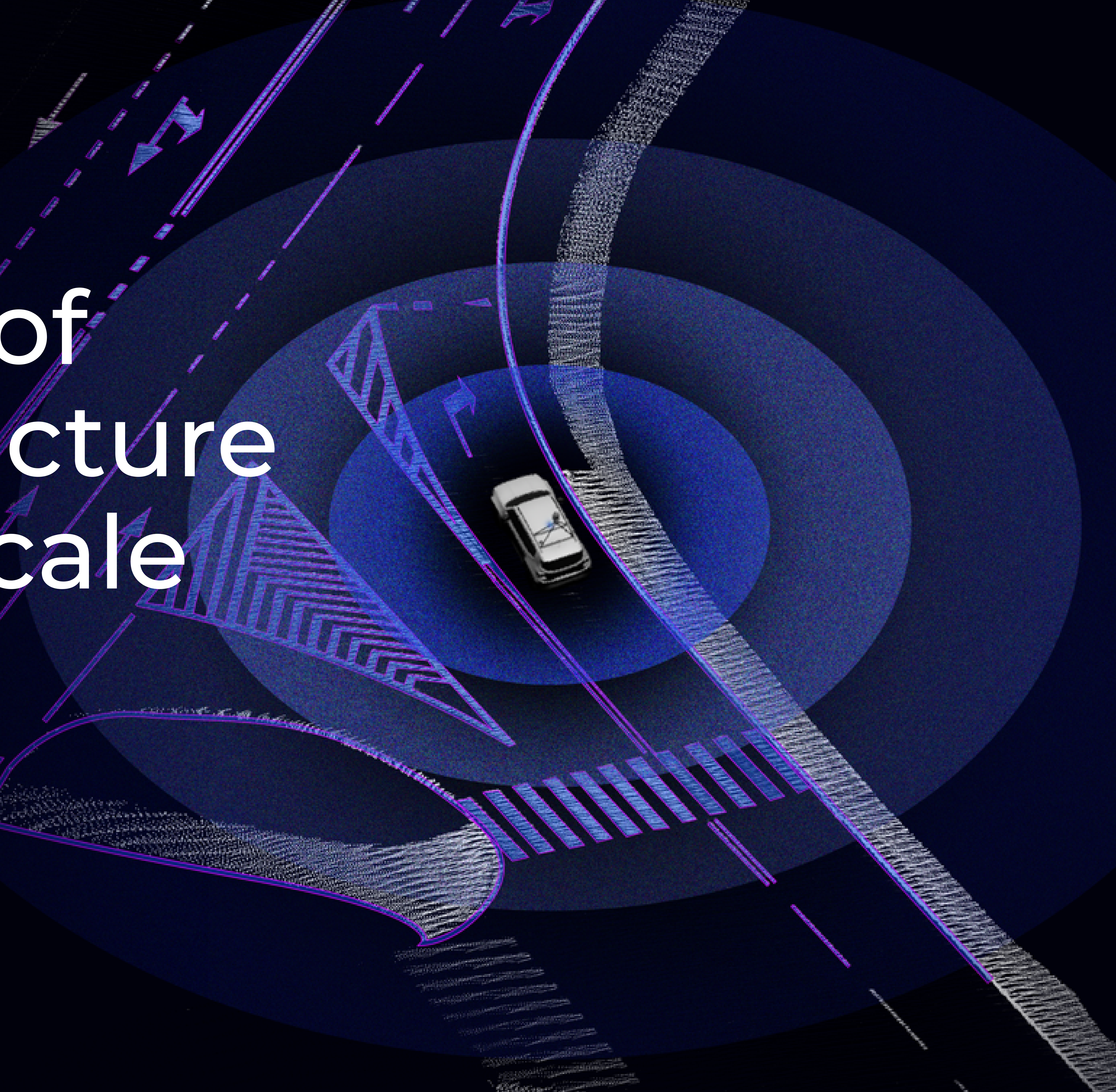
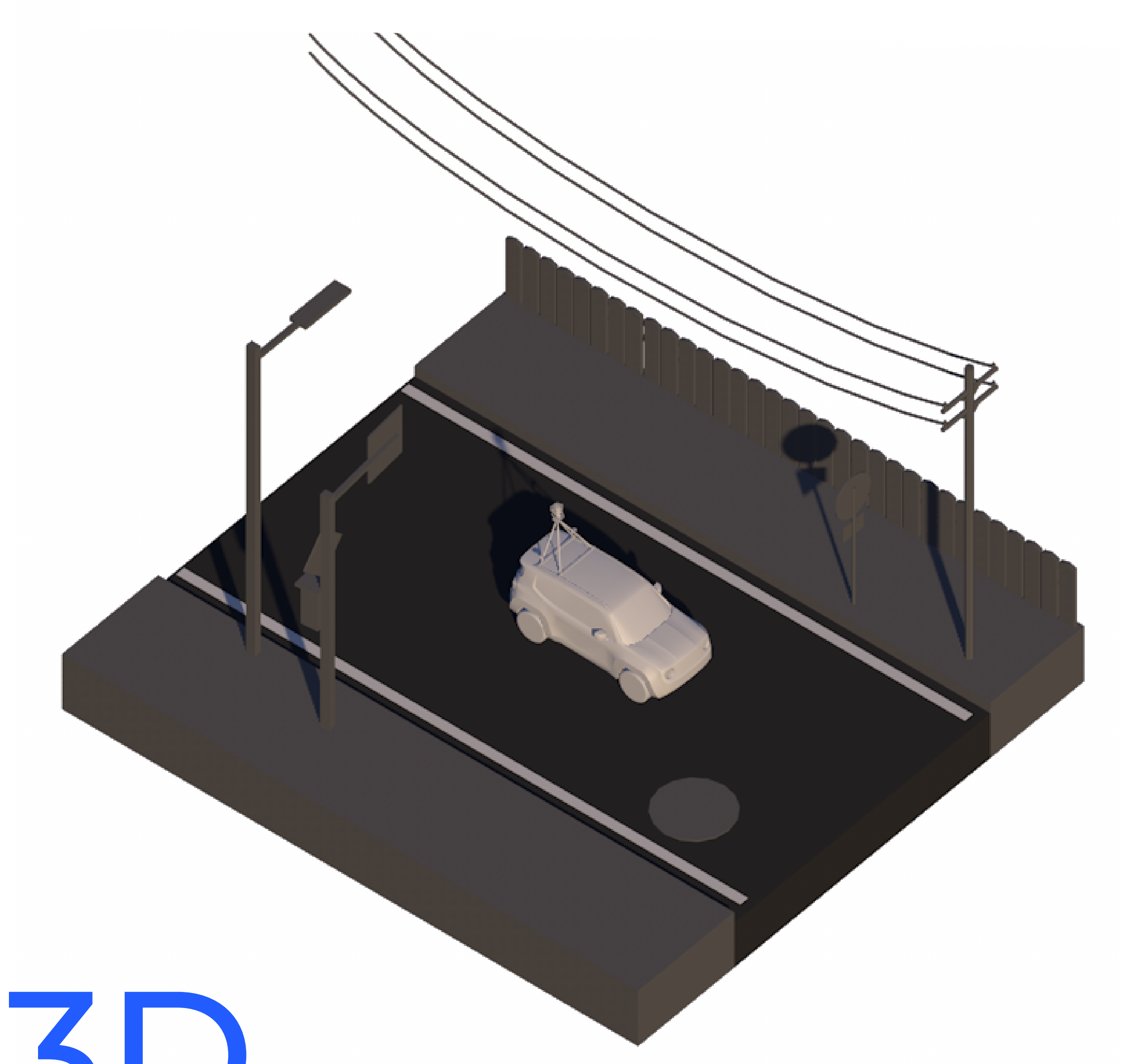
EYEVI TECHNOLOGIES

Digital twins of road infrastructure on network scale

See the roads like never before



EyeVi will become the biggest 5D road infrastructure data platform in EU and North America

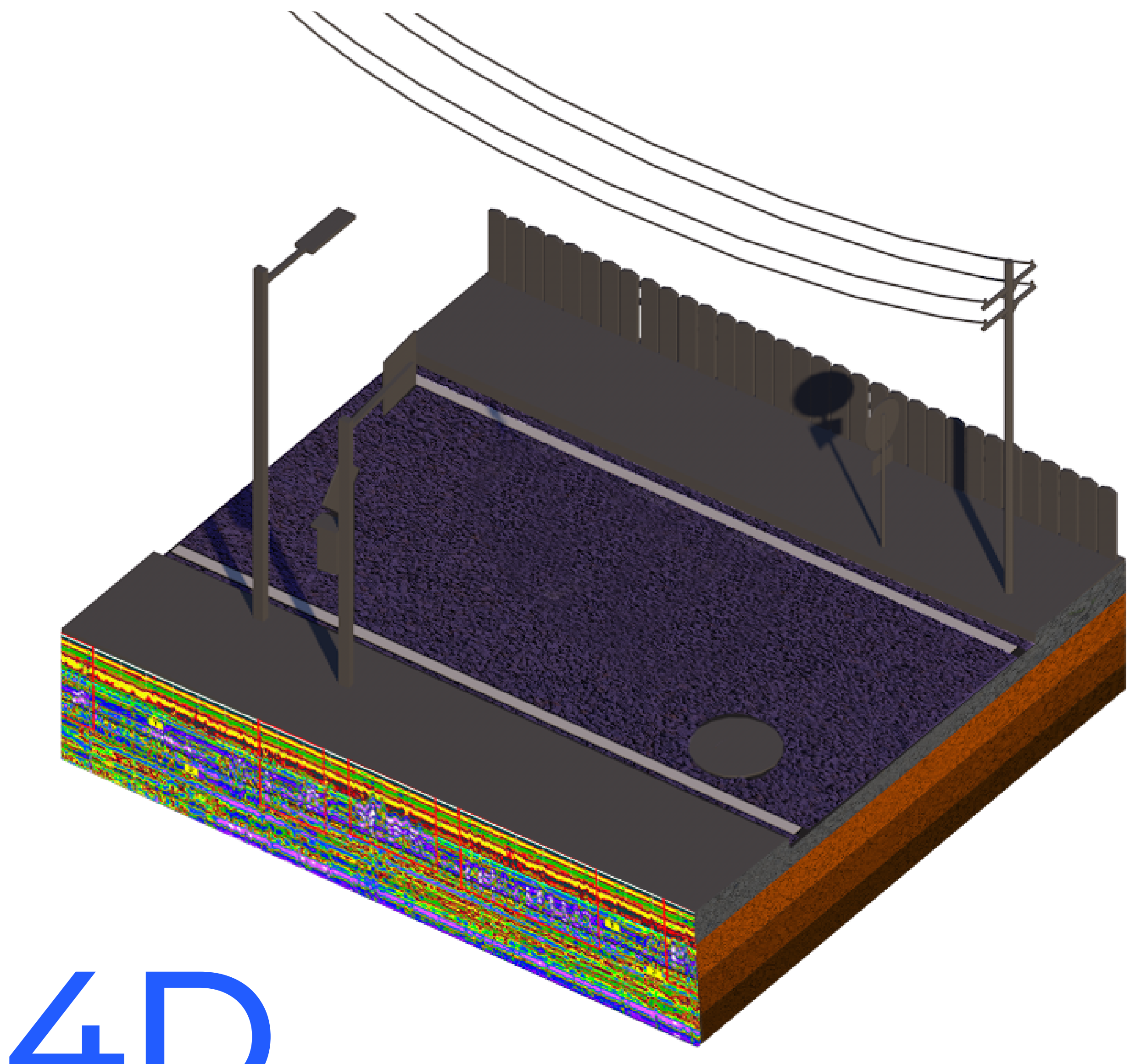


3D

Visual intelligence

Know where defects are, manage road assets and act on insights.

