Road Safety Inspections: An Overview

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Comhairle Contae Ros Comáin
Roscommon County Council

Bonneagar Iompair Éireann
Transport Infrastructure Ireland

Road Safety Inspections (RSI's)

Why do we do undertake RSI's?

- The EU Directive on Road Infrastructure Safety Management requires periodic safety inspections to be completed by the competent entity on the trans-European road network.

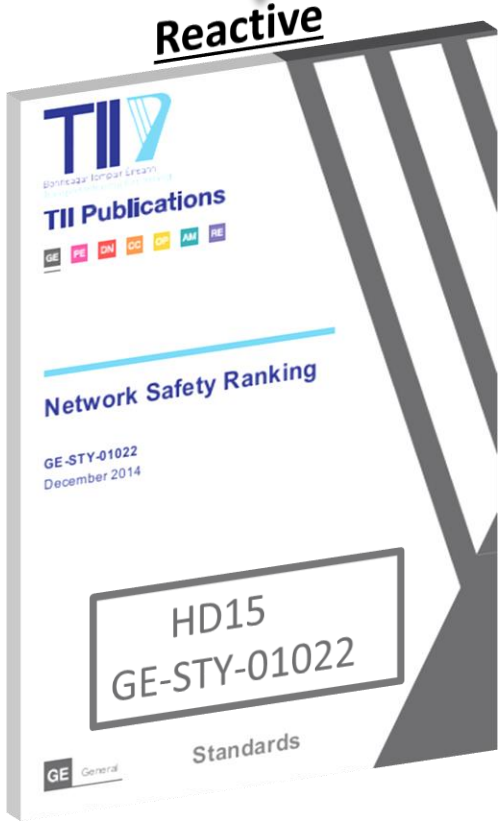
- Safety Inspections are defined as an ordinary periodical verification of the characteristics and defects that require maintenance work for reasons of safety.

- The EU RISM Directive was transposed into Irish Law by the European Communities Regulations 2011 (S.I. 472 of 2011).

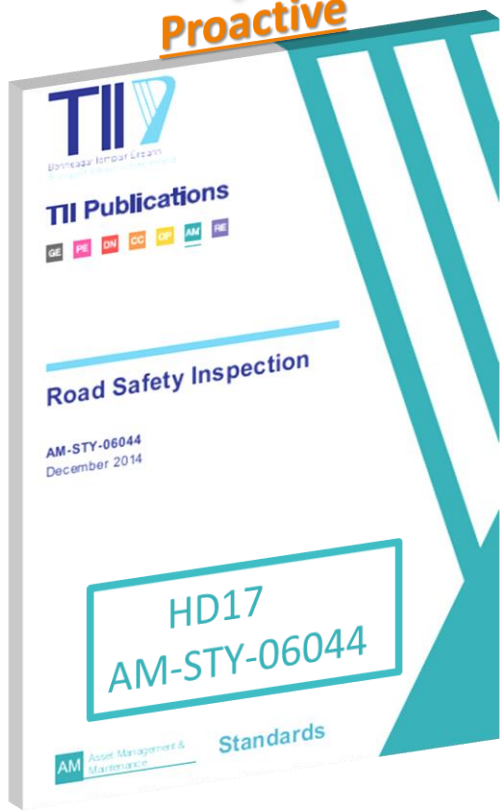
- Road Safety Inspection (RSI) is a safety procedure introduced by TII to comply with the above legislation.

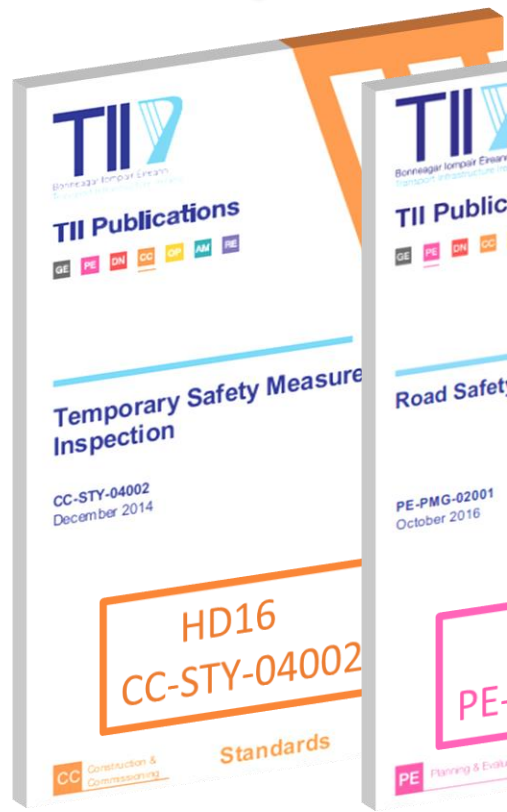
EU RISM Directive 2008/96/EC → EU → SI No. 472 of 2011 → IRL → Implementation body → TII

