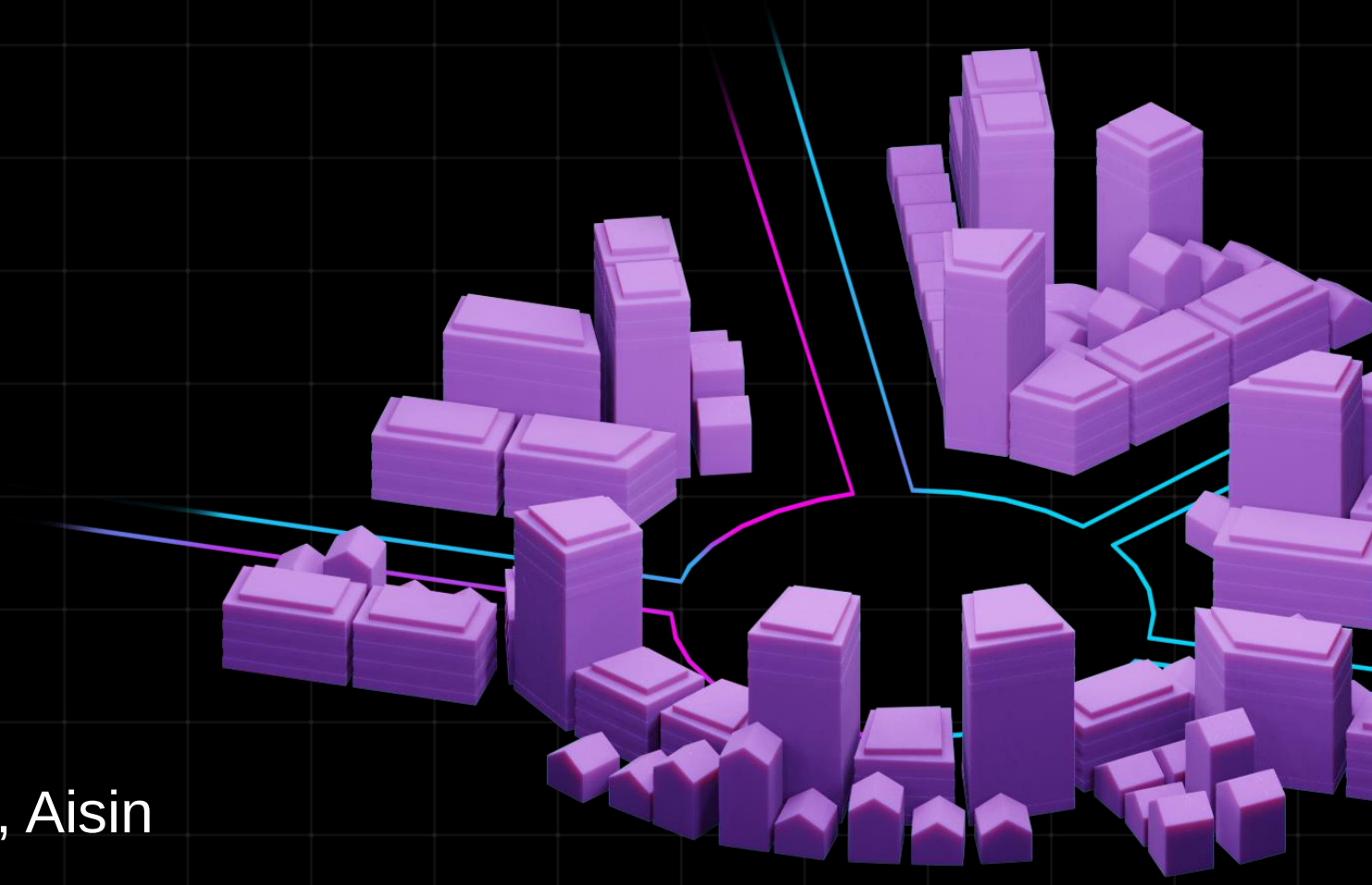
RoadTrace

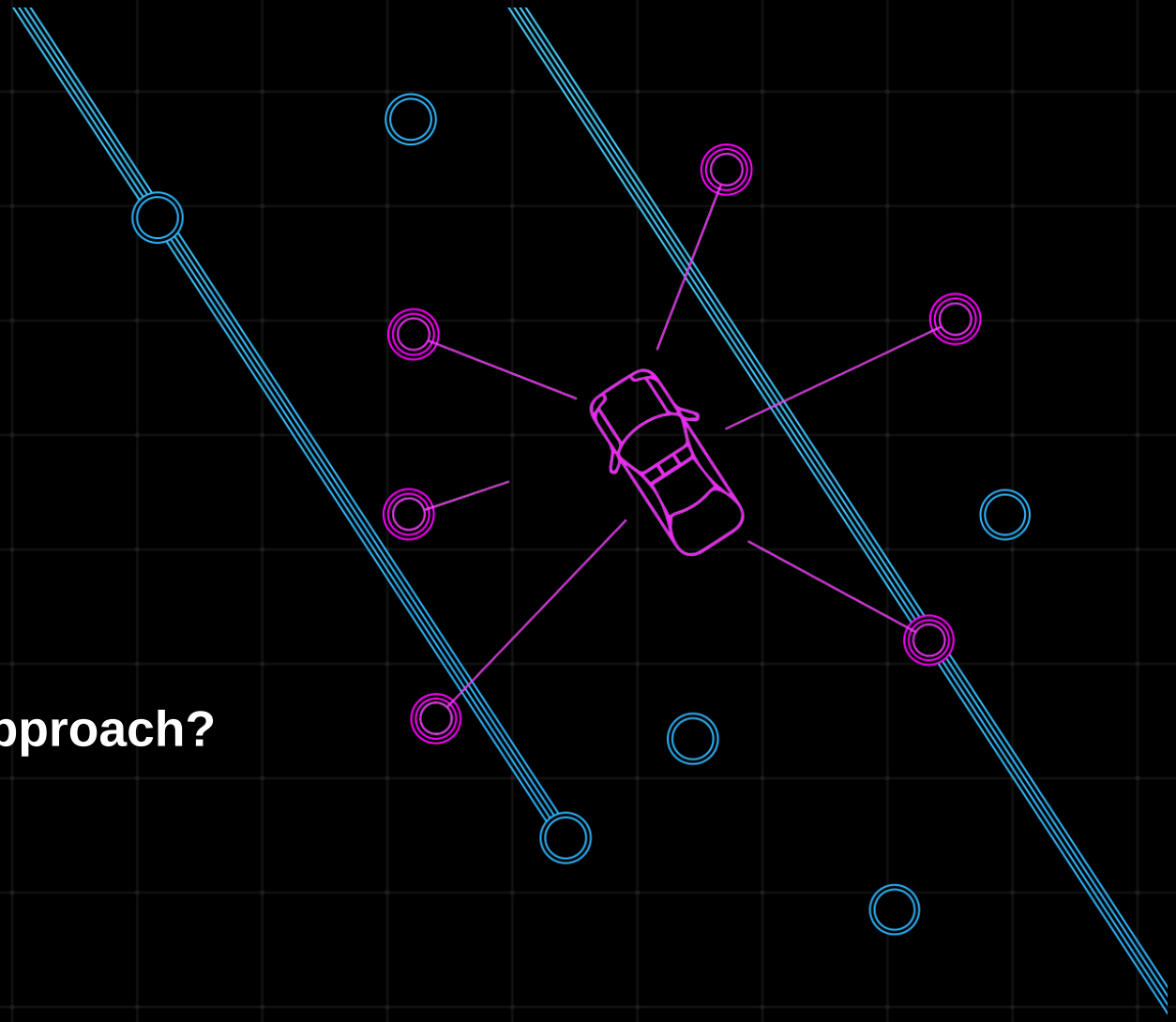
Connected insights by AISIN

Towards Vision Zero:
Safety insights from connected vehicles



Lorna Payne
Business Development Manager, Aisin

New insights from connected vehicles



Introduction

- Connected vehicles on UK’s roads
- The Road Safety challenge
- Network coverage

Insights - Identifying risk areas

- Monitoring & trend analysis
- Urban Safety analysis

Can this contribute to the Safe System approach?