Everything that is visible.
Defects, objects, attributes.

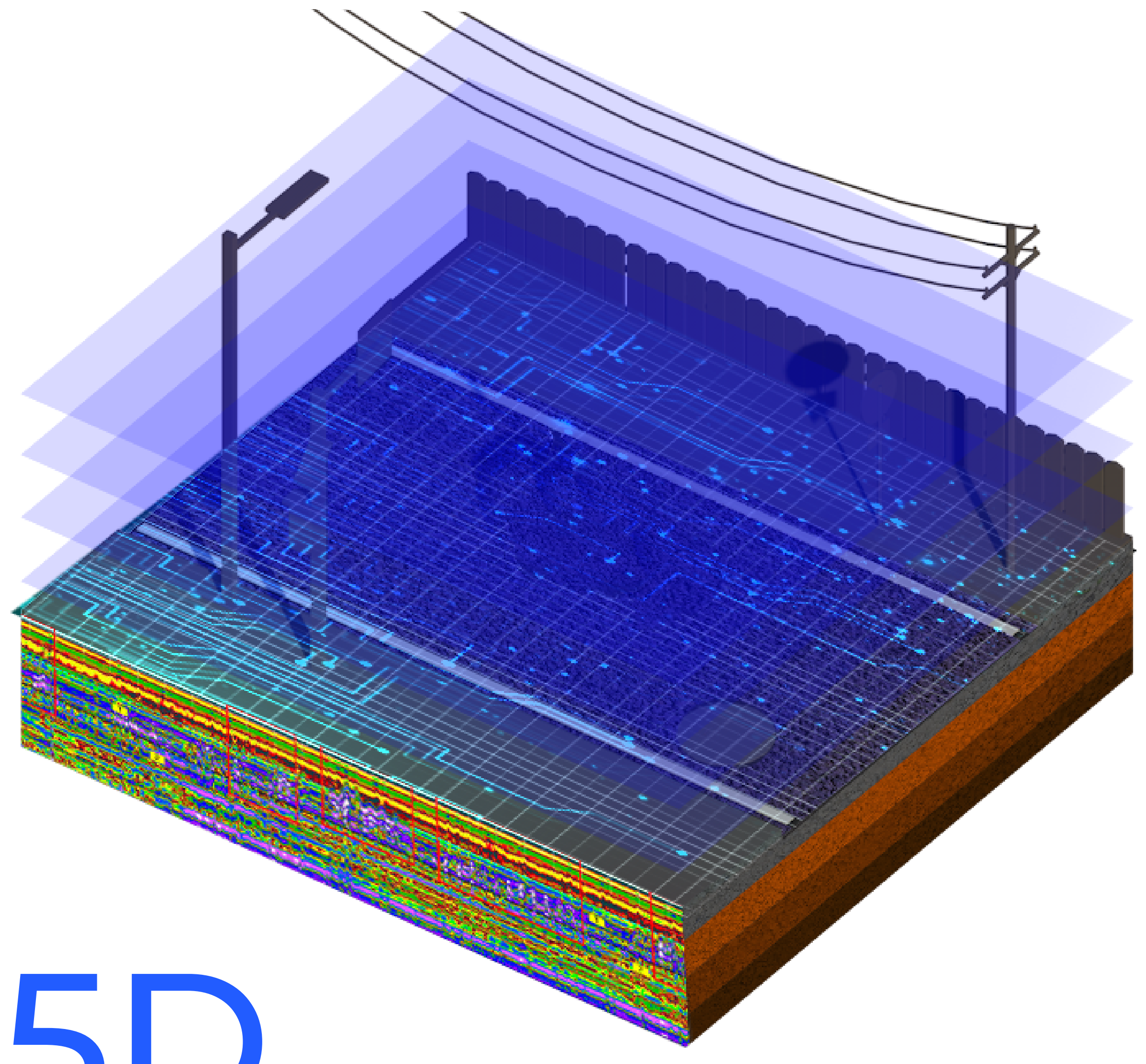


4D

Sub-surface intelligence

See and visualize what can't be seen.

Materials, layers, compositions, reflectability, skidding.



5D

Predictive intelligence

Anticipate, predict the future, simulate, and execute.

Historical comparisons.
What will happen and where will it happen.

How will we achieve the vision?

3D
2022-2025

Building a 3D layer at our road network intelligence platform with data from:

Camera based mapping input	LIDAR based mapping input

Processed mileage milestones

2023 - 250 000 km

2024 - 1 000 000 km

2025 - 3 000 000 km

Detection of features and objects.

4D
2024-2026

Merging 4D data with 3D layer

4D data from clients/partners

Compositions	Roughness
Deflections	Texture
Reflections	Gradients
Skidding resistance	Materials etc.

We will not take ownership of the data

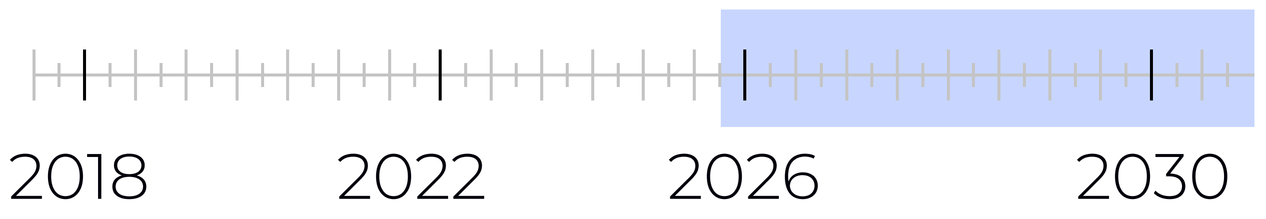
Merging with AI algorithms to match 3D data

Visualizing and analyzing 4D data on 3D visual platform

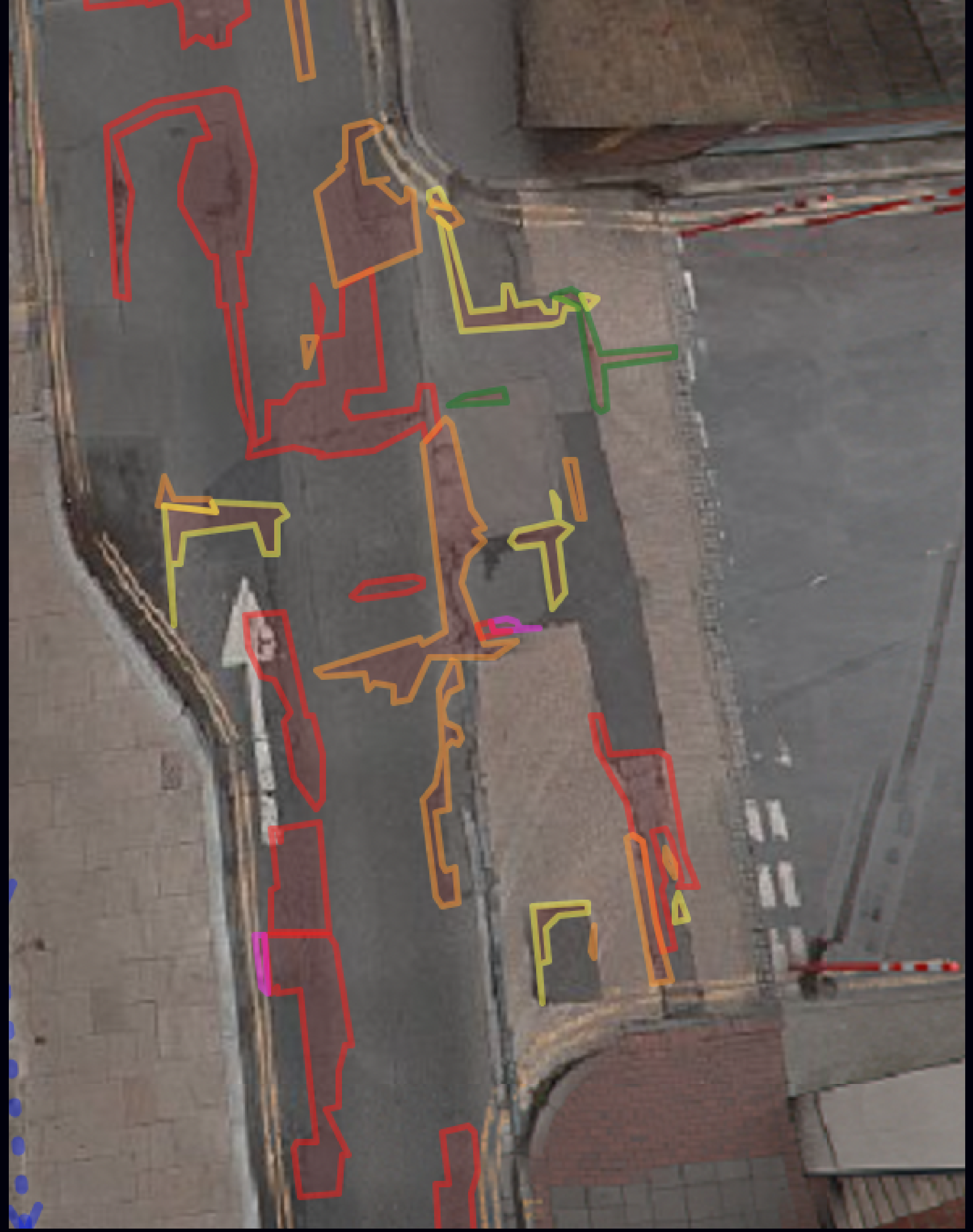
5D
2026-

Teaching AI to predict from the data we own.