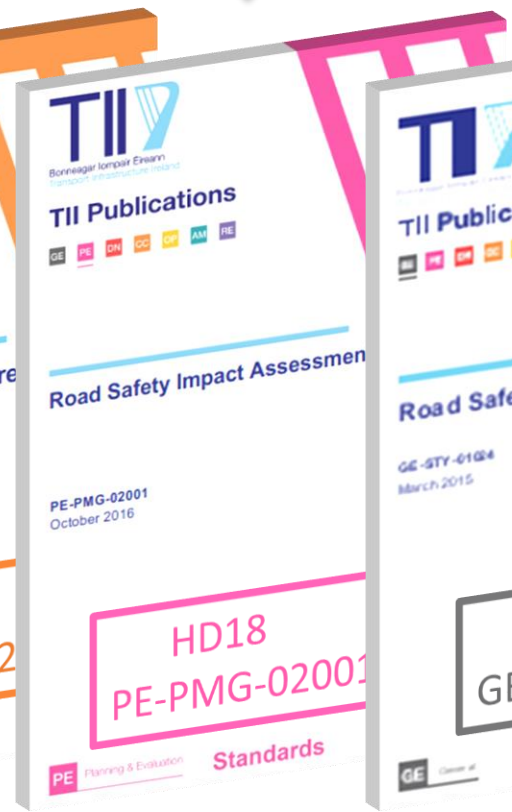
Reactive

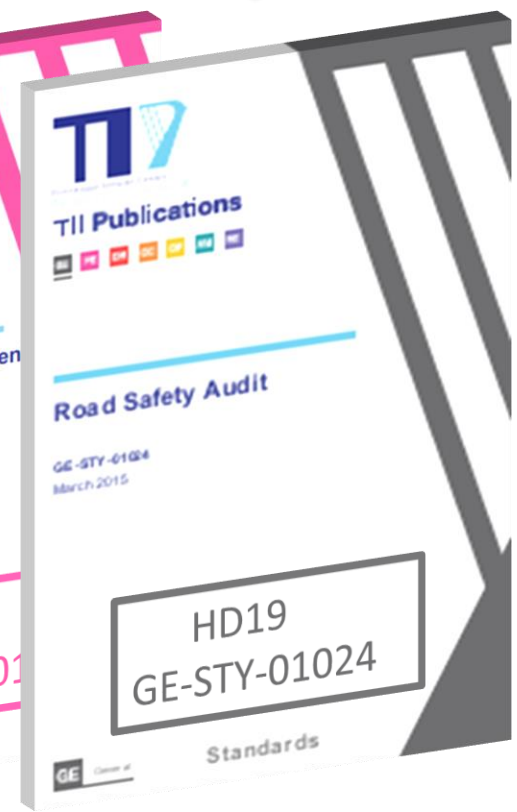


Proactive







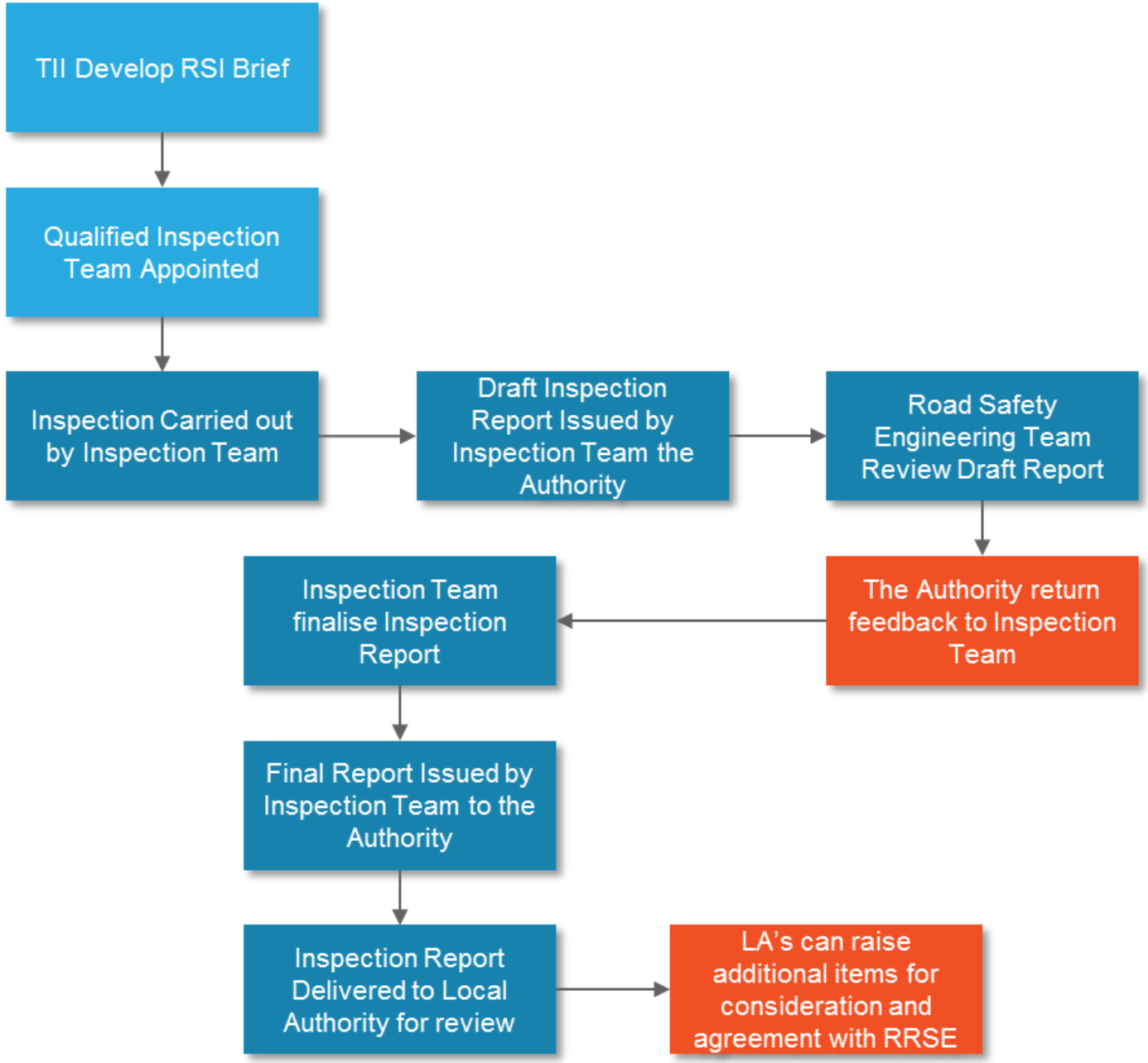


Road Safety Inspections.

What are Road Safety Inspections (RSI)?

- The primary purpose of RSI is to identify issues along the national road network that relate to road safety.
- RSI is a proactive approach to improving the safety of the existing national road network.
- The RSI requirements are described by the TII standard AM-STY-06044 (HD17). The process applies **to all National Roads**.

Road Safety Inspection Flow Chart



Road Safety Inspections are carried out by a qualified team consisting of a team leader and a team member.

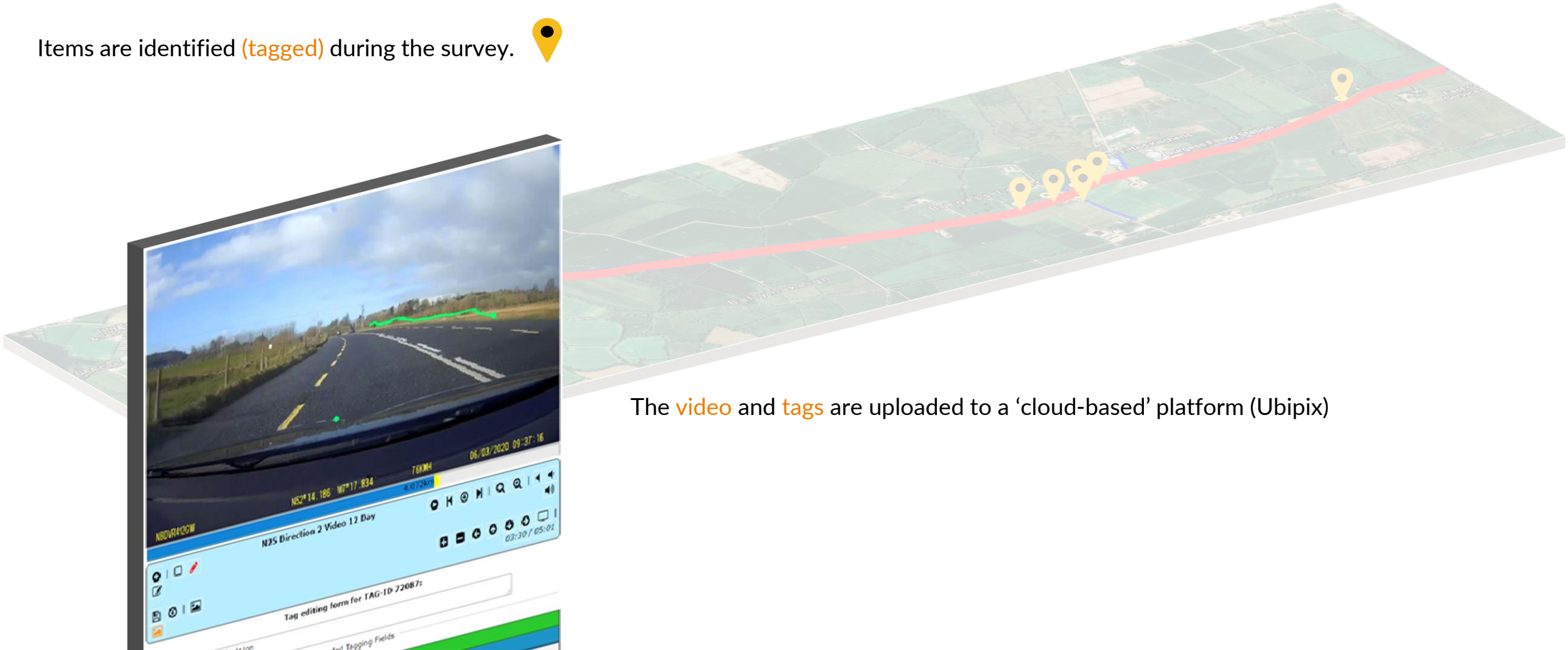
These are visual inspections. Video is collected during ‘drive-through’ surveys.

