

Protection of Road Work Area at Hungarian Public Roads

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28 – 29 November 2023, České Budějovice

Motto: Let's asphalt out of the crisis

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CEDR Transnational Road Research Programme

Call Safety

Funded by Belgium-Flanders, Ireland,
Netherlands, Slovenia, Sweden, United Kingdom



Incursion **R**eduction to **I**ncrease **S**afety
in road work zones

CEDR – IRIS report

- 1. Human factors**
- 2. Designing diversions**
- 3. Good practices**
- 4. Setting up diversions (automation)**
- 5. Drawing attention**

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1

Human factors



1: Human factors

What leads to accidents?

- road agency can't control ● moderate control ● road agency can control

Motorists:

- **physical state** (fatigue, sickness, altered conscience)
- **inattention** (health, passengers, devices, road environment)
- **confusion** (path to drive, lack of understanding, no time to react)

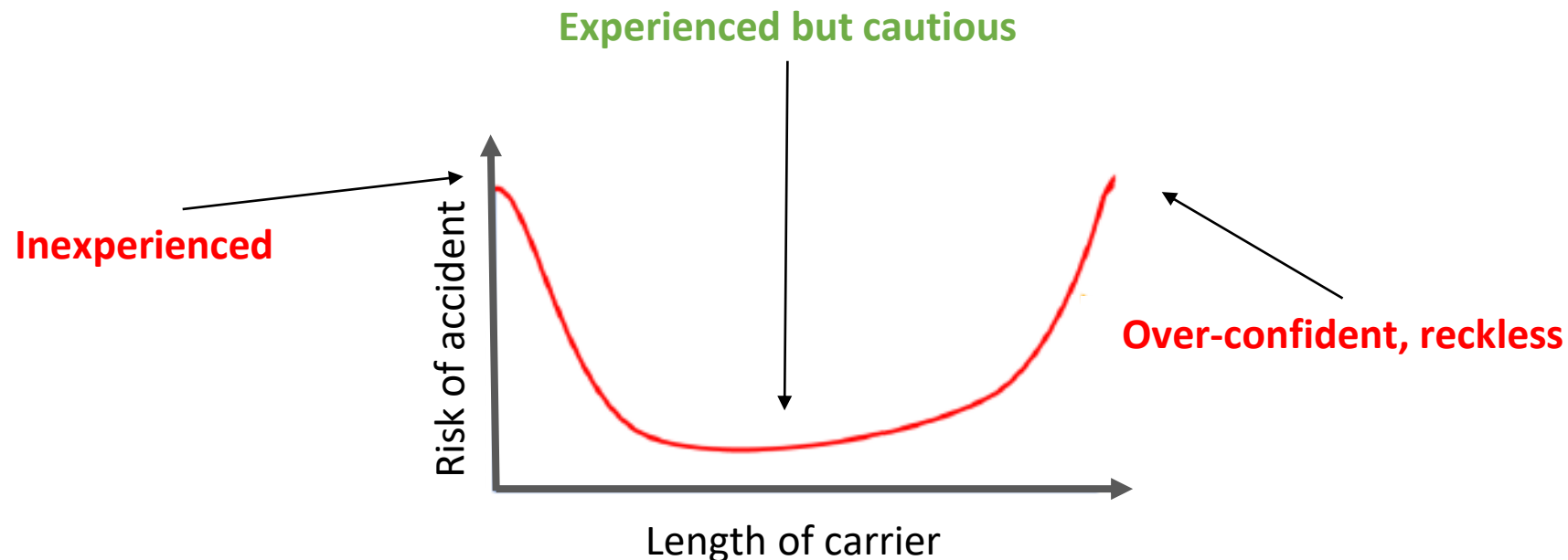
Road workers:

- **inexperience**
- **over-confidence**
- **aging** (reflexes, mobility)
- **deadline pressure** (haste, recklessness)

1: Human factors

What leads to accidents?

Accident risk for road workers:



1: Human factors

What motorists want?

