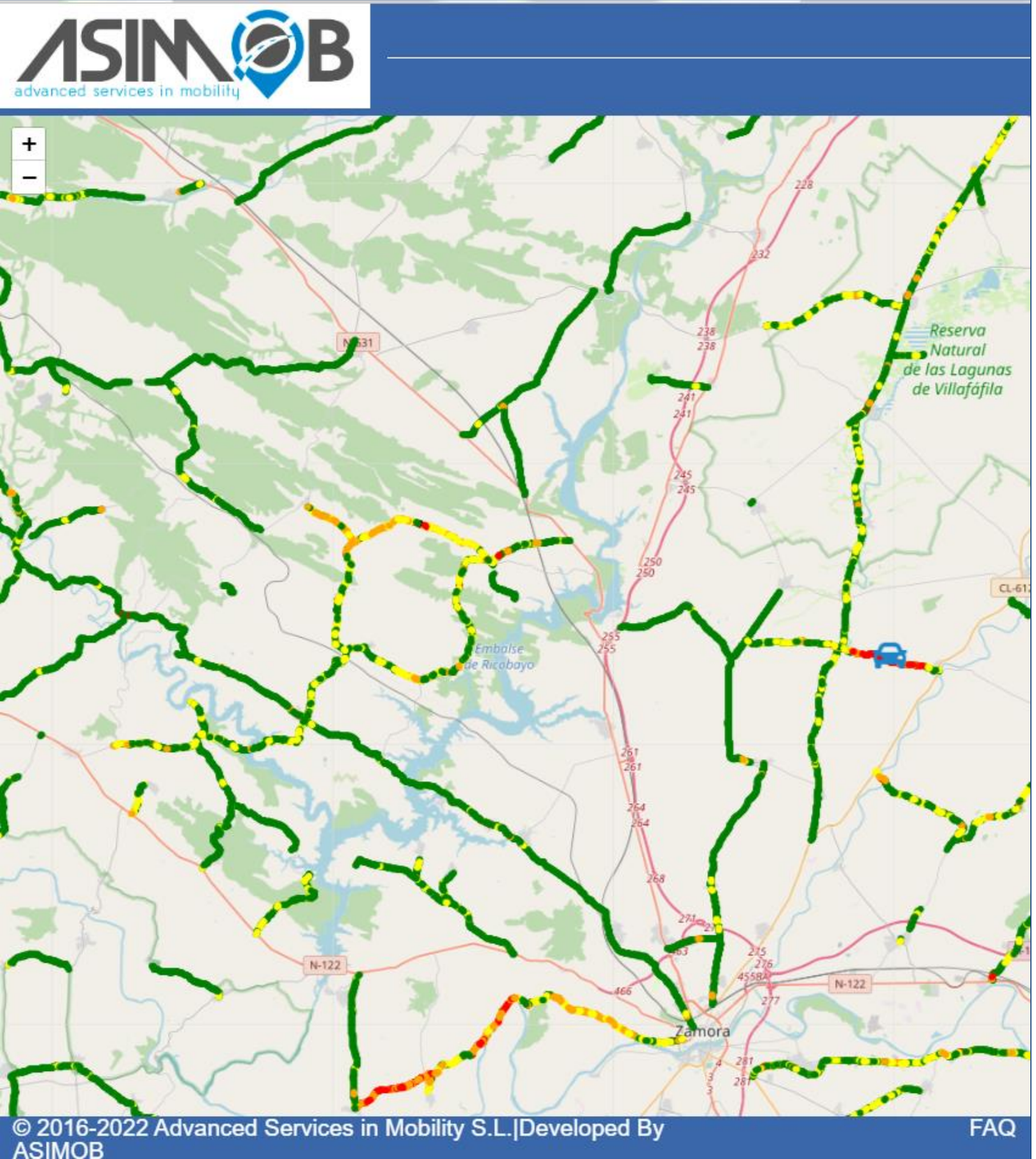
ASIM OB
advanced services in mobility

Visual Inspection indexes obtained by Computer Vision monitoring

IRF



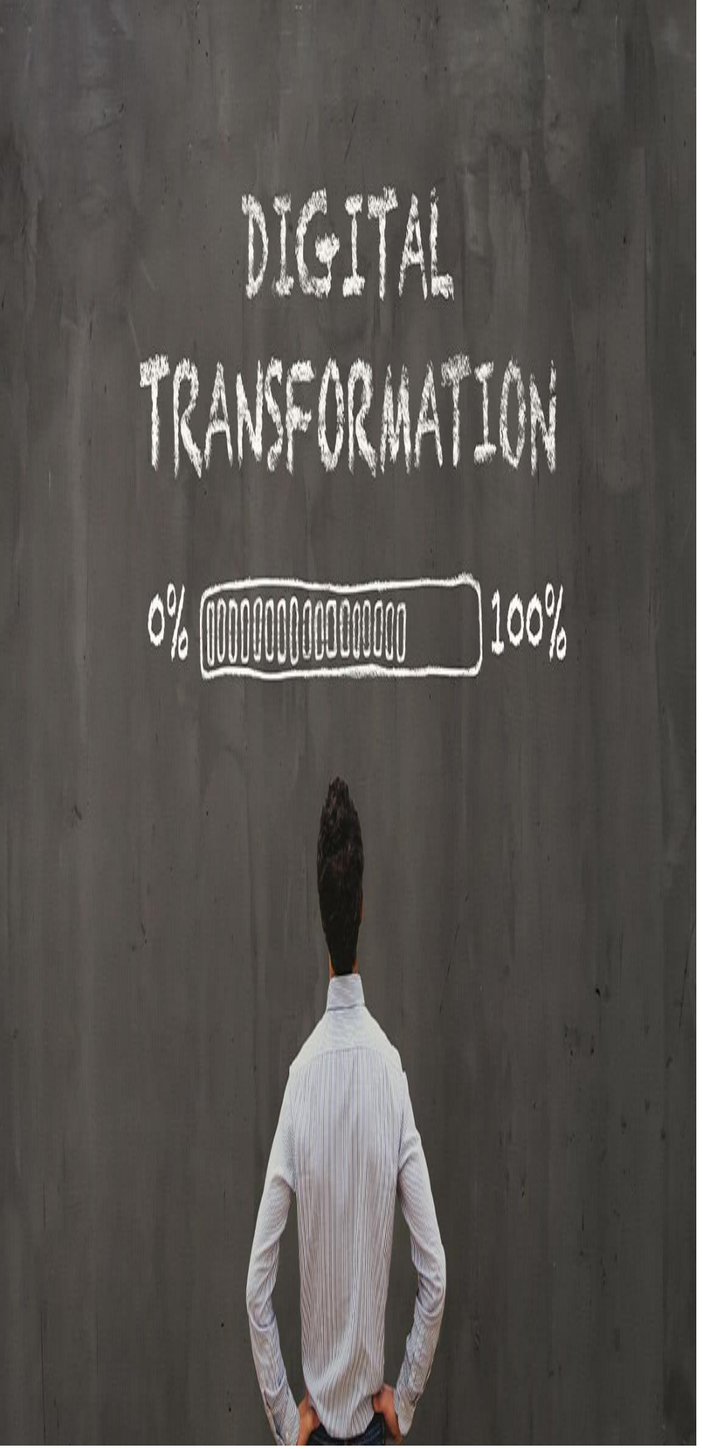
Index

Are you prepared for the digital transformation?

Do you understand the Computer Vision?

Do you have a procedure to apply it?

An example: MF-89 procedure designed by CRR



Are you prepared for the digital transformation?