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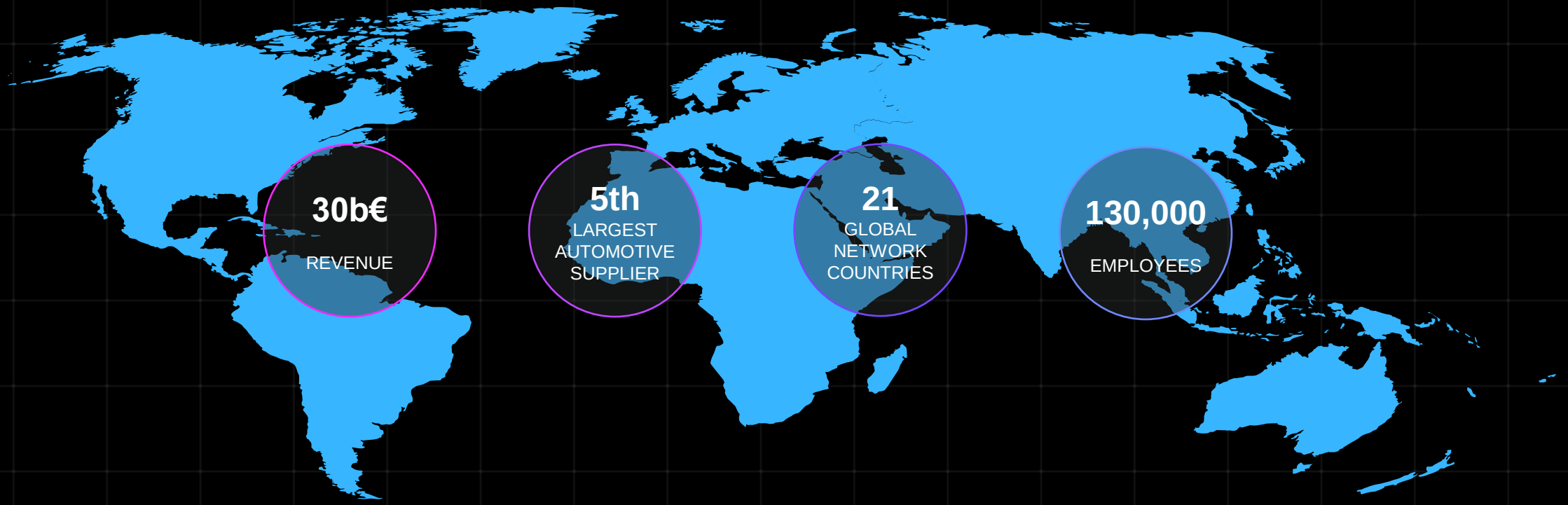
Global support for the automotive industry



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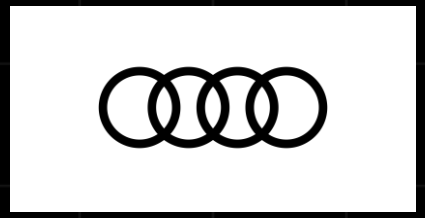
AISIN Global connections – data agnostic



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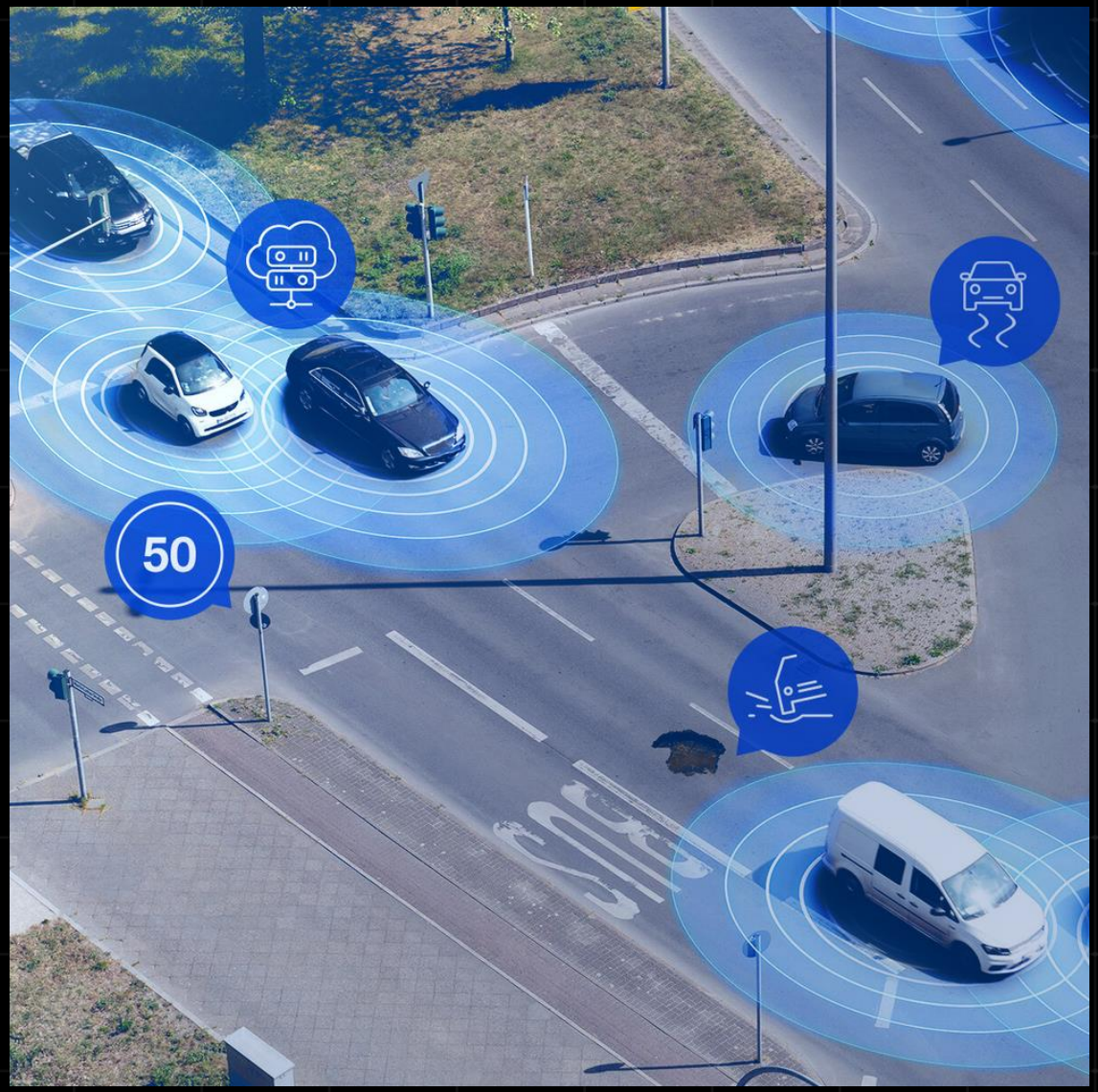
Connected Vehicles

- Connected Automated Vehicles (CAVs)
- Vehicles on UK roads
- 85% of new vehicles in 2023
- What can the data be used for?



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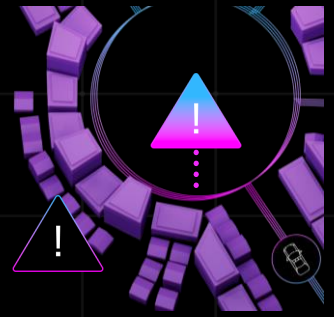
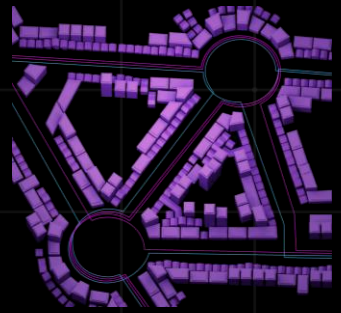
RoadTrace Connected insights for better roads