Analyzing historical data with AI to predict where and why defects on roads will occur.

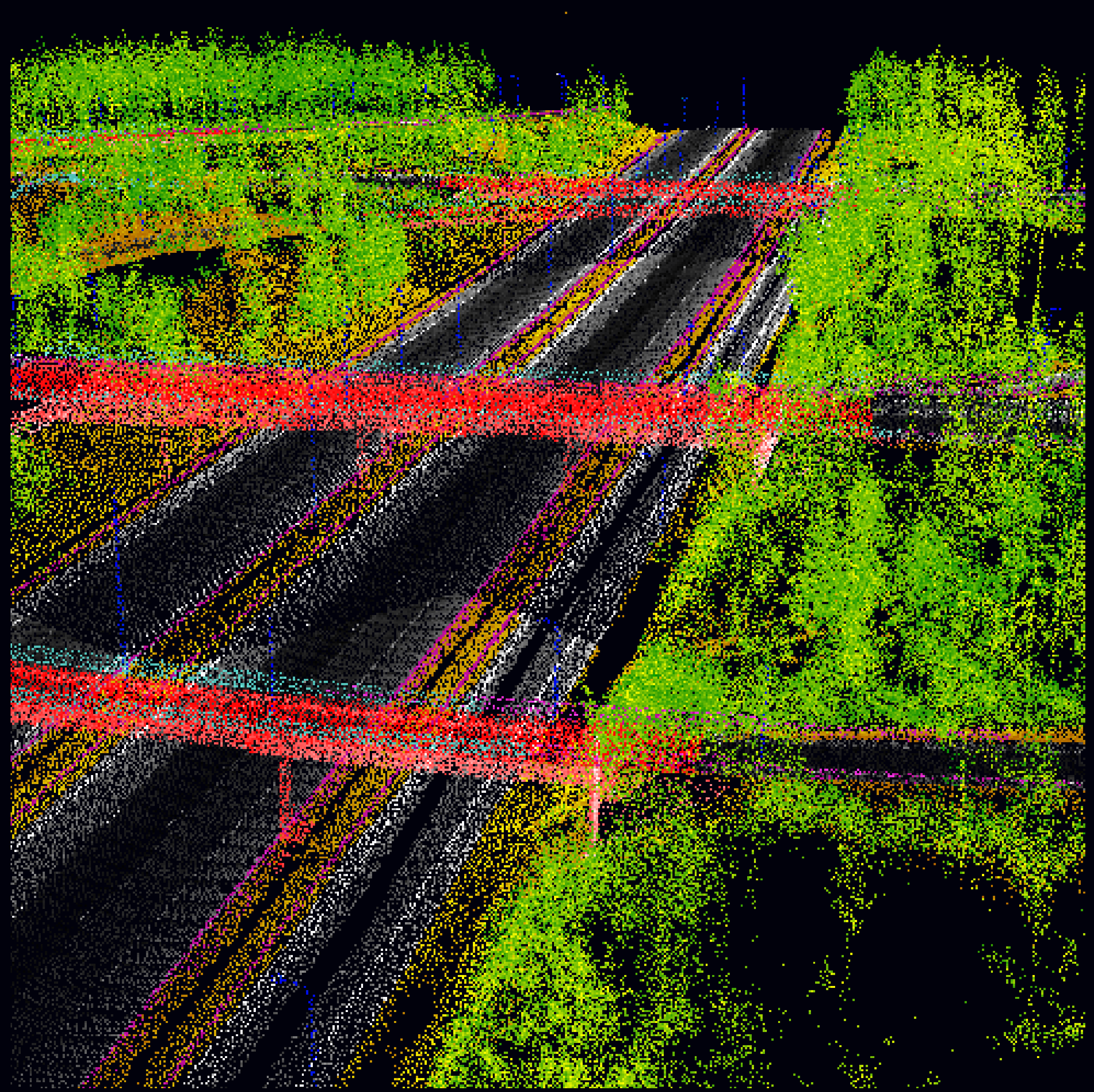


AI predictive intelligence



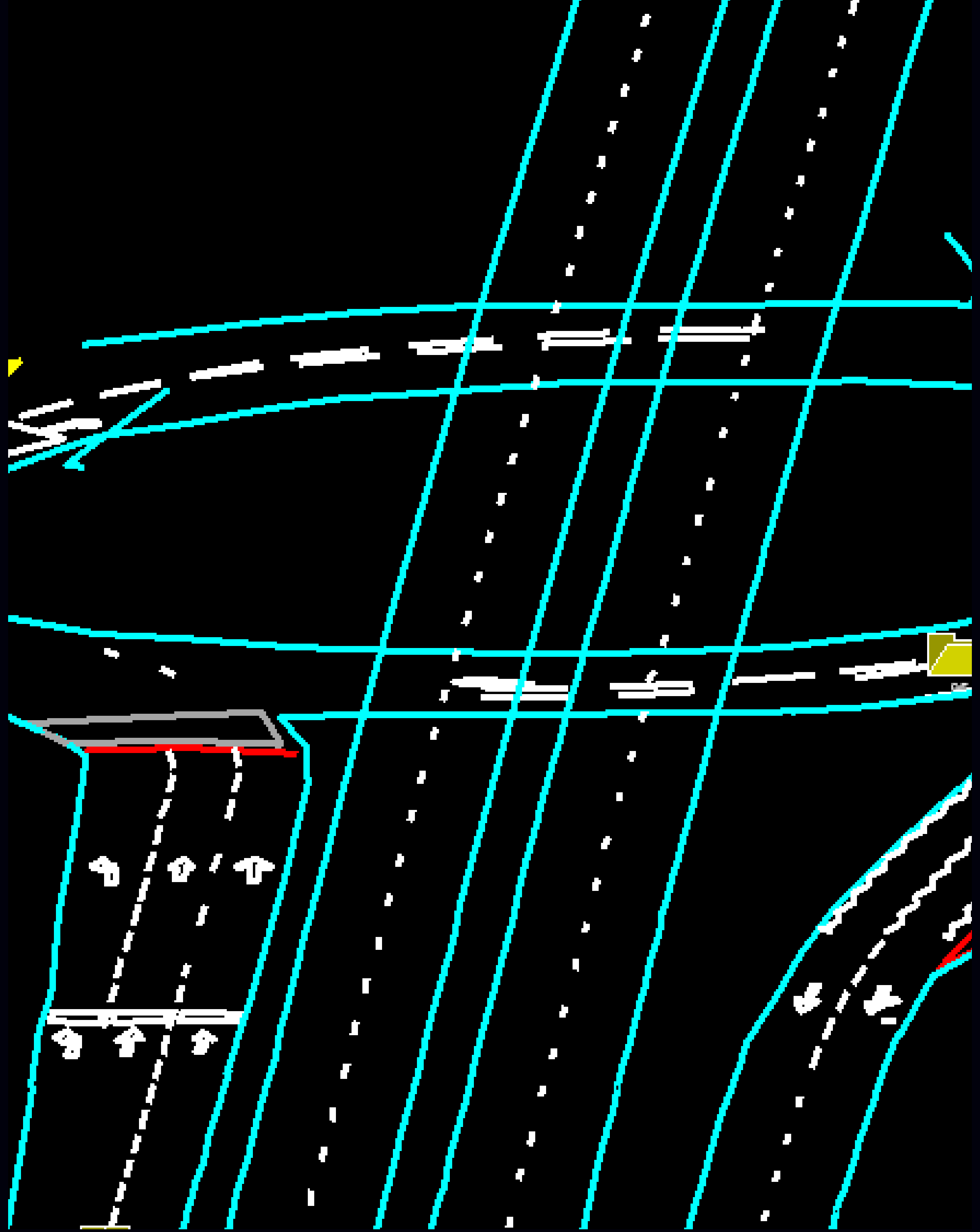
1. Object detection

Road defects, road signs, markings, curbstones, etc



2. 3D data from point clouds

Alignment, classification, colouring



3. Vectorisation with attributes from point clouds

Overpassess, fences, barriers, shoulders, safety islands, curbstones, etc.

1. Object dection visualisations for superior road surface and asset managment

Road defect detection

Cracking (network, transverse/reflection, lognitutional, wheel track), fretting, edges, fatting, wheel path rutting, HFS loss, potholes, etc.

Road markings

Longitutional, transverse, crosswalks, etc.