A team leader must be a chartered engineer, with recent experience in road safety audits and have a certificate of competence in road safety audits.

A team member must be an engineer with recent experience of road safety audits and have attended an accredited course in road safety audits.

Both directions of travel along the mainline are surveyed road during the hours of daylight and darkness using video, to identify any potential safety issues along the route.

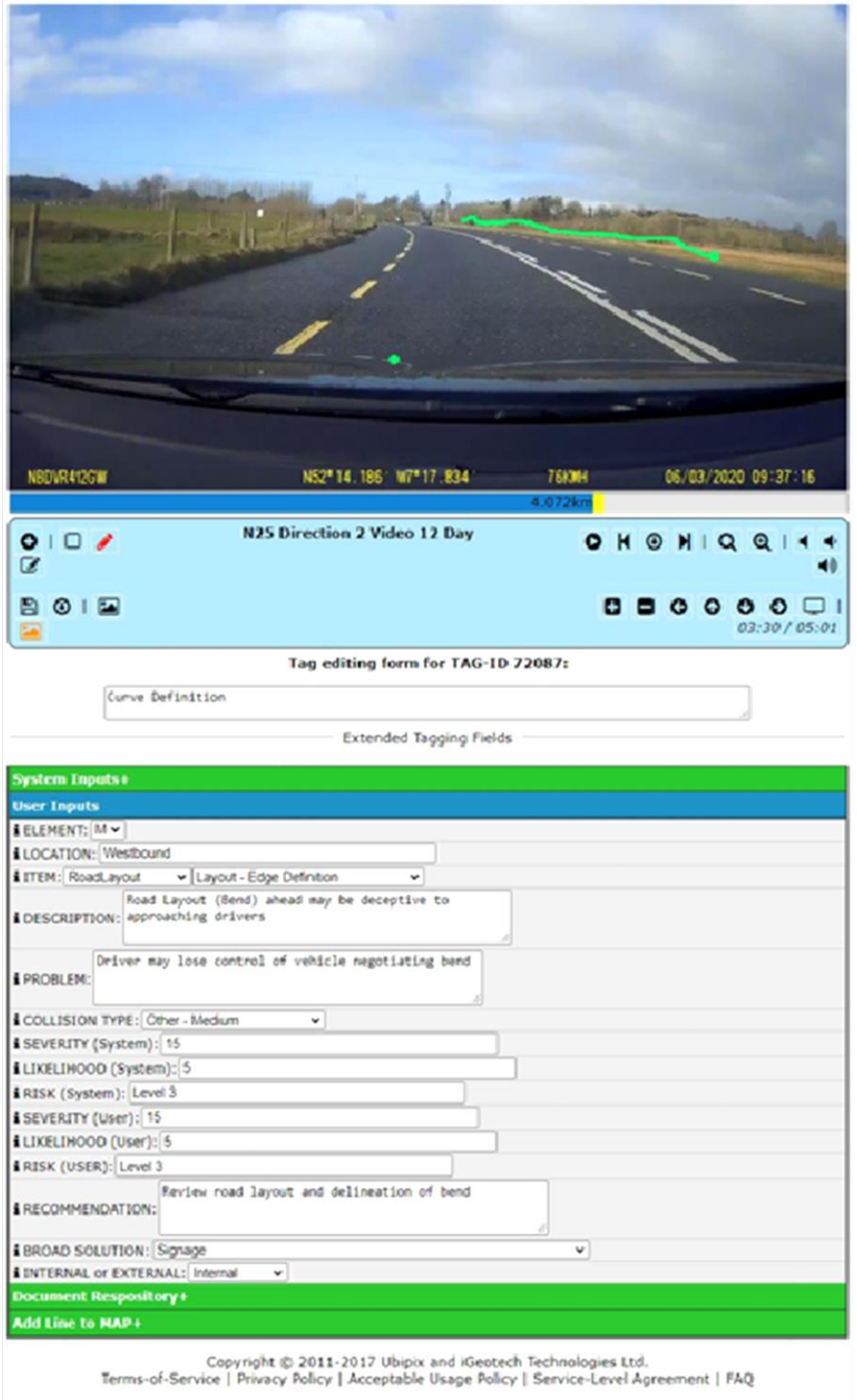
Items are identified (tagged) during the survey.



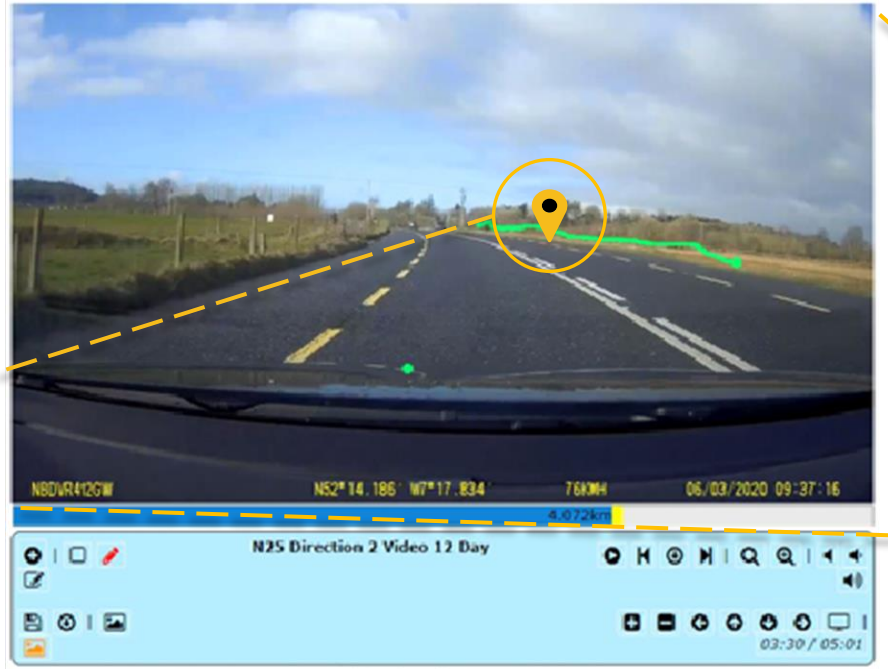
The video and tags are uploaded to a ‘cloud-based’ platform (Ubipix)

Tagged items, captured during the visual inspection, are reviewed as part of a desktop study and risk rated via the platform.

Focusing on items where a risk can be calculated limits the amount of data collected. All the attention is aimed at those road, and roadside items, that can be improved.



The platform makes use of a mobile app to tag items during the visual survey.



Video is recorded along with GPS.

Each tagged item can be attribute with information to help measure risk.

Tag editing form for TAG-ID 72087:

Curve Definition

Extended Tagging Fields

System Inputs+

User Inputs

ELEMENT: M

LOCATION: Westbound

ITEM: RoadLayout | Layout - Edge Definition

DESCRIPTION: Road Layout (Bend) ahead may be deceptive to approaching drivers

PROBLEM: Driver may lose control of vehicle negotiating bend

COLLISION TYPE: Other - Medium

SEVERITY (System): 15

LIKELIHOOD (System): 5

RISK (System): Level 3

SEVERITY (User): 15

LIKELIHOOD (User): 5

RISK (USER): Level 3

RECOMMENDATION: Review road layout and delineation of bend

BROAD SOLUTION: Signage

INTERNAL or EXTERNAL: Internal

Document Respository+

Add Line to MAP+

A measure of risk can be made by looking into the consequence of an event and also the likelihood that event will occur.

