



Artificial Intelligence for Road Maintenance





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ROAD MAINTENANCE IS NOT ONLY MAINTENANCE

The Road Authorities * in charge of roads must:

- Manage the traffic
- Manage the roads, with special tasks in winter
- Manage the incidences
- Manage the bridges and tunnels
- Manage the pavement
- Improve the Road Safety of all the users
- Ensure the safety of maintenance workers

From different departments for each task, taken its own data



To an integrated system for advanced and intelligent management

Hoe innovaties waardevol maken voor RWS?

- Rapid prototyping
- Nieuwe toepassingen van kleine organisaties
 - Proberen (zonder ingewikkelde processen vooraf)
 - Leren & ontdekken
 - Integreeren



11. Effectief gebruik van data met KPN



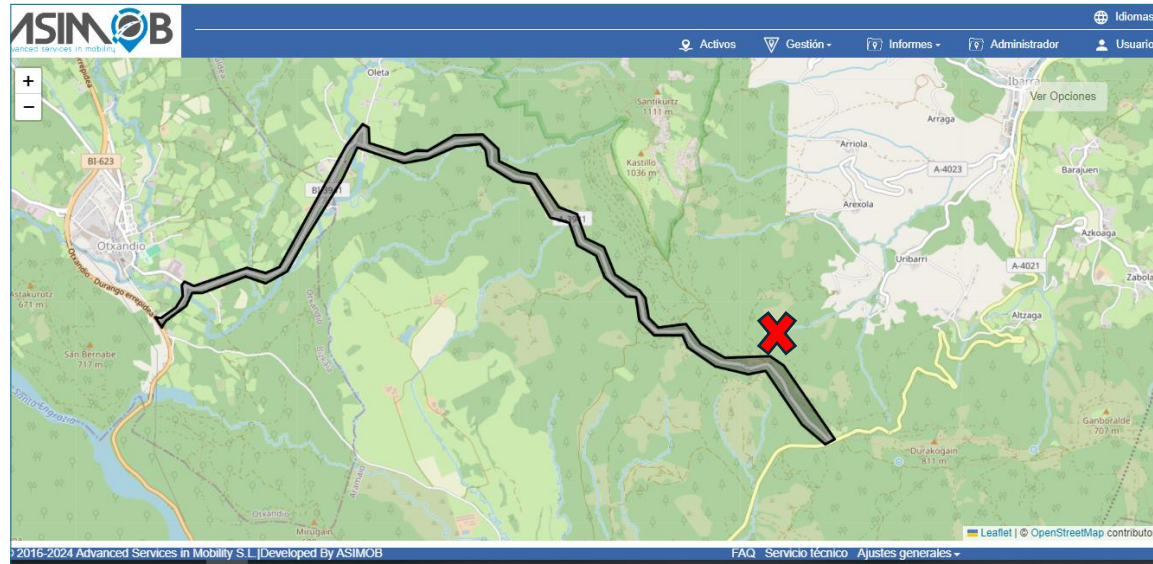
Ilustración 2: Esquema de funcionamiento de sistemas y subsistemas de la DGC.

* Examples taken from DGC of Ministry of Transports in Spain and Rijkswaterstaat, Ministry of Transports in The Netherlands

ROAD MAINTENANCE IS NOT ONLY MAINTENANCE



FORENSIC ANALYSIS OF AN ACCIDENT



USERS

- Speed of the cyclists
- Protection of the cyclists
- Condition of the bicycles
- Fast response after accident