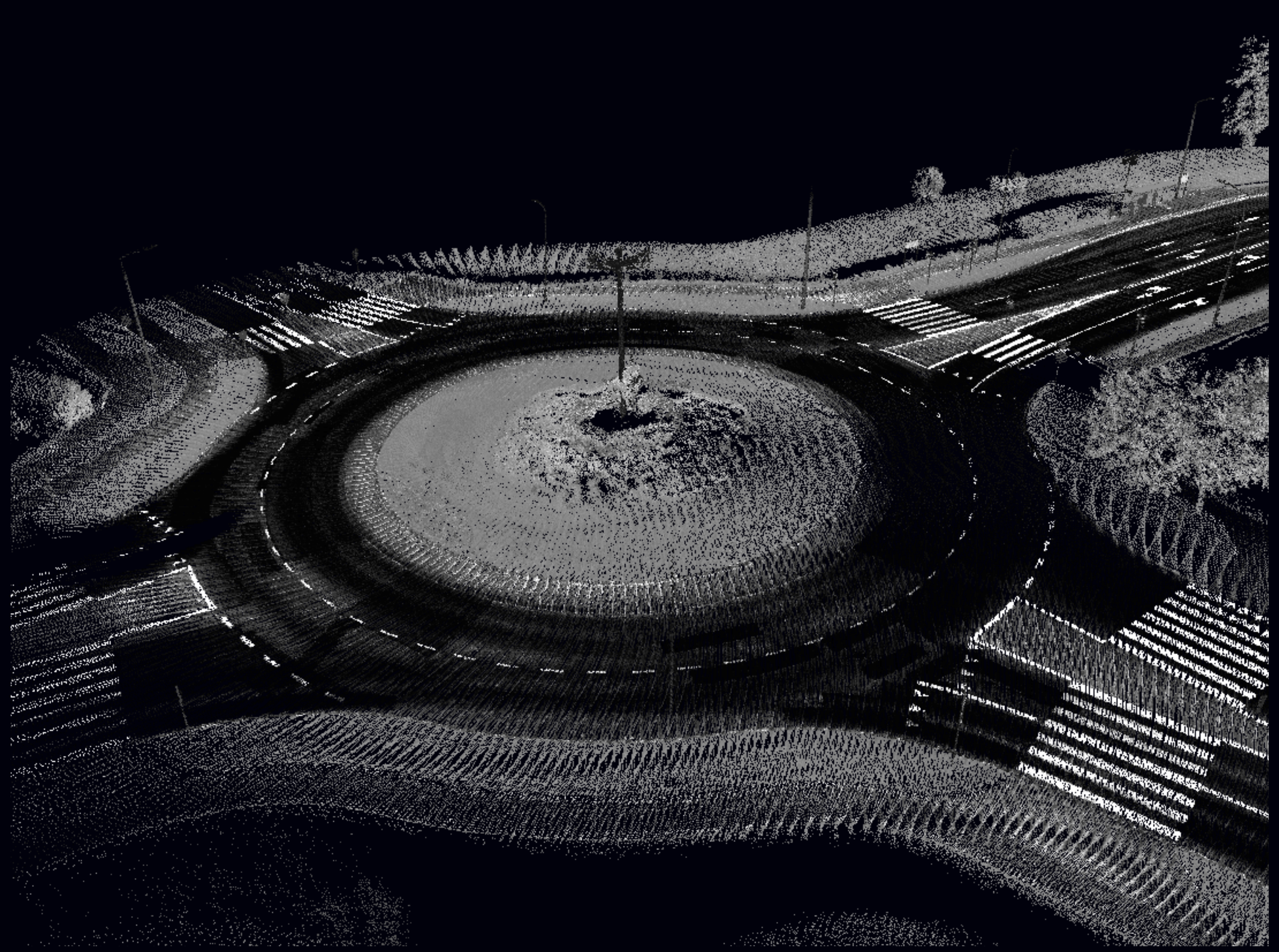
Road signs

Individual marking signs, signals, road signs on poles, portals, walls, etc
(Position. type, illumination, post type, conditon)

Other road assets

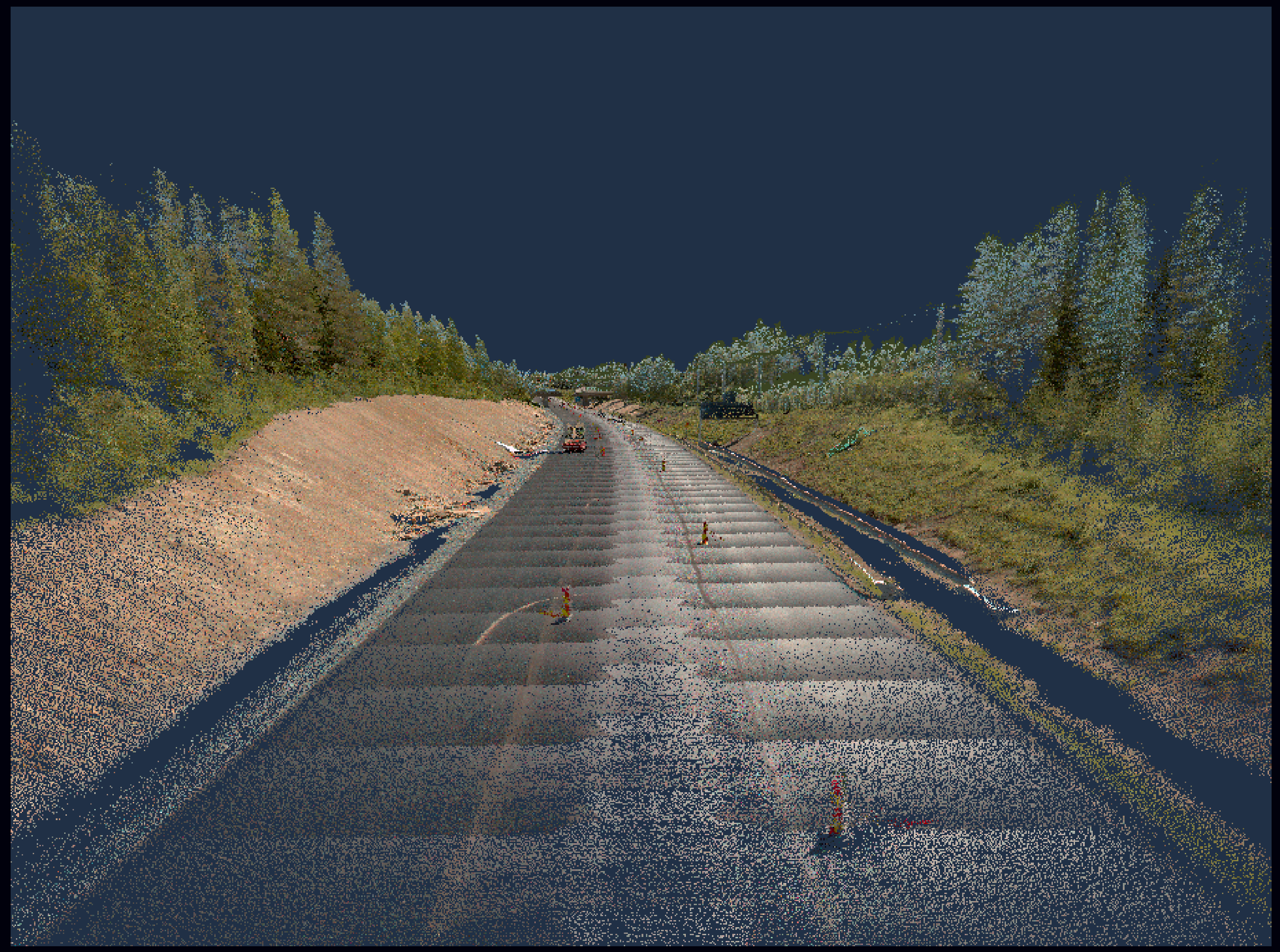
Streetlights, curbstones, manholes, speed bumps, traffic islands, railings, sidewalks, etc.

2. Data-rich point clouds



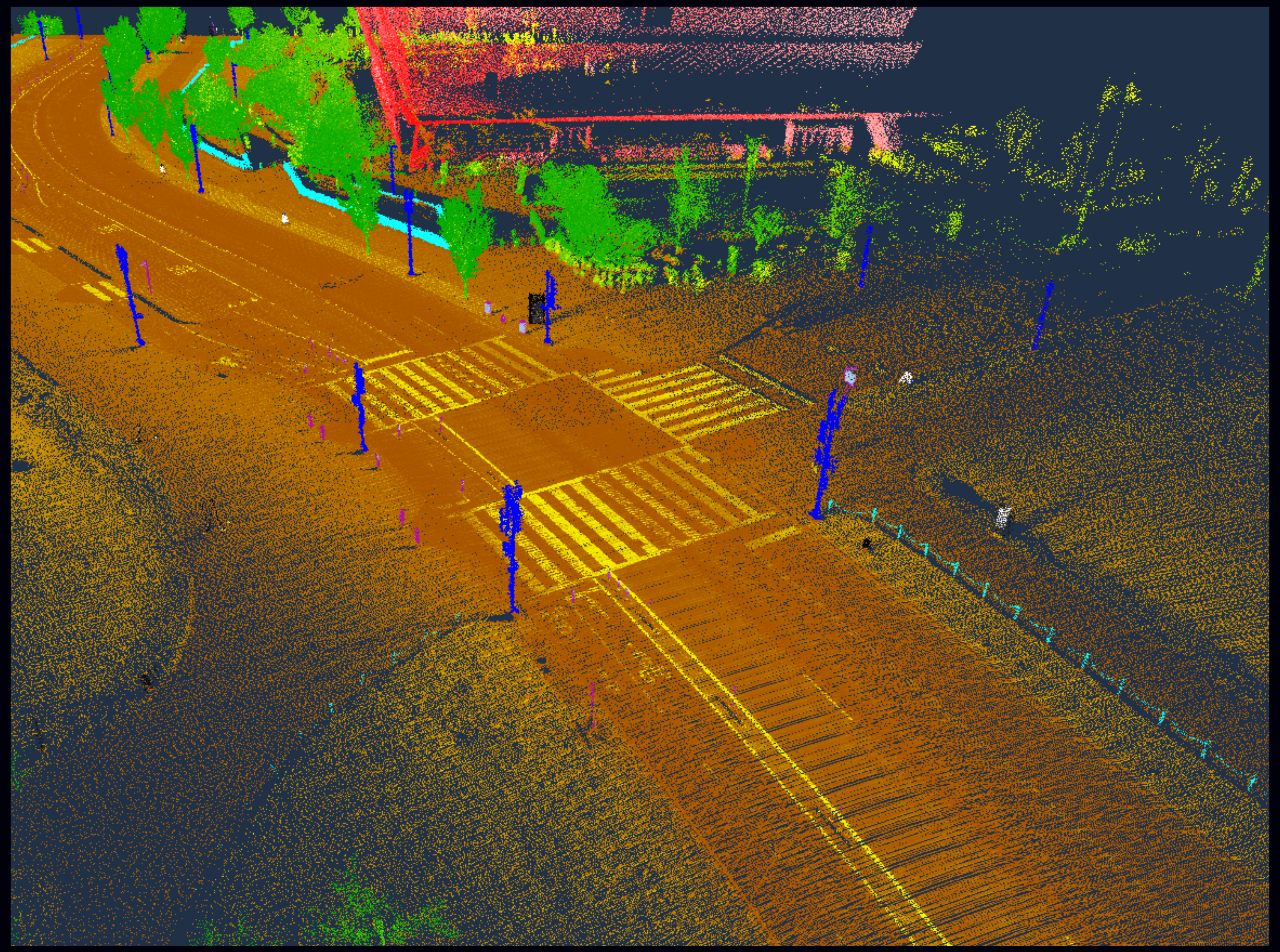
Raw point clouds

Raw data from LiDAR is combined with post-processed trajectory data so each dot in the point cloud is georeferenced. For extra accuracy, several point clouds are aligned.