Likelihood X Consequence = Risk

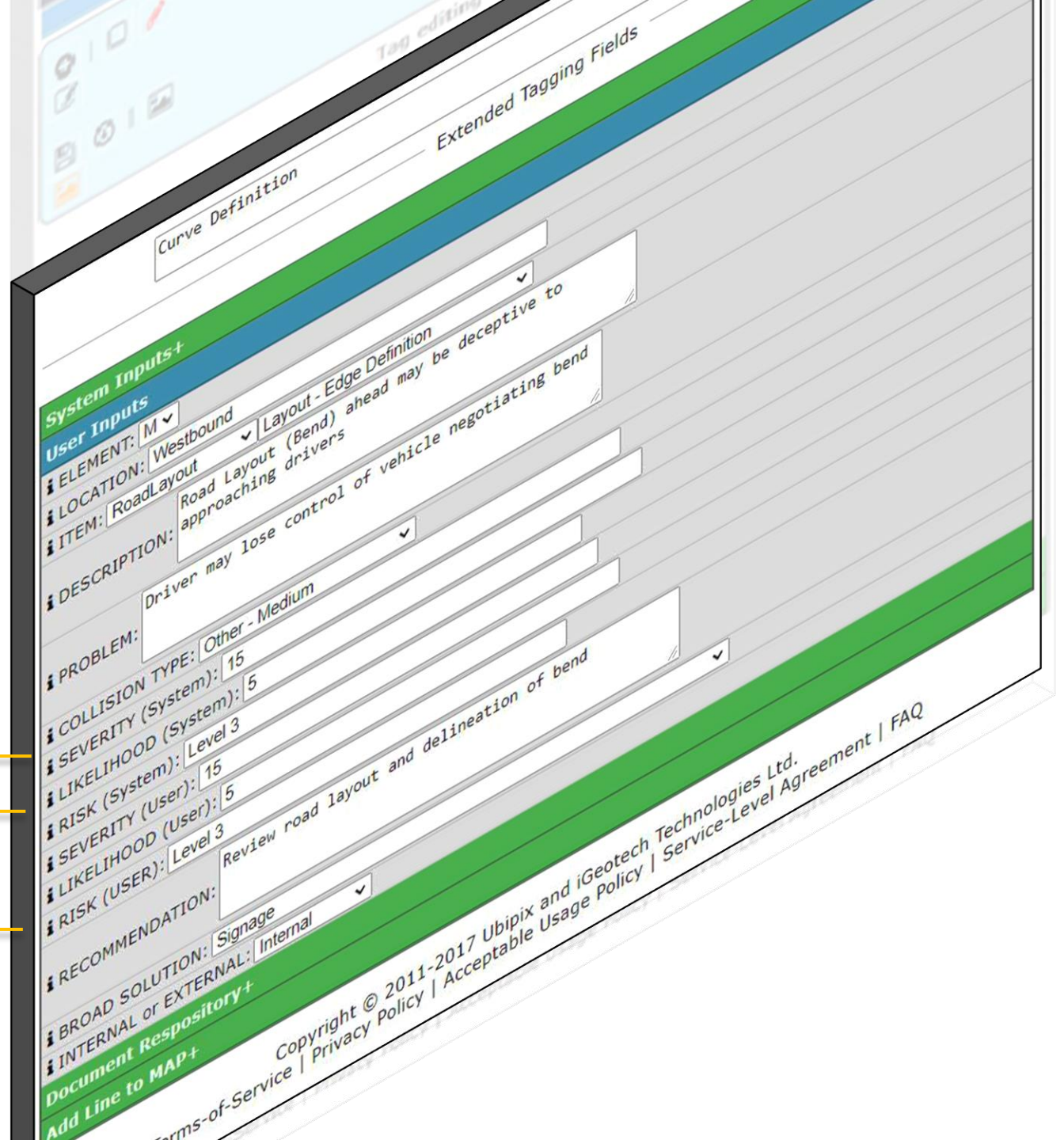
The different ratios of injury collision to material damage collisions are a proxy for the collision severity or consequence.

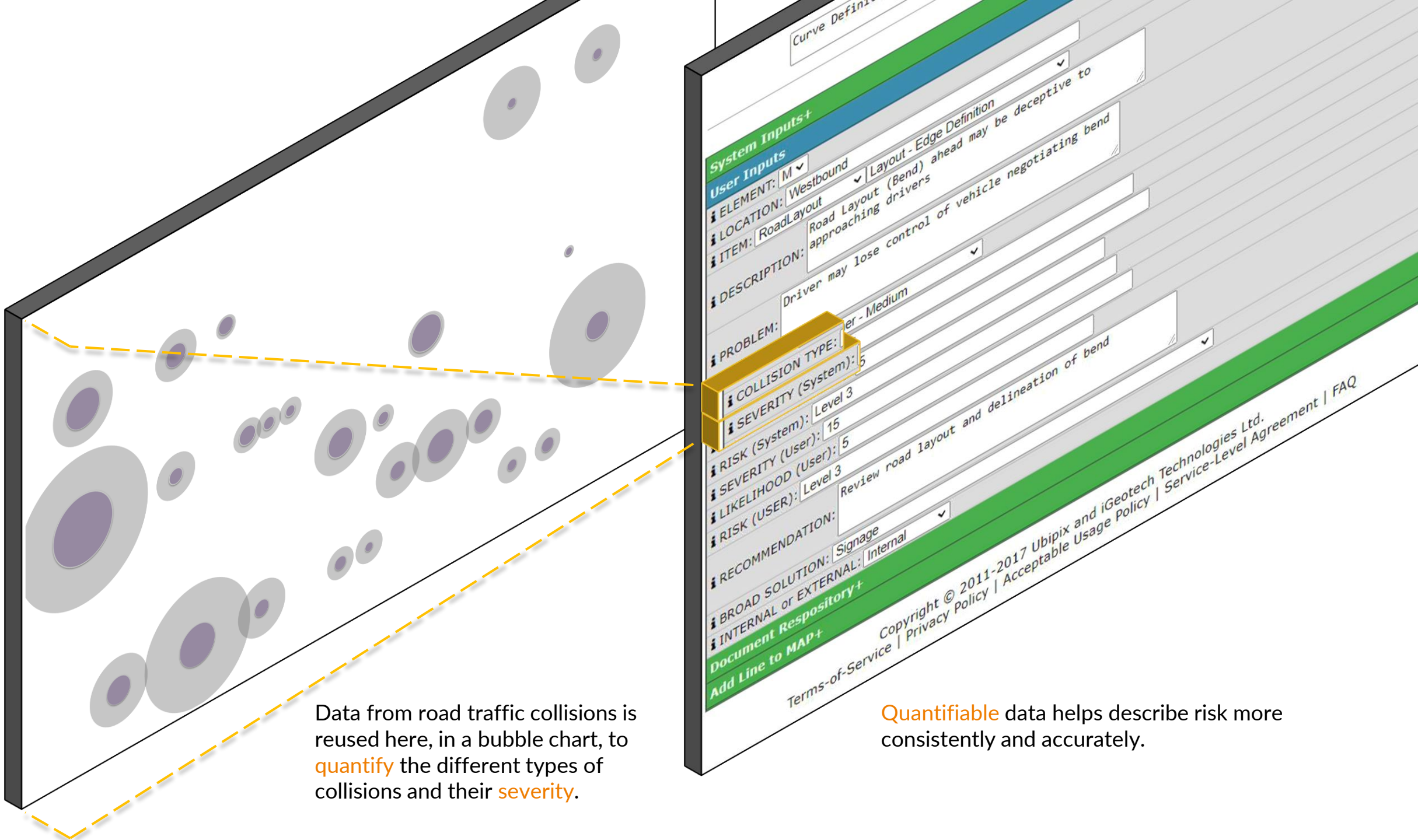
Values for the likelihood are estimated from some static road geometry elements.

