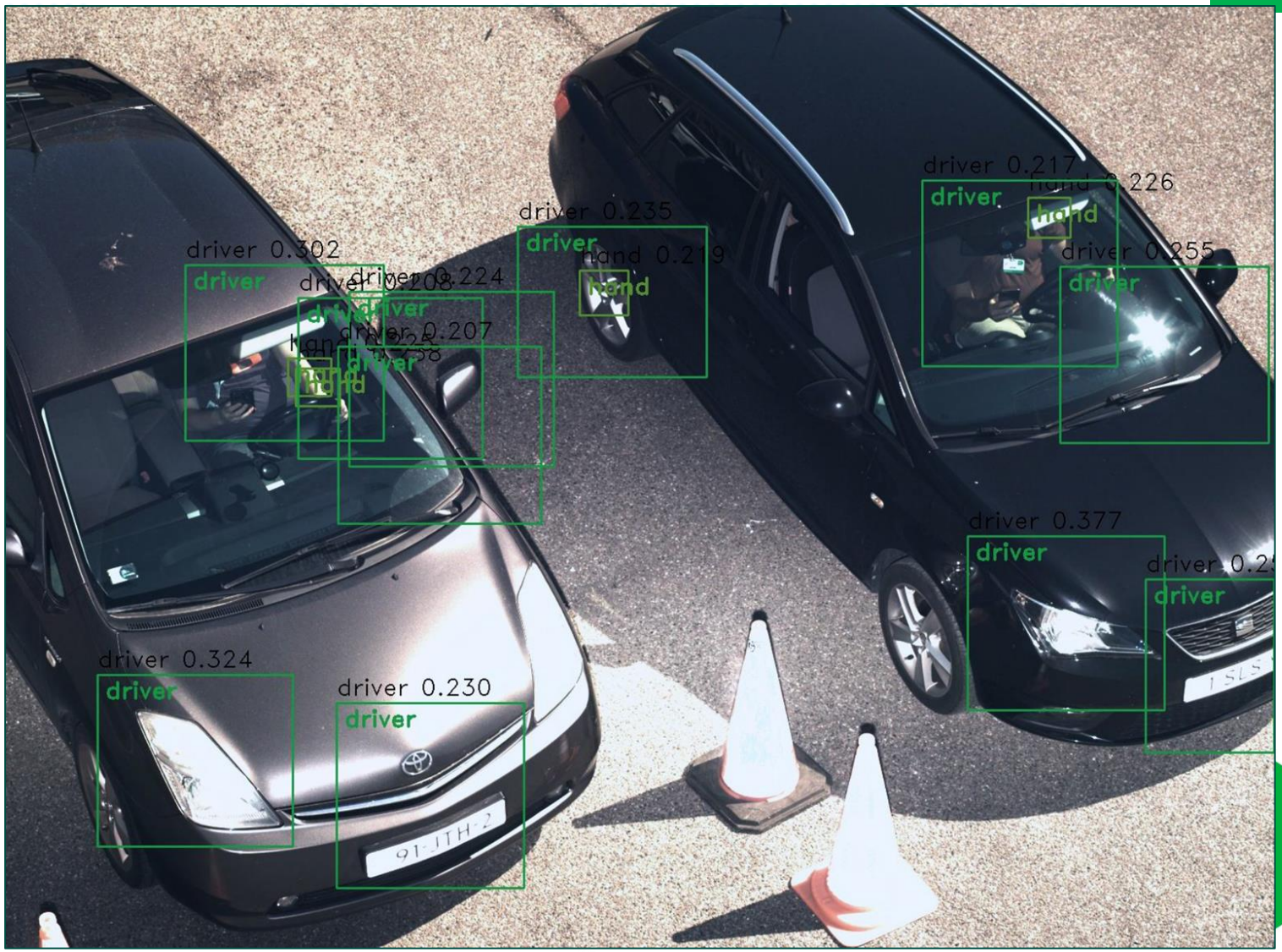
Image enhancement

»Local contrast

Driver detection

» First step in algorithm



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Hand detection

» Within crop of driver

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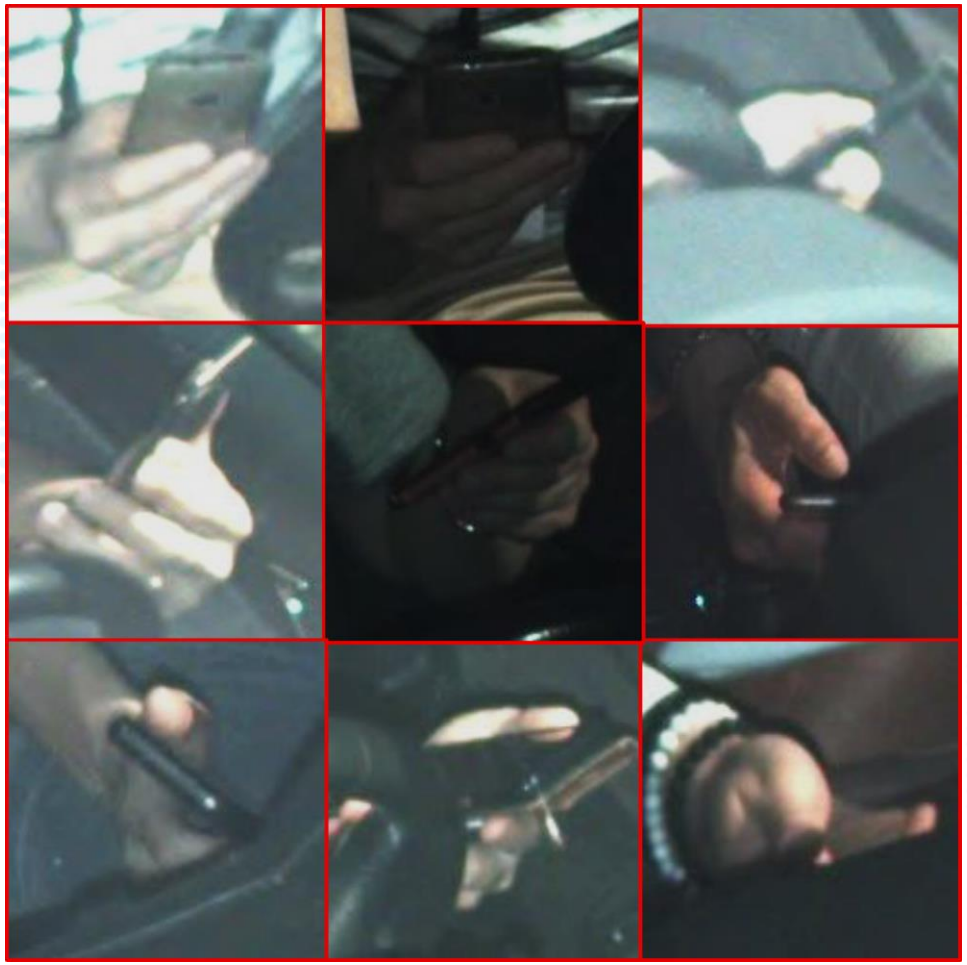
Hand classification



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Data collection

6 locations during 10 days:

- N9 Alkmaar
- N205 Hoofddorp
- Industrial area Haarlem
- A10 Amsterdam
- A4 Schiphol airport
- A9 Amstelveen

Total:

- 120.982 images
- ~2% violations

Speed management

- Importance of speed management
- Infrastructure
- Vehicle technology
- Signage
- Publicity
- Enforcement
- Emerging technologies

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Thank you for your attention

- Questions?