





IP in innovative digital safety solutions at Infrabel

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- Geneva
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1. Who is Infrabel?
 2. The Safer Works program
 3. Digitalization of the ballast
examples and how IP-rights are handled
 4. Conclusion: IP-rights are assets
It's important to manage them
- 

1. Who is Infrabel?



INFRABEL



We build, maintain and modernize the Belgian railway infrastructure



We direct all the trains that run on the Belgian rail network

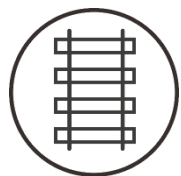
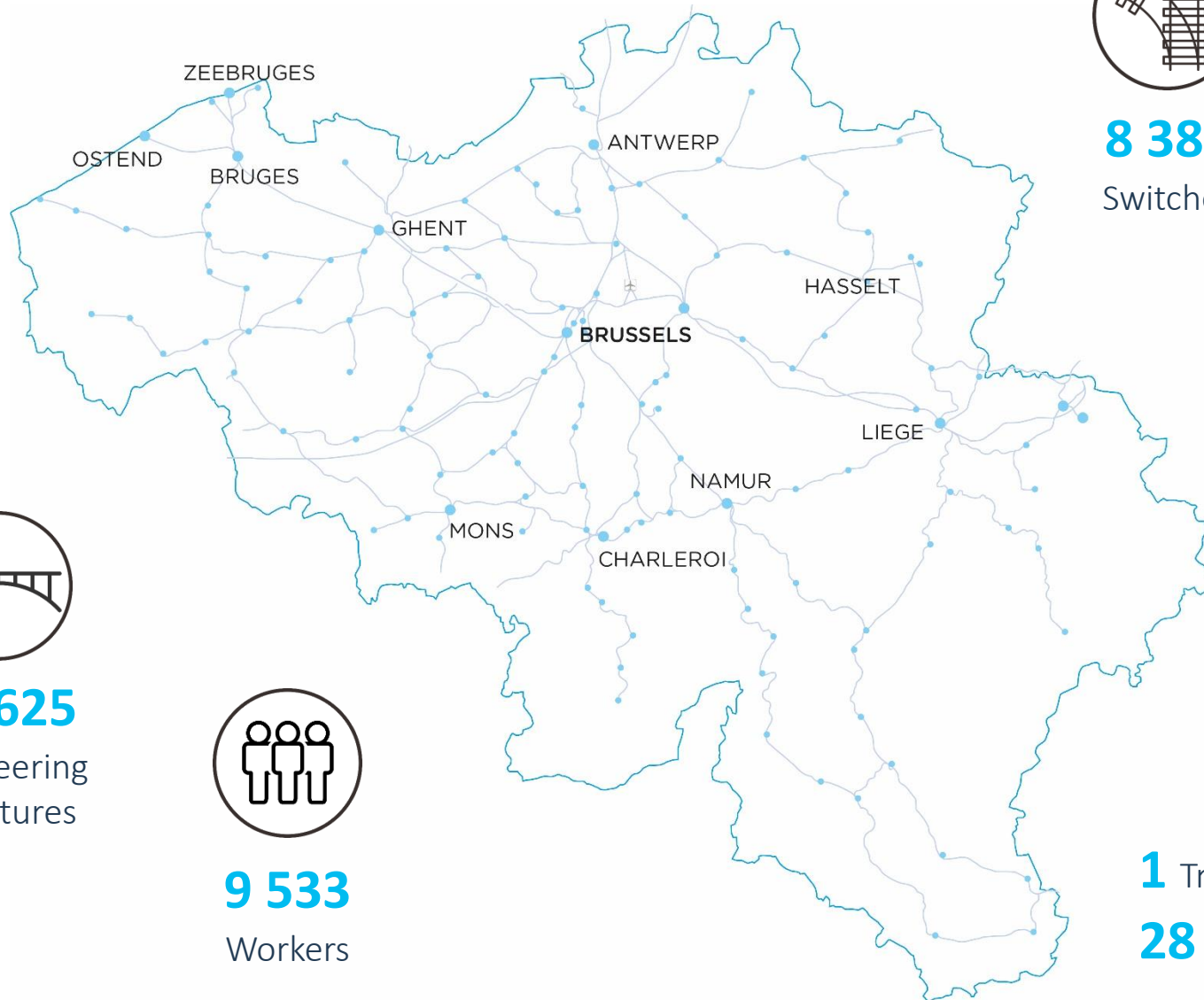
Infrabel wants to make **rail the preferred choice** for passengers and freight transport companies

Infrabel invests approximately **€1 billion annually** to manage, renovate and develop the Belgian railway infrastructure

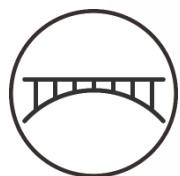
As a driver of sustainable mobility, **Infrabel works 24 hours a day, 7 days a week**, to guarantee a safe and reliable rail network



