

USING ROAD ASSET DATA FOR ROAD SAFETY STRATEGIES

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IMMERGIS

ABOUT IMMERGIS

- ▶ Professional road services company, subsidiary of Imajing
- ▶ Founded in 2011
- ▶ Based in France (Montpellier), Cameroon (Yaounde) & Craiova (Romania)
- ▶ **Multi-disciplinary team:** 35 experts in mapping, GIS analysis, road expertise, IT and software developers, various consultants abroad
- ▶ More than **60,000km** of road surveyed in Europe and Africa, Partners in many countries

Immergis focuses on:

- ✓ Road data collection
- ✓ Road Asset inventories
- ✓ Pavement condition
- ✓ Road safety inspection
- ✓ Investment programmes
 - ✓ Work scheduling
 - ✓ Monitoring tools

RECENT PROJECTS & CUSTOMERS

LAST MAIN PUBLIC AUTHORITIES

Ministries (Equipment and Transports
Ministry – National Road Agency – Mali)

French counties and provinces
(34, 73, 33, 13)

Urban districts - Yaounde (Cameroon), Lille,
Strasbourg (France)

PUBLIC WORKS COMPANIES

Vinci Construction, Bouygues Group, Eiffage

CONCESSIONARIES

Vinci Autoroutes - Cofiroute (French
highways),

SNCF - French national railway company

INTERNATIONAL PROJECTS

Togo, Mali, Cameroon, Ivory Coast, Senegal, Algeria,
Republic of Congo, Turkey

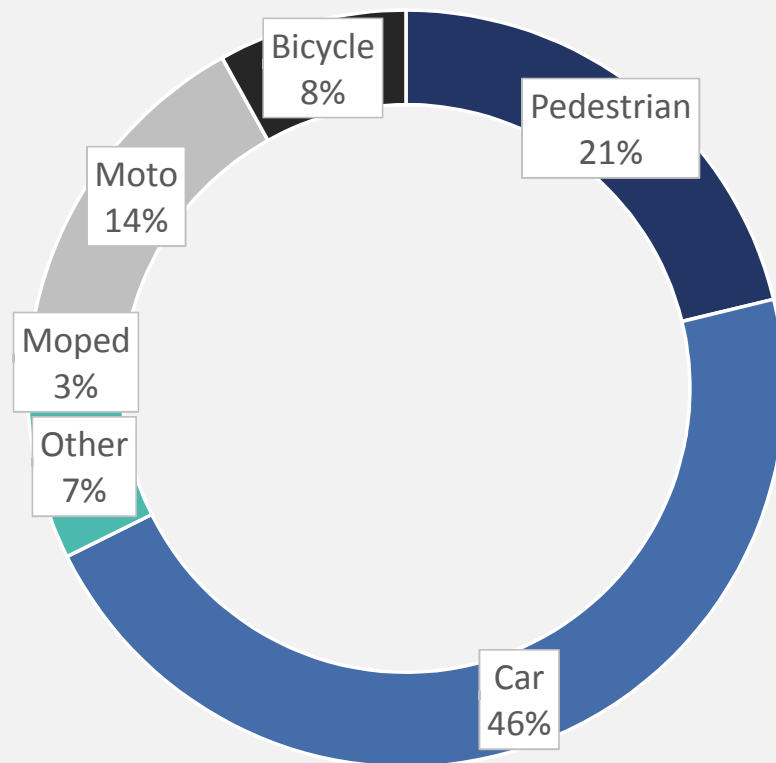


ROAD SAFETY & ROAD ASSET DATA

From field knowledge to road safety

ROAD SAFETY OVERVIEW

Road fatalities in the EU by transport mode :




Causes

- Alcohol
- Speed
- Unsafe road infrastructure
- Lack of visibility
- Lack of dedicated infrastructure for vulnerable road users

Infrastructure plays a key roles in reducing road fatalities and the severity of injuries

ROAD ASSET DATA FOR ROAD SAFETY?