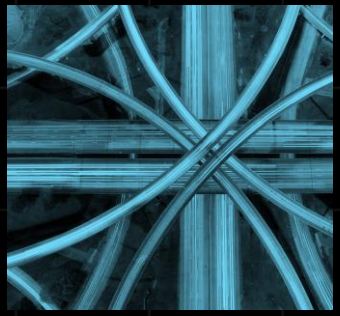
A comprehensive product portfolio



Safety Insights



Road Condition



Mobility Analysis

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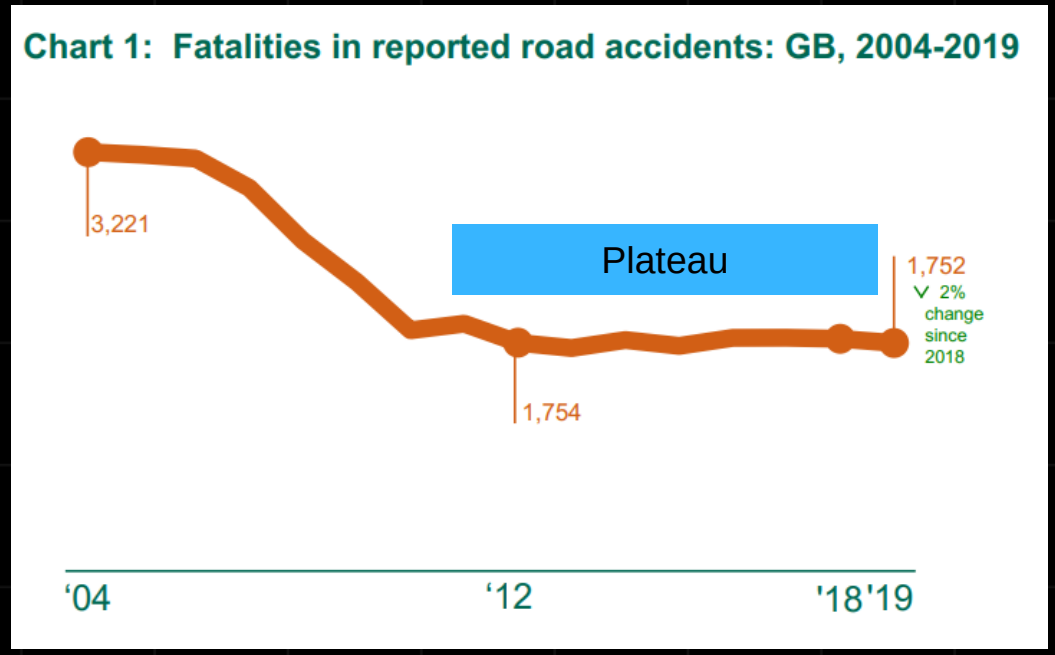
The Road Safety challenge

1. Road safety is measured in terms of **deaths and injuries**
2. Current solutions are often **reactive** rather than proactive
3. Road surveys are conducted on pavement level, but not on **road user level**



Reported road casualties in Great Britain: 2019 annual report (publishing.service.gov.uk)

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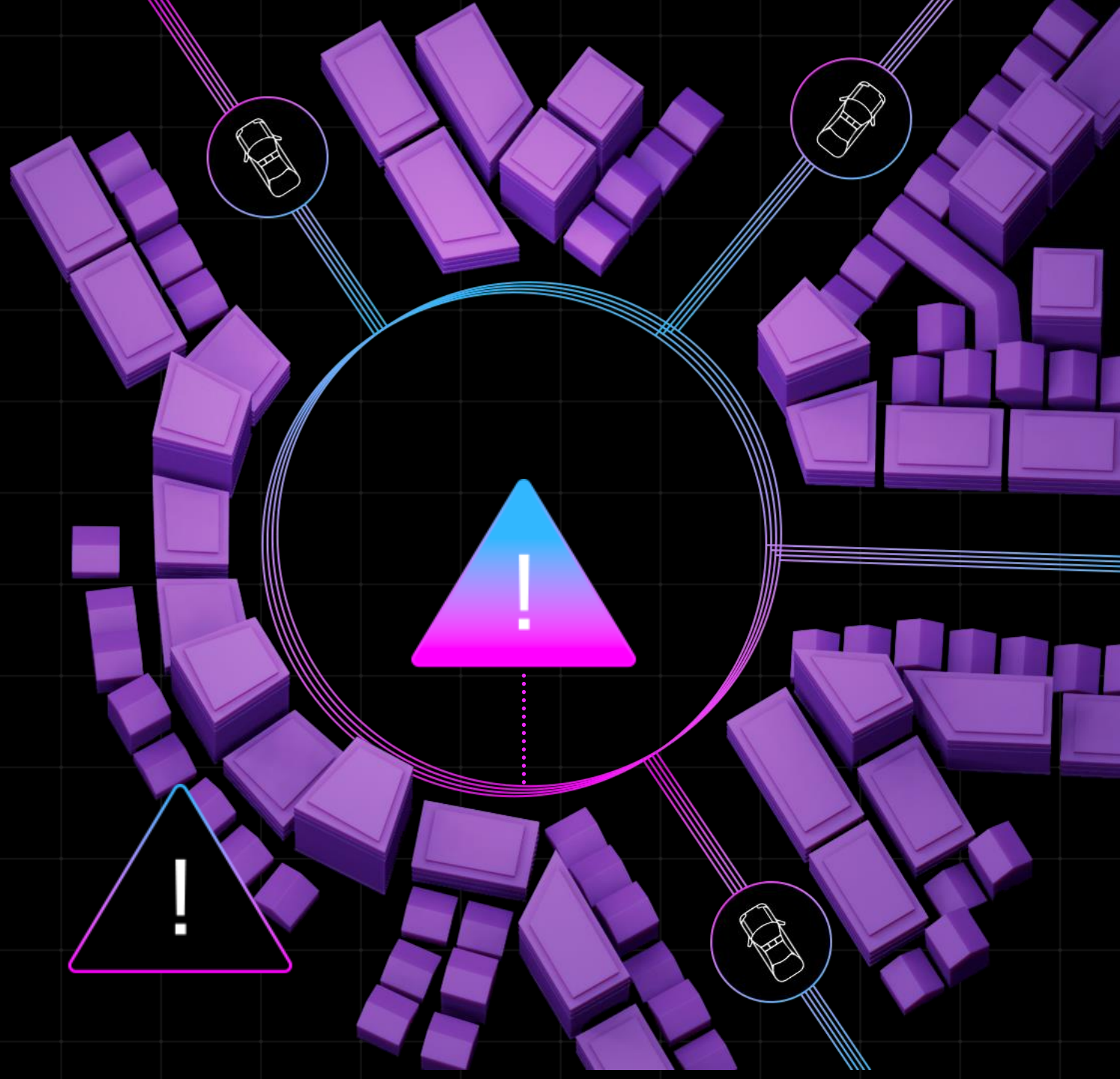
We can now identify clusters of risky driving behaviour even **before** a crash occurs, using **connected car data**



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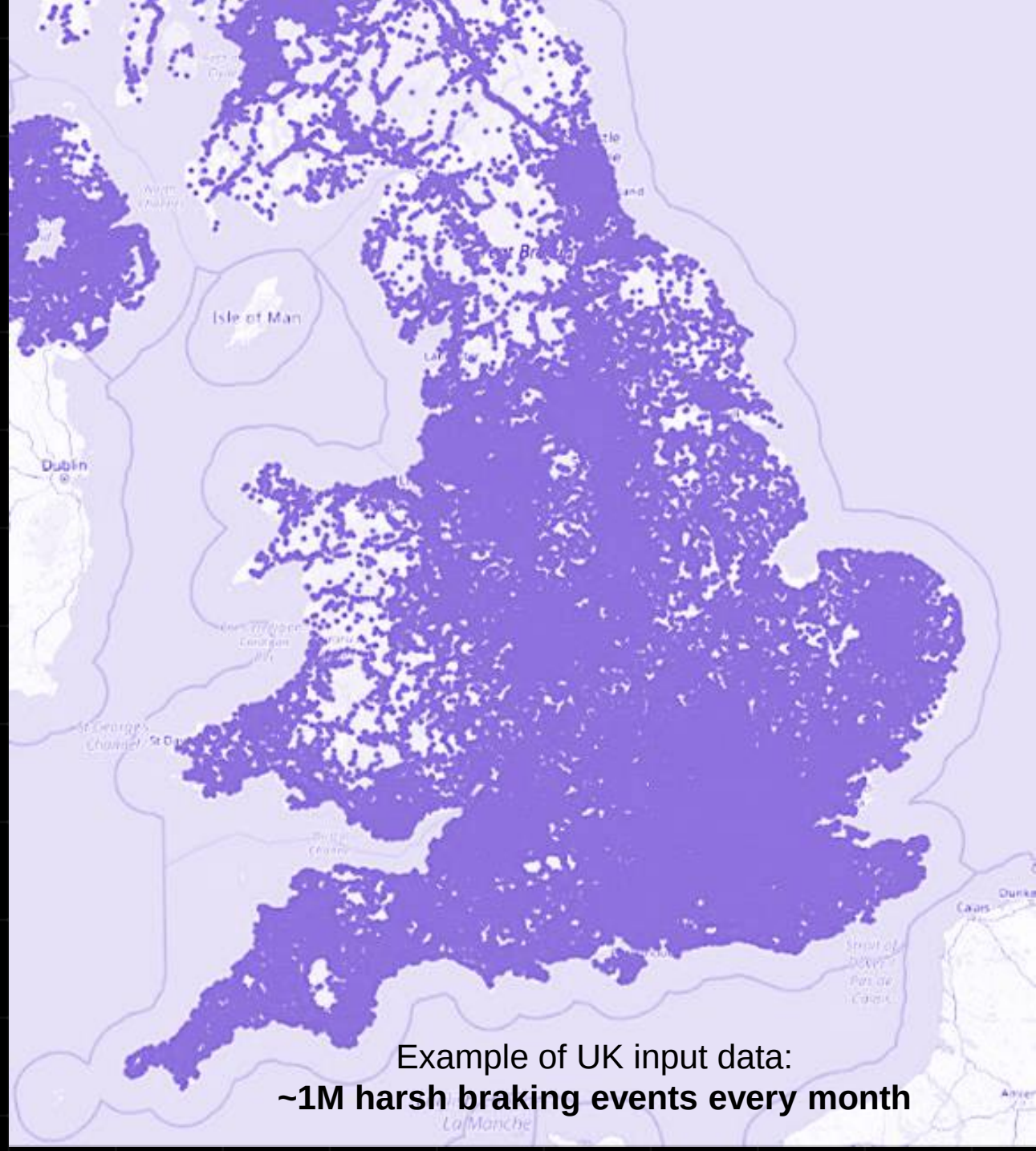
What’s New?