Key Figures



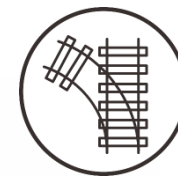
6 534 km
Main Tracks



11 625
Engineering Structures



9 533
Workers



8 382
Switches



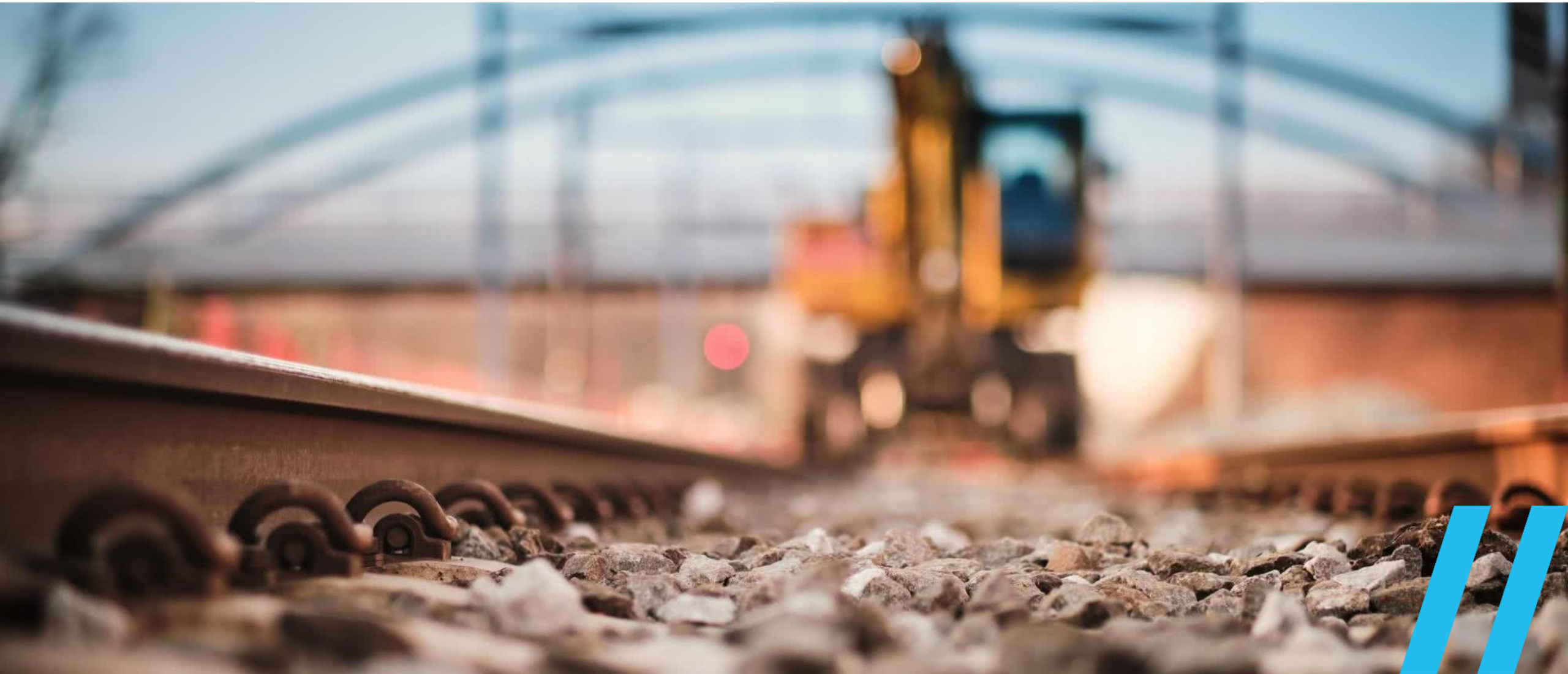
1 650
Level Crossings



1 Traffic Control &
28 Signalisation box



2. The Safer Works program



The Safer Works program

// Safer-W

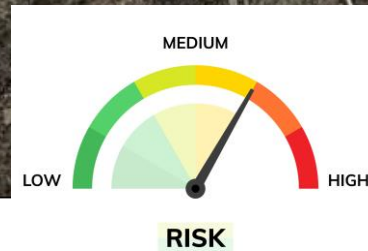
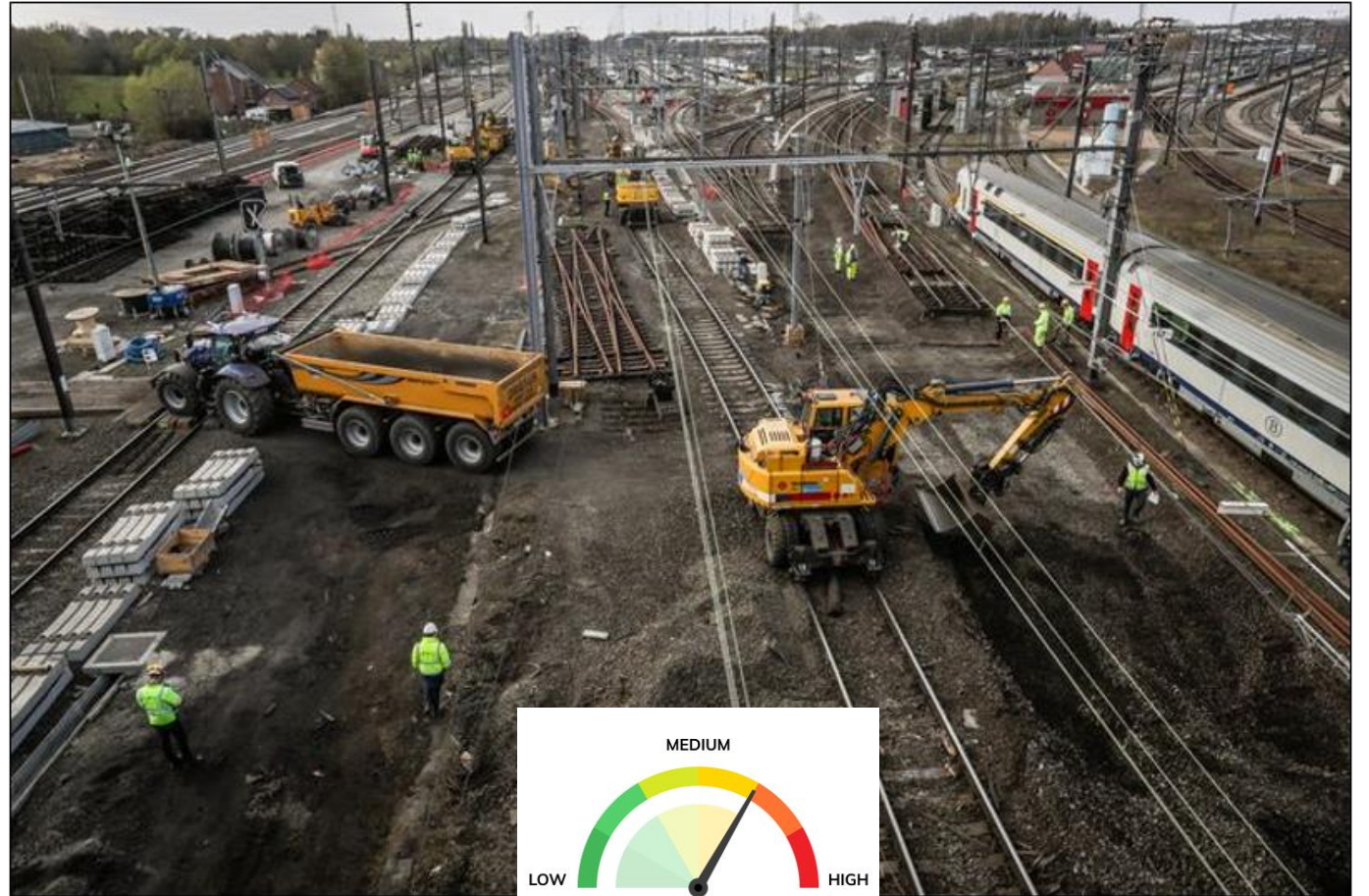
Worker



Machinery

Train

Risky business



The Safer Works program

// Safer-W



Project portfolio

ATW-Tx
CMB
Virtual Fencing

ATWS
!nfrSPAD
InfrAlert

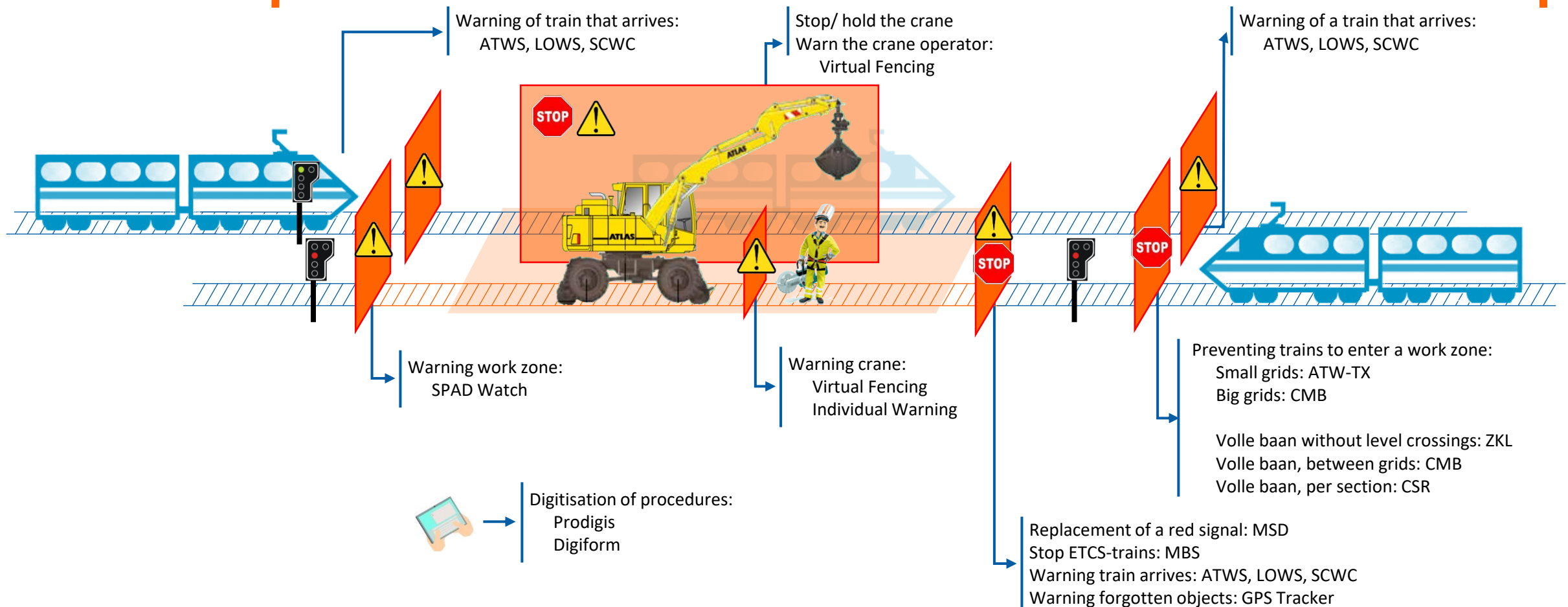
Prodigis
Mobile Safety Door
Safety Protection Integrator

...

The broader and ultimate perspective

More adequate safety tools by using digitalization

SPI - Safety Protection Integrator (umbrella platform)



3. Digitalization of the ballast examples and how IP-rights are handled



1

Digitalization InfraSPAD

Inhouse
Development

// Safer-W



Several business requests integrated in a mobile application

#1

to help preventing SPAD's

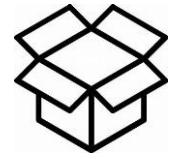
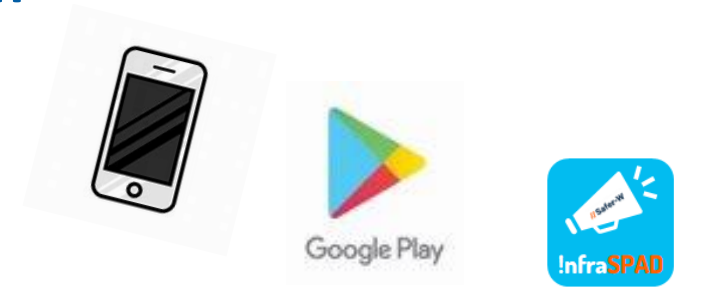
#2