The survey teams can, if appropriate, override the ‘default’ values that establish the final risk.

A measure of risk can be made by looking into the consequence of an event and also the likelihood that event will occur.

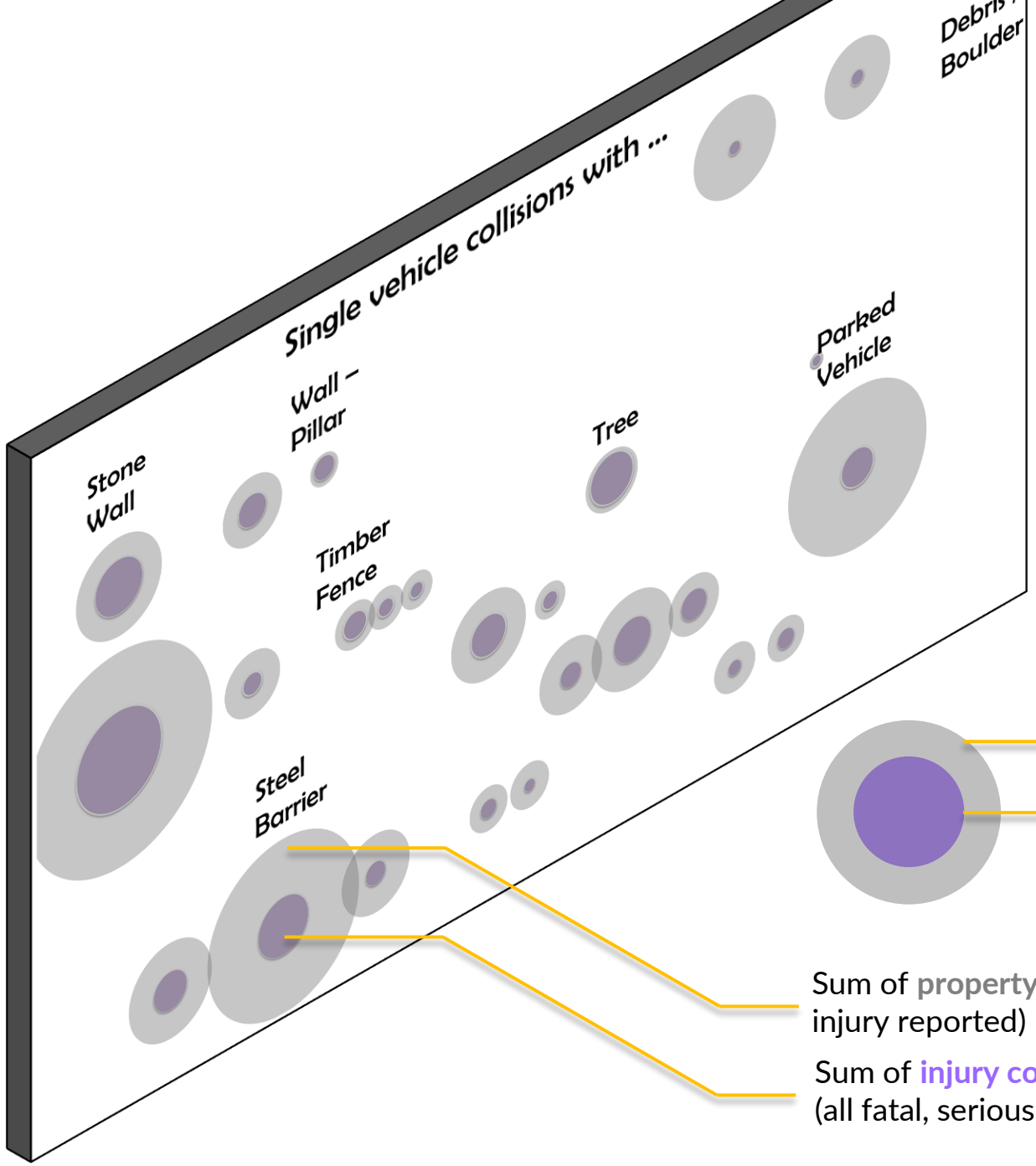
Likelihood X Consequence = Risk





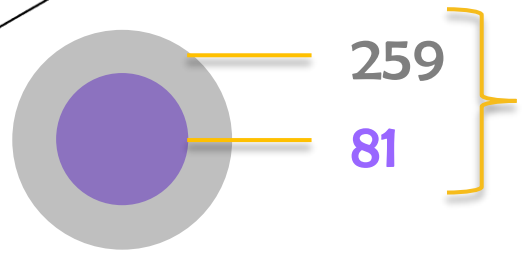
Data from road traffic collisions is reused here, in a bubble chart, to quantify the different types of collisions and their severity.

Quantifiable data helps describe risk more consistently and accurately.



Quantifiable data helps describe risk more consistently and accurately.

This bubble chart shows different ratios of injury collision to material damage collisions. The area of each bubble represents a count (sum) of different types of collisions reported on the national road network. This data is then used as a proxy for the collision severity or consequence.