Coloured point clouds

RAW point cloud is combined with panoramic imagery to color each point and make all the details stand out clearly.

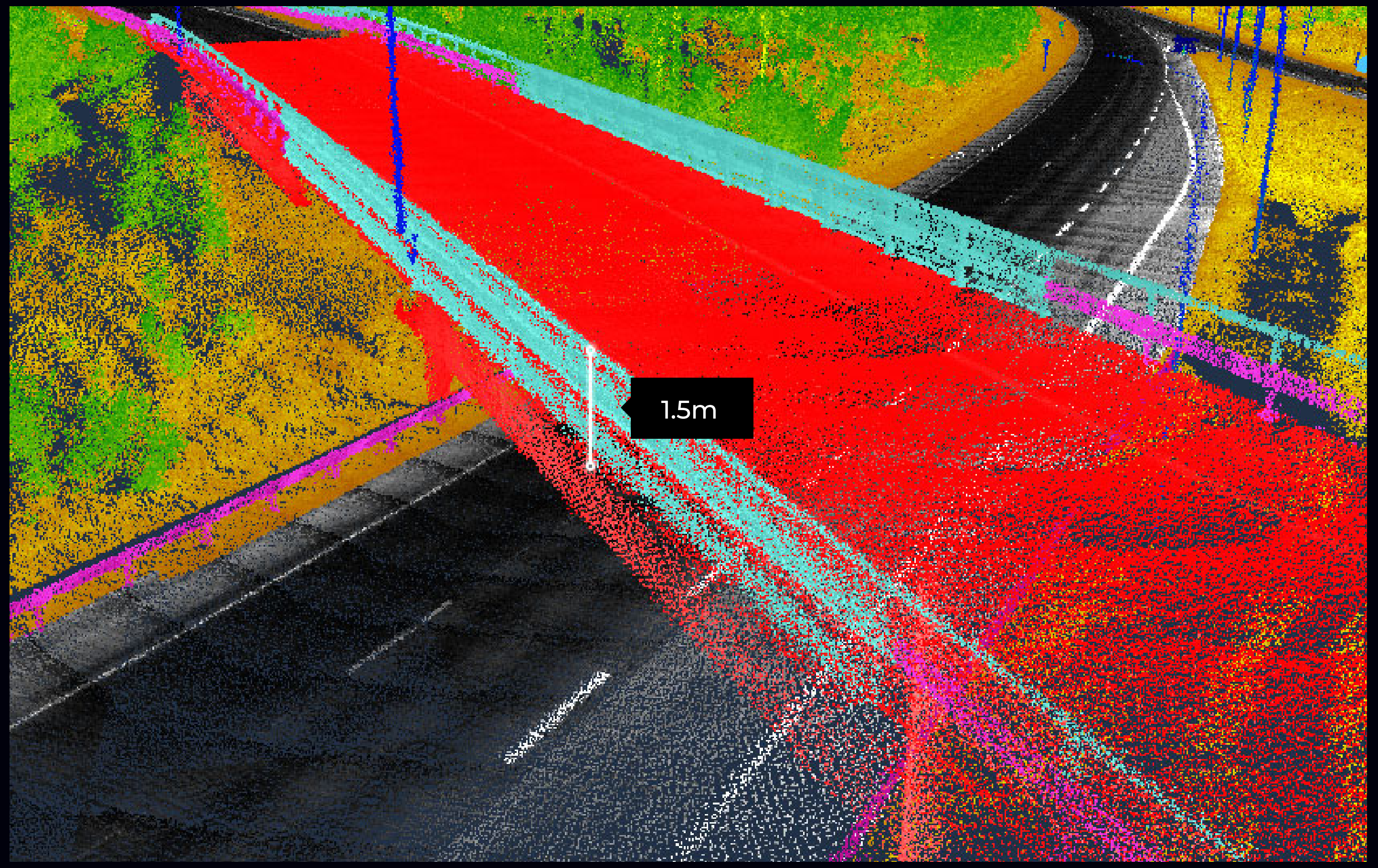


Classified point clouds

All points are classified according to their type, such as bridges, ground, road area, shoulder, and high and low vegetation.