to manage red panels

#3

REALITY
not as on
PLAN

to send quick feedback

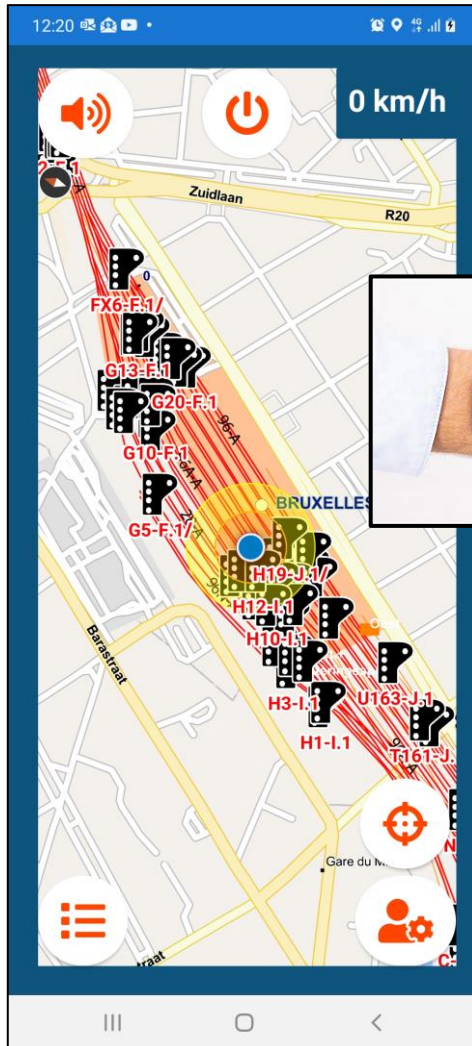


INFRABEL

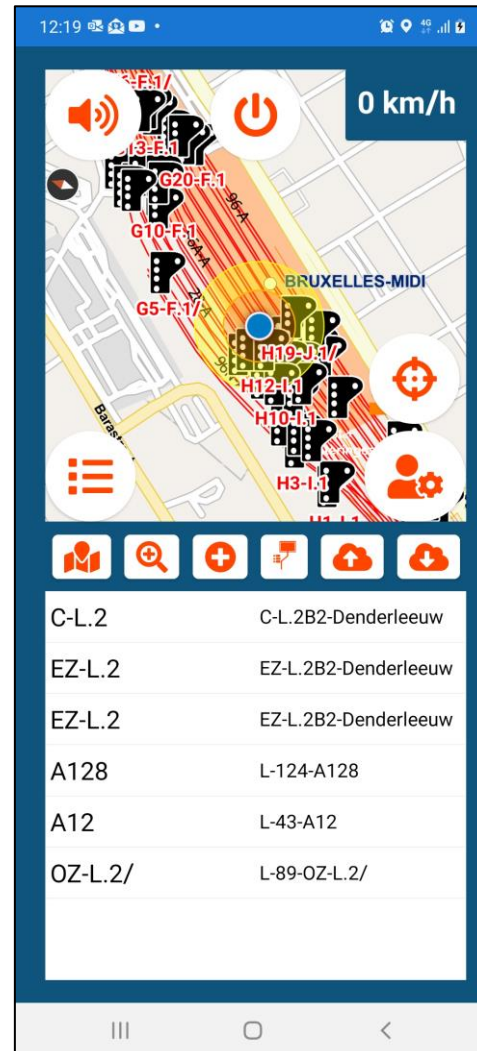


LINEAS

Digitalization InfraSPAD



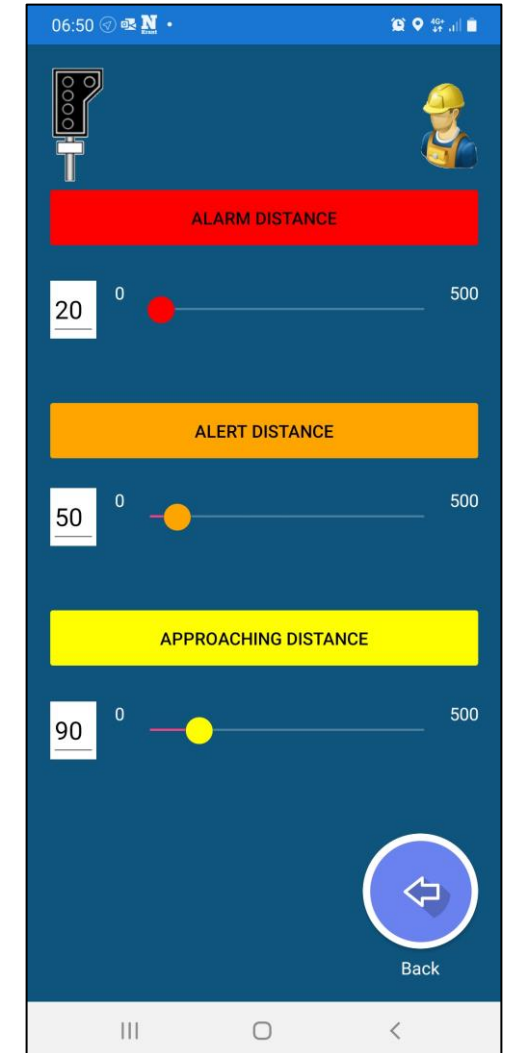
map view



list view



share signal list



alert configuration

2

Digitalization InfrAlert

Partnership
reuse of existing hardware



Independent detection and individual warning



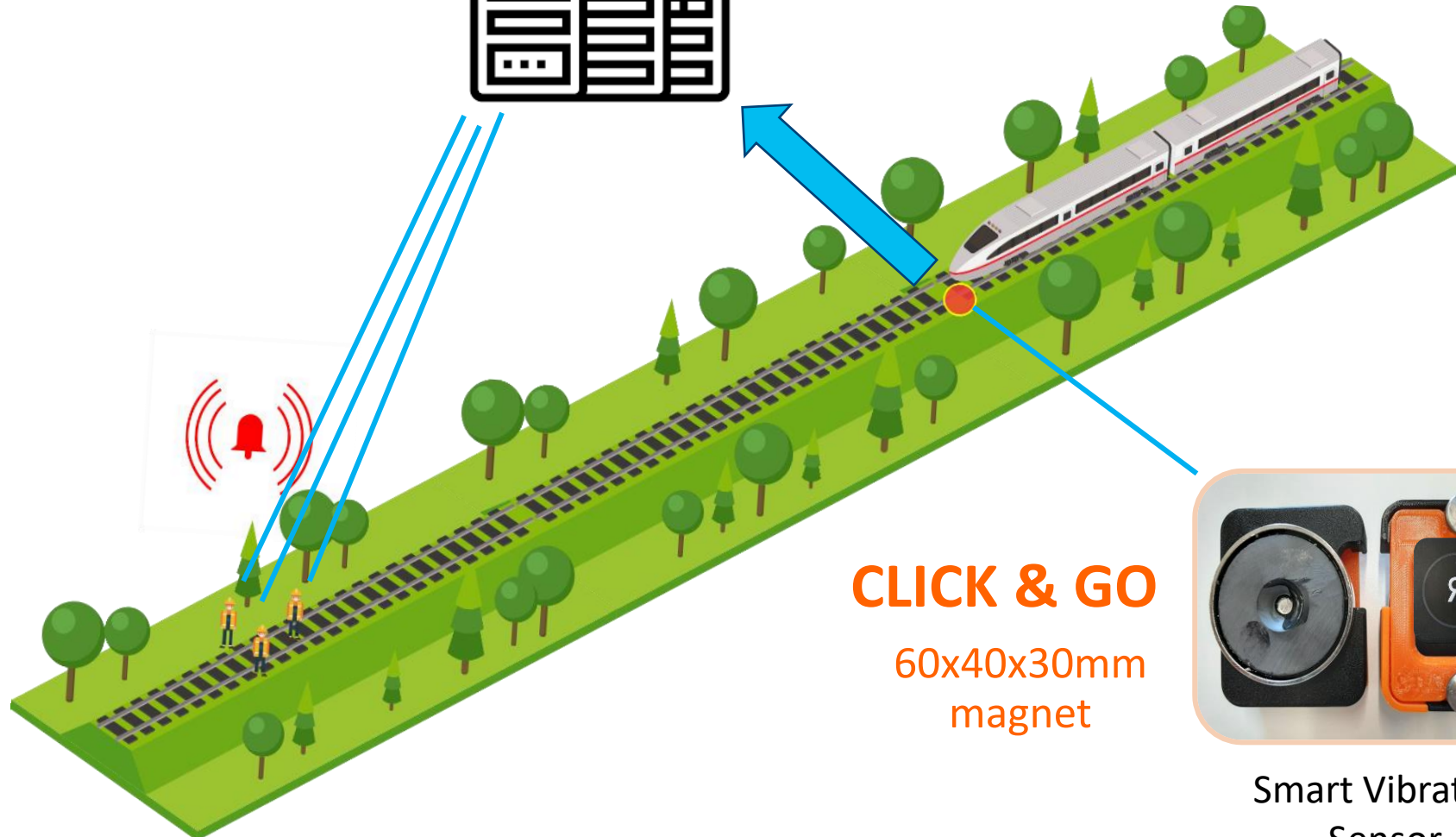
WORKER