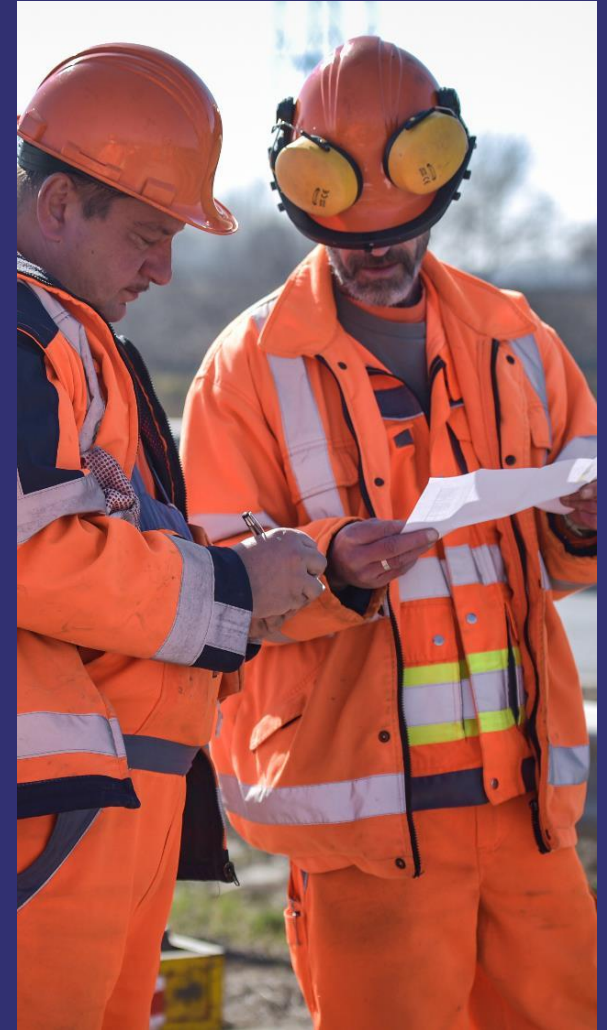
low cognitive load: **not having to pay attention to a 1000 things**

avoid surprises: **no parts of diversion appear unexpectedly**

avoid confusion: **required behavior should be obvious**

2

Designing diversions



2: Designing diversions

4C rule

Conspicuous Seen from afar

Clear Obvious, simple

Consistent Always the same

Credible Take our word for it

2: Designing diversions

Conspicuous

Clear

Consistent

Credible





2: Designing diversions

Conspicuous

Clear

Consistent

Credible

 <p>Source: KfV</p>	 <p>Source: KfV</p> <p><i>Comment: sometimes existing signs are damaged due to crossings (e.g. by use of screws or adhesives). There are magnetic systems available that are easy to apply, and a damage of the signs is prevented.</i></p>
<p>Complete coverage of obsolete sign</p>	<p>Obsolete sign is crossed – which might be seen and recognised during daylight but hardly at night</p> <ul style="list-style-type: none">⇒ camouflage⇒ not conspicuous