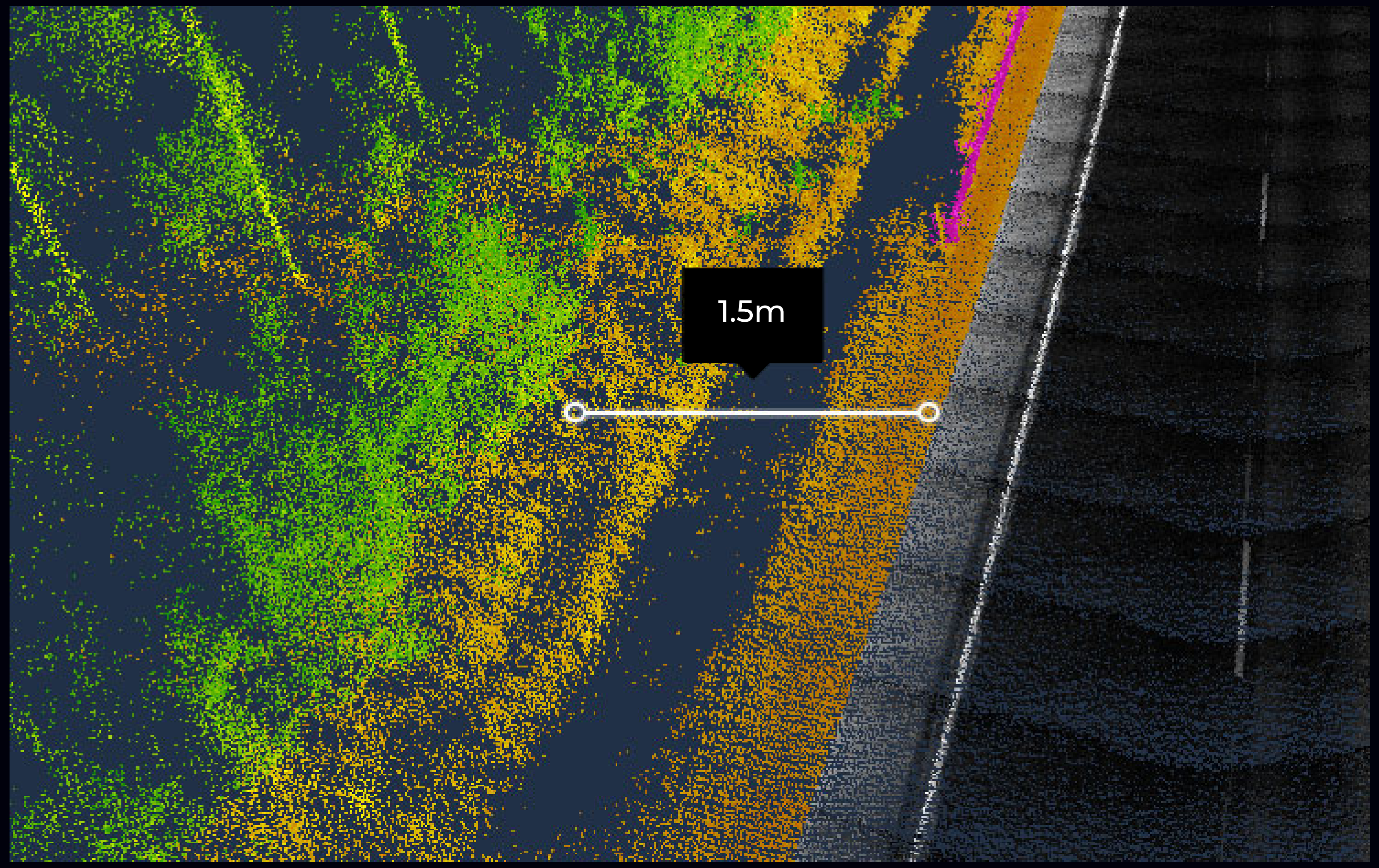
3. Vectorised objects with attributes

Raw point clouds can be used for 3D measuring



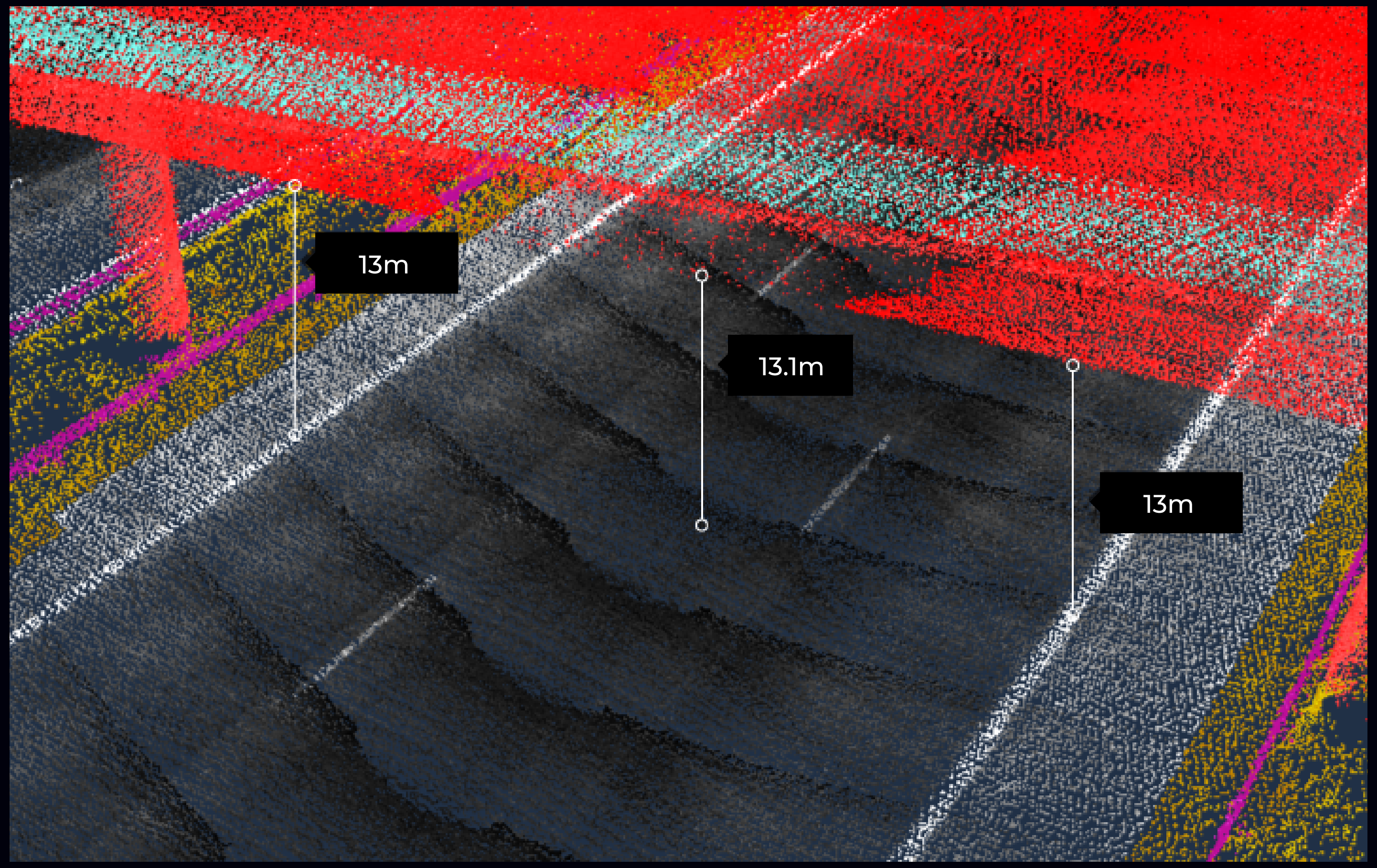
Height, width, and length

Extra attributes like height, width, length, and degrees give valuable information for road inventory information, valuation of existing assets, and planning road infrastructure changes.



Spatial relationships

By classifying different types of areas and geospatial data, we can provide special relational attributes. For example how far is the tree from the sign post? This is valuable information for safety analysis.



Safety clearences of road structres

From a safety perspective and in road infrastructure management certain information such as the height of overpasses is vital. We can provide this information for every road network.

WEB APPLICATION

Oslo, Norway

1,300km covered in total
14 object types digitalized


1.3 million assets
in 8 classes
OSLO, NORWAY

Asset detection

Markings

Road signs

Condition

XAIS Asset Management

London Borough of Barnet, UK

2021

Client: XAIS

Total milage: 761km

10 datasets and 2,654 areas of interest being detected.

Pavement markings analysis

Identifying road markings and their wear condition from aerial orthoimages by artificial intelligence.

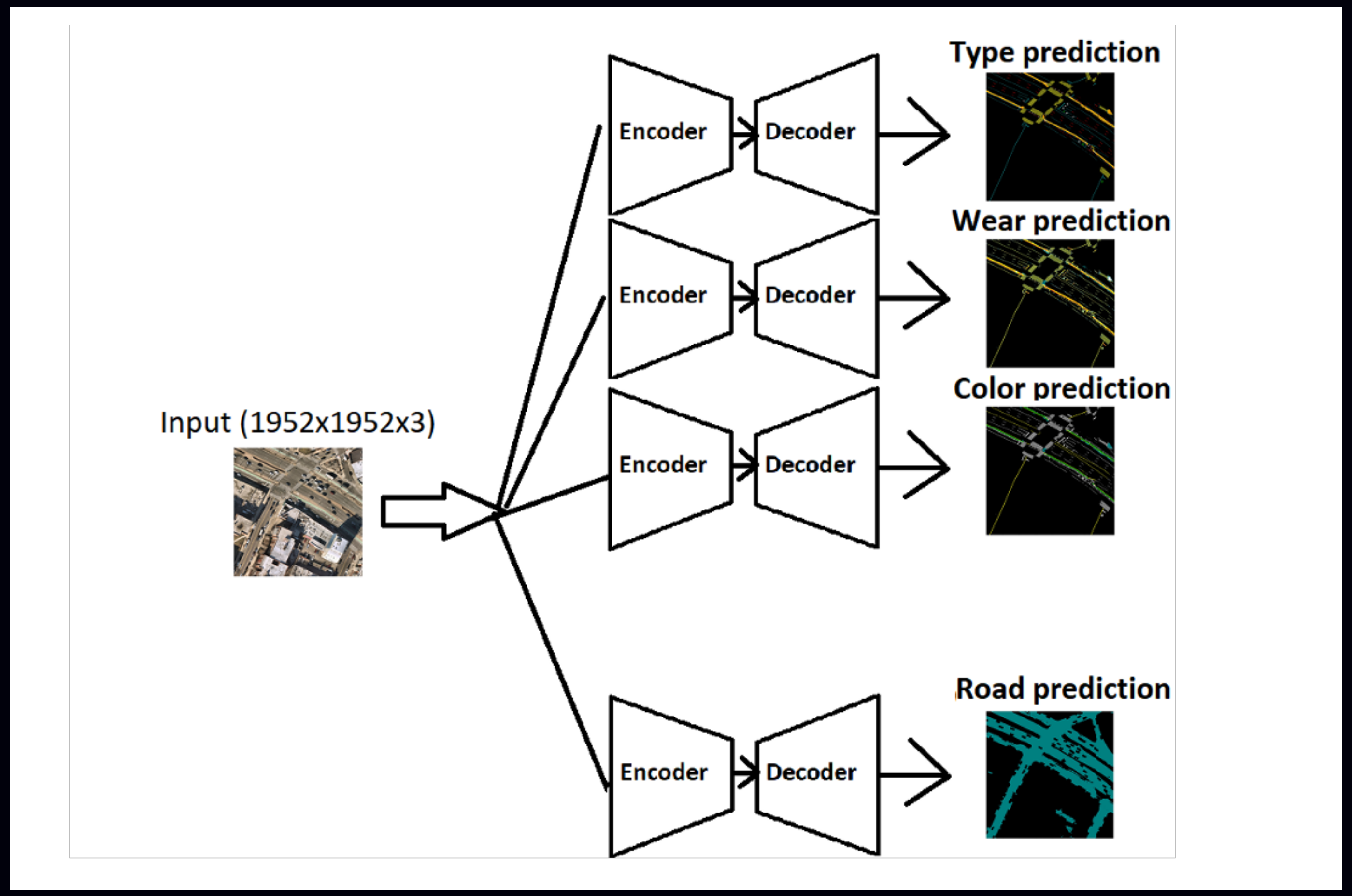
AI

Detection and pixel-level segmentation of road marking types.
Evaluating the wear and color of segmented road markings.
Detecting clusters of predicted road markings to attain wear, color and type of road marking (Multi)Polygons.

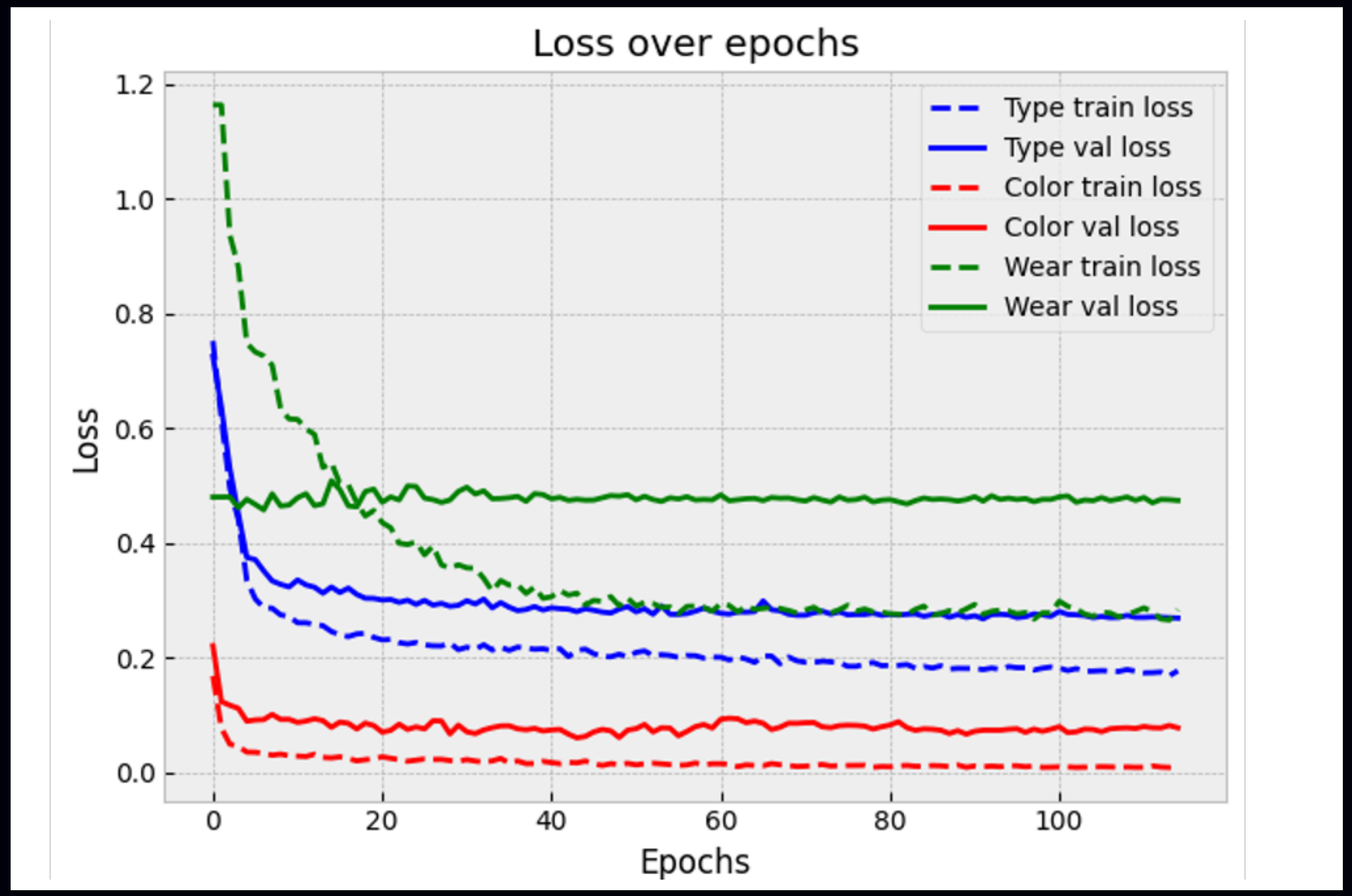
GIS

Linking the road markings with LION segments.
Aggregating the road marking wear condition for LION segments.
Change detection.