- 
1.
Identify road section needing rehabilitation
(pavement, signalisation, black spots,...)
 2.
Prioritise road works with a safety target
 3.
Plan annual and pluriannuel maintenance with costs estimation
 4.
Set up tools to constantly update road asset data and monitor road works



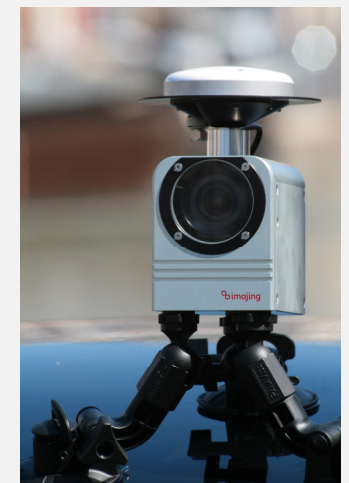
ROAD DATA ASSESSMENT

Build a solid network knowledge

DATA COLLECTION

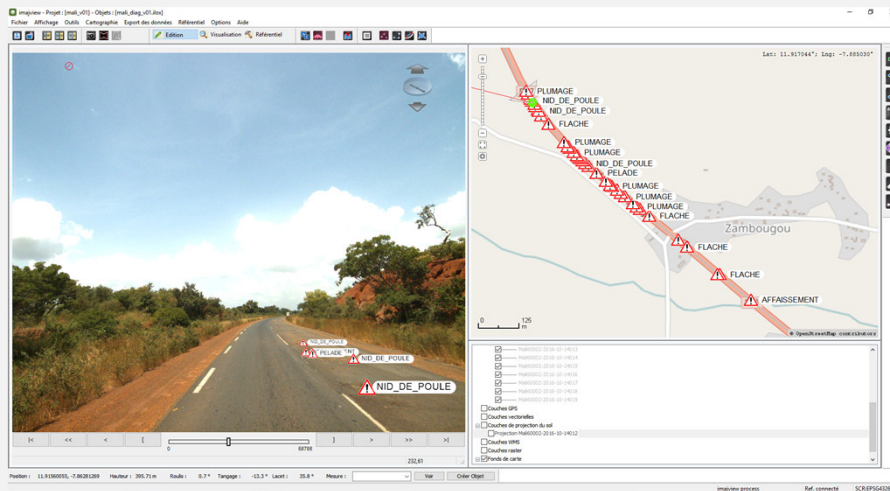
- ▶ Simultaneous collection of all required information:
 - ✓ signalization,
 - ✓ pavement,
 - ✓ road marking,
 - ✓ Roadside environment & equipment
 - ✓
- ▶ Geo-referenced images of the network (IMU, DMI, RTK)

**Portable Mobile Mapping System
(80° to 360°), Large-scale data
collection, Efficient and quick region-
or nationwide - road survey**



ROAD DATABASE

- Road GIS database model creation
i.e. lateral security equipment, public lighting, horizontal road signs, trees and vegetation, etc.



Security and safety inspection from collected information, detection and identification of non-compliance
i.e. readability of road signs and markings, condition of pavements, safety of vulnerable road users, ...

PAVEMENT CONDITION

- ▶ **Visual condition assessment** of roadways, pavement, shoulders, assets
- ▶ **Rating** according to damage severity (i.e. Visual Condition Index)
- ▶ Compilation of all data by section/road, to **determine its global condition**
- ▶ Data and results **integration into GIS tools**, Web-GIS, RAMS, PMS, HDM-4, etc.