2: Designing diversions

Conspicuous

Clear

Consistent

Credible



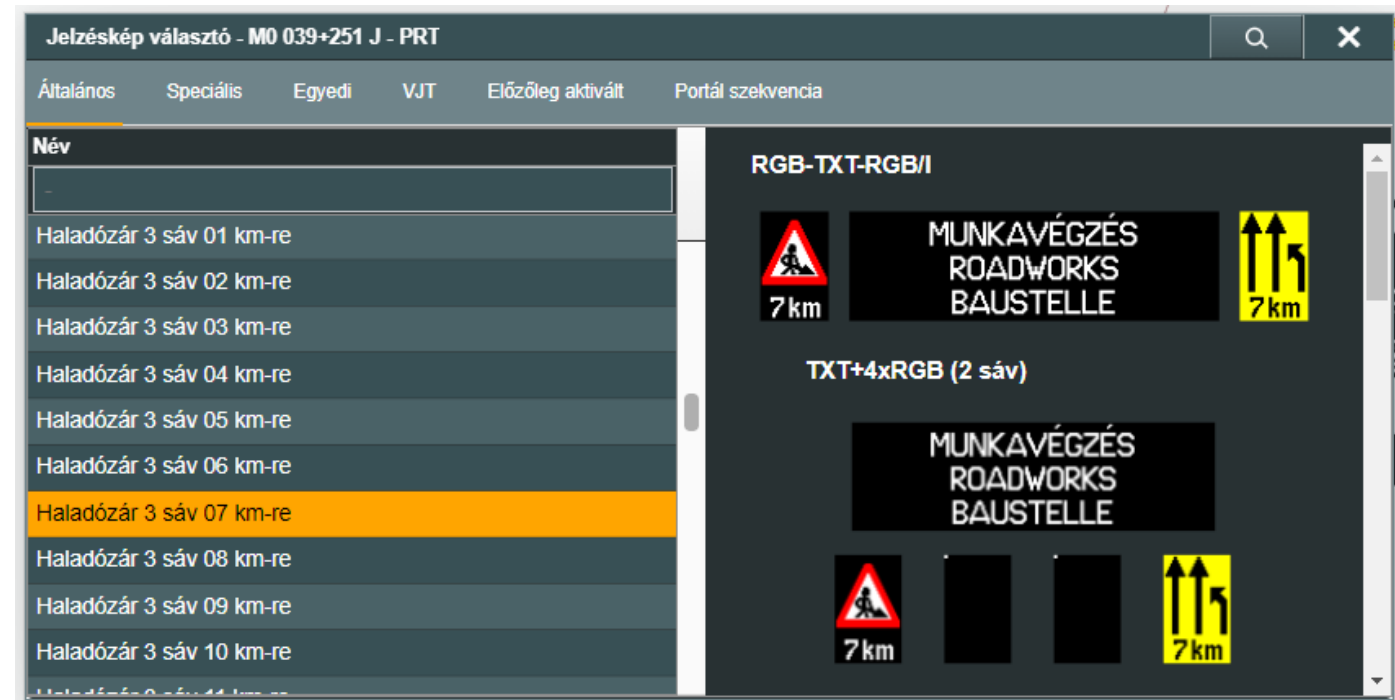
2: Designing diversions

Conspicuous

Clear

Consistent

Credible



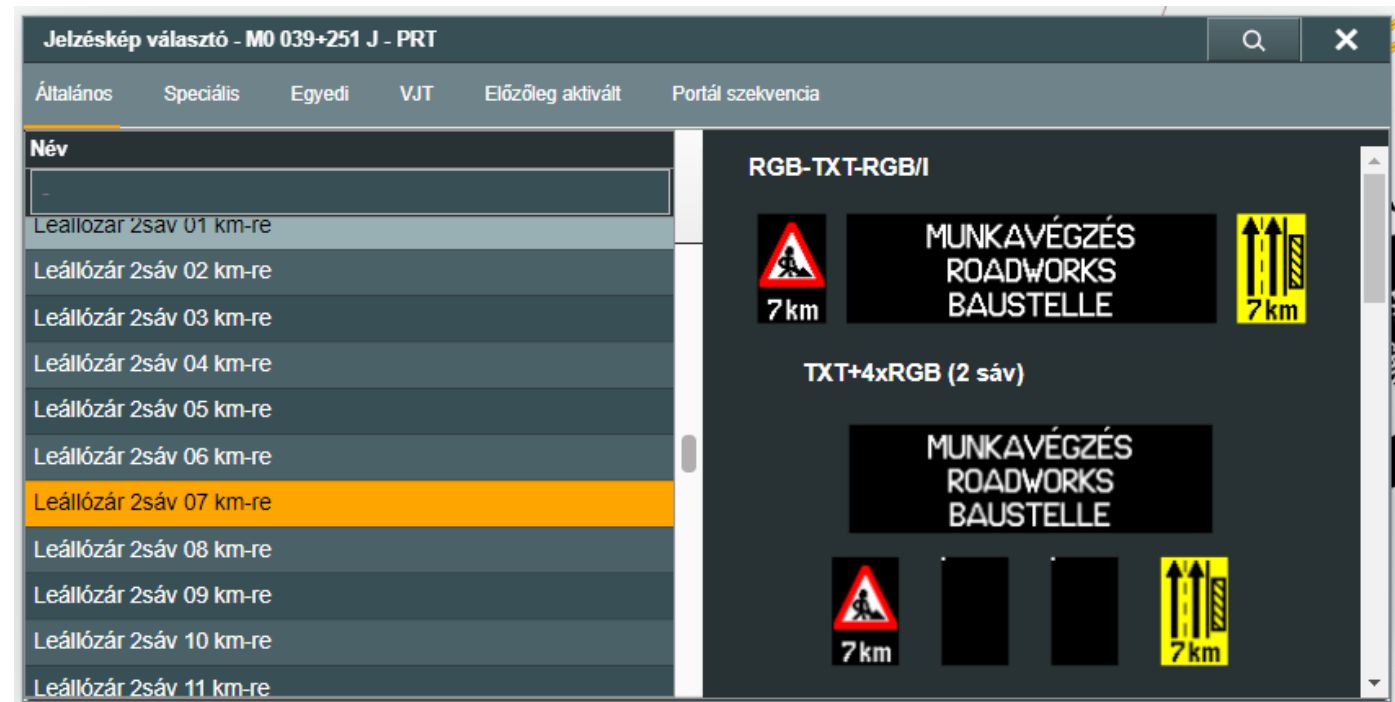
2: Designing diversions

Conspicuous

Clear

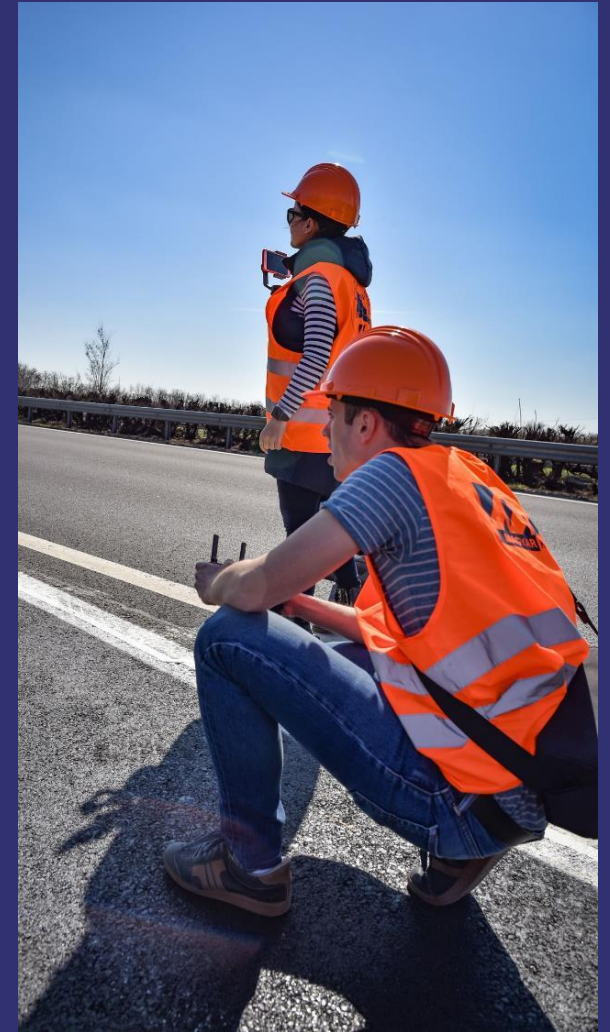