Signals **direct** from the **vehicle sensors** - brakes, steering, accelerometer, driving assistance (ABS / Traction Control etc)

Collected ‘over the air’

Analysis of driving behaviour

- Near misses and high risk areas
- How driver behaviour changes over time



Example of UK input data:
~1M harsh braking events every month

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What’s new?

RoadTrace harvests existing connected car & contextual data

Connected car data

Entry Speed
GPS position
Vehicle type
Heading
Exit speed
Long. Accel.
Lat. Accel.
Brake pressure

Contextual data

Map attributes
Speed limit
Road class
Time of day
Position of sun
Weather conditions
Temperature
Historical data
Traffic
Road curvature

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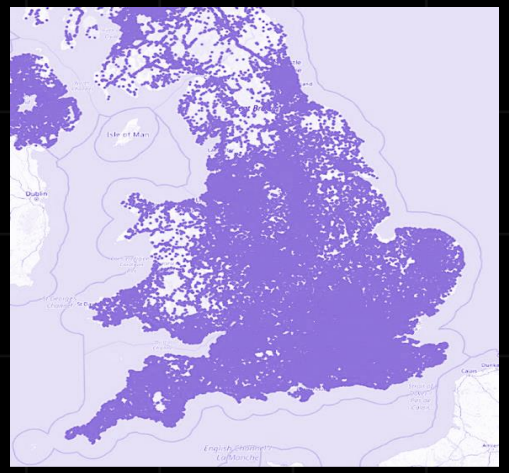
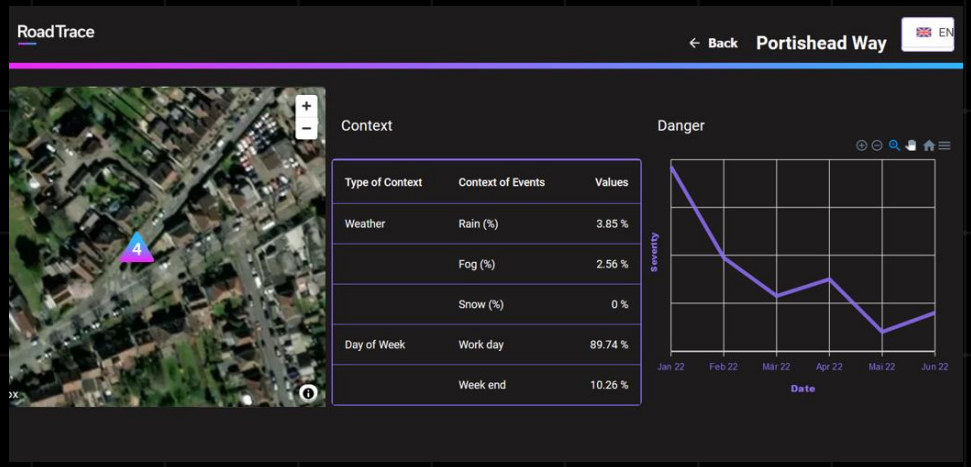
RoadTrace can help with critical decision making

Constantly monitoring driver behaviour, 24/7, all weather conditions



Analysing patterns to identify repeated abnormal driving

Prioritising a manageable number of Areas for Investigation - delivered through existing channels



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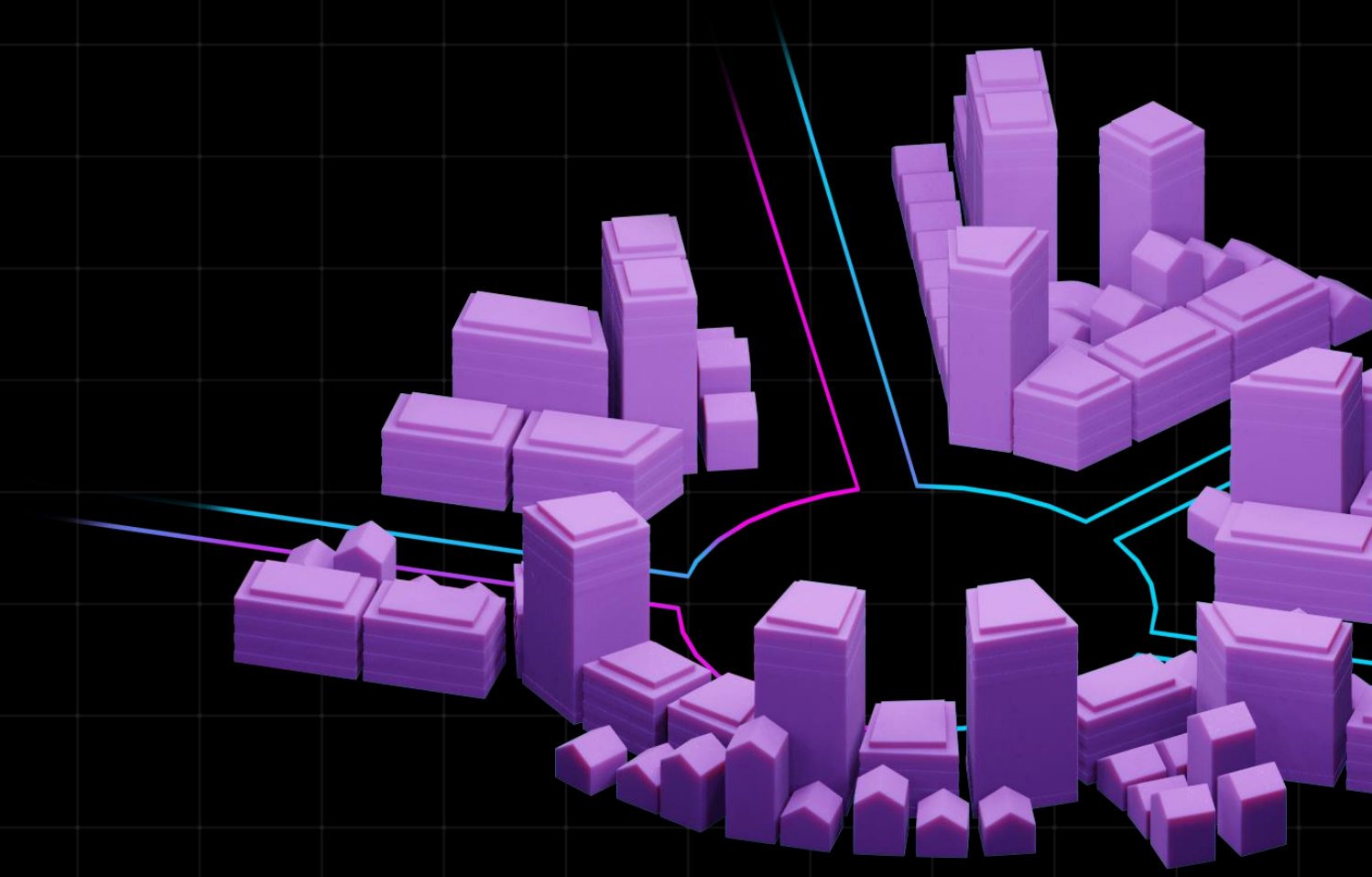
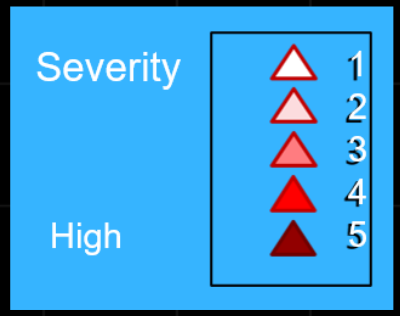
But how do we interpret what this means?