DETECTION



Digitalization InfrAlert



Vibrating
Wristband

CLICK & GO

60x40x30mm
magnet



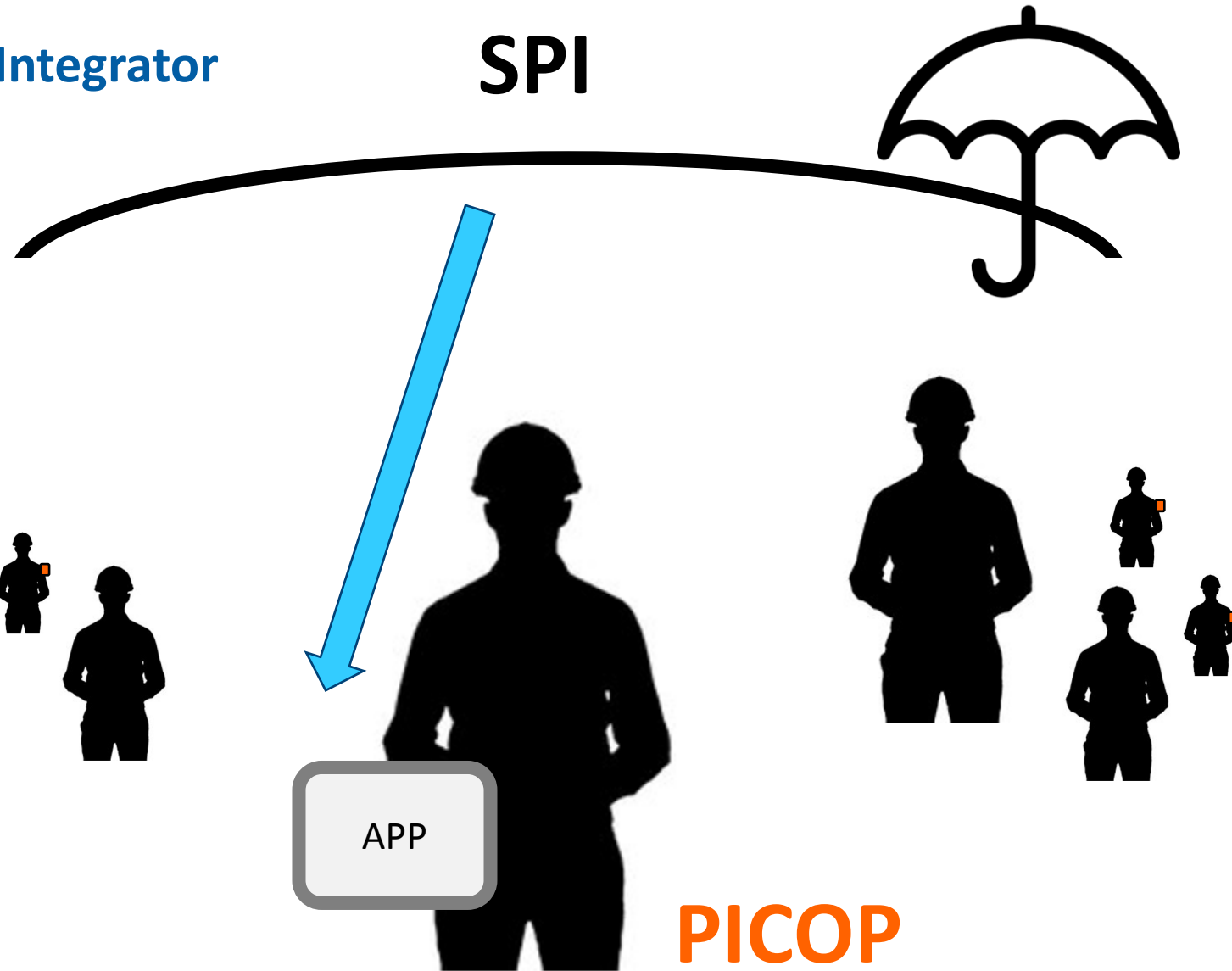
Smart Vibration
Sensor

2

Digitalization SPI

Safety Protection Integrator

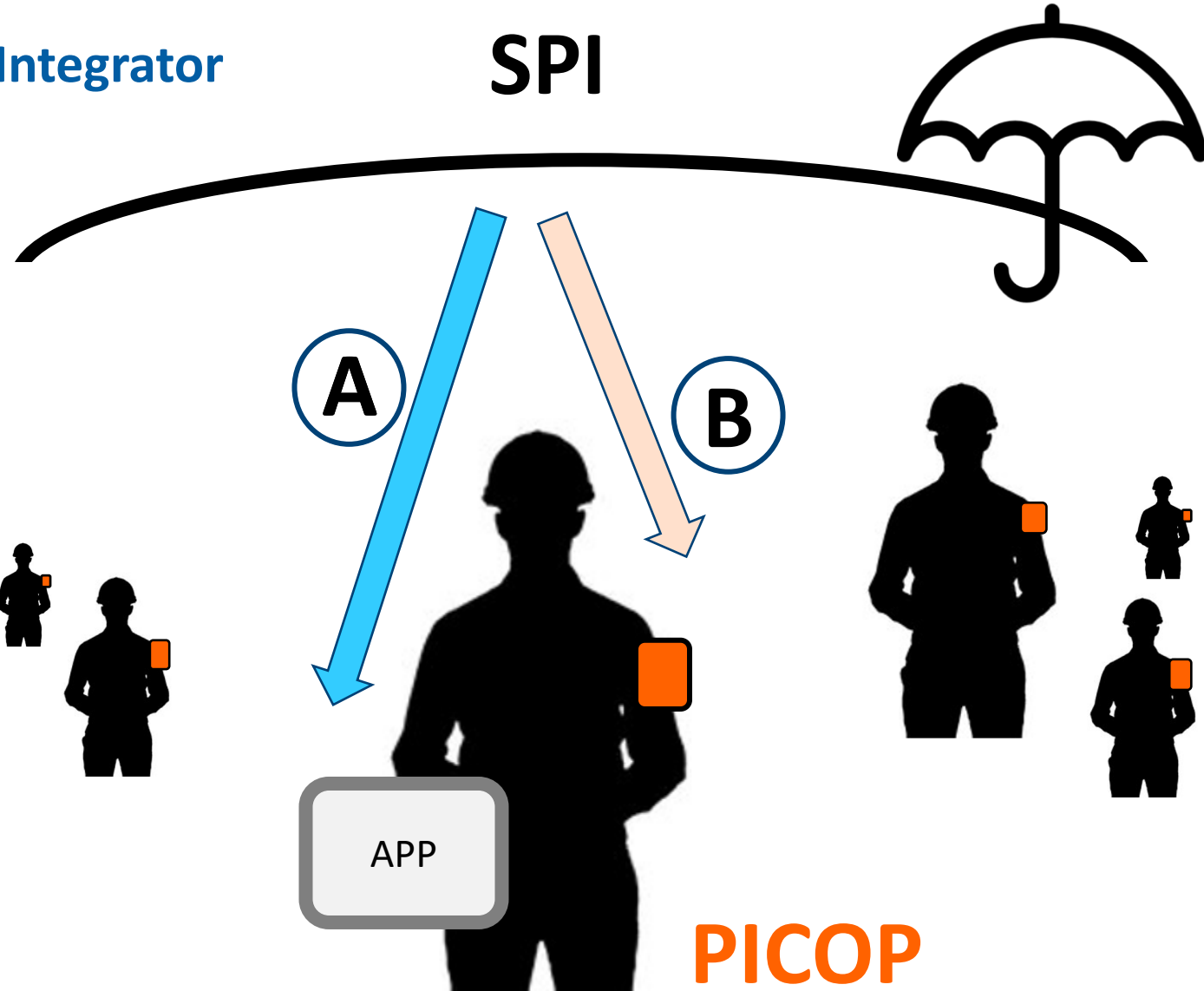
Innovative Solution
IP rights within Infrabel



Digitalization SPI

Safety Protection Integrator

Innovative Solution
IP rights within Infrabel

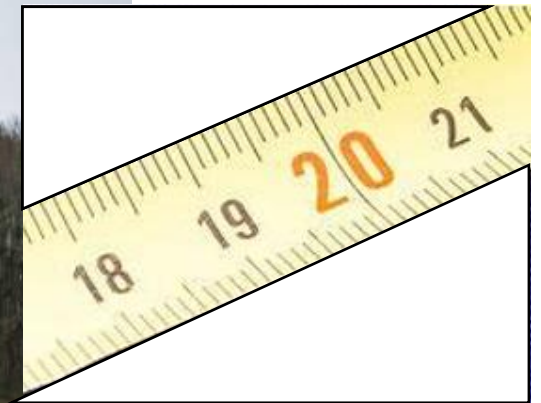
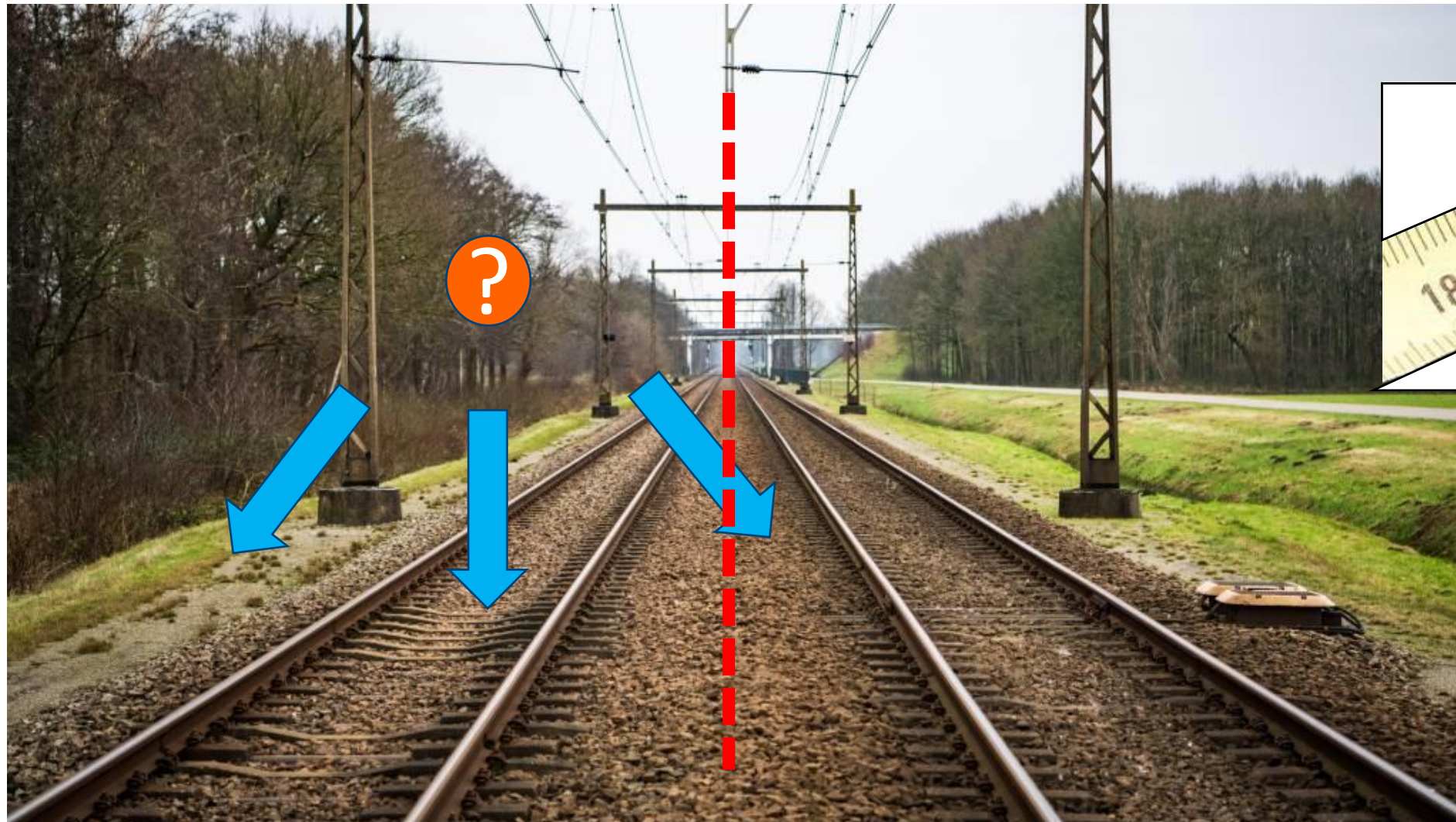