Consistent

Credible



3

Education and training



3: Education and training



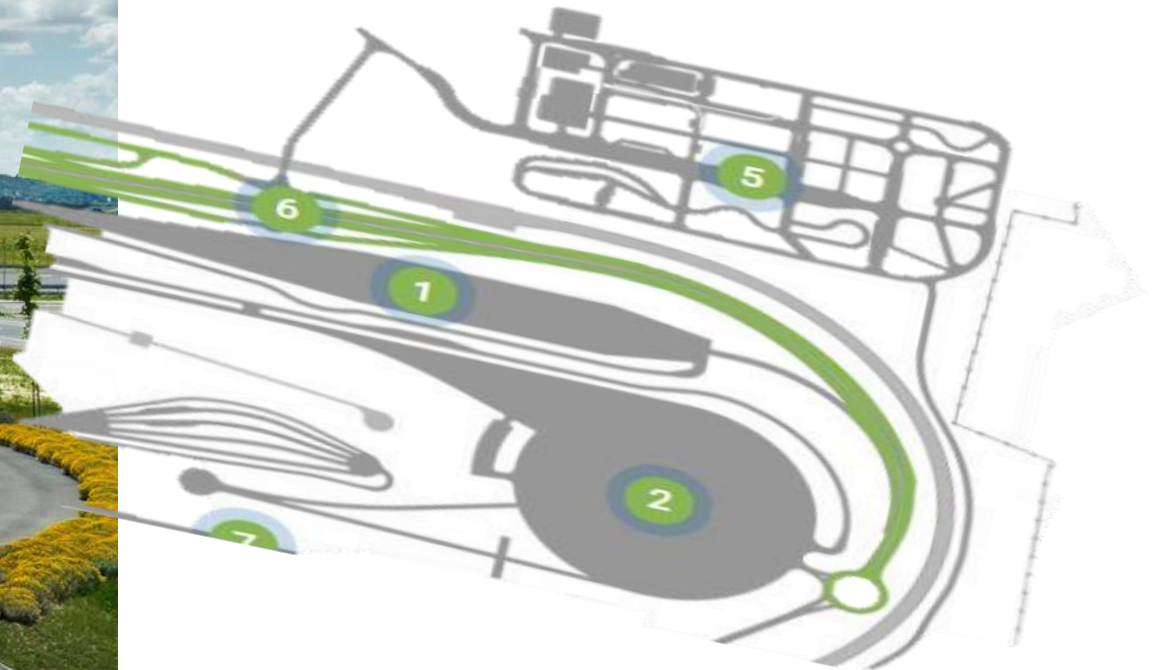
(this is cool though)

3: Education and training



3: Education and training

Cooperation with ZalaZone



3: Education and training

Completed roads before opening



4(a)