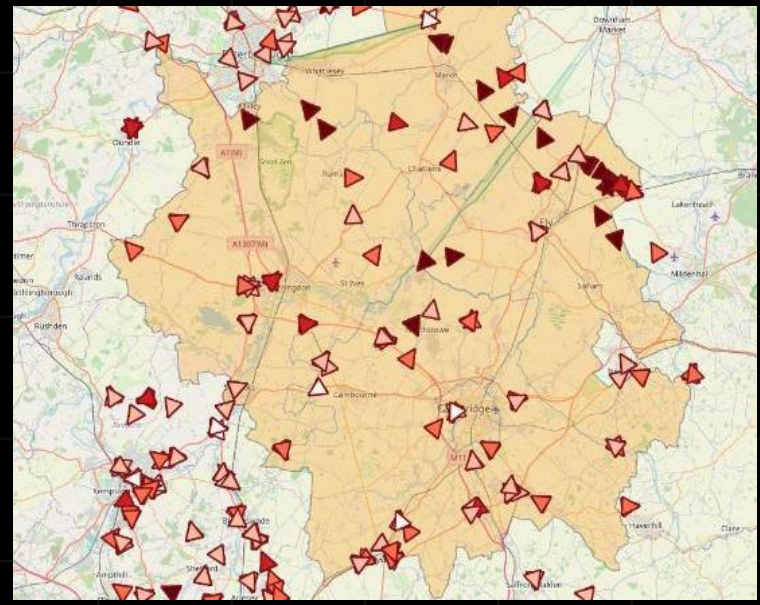
Risk based approach – targeting highest risk sites first

All events

One month of data
Each point = 1 harsh braking event



1. Frequency
2. Deceleration



Filtered – high risk areas

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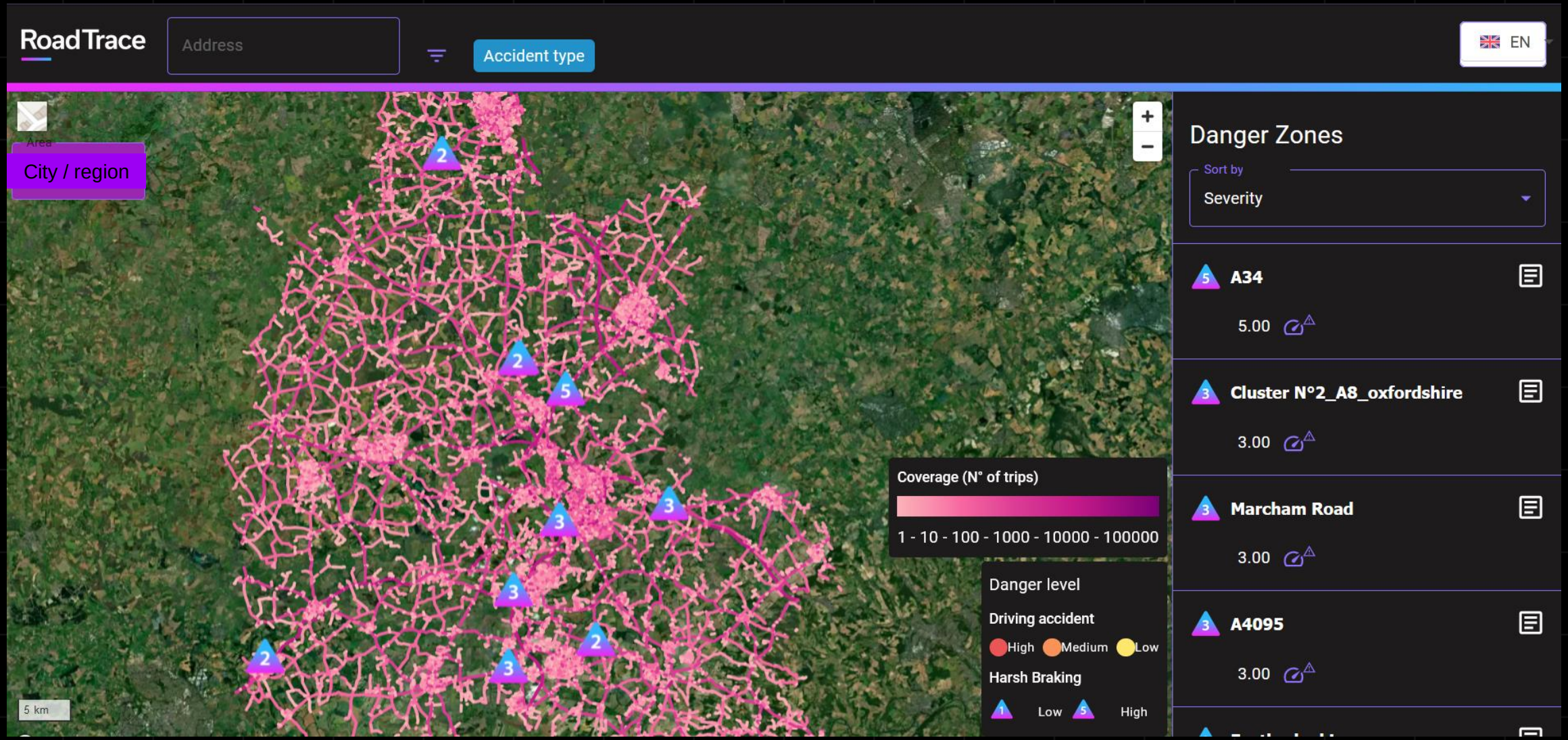
Example – Coverage & Safety Insights



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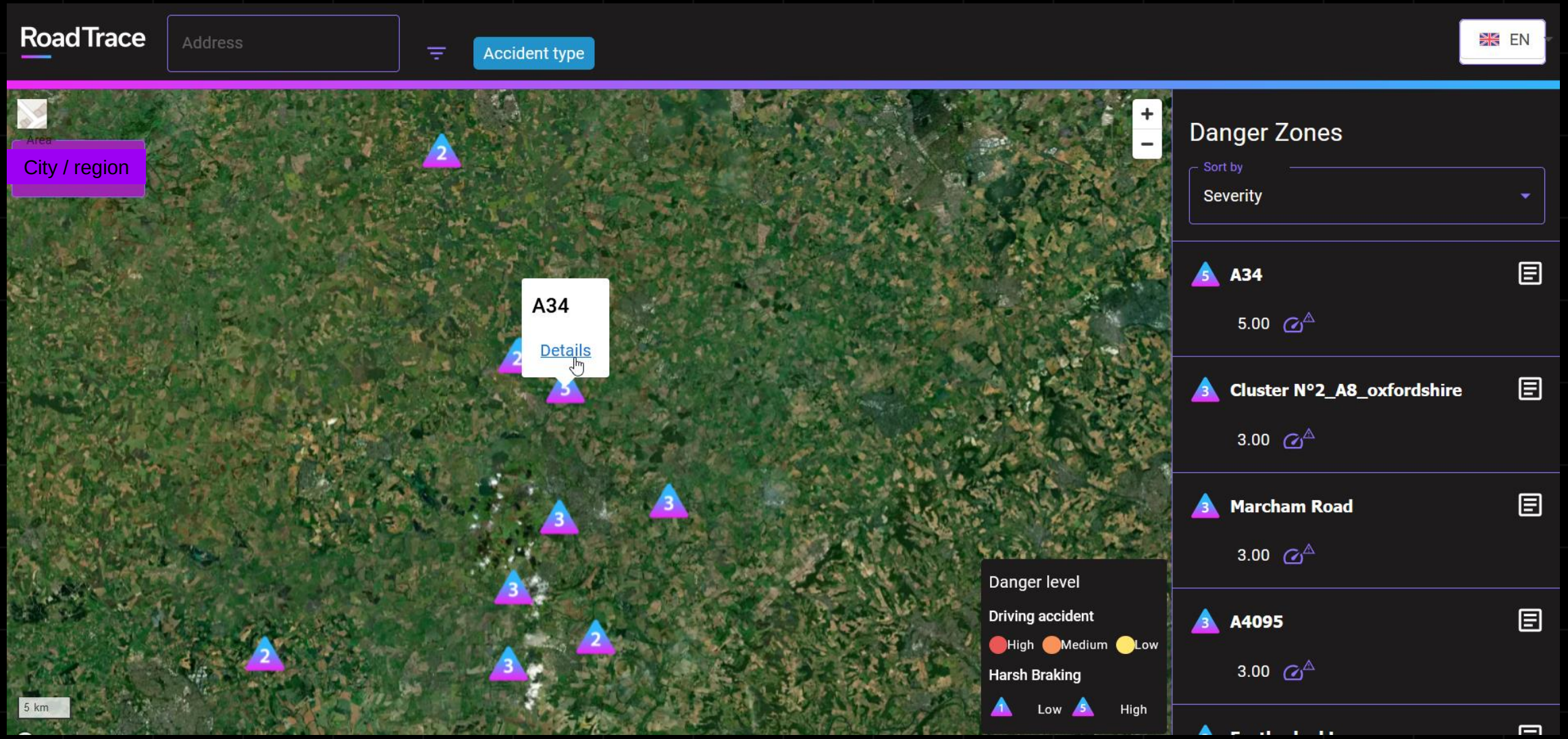
Safety insights – Most severe clusters only