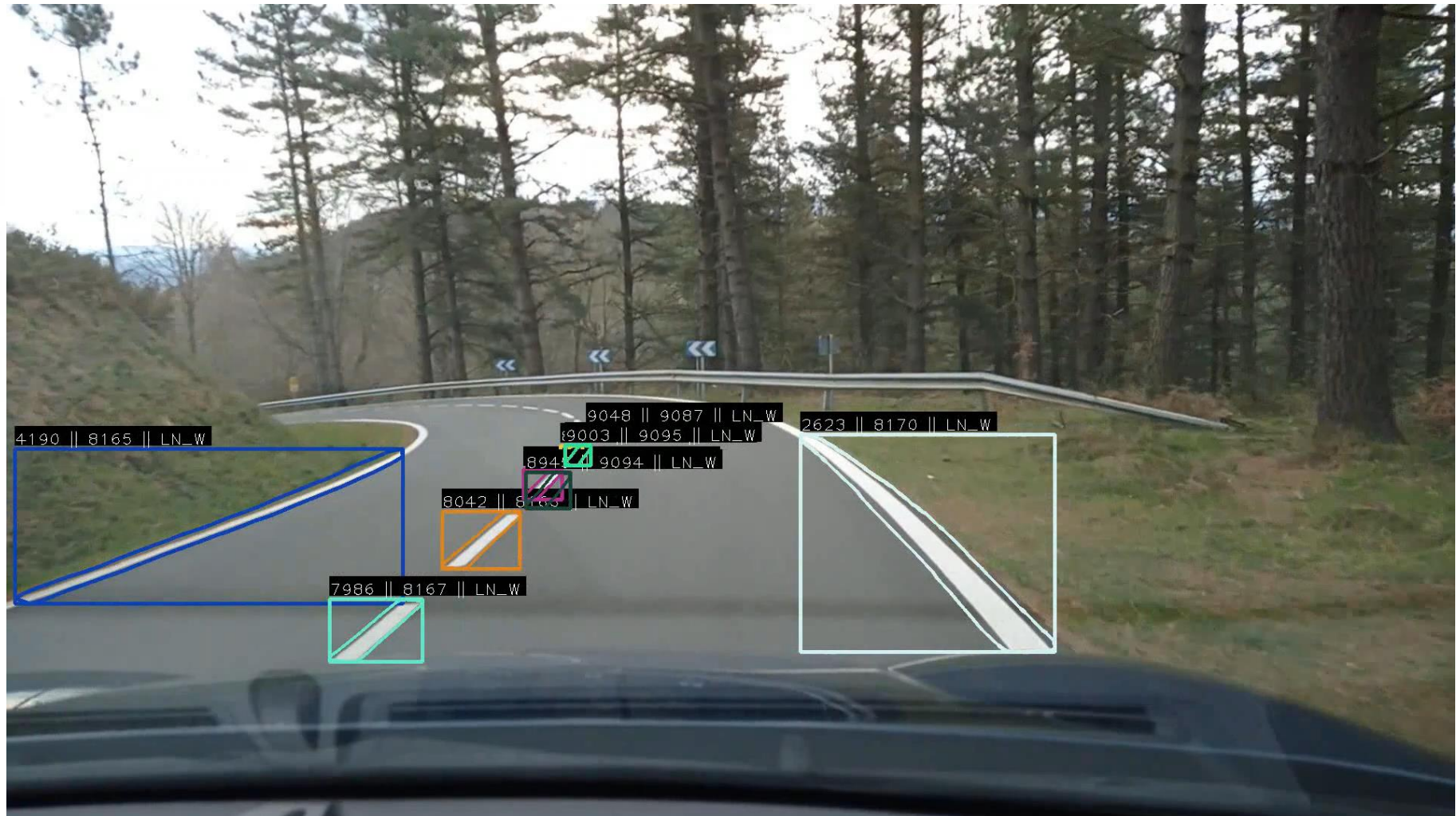
VEHICLES

RESPONSE

- Geometrical data
- Weather conditions
- Status of the pavement
- Vertical signage
- Horizontal signage
- Safety barriers
- Dangers in escapes