Setting up diversions



4(a): Setting up diversions

Rolling roadblock

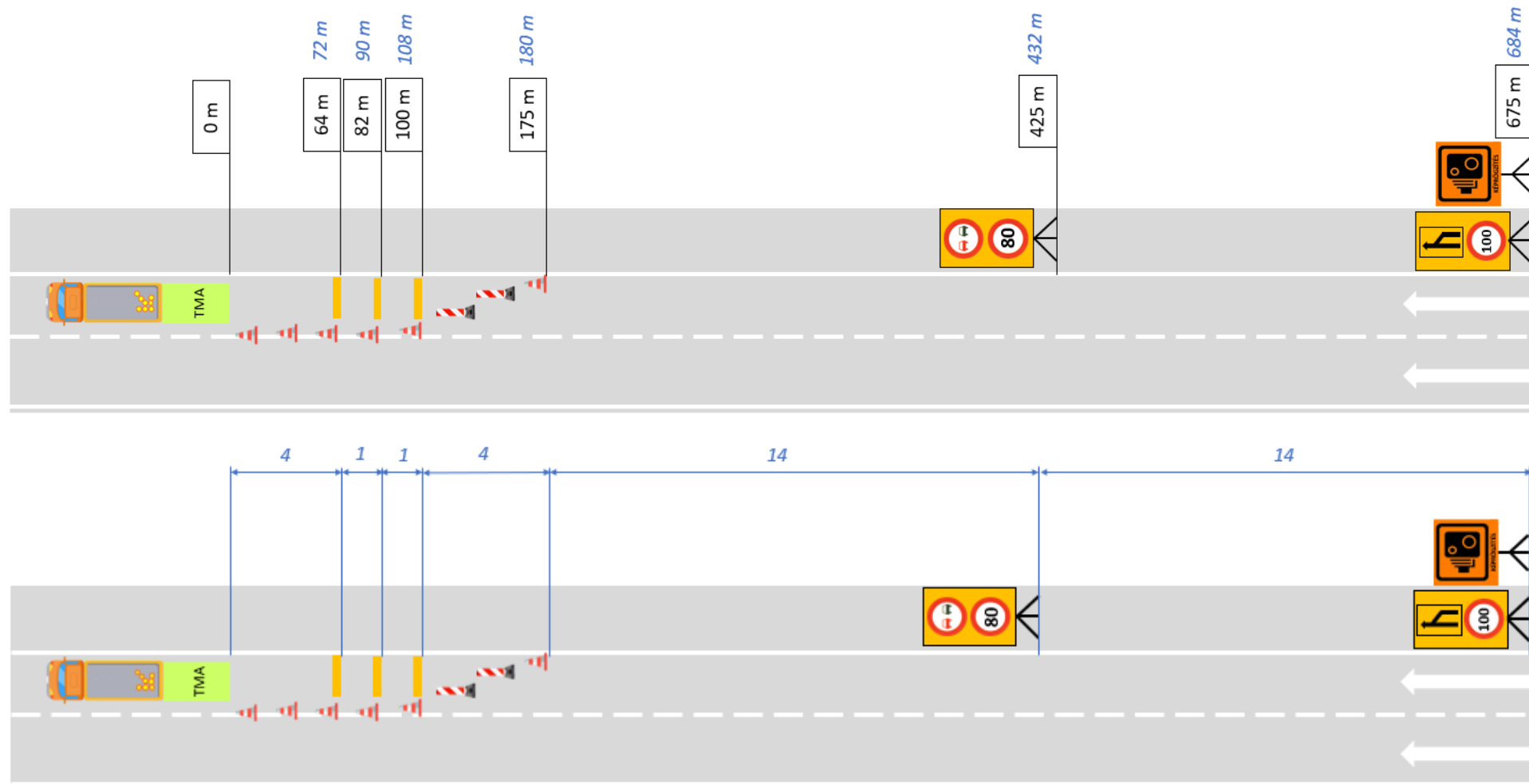




- accident management
- responding to scene
- accident prevention

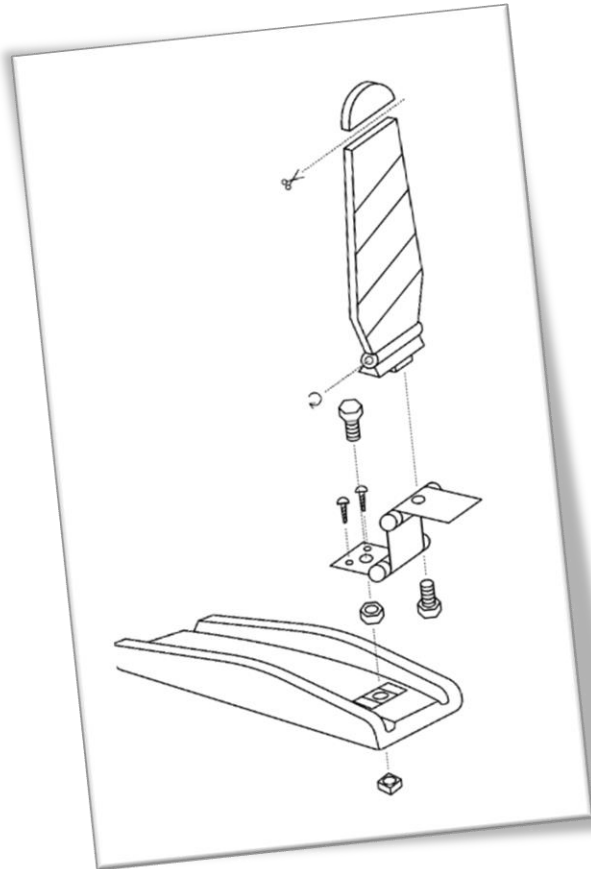