AI methodology



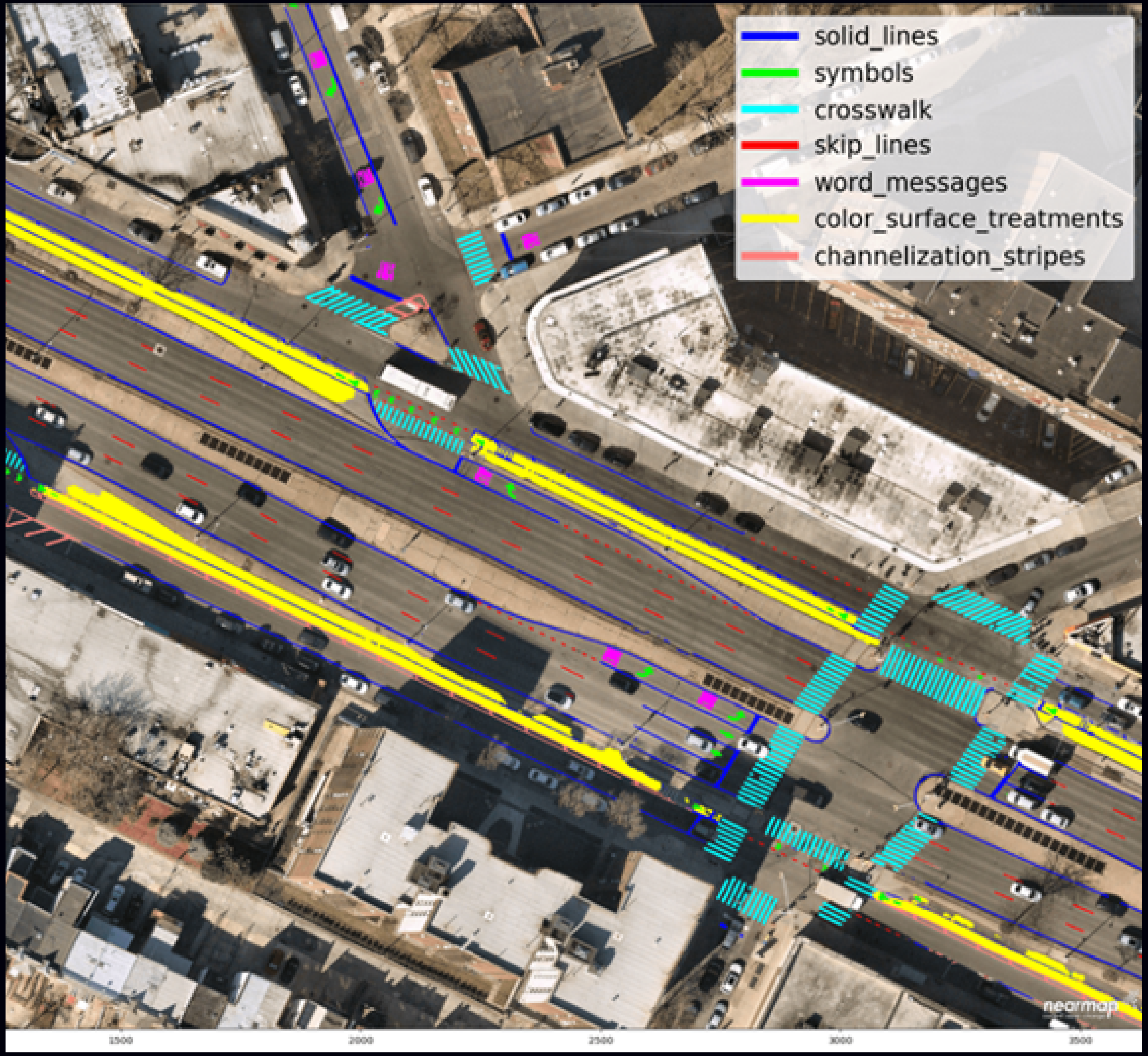
- Pixel-level segmentation of road marking type, wear, color and road area.
- Rotated bounding box object detection to cluster detected segmentations into instances.
- Assigning wear and color to instances by averaging wear and color predictions over the detected instance area.



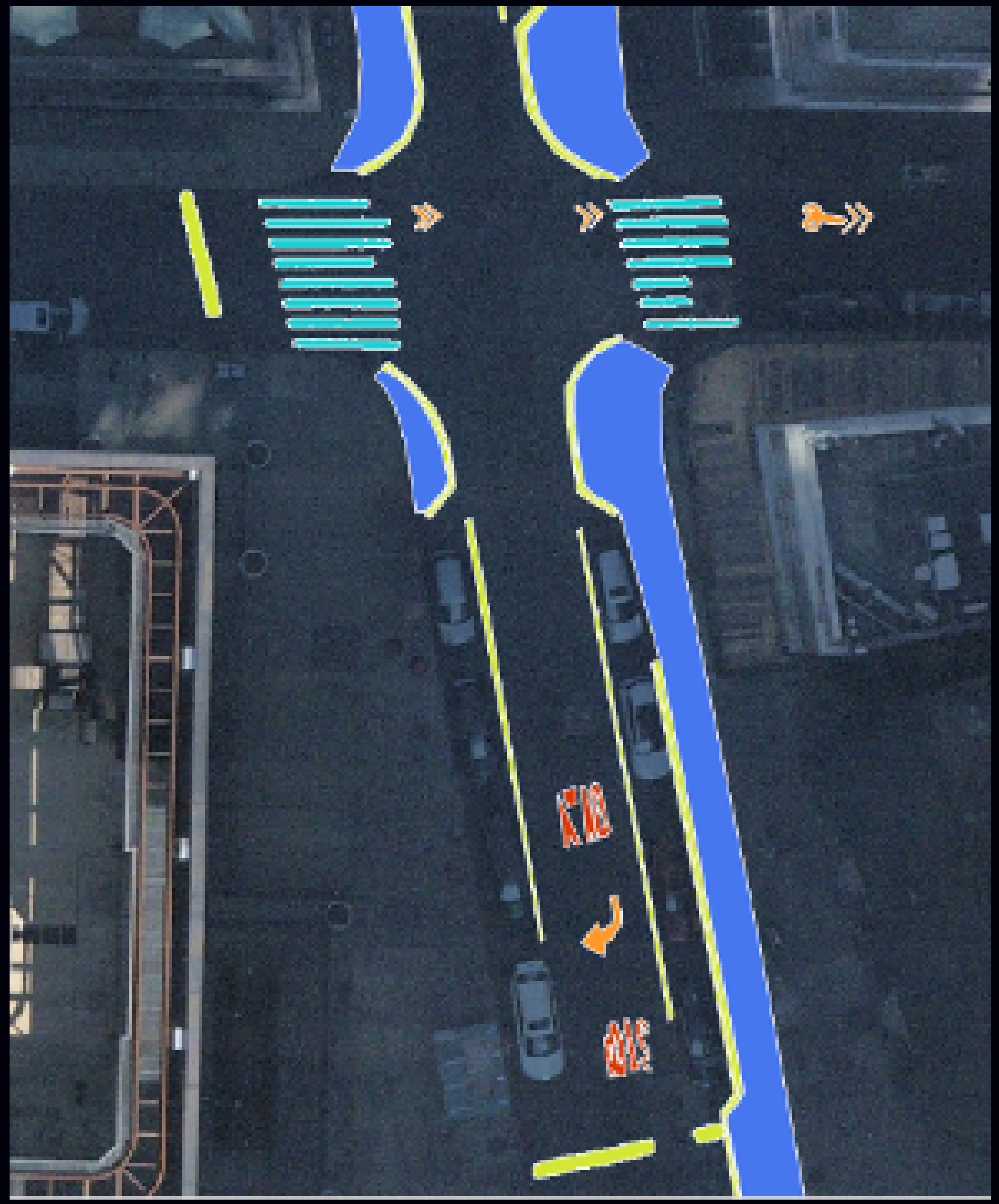
Trained over 68 annotated images, validated over 18 images.