Personal warning
+ geolocalisation

PICOP

Digitalization Precise Geolocalisation

adding innovative
technology





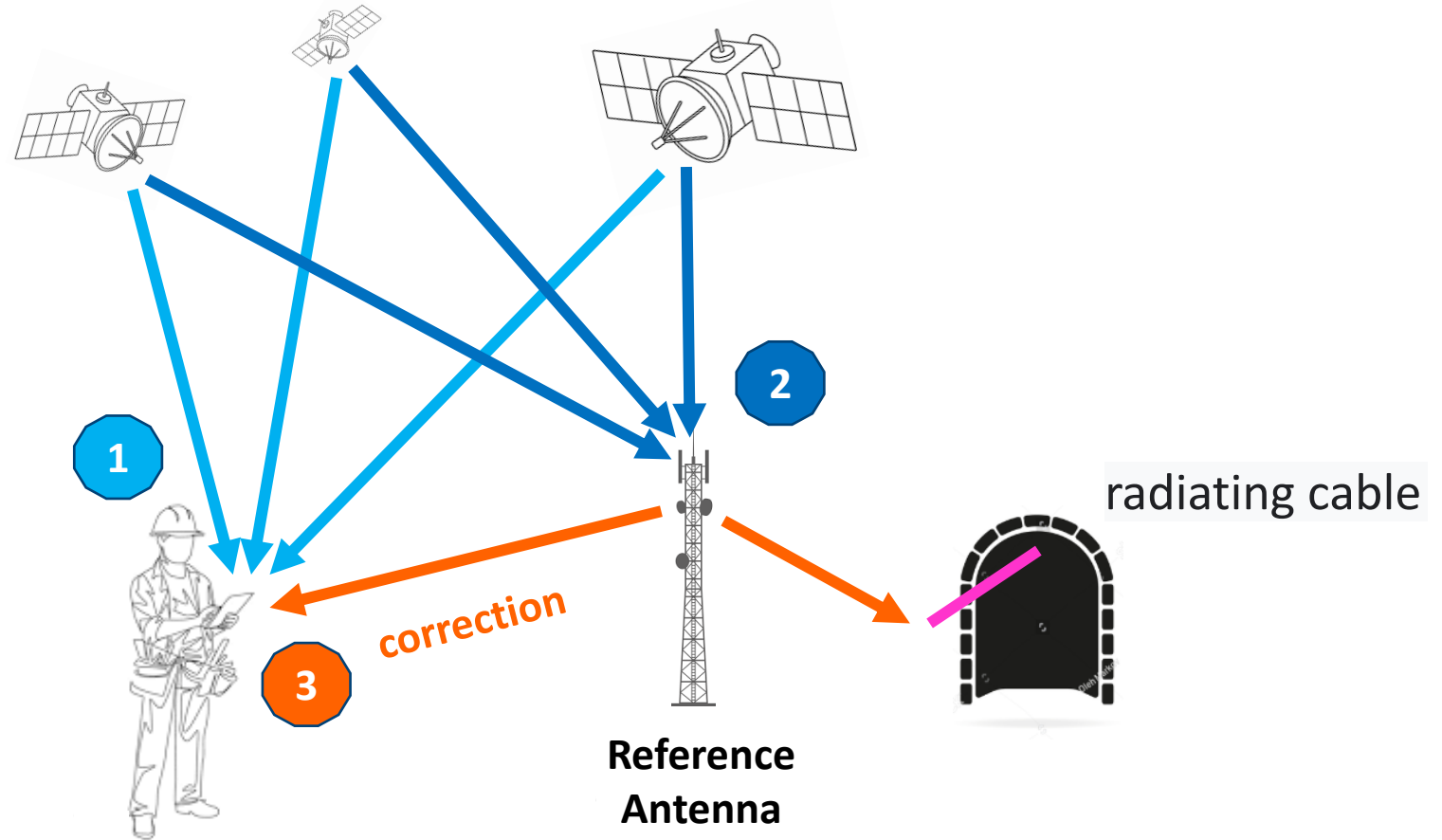
Digitalization Precise Geolocalisation

RTK versus UWB

Real Time Kinematic corrections

Ultra Wide Band beacon based

accuracy: 10-20 cm
right side of the track



Digitalization

Innovative Solution
IP rights within Infrabel



Introducing PaSCal

an innovative cross-industry solution

an individual digital wearable



Hi,
I am
PaSCal,
your
Personal
Safety
Companion

Situational Awareness



Digitalization

Innovative Solution
IP rights within Infrabel

// Safer-W



Introducing PaSCal

an innovative cross-industry
solution

an individual digital wearable