4(a): Setting up diversions

User friendly manuals



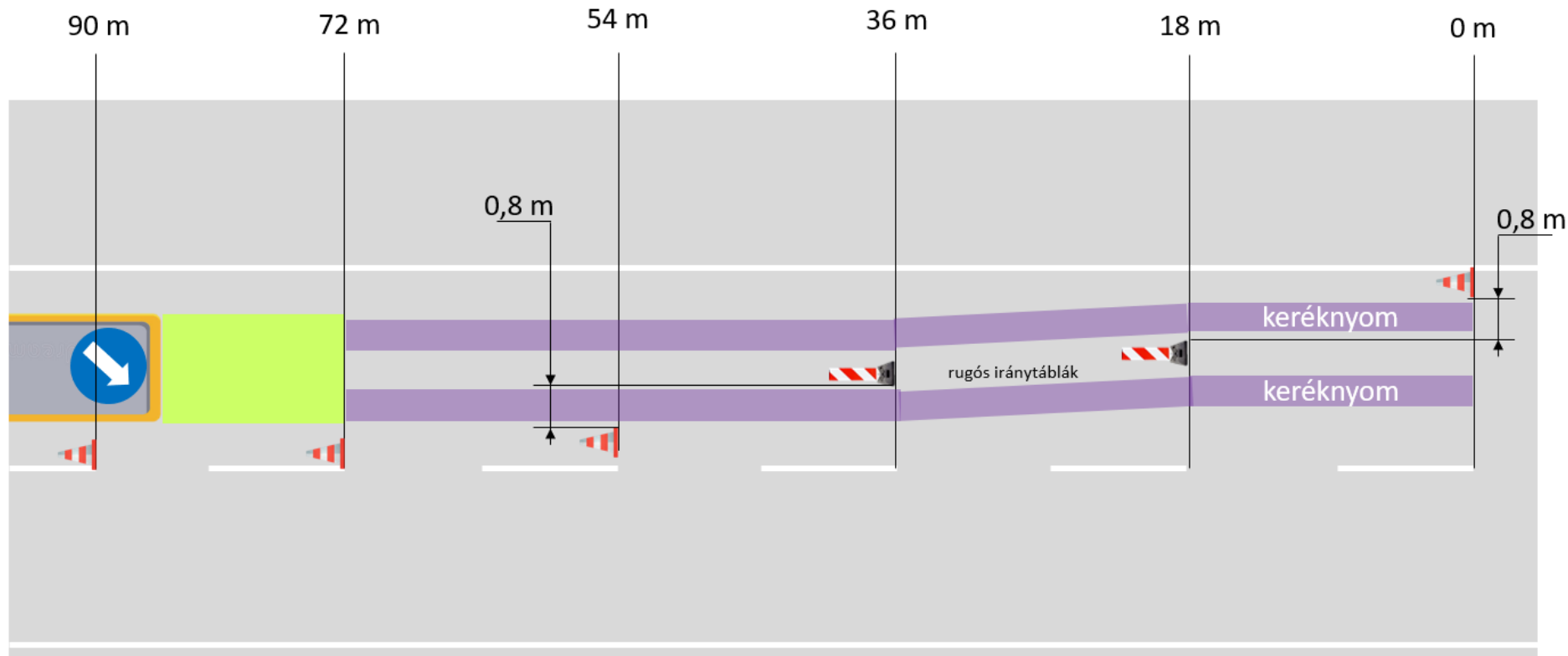
4(a): Setting up diversions

Spring loaded bollards (HPR invention!)



4(a): Setting up diversions

Spring loaded bollards (HPR invention!)