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Safety Insights – Details and trend analysis

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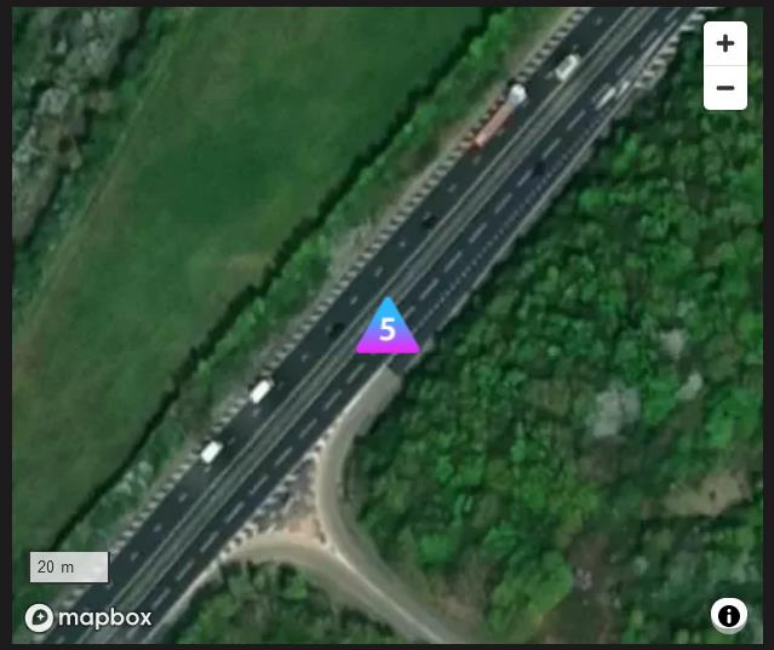
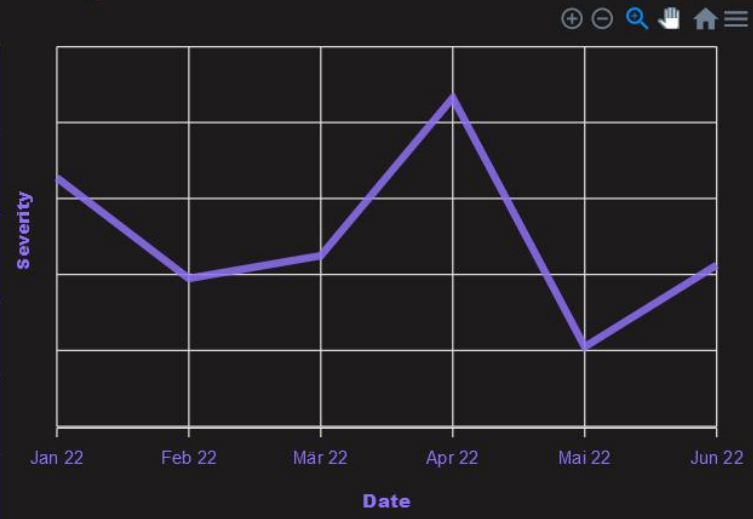


Context

Type of Context	Context of Events	Values
Weather	Rain (%)	2.15 %
	Fog (%)	7.53 %
	Snow (%)	0 %
Day of Week	Work day	84.95 %
	Week end	15.05 %

Danger



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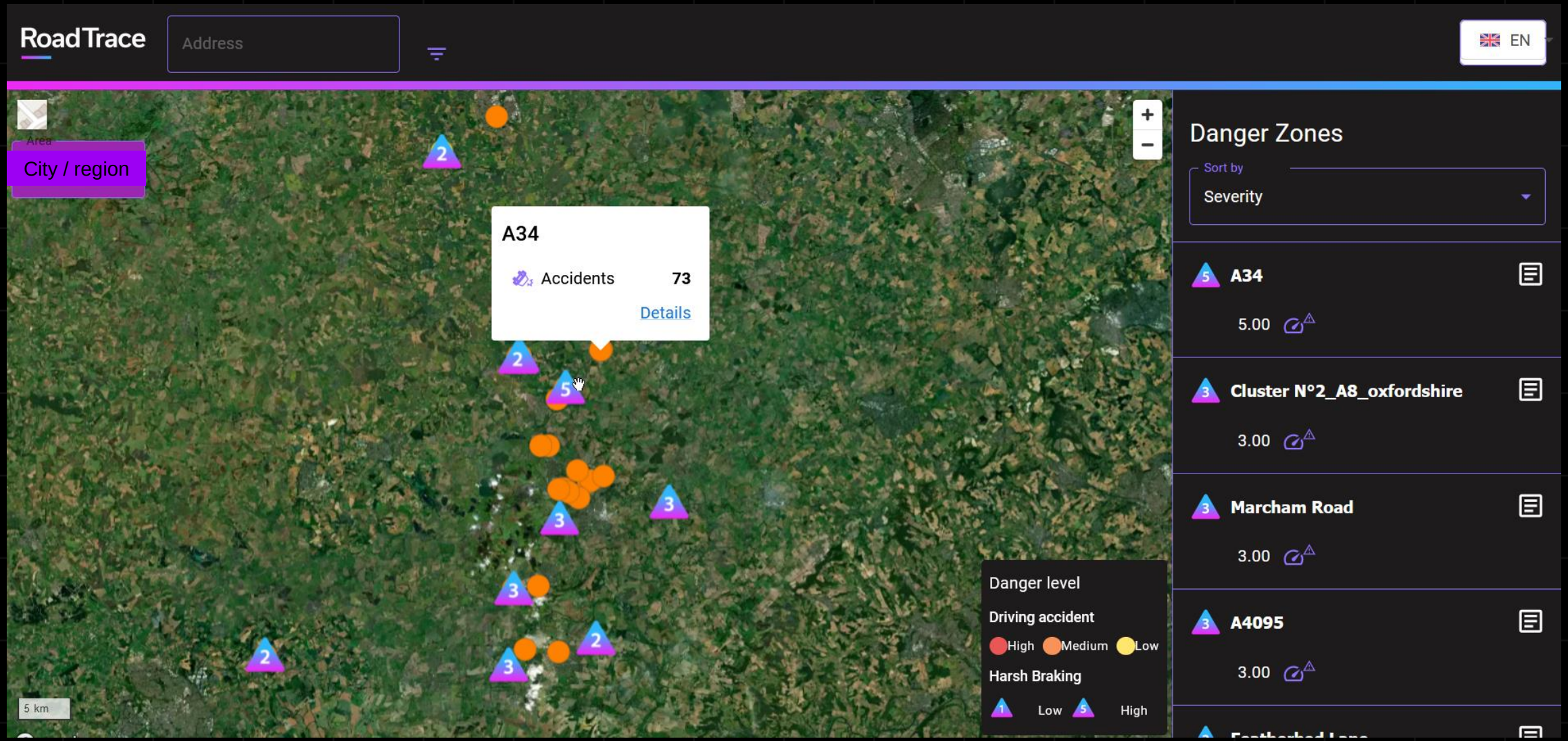
Integrate with other data streams (Stats19 / KSI)