259

81

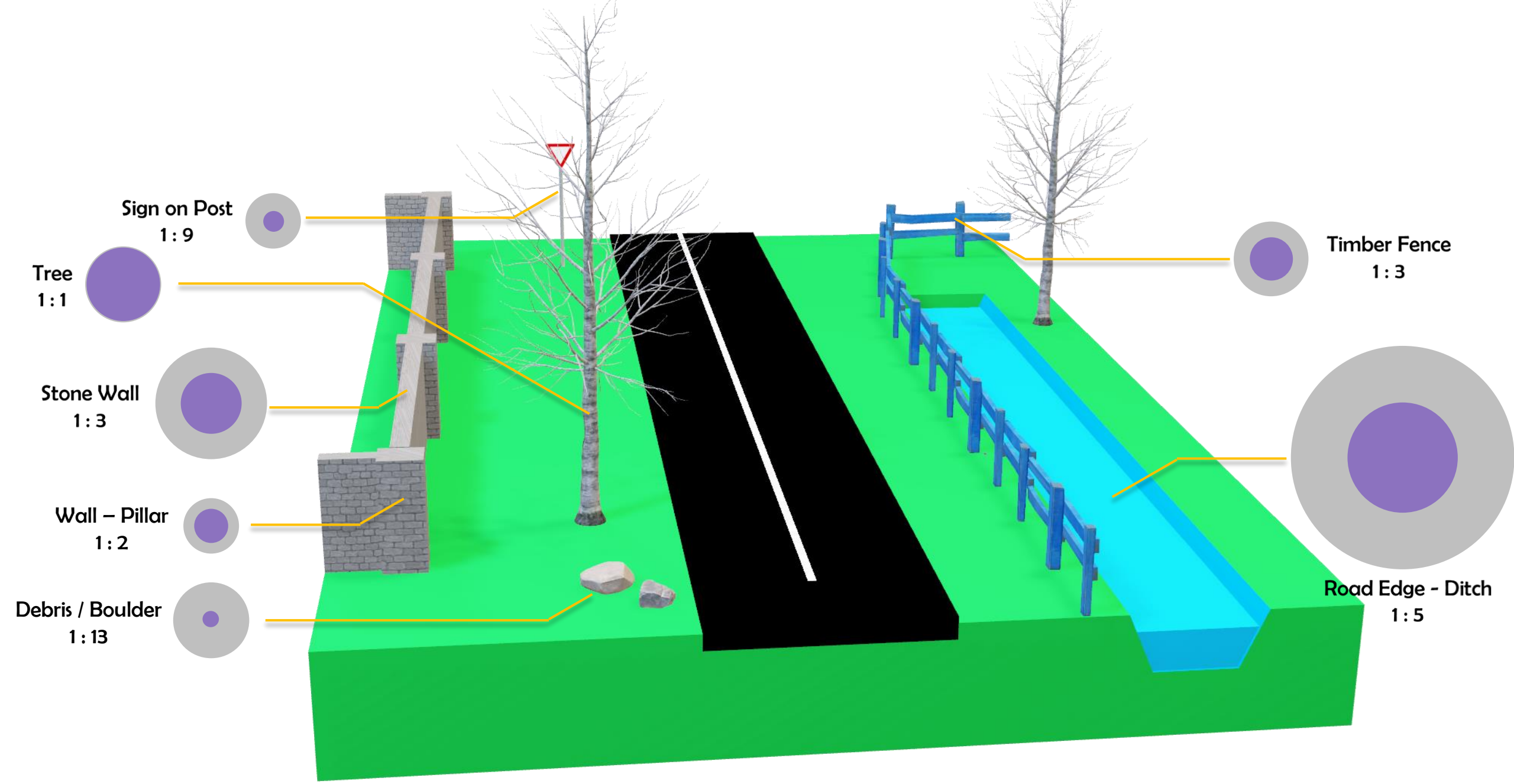
1 : 3

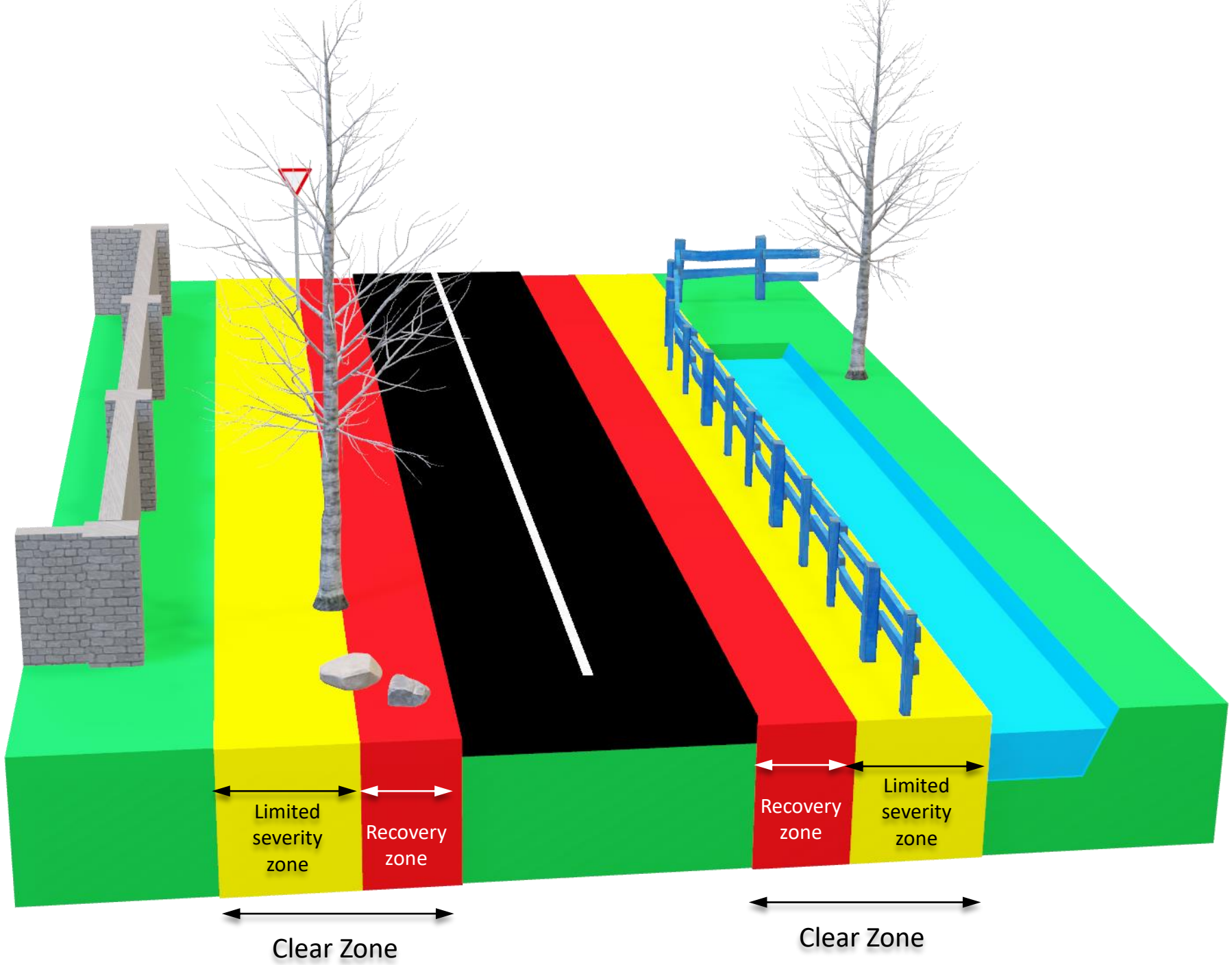
For every one injury collision with a 'stone wall', three others result in property damage only*