4(a): Setting up diversions



4(a): Setting up diversions



4(b) Automation



4(b): Automation – Iveco-Nissen Drop&Pick



4(b): Automation – Iveco-Nissen Drop&Pick



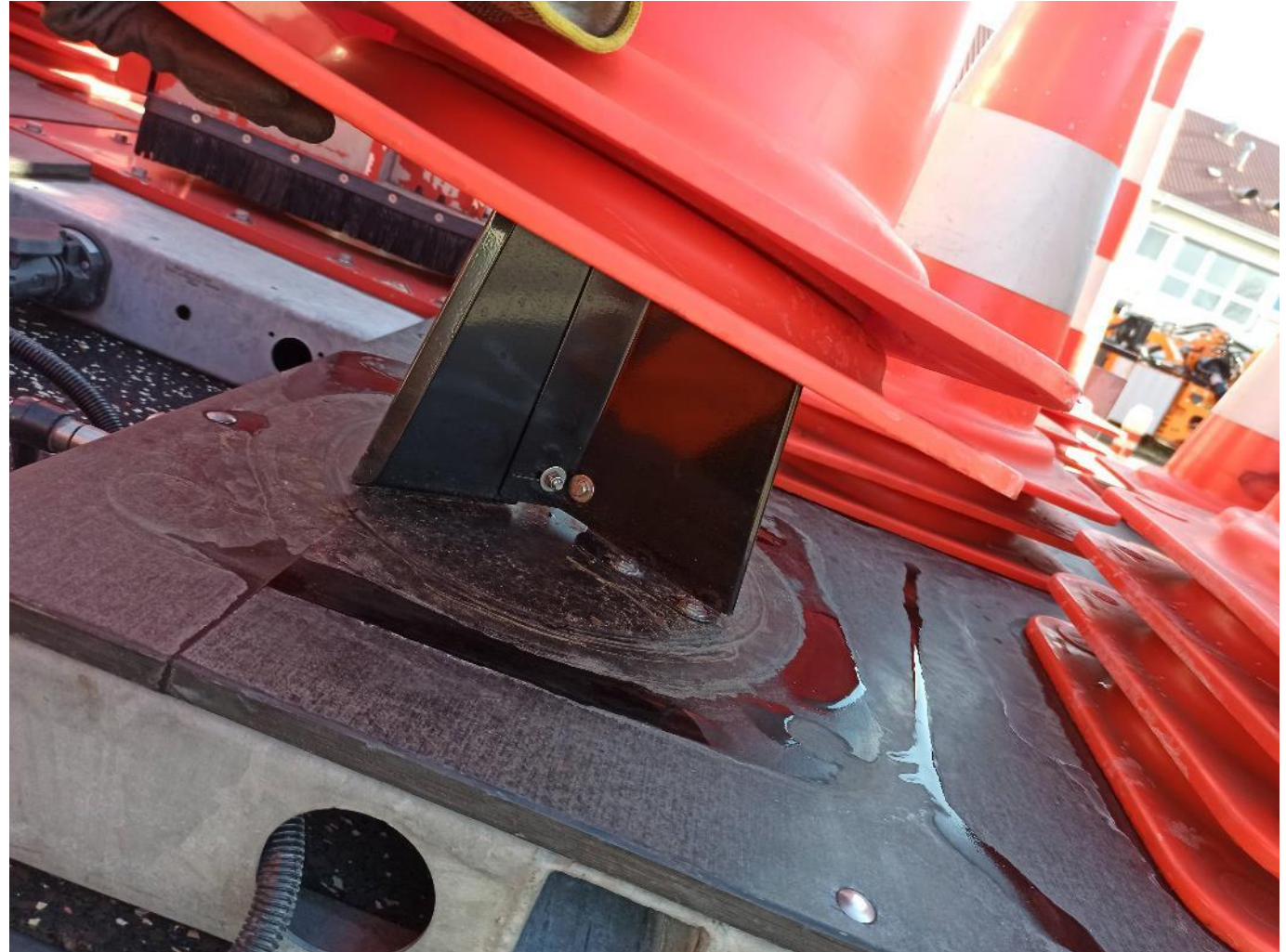
4(b): Automation – Iveco-Nissen Drop&Pick