Hi,
I am
PaSCal,
your
Personal
Safety
Companion

Situational Awareness





Digitalization Warning & Virtual Fencing

Collision Avoidance

Real Time Monitoring

Worker



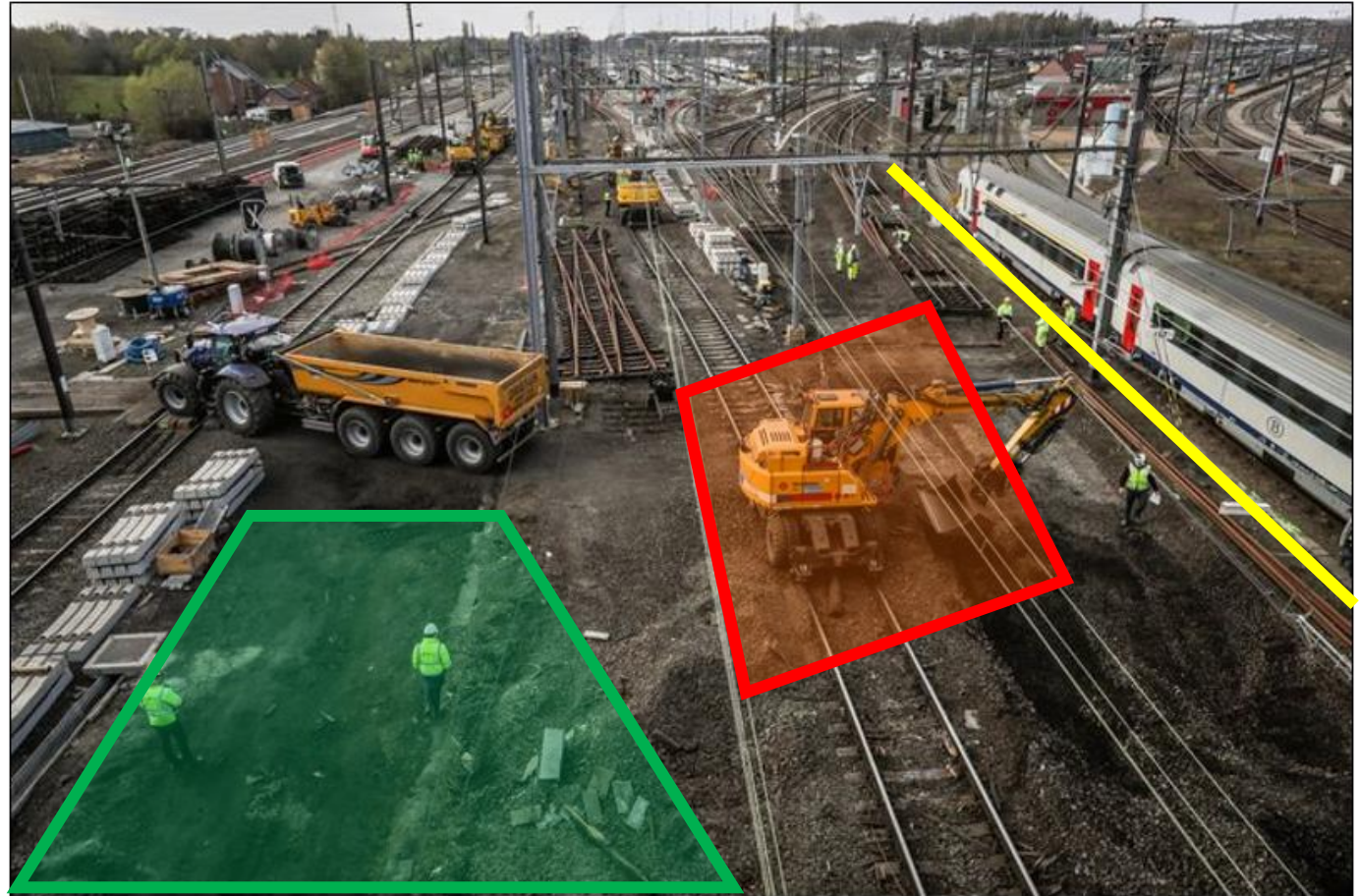
Machinery

Train

GO / NO GO

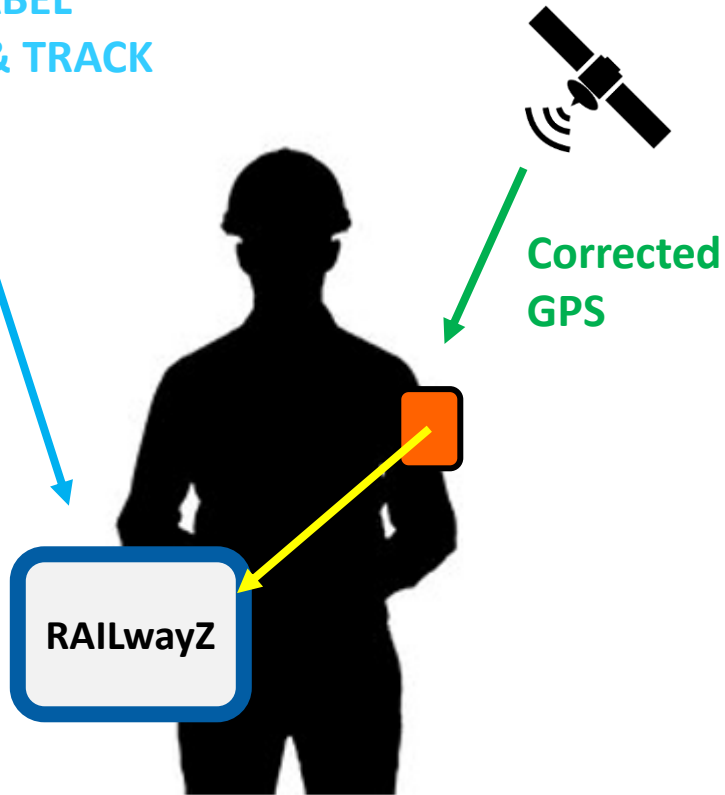


including
Augmented Reality



PaSCal & beyond

INFRABEL
LINE & TRACK
DATA



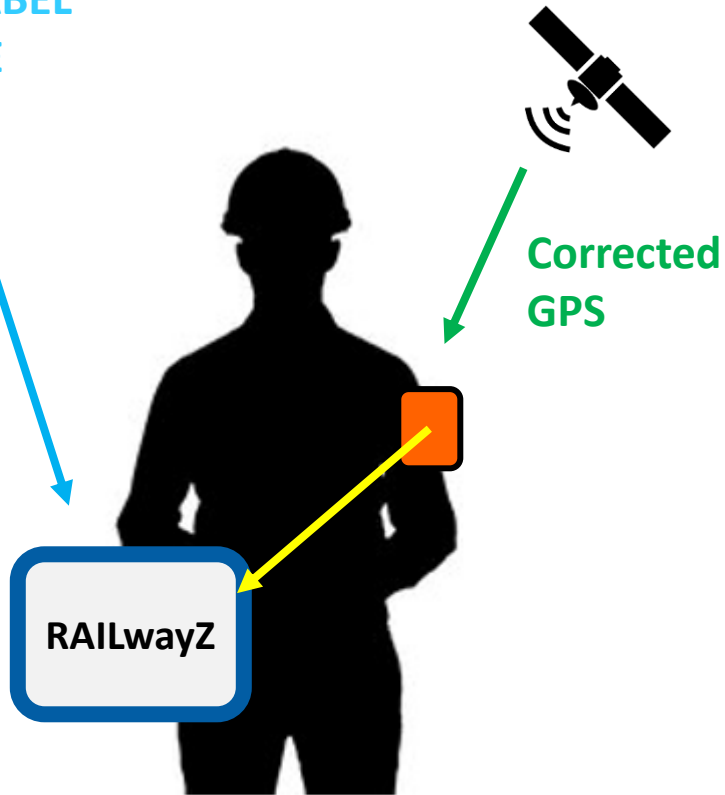
a) Visualisation of Assets eg Line & Track identification

(Augmented Reality experience)



PaSCal & beyond

INFRABEL
CABLE
DATA

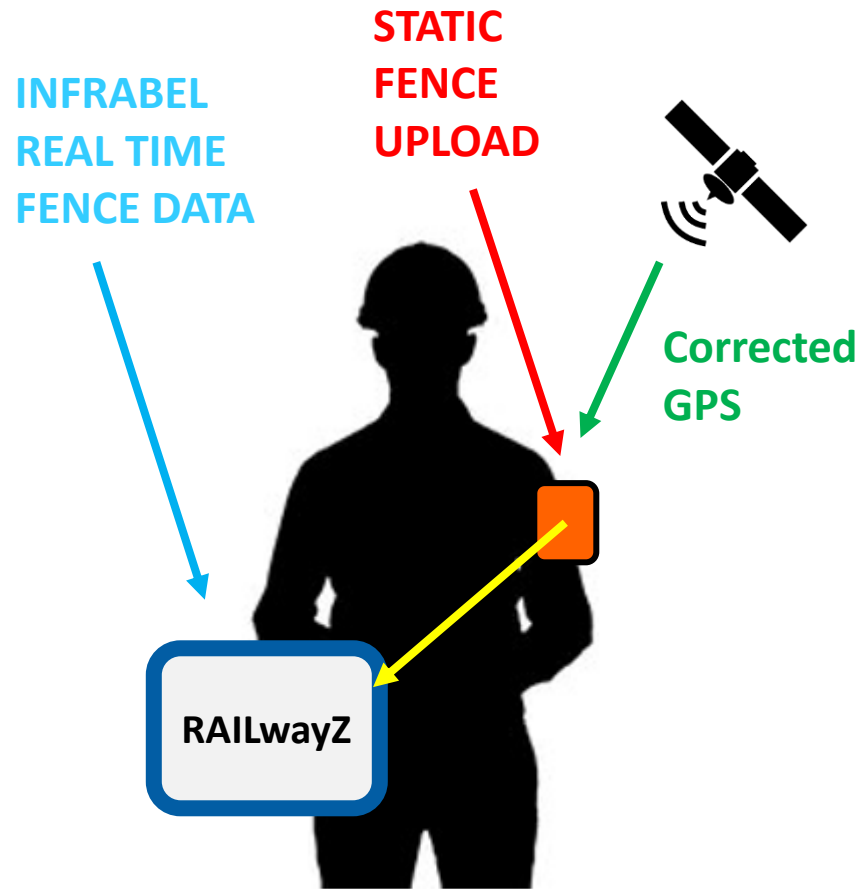


b) Visualisation of Assets eg Cable View (underground)

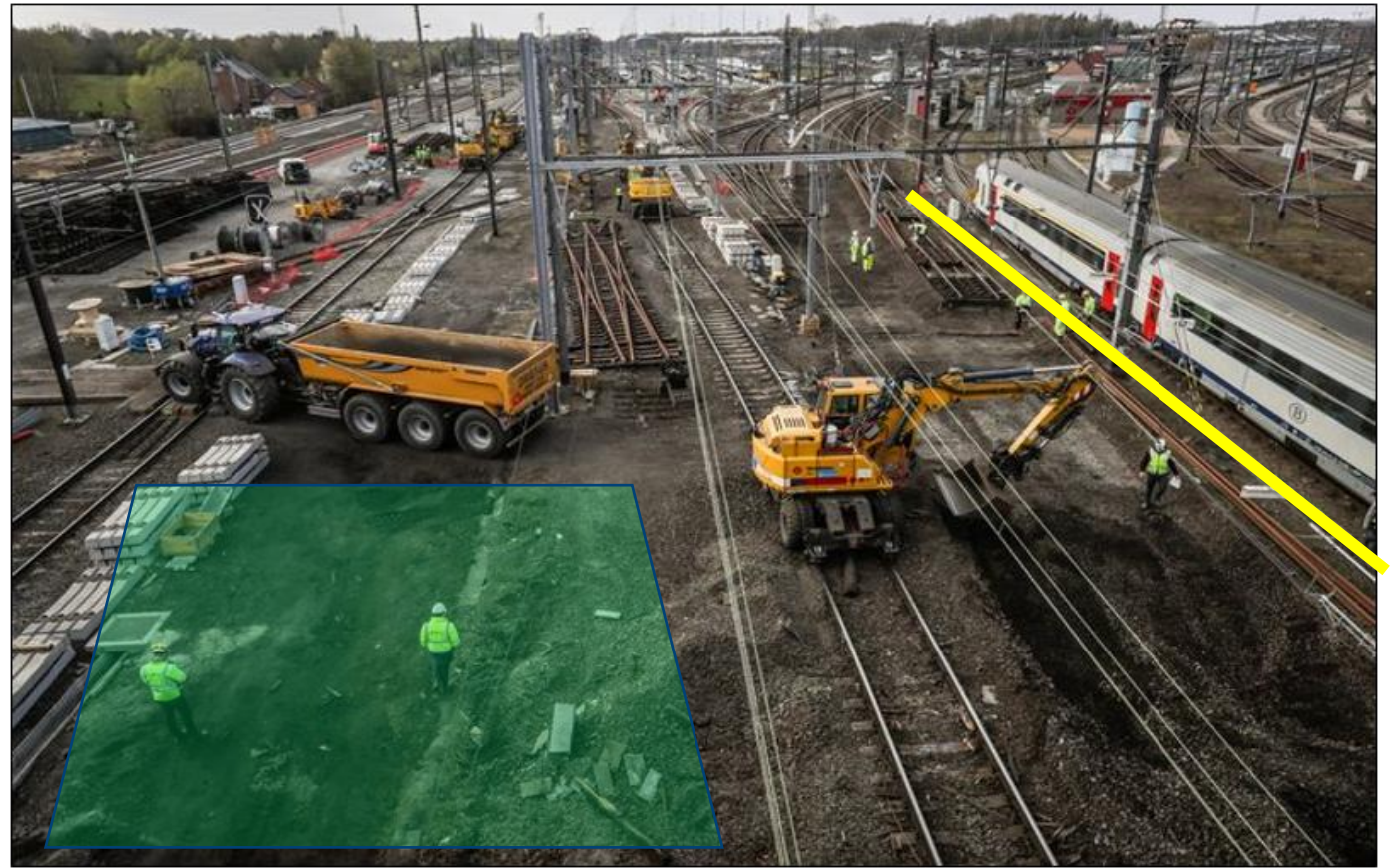
(Augmented Reality experience)