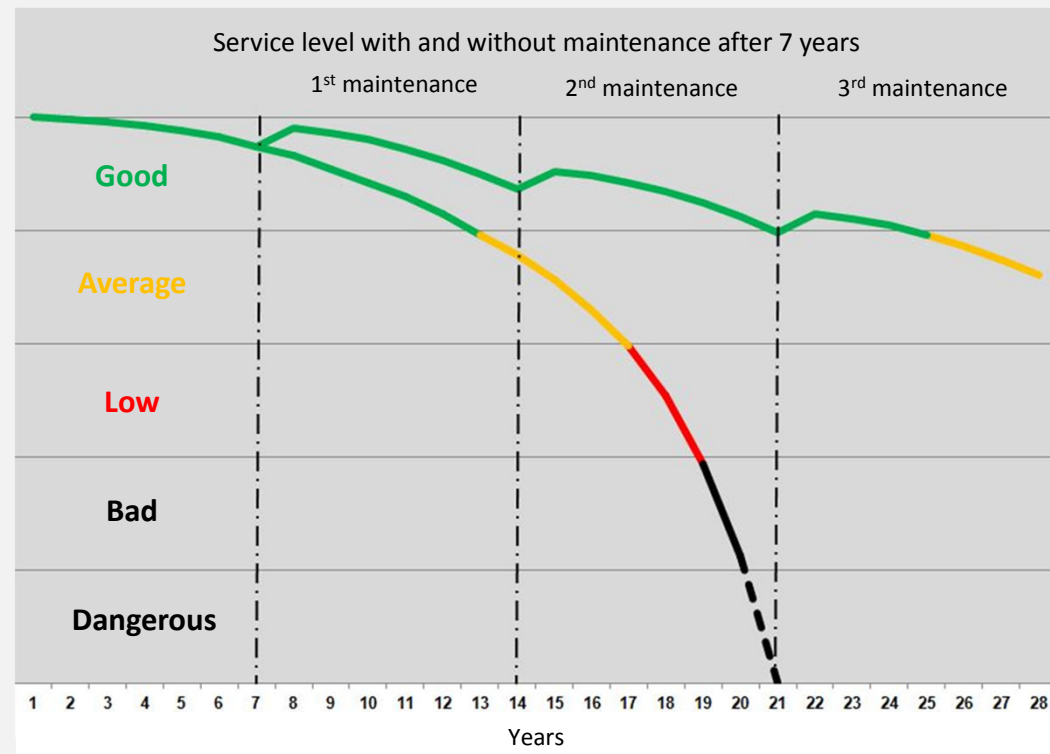
ROAD DATA FOR SAFETY STRATEGIES

Benefits for investment programs

BETTER UNDERSTAND SAFETY ISSUES

Inventories, analysis, assessments and reports enable Immergis to define:

- ▶ Road safety improvement recommendations
- ▶ Rehabilitation and maintenance costs evaluation
- ▶ Works programs (functional, investment)



RECOMMENDATIONS & WORKS PROGRAMS

- ▶ Improving road signs visibility
- ▶ Improving coherence, visibility, readability and position of road markings
- ▶ Improving junctions signalization
- ▶ Changing width of road
- ▶ Reducing potential conflict with vulnerable road user
- ▶ Creating bike or pedestrian path
- ▶ Restoring or replacing pavement
- ▶ ...

- ▶ Type of work solutions definition (urban/rural) depending on superficial and structural assessment:

For paved roads:

- Resurfacing (crack filling, patching) (maintenance)
- Structural reinforcement
- Restructuration (complete rehabilitation)

For gravel roads:

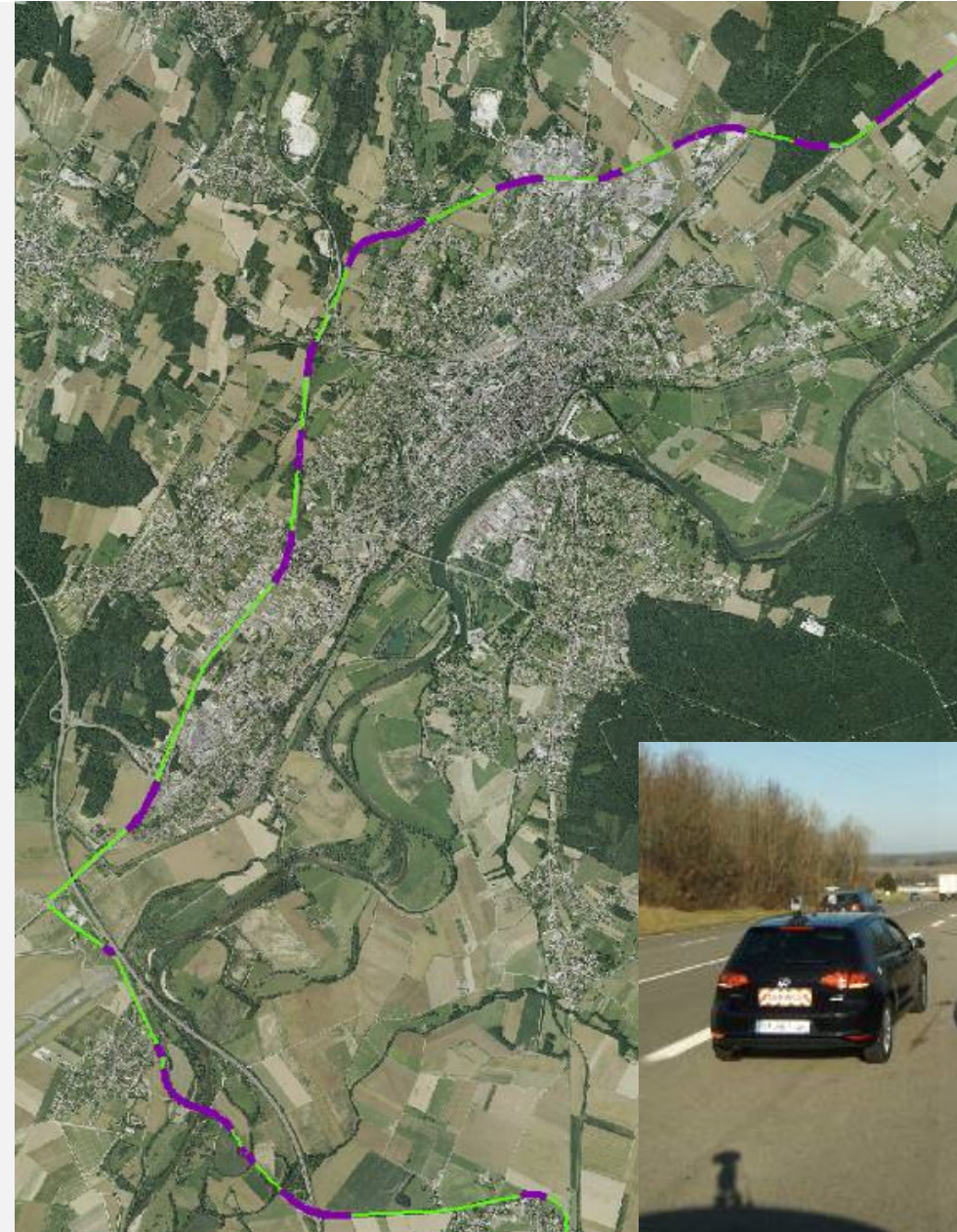
- Routine shaping surface and shoulders (crown & drainage issues)
- Rehabilitation