We are addressing a digital transformation of a sector, that implies:

- Process transformation and
- Organizational transformation

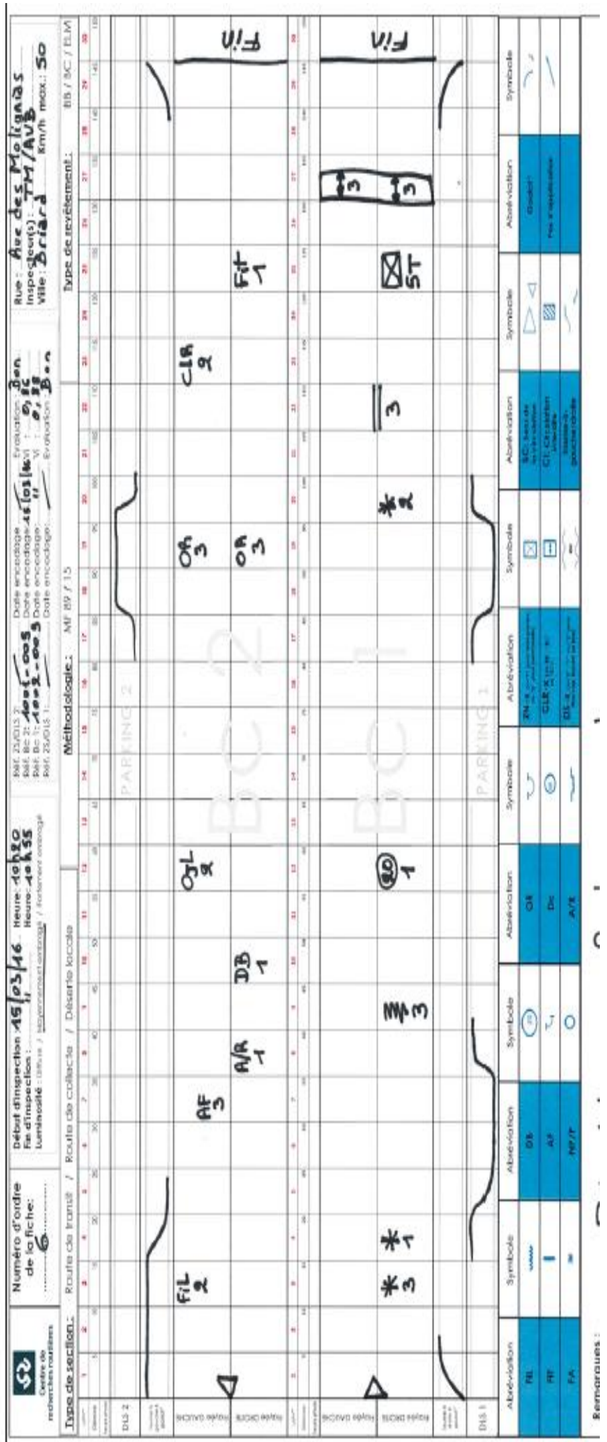
Probably, you need to address these issues:

- You need to know the evolution of the pavement frequently
- You want to be efficient and homogeneous in the inspection
- You want to prioritize the repairments and be efficient in the decision
- You do not have infinite resources to do that

Do you understand the Computer Vision?

Computer Vision is the part of Artificial Intelligence that includes methods for acquiring, processing, analyzing and understanding digital images, and extraction of high-dimensional data from the real world in order to produce numerical or symbolic information to take decisions.

- Not only visible spectrum
- Zoom according to the limits of the lens
- Analyse several items at the same time
- Only detect the items that are trained



Do you have a procedure to apply it?

We need a procedure with the following parameters defined:

- Type of the surface
- Type of degradation, with the parameters that define it (length, width, shape…)
- Weighting index depending on the severity of that type of degradation
- Footprint: vectorial graphic explaining the impact
- Thresholds to evaluate zones with several damages.

Do you have a procedure to apply it?