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Safety Insights can be complemented by imagery

Severity: 5
Average Speed: 27,3 mph
Night: 0%
Weather: 17% Rain
Weekend: 0%

Repeated severe braking where road is damaged, before bend

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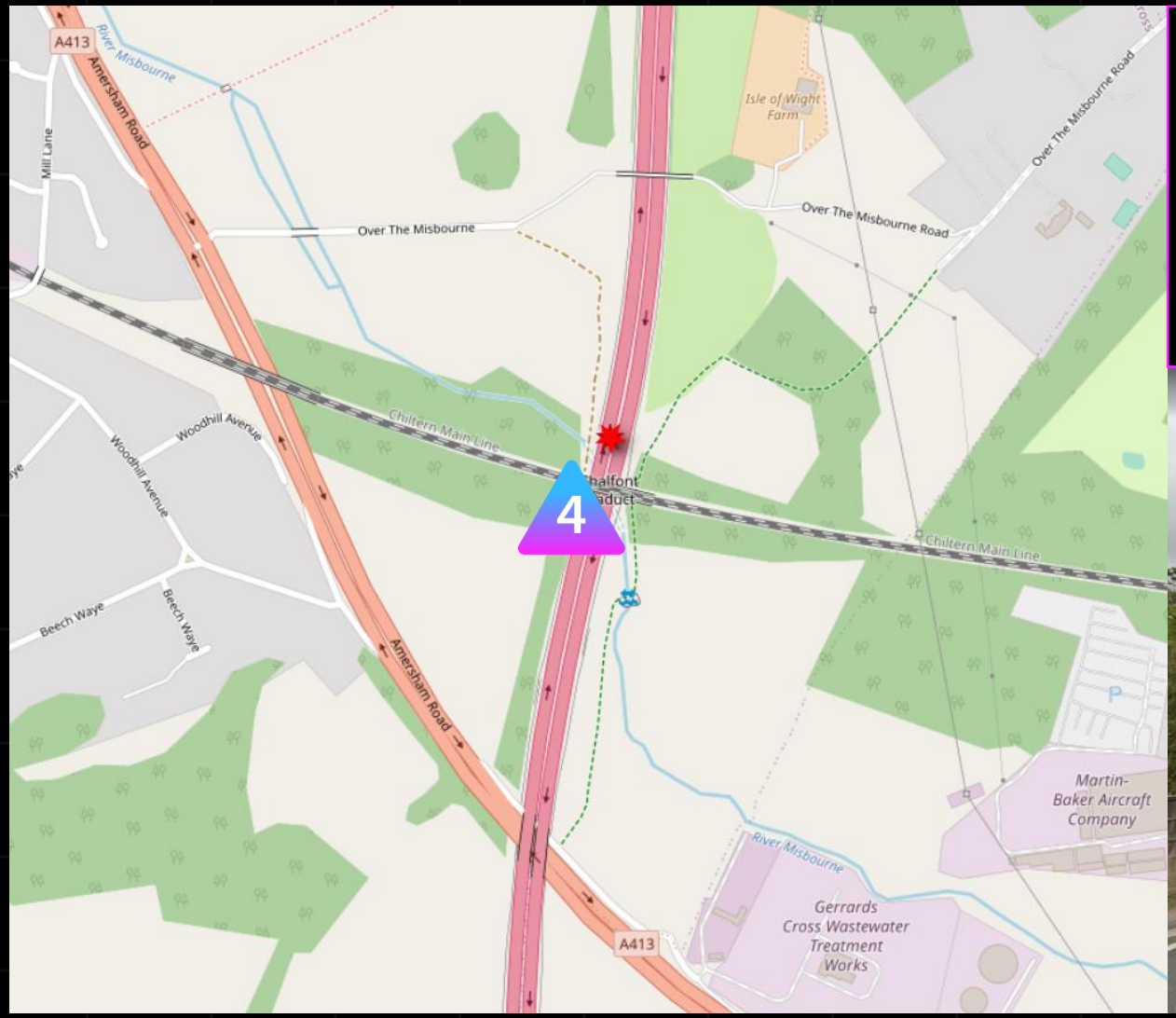
M25 Examples



Severity score : 4
Average start speed : 48mph
Average Delta speed : 24mph
Actual deceleration : 0.55g
Night : 12%
Rain : 11%

KSI cluster

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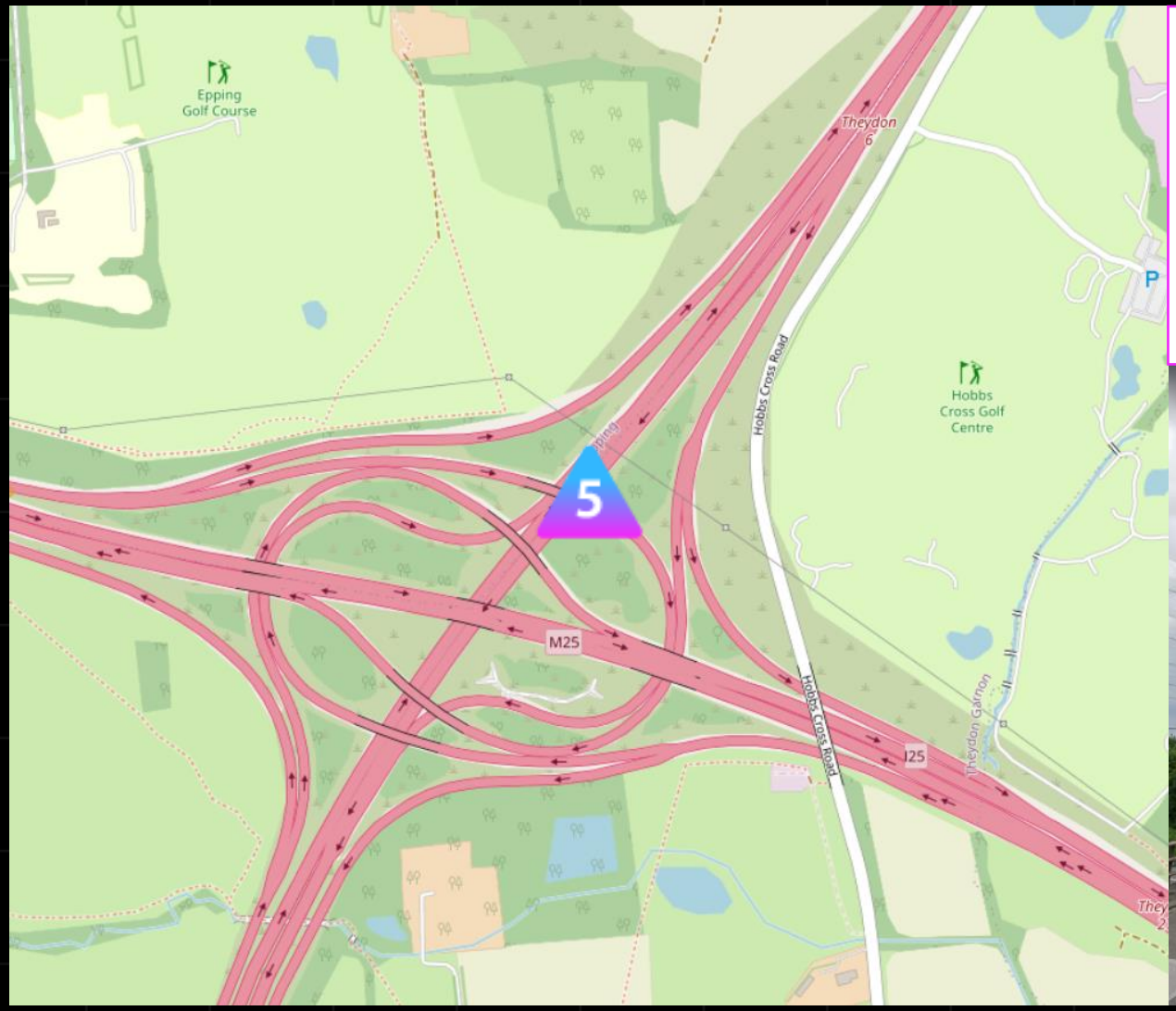
M25 Examples

Could entry speed be reduced and signage improved before tight corner?