4(b): Automation – TSS X-Cone 2.0



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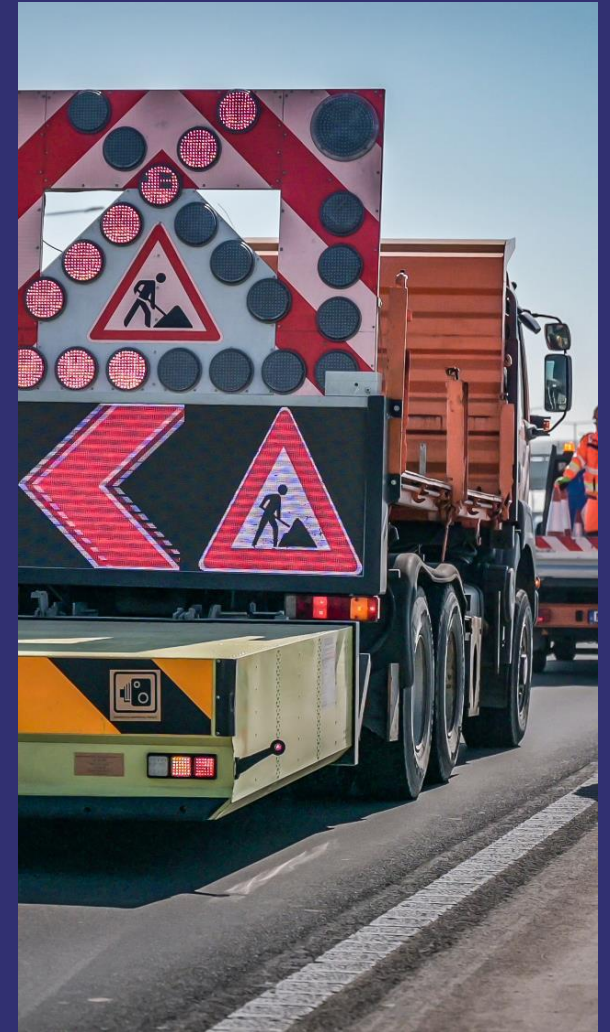


4(b): Automation – SignalTerv Portable VMS



5

Drawing attention



5: Drawing attention

Mindset activation in motorists



(video recording)



(video recording)

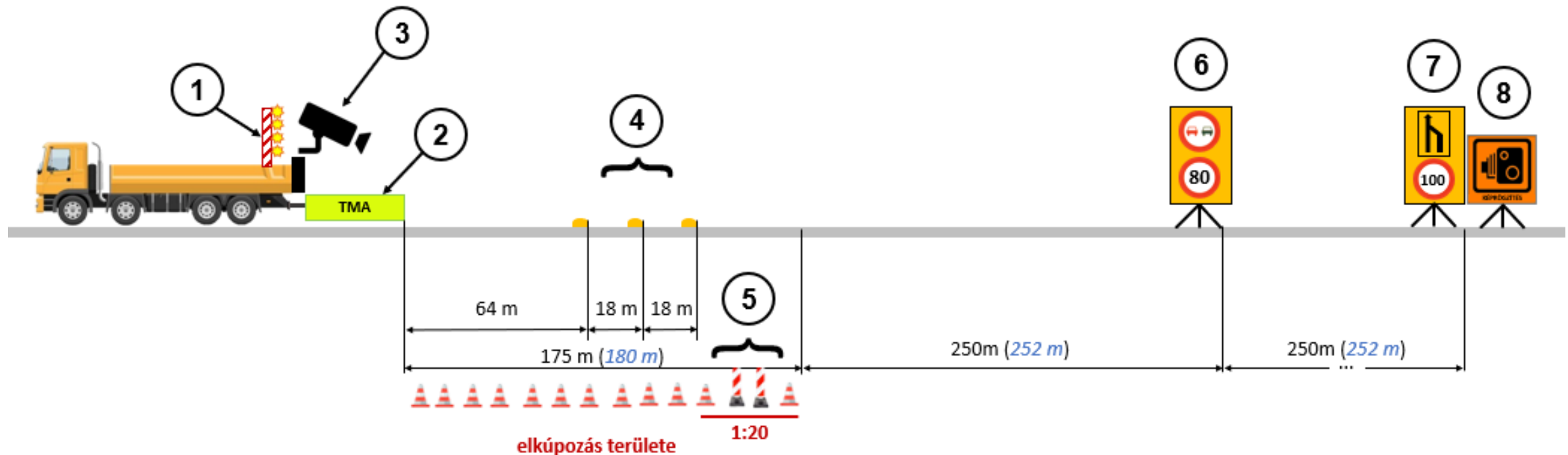
5: Drawing attention

Portable speed bumps



The result: SAFE DIVERSIONS CONCEPT

- | | |
|-----------------------------|----------------------------------|
| 1. Arrow light | 5. Spring loaded bollard |
| 2. TMA | 6. 80 km/h warning |
| 3. Portable VMS with camera | 7. 100 km/h warning |
| 4. Portable speed bump | 8. „Video recording” custom sign |



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