INFRASTRUCTURE

FORENSIC ANALYSIS OF AN ACCIDENT



FORENSIC ANALYSIS OF AN ACCIDENT

DEFECTS IN THE PAVEMENT

ASIMOB advanced services in mobility

Assets Management Reports Administrator User

Filters Video

0:45 / 1:52

Aerial View BETA

Information - KM. 24 m.800 - 2024-04-05 12:35:34

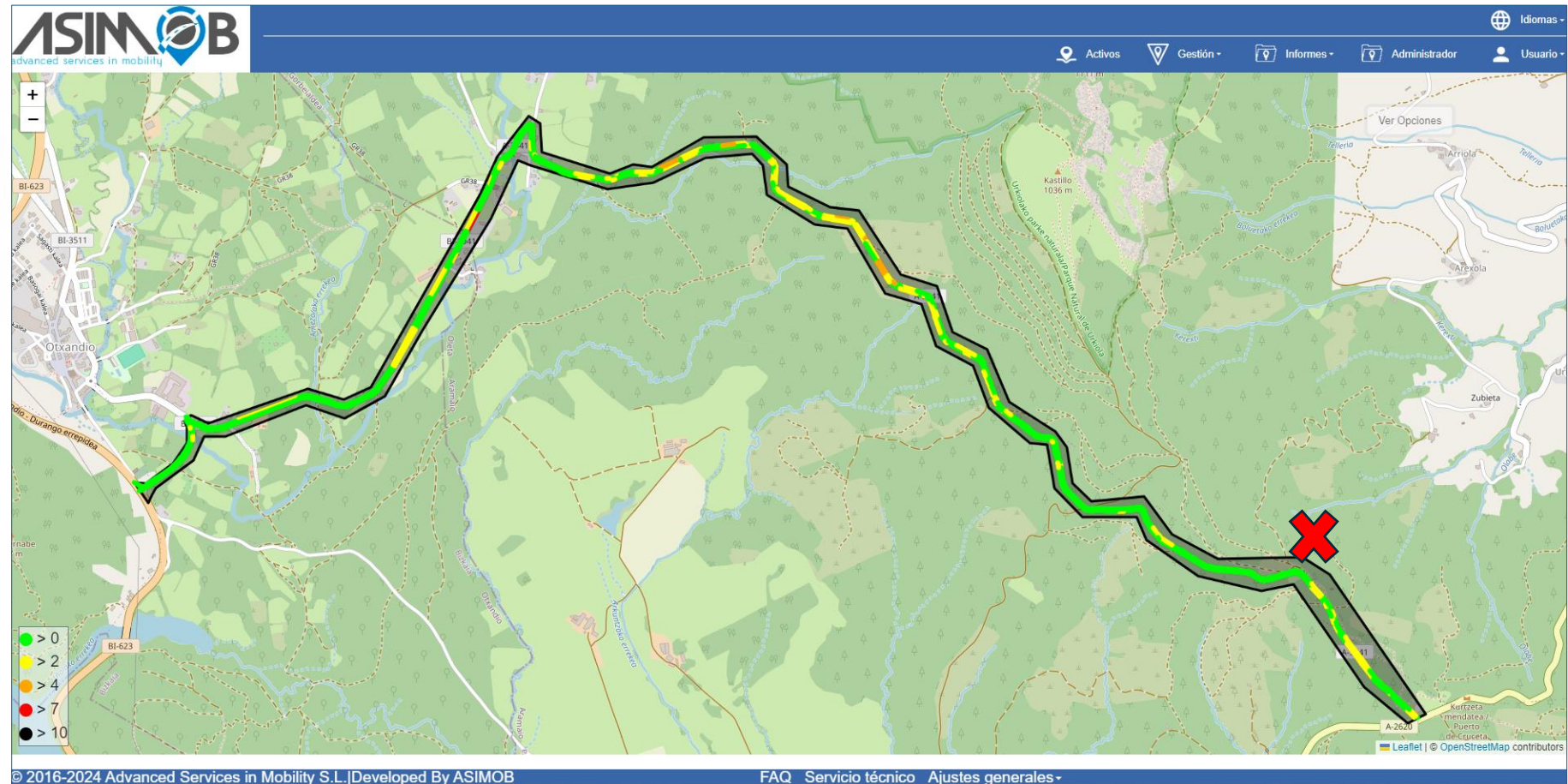
Type	Area (px)	Lane (%)	Length (m)	Width (m)	Annotation
Pothole	4552	18.55	0.56	0.21	🗑️
Patch	N/A	46.15	0.79	0.31	🗑️