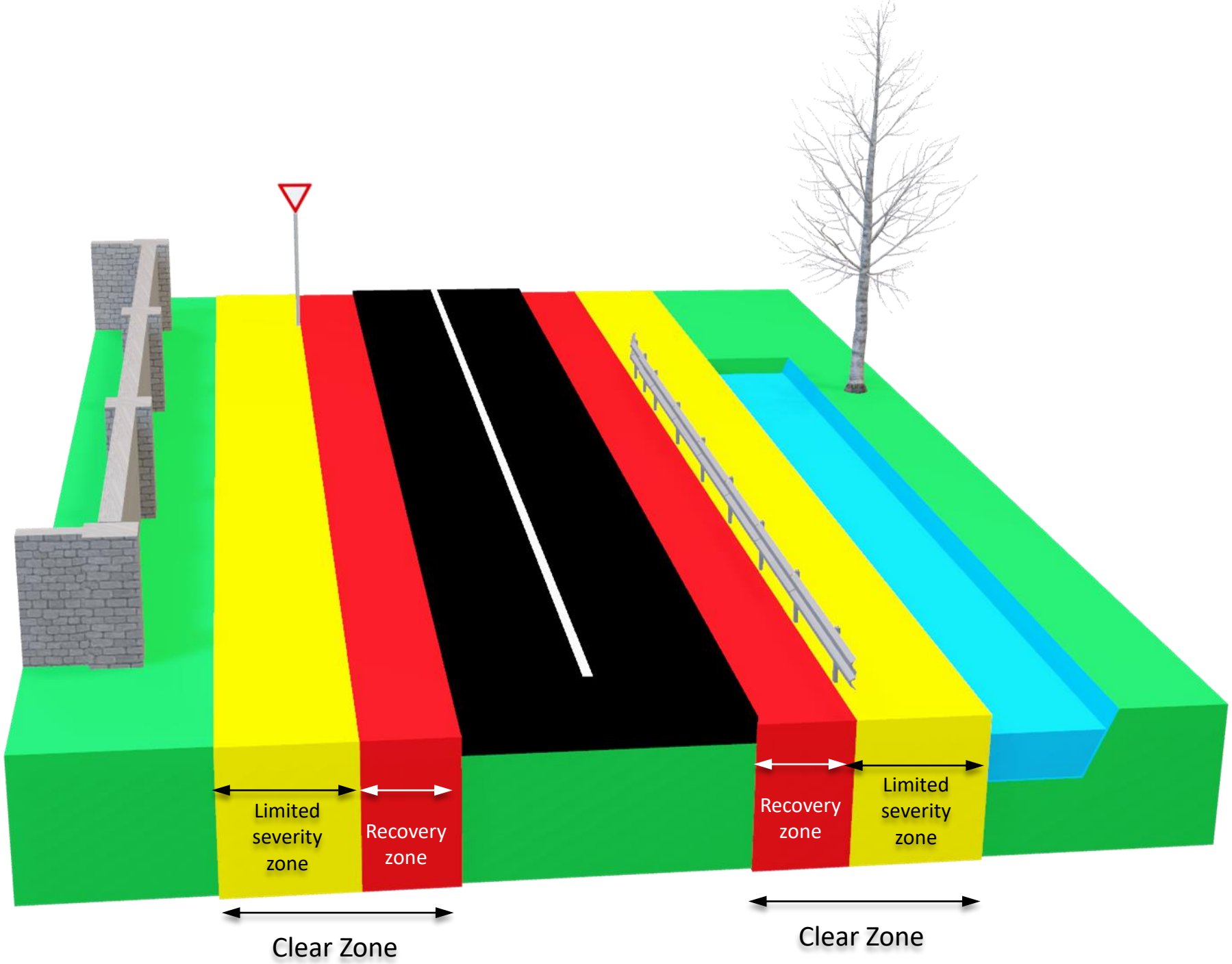
Sum of **property damage only collisions** (no injury reported)

Sum of **injury collisions** (all fatal, serious and non-serious collisions)

* Data collected from 2016 to 2018 on Irelands national roads. Not adjusted for underreporting. More PDO collisions go underreported than injury collisions.


Sign on Post
1 : 9
Tree
1 : 1
Stone Wall
1 : 3
Wall – Pillar
1 : 2
Debris / Boulder
1 : 13
Timber Fence
1 : 3
Road Edge - Ditch
1 : 5


Limited severity zone
Recovery zone
Clear Zone
Recovery zone
Limited severity zone
Clear Zone


Limited severity zone
Recovery zone
Clear Zone
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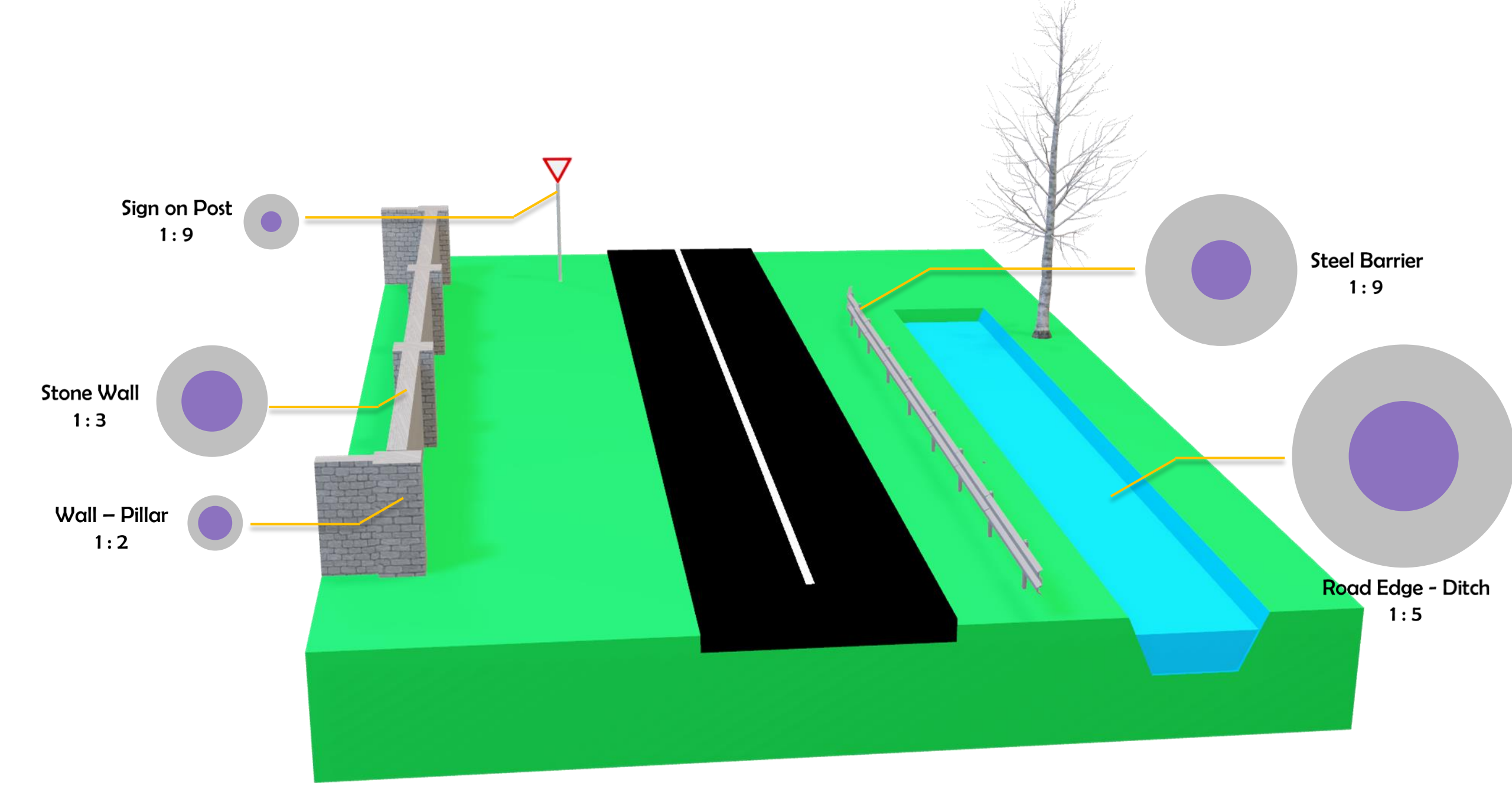
Clear Zone


Sign on Post
1 : 9
Steel Barrier
1 : 9
Stone Wall
1 : 3
Wall – Pillar
1 : 2
Road Edge - Ditch
1 : 5

Current Programme

Within the existing budgets both high and medium risk items will be further investigated and a mitigation programme undertaken.

In 2020/21, a quarter of the road safety budget has been spent reducing risk identified from the RSI programme.

Future Programme

In an effective programme, risk will be reduced over time. Consequently, fewer deaths and serious injuries will occur from road traffic collisions.