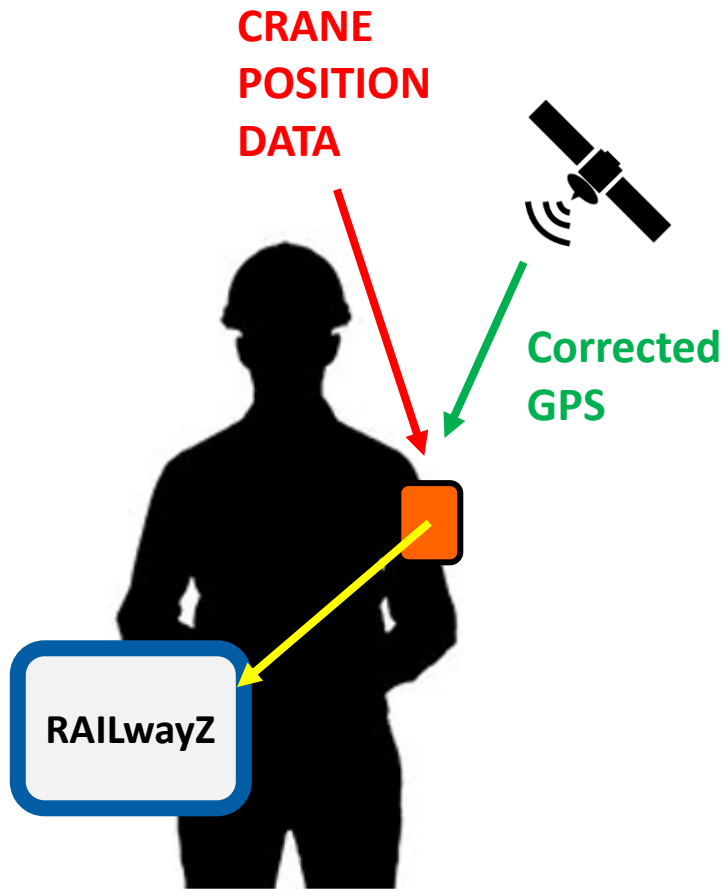
PaSCal & beyond



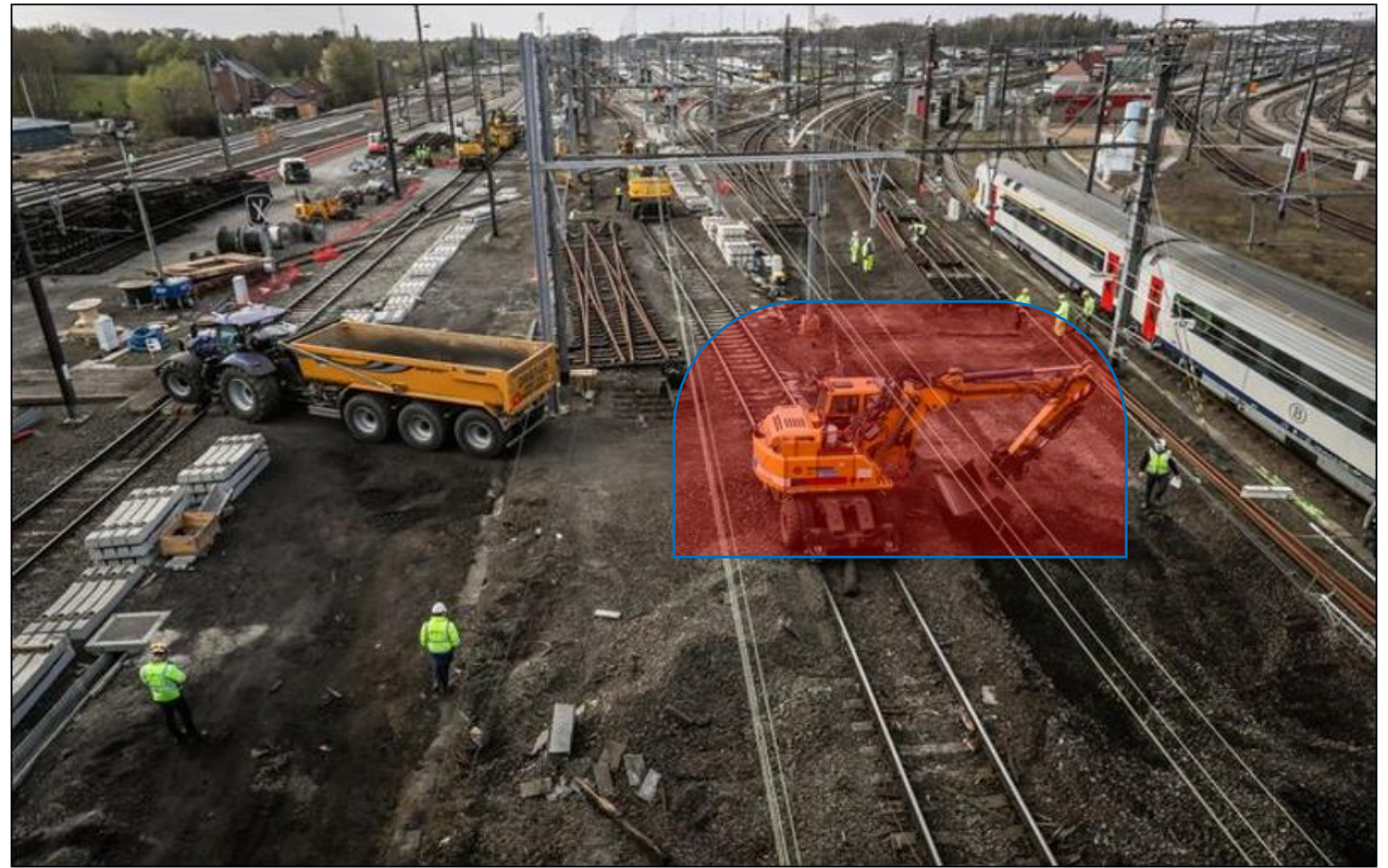
c) Virtual Fencing static (uploaded) ↔ dynamic (real time)



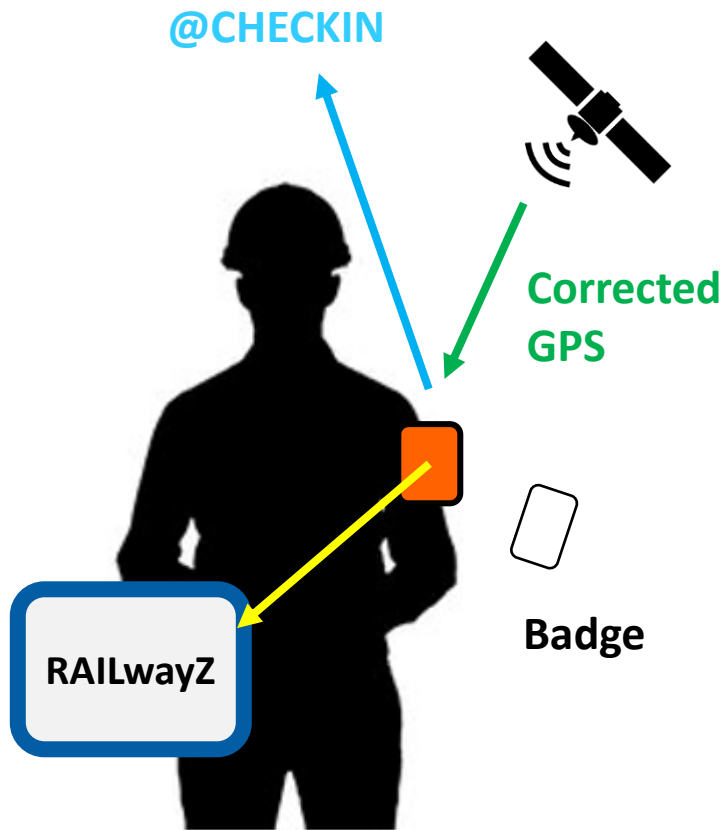
PaSCal & beyond



d) Virtual Fencing (dome) Collision Avoidance local dynamic (real time)