Centre de recherches routières
Ensemble pour des routes durables

Inspection visuelle & gestion de réseaux routiers (villes et communes)

An example of MF-89 procedure designed by CRR

$$I_V = \max (0{,}90 - \Sigma_{dis}\ w_{dis} \cdot P_{dis}\ ;\ 0{,}00)$$

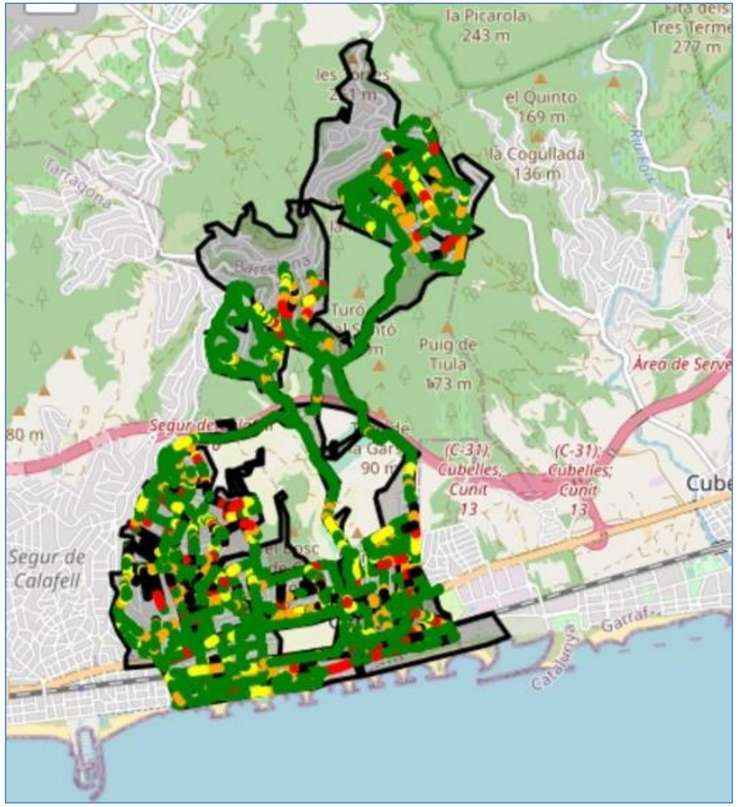
I_V = indice visuel pour la gestion des routes selon la systématique du CRR
dis = dégradation (*distress*)
Σ_{dis} = somme de toutes les dégradations observées
w_{dis} = poids d'une dégradation constatée
P_{dis} = pourcentage de la **sous-section** de route endommagé par une dégradation constatée