Severity score : 5
Average start speed : 60mph
Average Delta speed : 14mph
Actual deceleration : 0.45g
Night : 14%
Rain : 8%

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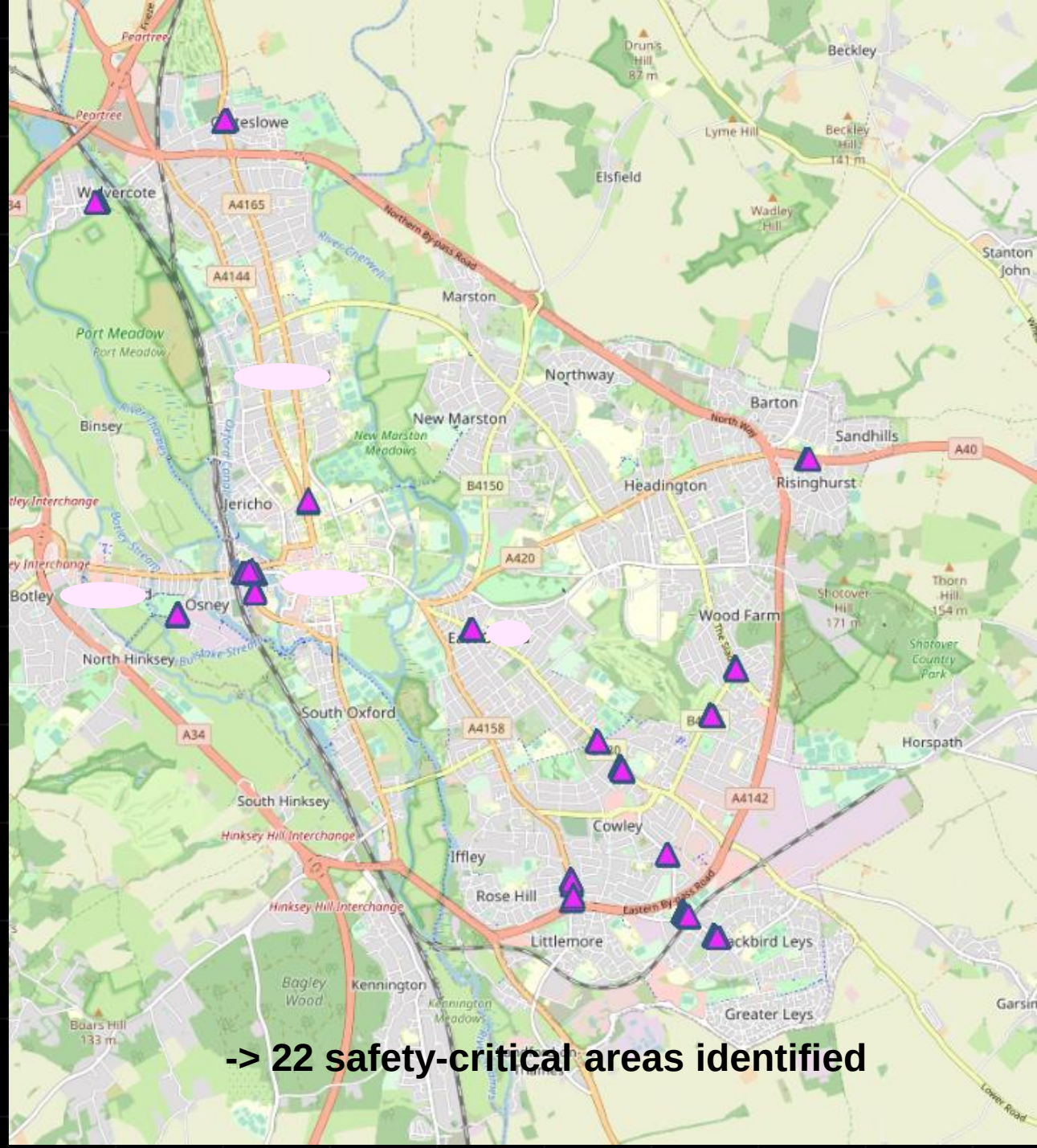
Urban Safety

- Specific ranking for areas with potential interaction of **vehicles with VRUs** :
  - Pedestrian crossings
  - Bike lanes/crossings
  - Bus/tram/taxi stops



-> 22 safety-critical areas identified

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Summary

An extra layer of intelligence:

- Spend public money where it will have greatest impact for road users
- Indicate where problem areas may be developing that they weren’t previously aware of
- Test the effects of new signage or road layout

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Conclusions

A new opportunity to contribute to the Safe System approach?

- Additional way of measuring safety
- Real impact on road users
- Integrate with existing measurements & surveys
- An informed risk-based approach
- Coverage of the whole network
- **Deliverable in 4 weeks**

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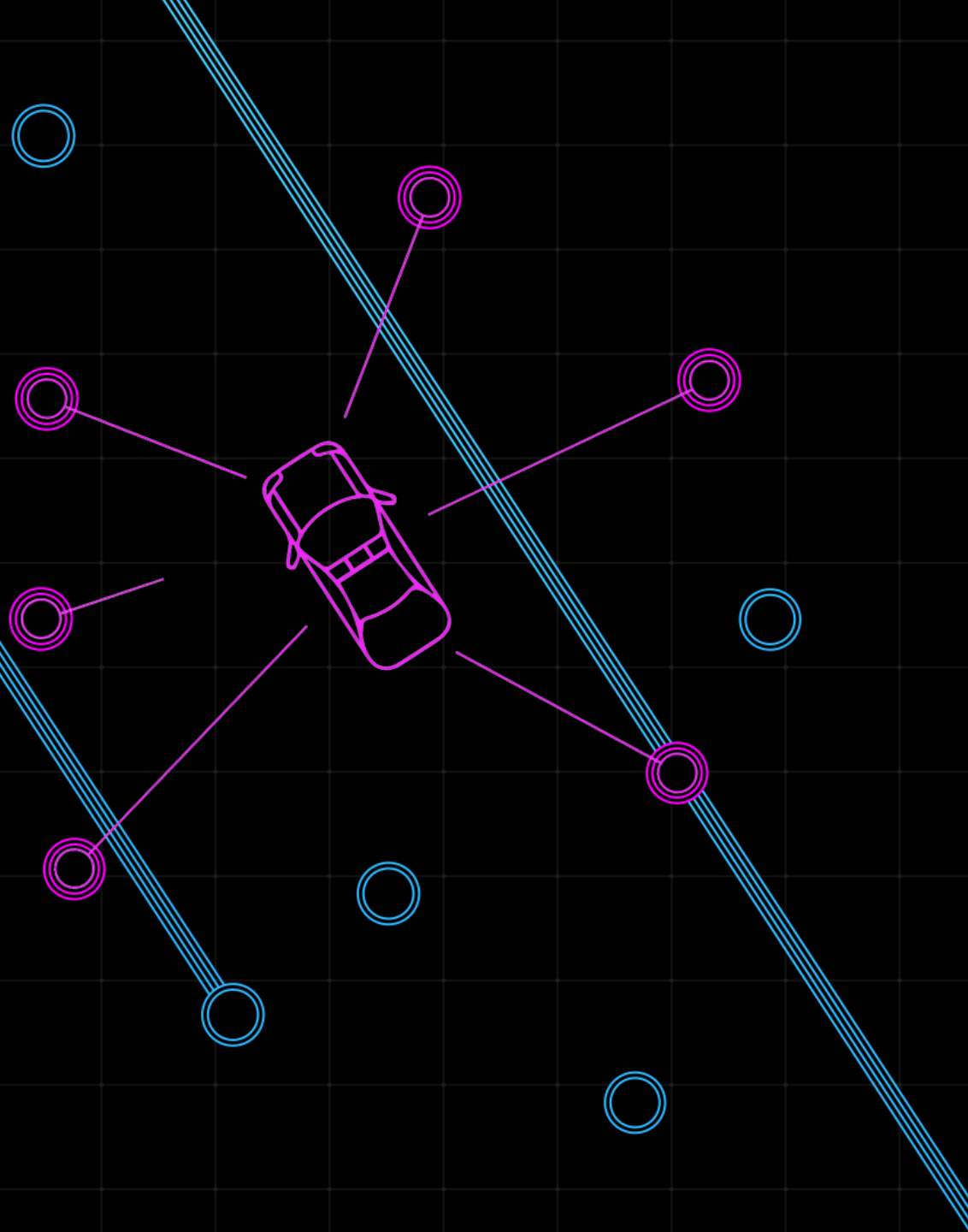
From **hindsight** to **foresight** in Road Safety



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