Price per m² or items definition (available or estimated based on existing tenders and procurements)

VISIBILITY MEASURES

Regional Council of Jura (France)

- Road network: 20 km
- Creation of **Horizontal signs database**: 20 km (roads marking)
- Road safety analysis: **visibility measures**
 - At different speeds (50, 70, 90km/h)
 - Road marking visibility
 - Curves and slopes visibility
- **Recommendations**



COMPLIANCE SURVEY

Strasbourg Eurometropolis (France)

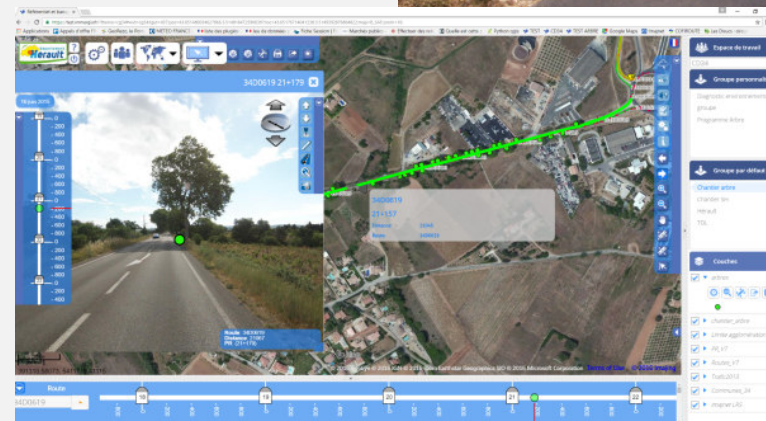
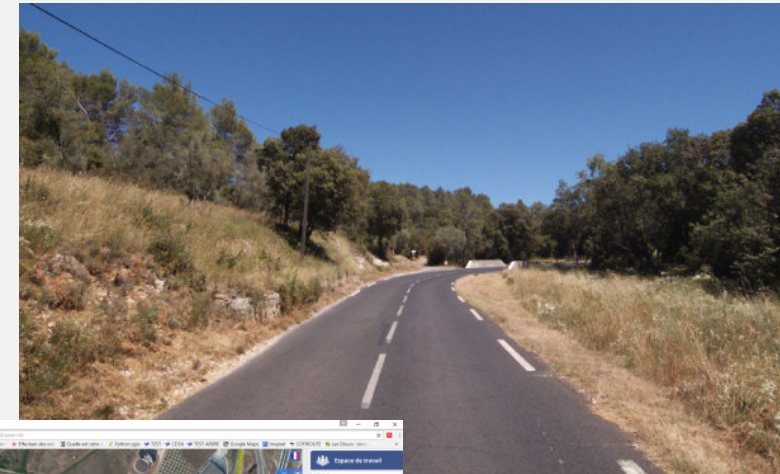
- Road network: 1 700 km
- Compliance survey:
 - **Vertical signs:** 42 500 signs (features, condition, orientation)
 - **Horizontal signs:** 41 500 roads marking and 3 400 blocks
 - **Major roads:** 275m² blocks, 445 km shoulders, 525 km sidewalk
- Analysis:
 - Roads **accessibility** for vehicles, bus, and vulnerable users
 - **Pedestrians and bicycle paths & parking spots:** 2 250 bicycle parking area, 20 000 cars parking area
 - **Security disposals:** 70 km of barriers inventoried
- **Recommendations**