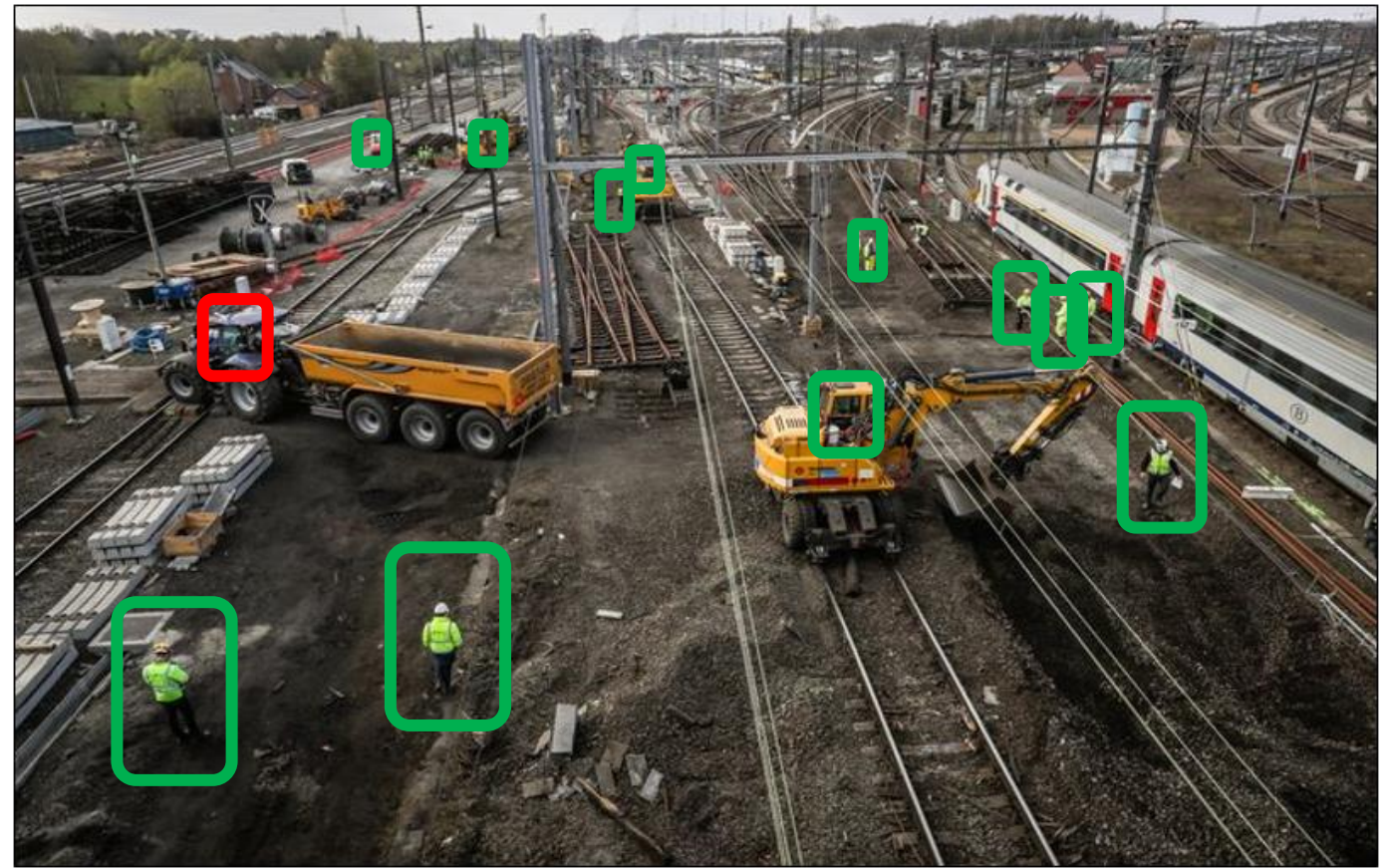
PaSCal & beyond



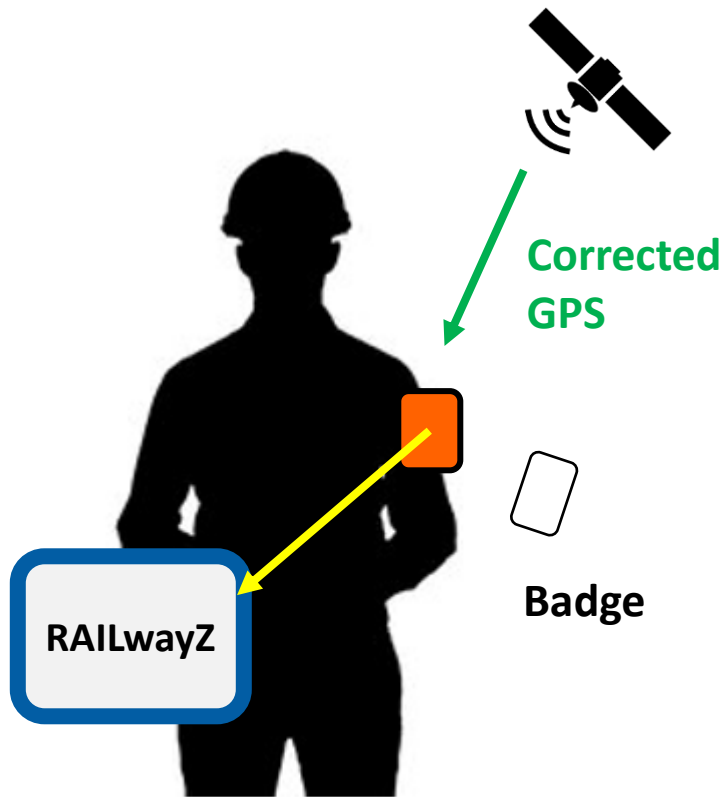
e) CHECKINATWORK integration



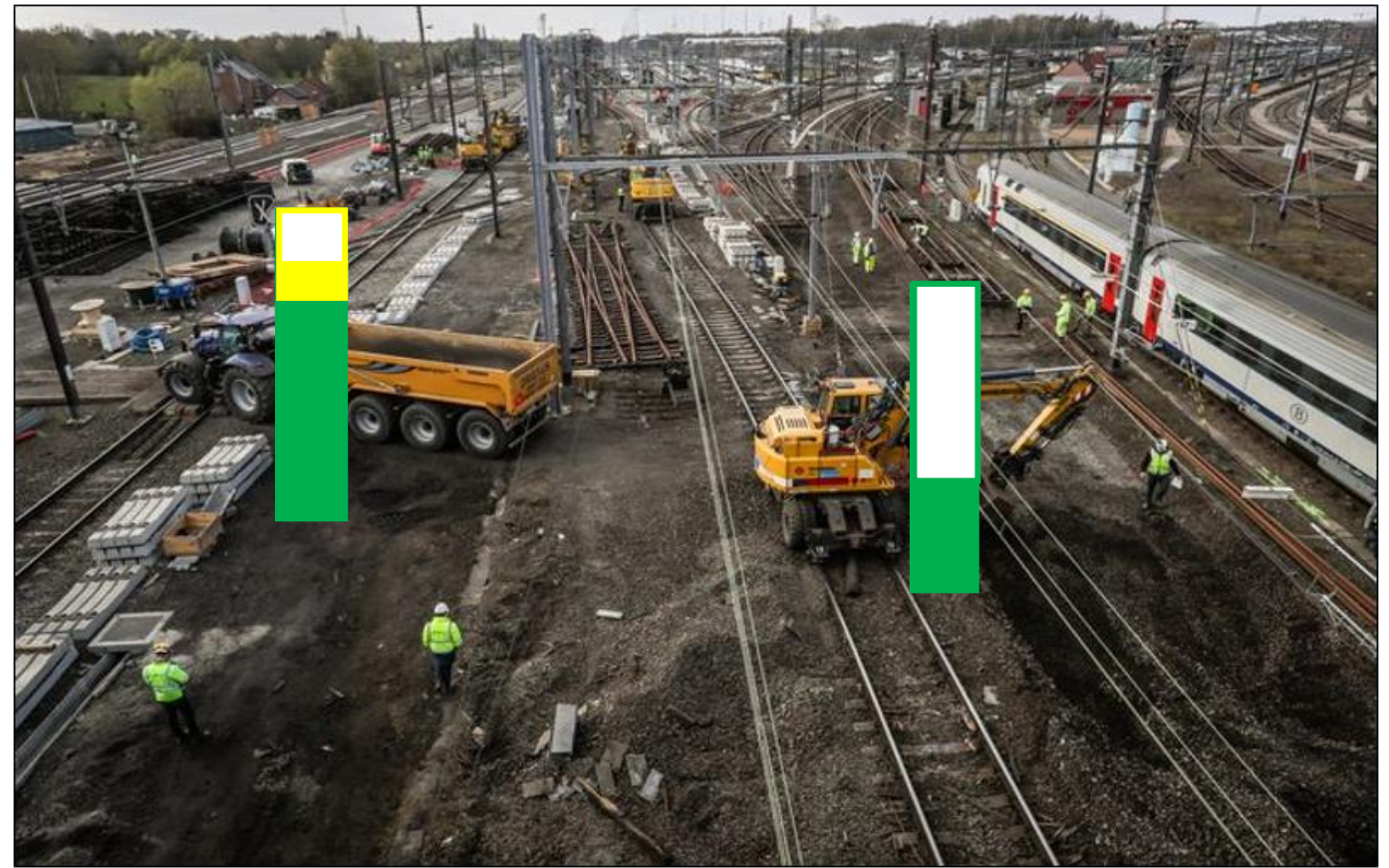
Sociale zekerheid
Onderneming



PaSCal & beyond

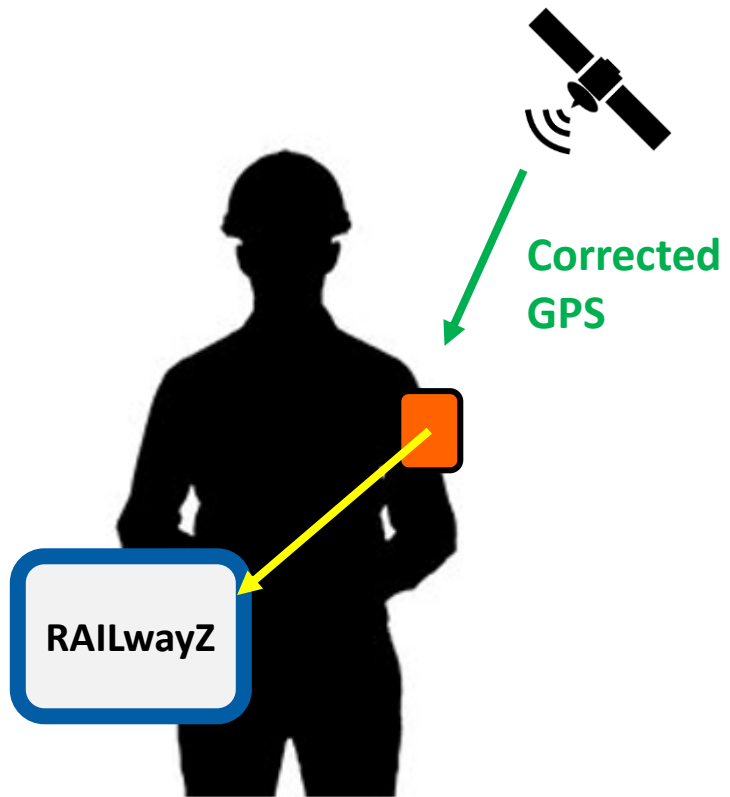


f) Tachograph < 11 working hrs



PaSCal & beyond

g) ...



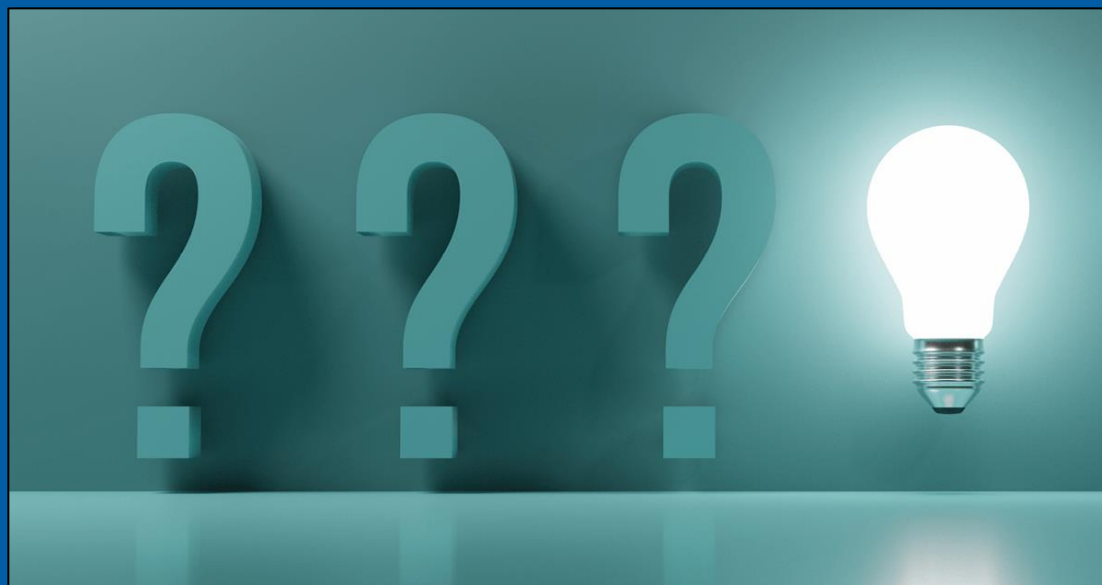
Conclusion: IP rights are assets it's important to manage them

Digitalization is moving fast
in every industry

Protecting the IP-rights to
keep the knowledge in
house and move solutions
to a higher level.

It allows commercialisation
or can be used as a leverage
to work closer together
with other players





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