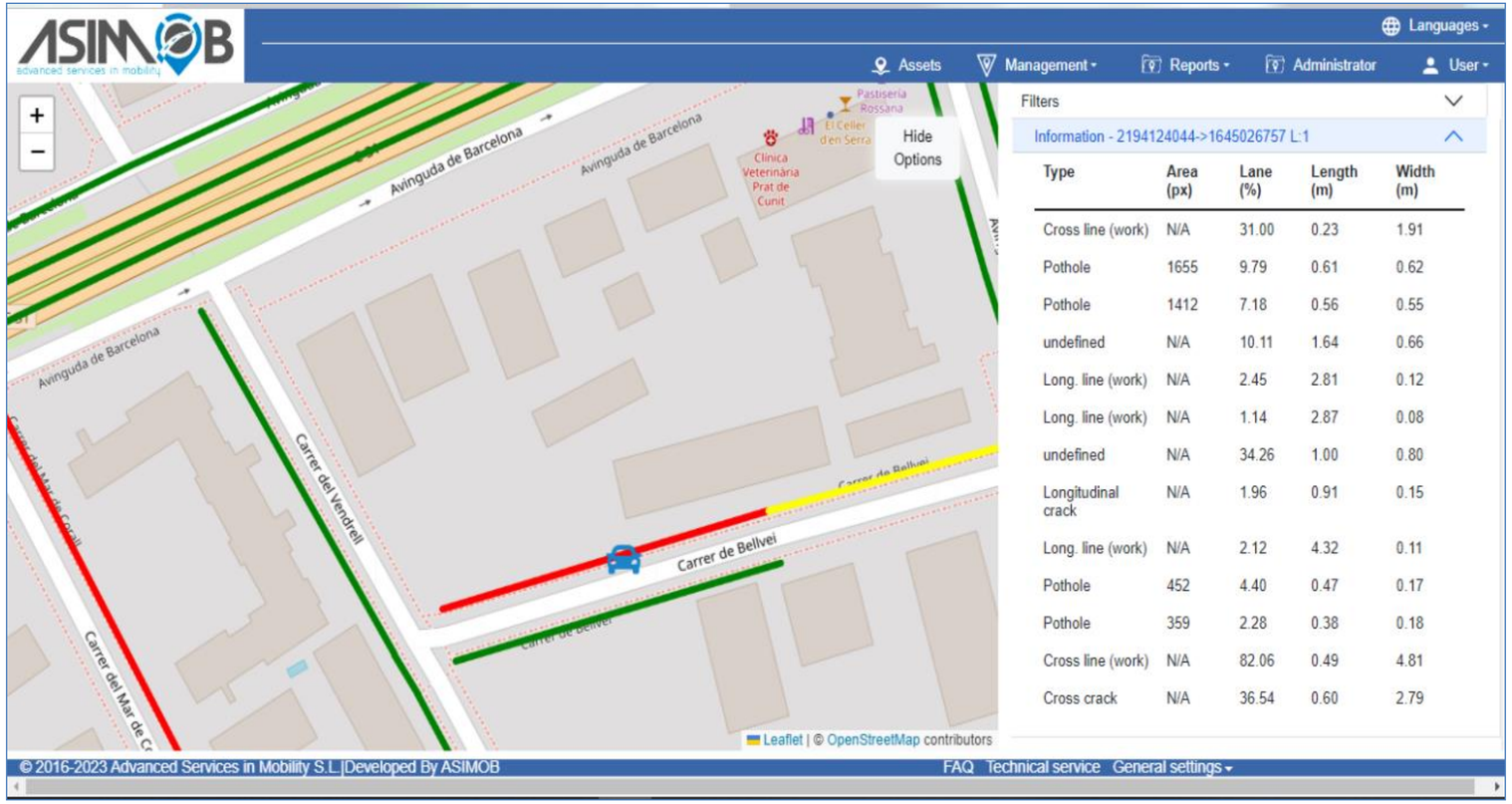
Poids des dégradations pour les revêtements en béton bitumineux

	Fissure longi-tudinale	Fissure transver-sale	Faïençage	Orniérage	Affais-sement/ Flache	Dégradation de bord	Nid de poule/ Pelade	Dégra-dation commune	Plumage/ Ressuage
w_{dis}	0,60	0,60	0,70	1,00	0,50	0,50	1,00	0,25	1,00

Classes I_G	Mesure d'entretien	Commentaire
$0{,}9 \geq I_G > 0{,}8$	Entretien de routine	Aucune réparation nécessaire
$0{,}8 \geq I_G > 0{,}5$	Réparations locales	Réparation des dégradations locales uni-quement
$0{,}5 \geq I_G > 0{,}3$	Réparation générale	Réparation des couches supérieures sur toute la longueur de la section de route
$0{,}3 \geq I_G$	Renforcement	Intervention structurelle sur toute la longu-eur de la section de route

An example of MF-89 procedure designed by CRR





Type	Area (px)	Lane (%)	Length (m)	Width (m)
Cross line (work)	N/A	31.00	0.23	1.91
Pothole	1655	9.79	0.61	0.62
Pothole	1412	7.18	0.56	0.55
undefined	N/A	10.11	1.64	0.66
Long. line (work)	N/A	2.45	2.81	0.12
Long. line (work)	N/A	1.14	2.87	0.08
undefined	N/A	34.26	1.00	0.80
Longitudinal crack	N/A	1.96	0.91	0.15
Long. line (work)	N/A	2.12	4.32	0.11
Pothole	452	4.40	0.47	0.17
Pothole	359	2.28	0.38	0.18
Cross line (work)	N/A	82.06	0.49	4.81
Cross crack	N/A	36.54	0.60	2.79

Ready for Smart Roads?

Thank you

ASIMOB
advanced services in mobility

ODS commitment
The way matters

Adrián Rey
adrian.rey@asimob.es

www.asimob.es