ROAD ASSET MANAGEMENT SYSTEM

Herault County (France)

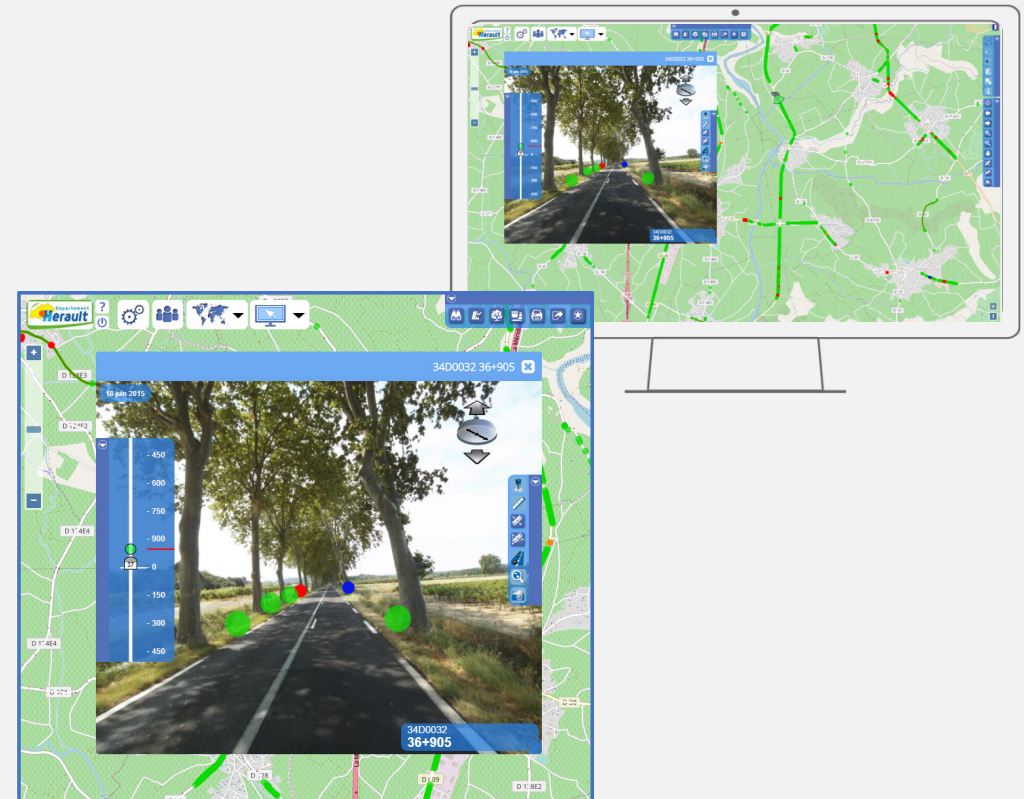
- Road network: 5 500 km
- Road survey with database creation:
 - Roads signs: 42 500 signs
 - Lateral obstacles digitizing
 - Identification of risk area
 - Street trees management
 - Road Referencing System
- Road Asset Management System



ROAD ASSET MANAGEMENT SYSTEM

Uses:

- Share asset information
- Update road database
- Define works priorities and maintenance projects
- Monitor & reception of road works
- 2 to 3 years works programme
- Automatic alerts sending
- Reports production



ROAD ASSET MANAGEMENT SYSTEM

Smartphone adaptation for the needs of the patrollers of the road:

- Circuits preparation
- Collect **field & geolocalised** events with Road Referencing
- **Create events** (signs damaged, ...)
- Easily **Capture field reality** (images, video & sound) to document any data
- Alert & share **GIS data** to trigger rapid and targeted interventions
- Automatic **monitoring report**



| SUMMARY

Road asset data are one of the pathways to safer road mobility. Better knowledge of the network allows to improve road safety. And knowledge of the network is only understandable with accurate and up-to-date road asset data

1. Identify road section needing rehabilitation
2. Prioritise road works with a safety target
3. Optimize safety investment with annual and pluriannuel maintenance
4. Constantly update road asset data and monitor road works through RAMS

THANK YOU
FOR YOUR ATTENTION

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