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FAQ Technical service General settings

FORENSIC ANALYSIS OF AN ACCIDENT

IRREGULARITIES IN THE PAVEMENT



FORENSIC ANALYSIS OF AN ACCIDENT

ROAD MARKINGS

The screenshot displays the ASIMOB software interface for forensic analysis. The main map shows a road with various colored markings: green (Bueno), yellow (Regular), orange (Mala visibilidad), and red (No detectada). A red 'X' marks an accident location. A video player on the right shows a street view of the road. Below the video is an 'Aerial View BETA' section and an 'Information' section with a table of road marking data.

Number	Name	Quality	Initial kilometer	Initial meter	End meter
D	LN_W_SOLID	Red	24	820	819
I	LN_W_DASHED	Orange	24	820	819
I	LN_W_SOLID	Yellow	24	818	813
D	LN_W_SOLID	Red	24	812	810
I	LN_W_DASHED	Green	24	812	810

FORENSIC ANALYSIS OF AN ACCIDENT

VERTICAL SIGNAGE

The screenshot displays the ASIMOB software interface for forensic analysis. The main map area shows a road with a red 'X' marking an accident site. A video player on the right shows a road view with a timestamp of 0:49 / 1:52. Below the video, the 'Información' section shows: Fecha: 2024-04-05 12:35:41, N° Revisiones: 1, A_3841, Tipo: BAL-10b, Group: 15021. A thumbnail of a blue arrow sign is also visible.

FORENSIC ANALYSIS OF AN ACCIDENT

SAFETY BARRIERS

The screenshot displays the ASIMOB software interface. The main map shows a road with a red 'X' indicating an accident location. A legend in the bottom-left corner identifies the barrier as 'BAR_01' (green line) and 'EMPTY' (white line). The right sidebar contains a video player showing a road view and a data table for the barrier.

Información	[355850819, 355850818, 674580402, 355850817, 355850816, 5986146932, 355850815, 355850814, 3389614026, 355850813, 355850812, 355850811, 5986146923, 355850810, 355850809, 5986146930, 355850808, 4462035069, 355850807, 5986146931, 4902096316, 5986146922, 355850805, 355850804, 355850803, 5986146921, 355850802, 355850801, 4462035014, 355850800, 355850799, 355850798, 355850797, 355850796, 355850795, 355850794, 355850793, 355850792, 355850791, 355850790, 355850789, 355850788, 355850787, 6147109196, 355850786, 5986146920]->74544 - 2024-04-05 12:35:36		
Tipo	Lado	Long. (m)	ID
EMPTY	D	868.64	602806

FORENSIC ANALYSIS OF AN ACCIDENT

DANGER IN SCAPES



Trees

Rocks

Gutter

FORENSIC ANALYSIS OF AN ACCIDENT

CONCLUSIONS: INFLUENCE IN THE CONSEQUENCES

Asset	Evaluation	Analysis	Influence
Pavement	Defects	High density	Yellow
	Irregularities	Lack of adherence	Yellow
Road Markings	Visibility defects	Good visibility	Green
Vertical signage	Defects	No relevant defects	Green
Safety barriers	Suitability for this user	No barriers in this turn	Red
	Defects	--	Grey
Danger in scapes	Presence	High risk scapes	Red

ROADS THAT FORGIVE. PREVENTION IS BETTER THAN FORENSIC ANALYSIS

This analysis has been applied after the accident. Real benefits appear when the analysis is applied for prevention.

Any vehicle from the Road Authority can be equipped in 10 minutes to apply the Autonomous Road Inspection. The inspection is applied at normal speed.

The assets management, applied automatically, can help to:

- Road Safety inspections
- Evaluation of roads, with different weather conditions
- Analysis after incidences
- Improve management of bridges and tunnels
- Improve management of the pavement
- Improve the safety of maintenance workers

Improve the roads
with us?

Thank you



Ibon Arechalde
ibon.arechalde@asimob.es
+34 657 652 776

www.asimob.es

ODS Commitment
The way matters