This will be observed in the data as:

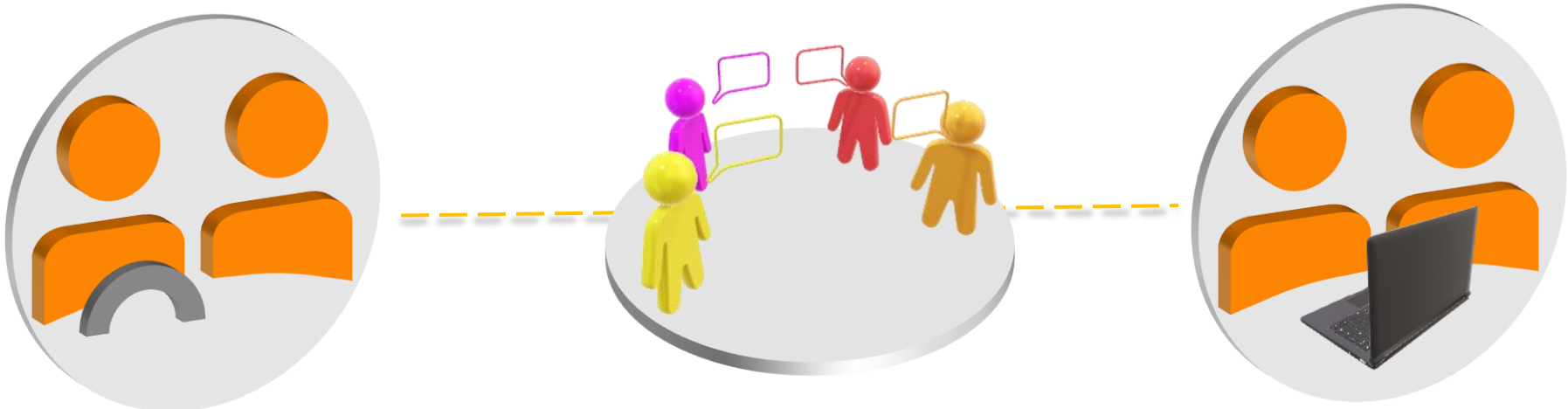
a) The fewer items identified, tagged and risk rated.

b) Remaining road and roadside items will be mitigated to such an extent that they contribute only a low risk to the road user in the event of future collisions.

c) Future analysis of collision counts will observe fewer fatal and serious injuries, post implementation of mitigation measures.

Observation & Experiences with Road Safety Inspections . People, tools & data needed for a proactive road safety programme:

- The current framework used by TII, to acquire services and expertise, was used for RSI.
- Some additional training, mainly via workshops, was required. Regular workshops are held (at least two annually) to maintain focus and share experiences.
- Consider the different phases of the RSI process and select teams with a mix of experience and expertise. Some of the RSI team have experience in road safety audits. Other team members will have experience in data managements and analysis.



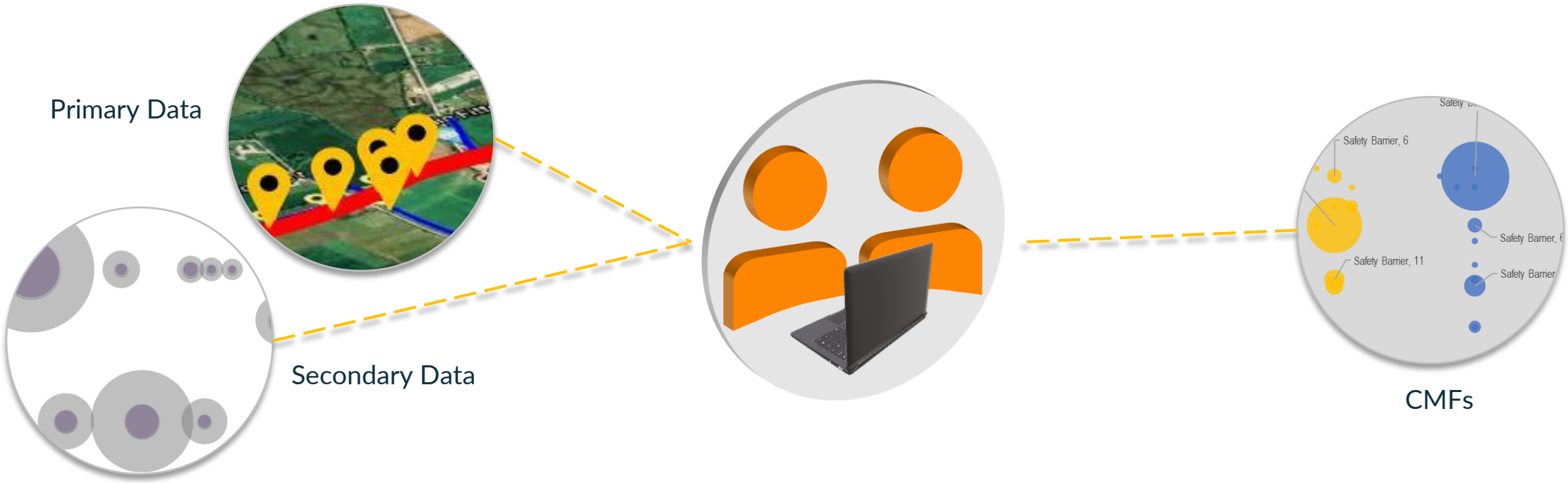
Observation & Experiences with Road Safety Inspections . People, tools & data needed for a proactive road safety programme:

- Through contact via CEDR research TII had the experience of working with new and innovative tools such as the Ubipix platform.

- Subsequent RSI will yield more data. Comparing old and new RSI data, after interventions have been implemented, we might expect to see;
  I. fewer items identified overall
  II. or a similar amount but with a lower risk ratings.

Observation & Experiences with Road Safety Inspections . People, tools & data needed for a proactive road safety programme:

- Data collected, on site, for a specific purpose (primary: geo-locating roadside hazards) and the reuse of existing data sources (secondary: collision data as a proxy for the likely consequence) can be put to good use for RSIs. Be aware of their limitations e.g. spatial accuracy.
- Post the RSI inspection survey, invest time and resources in people comfortable working with large data,. This will ensure the information collected and processed will be available further down the line e.g. prioritizing interventions, KPIs for subsequent RSI rounds, etc.



Example of RSI Projects.

Before RSI Works

RSI Issue identified: dropped kerbs were not provided at the entrance.

Example of RSI Projects.

After RSI Works

Works Implemented:

VRU given priority at the crossing. Use of different materials highlighted the footpath to drivers entering and exiting.

Including an upgrade of 300m of footpath .

Example of RSI Projects.

Before RSI Works

RSI issue identified:

ESB pole adjacent to carriageway .

Other hazards at location also: mature trees, concrete post and rail fence (route wide issue) & Ramped terminal end on the existing barrier.

Example of RSI Projects.

After RSI Works

Works implemented:

The ESB pole was set back to the existing boundary.

The existing VRS was extended to provide protection to the pole and mature trees and a compliant terminal was installed .

The concrete post and rail fence was removed and replaced with a timber post and tensioned mesh fence.

Example of RSI Projects.

Before RSI Works

RSI issue identified:

Inadequate sight distance from junction.

Location of side road junction unclear to a driver on the mainline approach.

Example of RSI Projects.

After RSI Works

Works implemented:

Tree and vegetation removal .

Regrading of the verge and removal of the VRS.

Thank You!

Comhairle Contae
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County Council

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Transport Infrastructure Ireland