Results

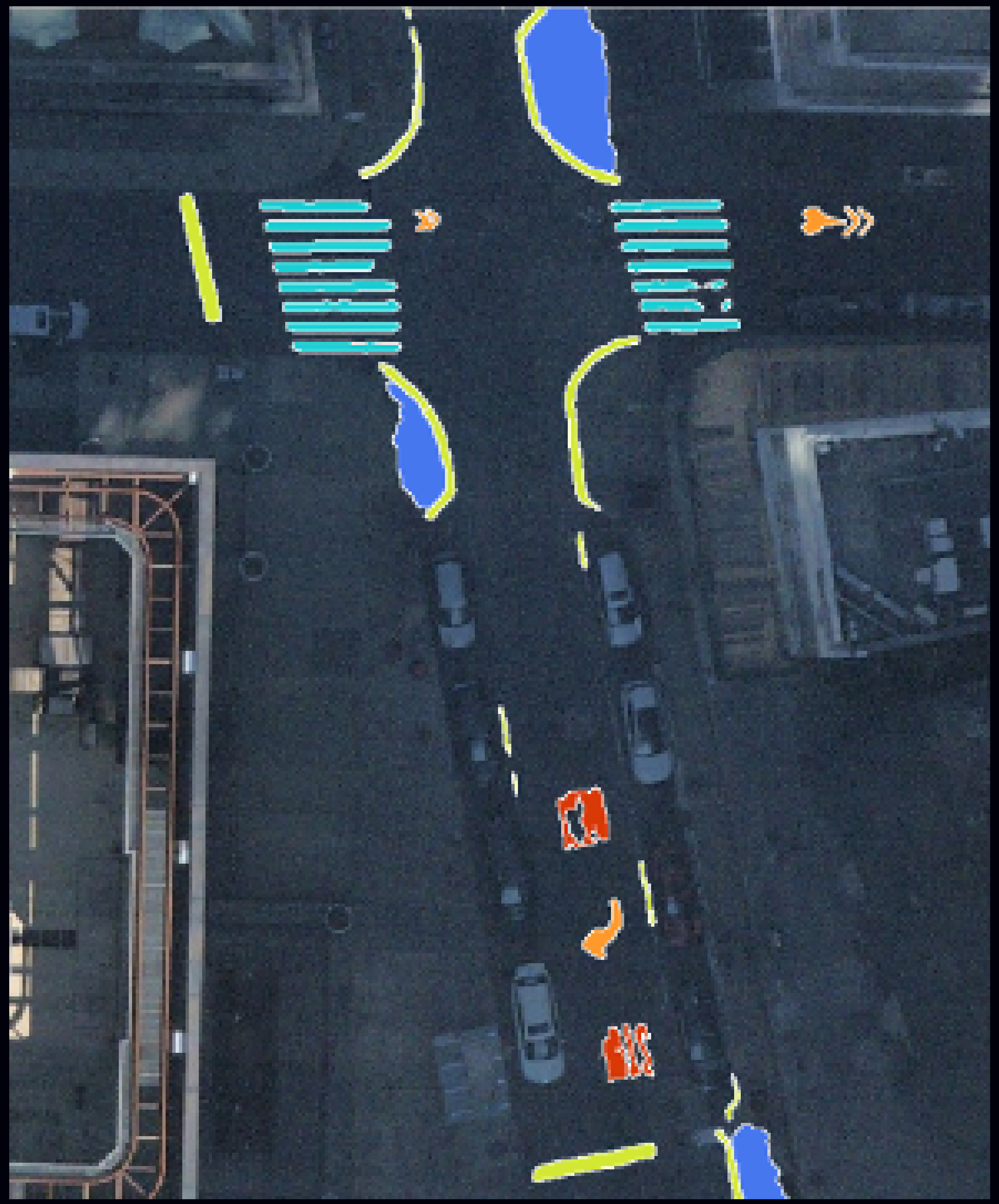
- Road marking type segmentation eRc 84%, ePr 89%.
- Wear assignment average error 17%.
- Color assignment accuracy 99.05%.
- Object detection Rc 76%, Pr 64%.


solid_lines
symbols
crosswalk
skip_lines
word_messages
color_surface_treatments
channelization_stripes
nearmap
1500
2000
2500
3000
3500

Original image



Annotations



Predictions

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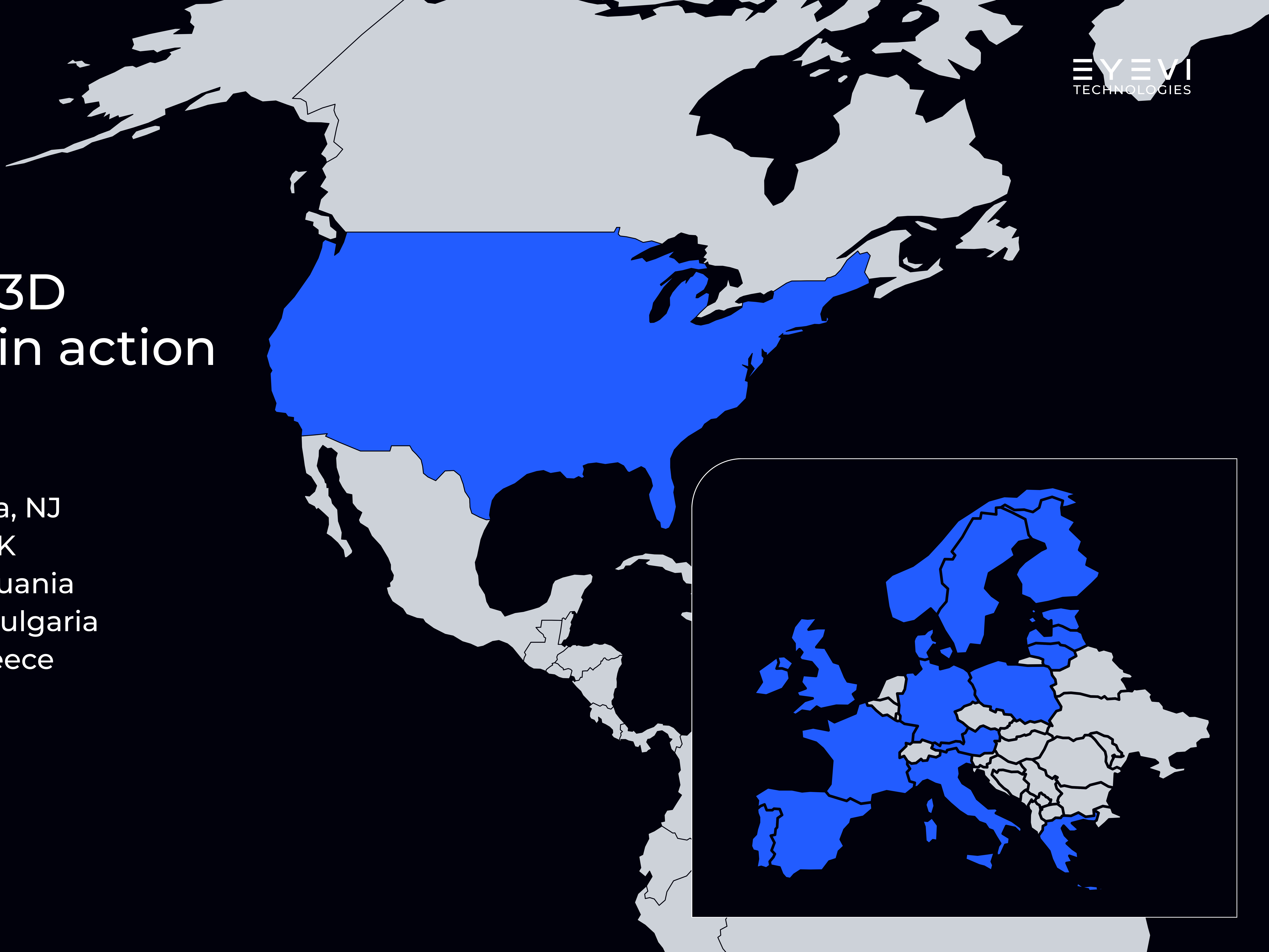
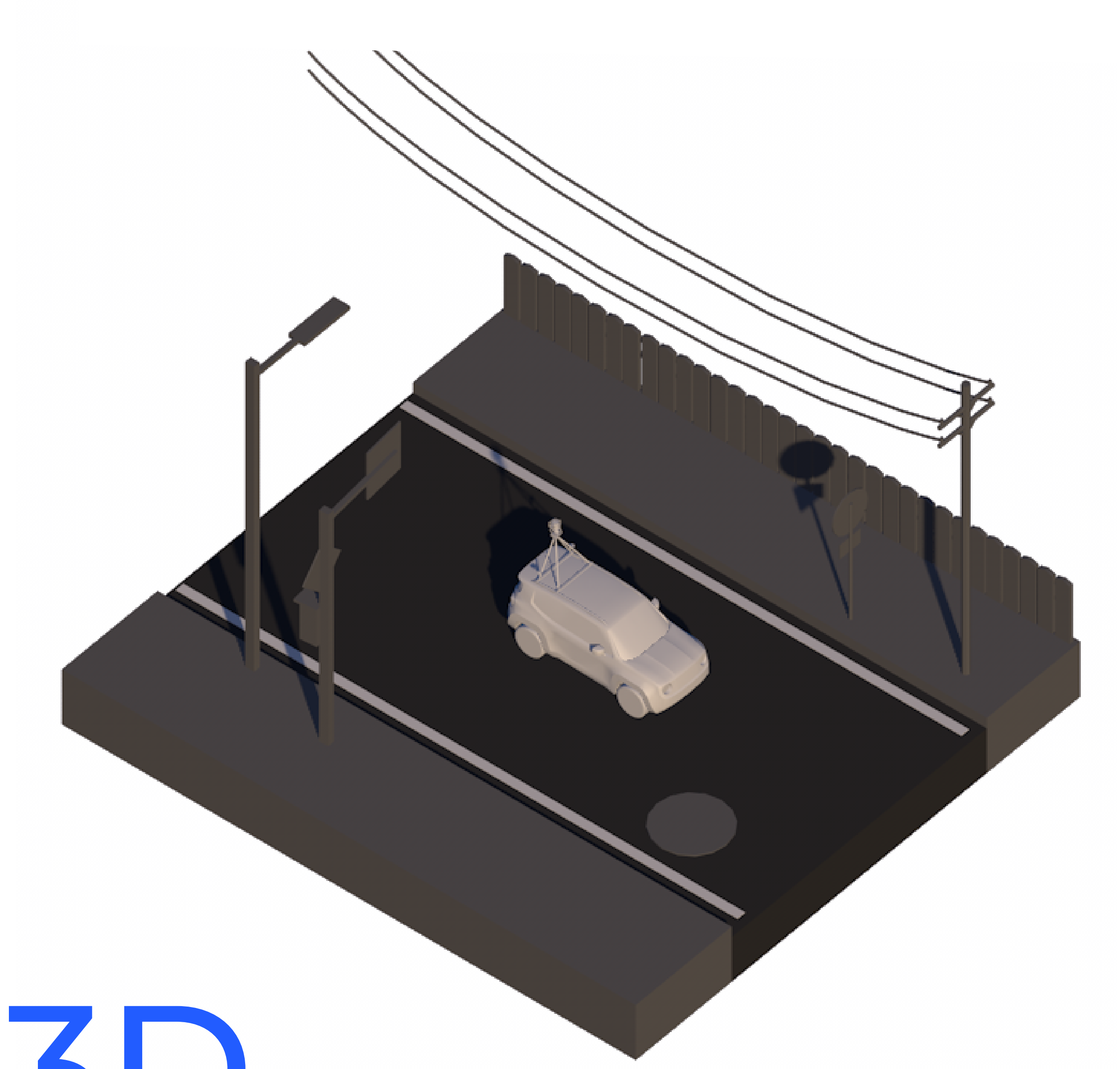
Large scale 3D mapping is in action



USA - Texas, California, NJ
Sweden - Norway - UK
Estonia - Latvia - Lithuania
Poland - Romania - Bulgaria
Spain - Portugal - Greece

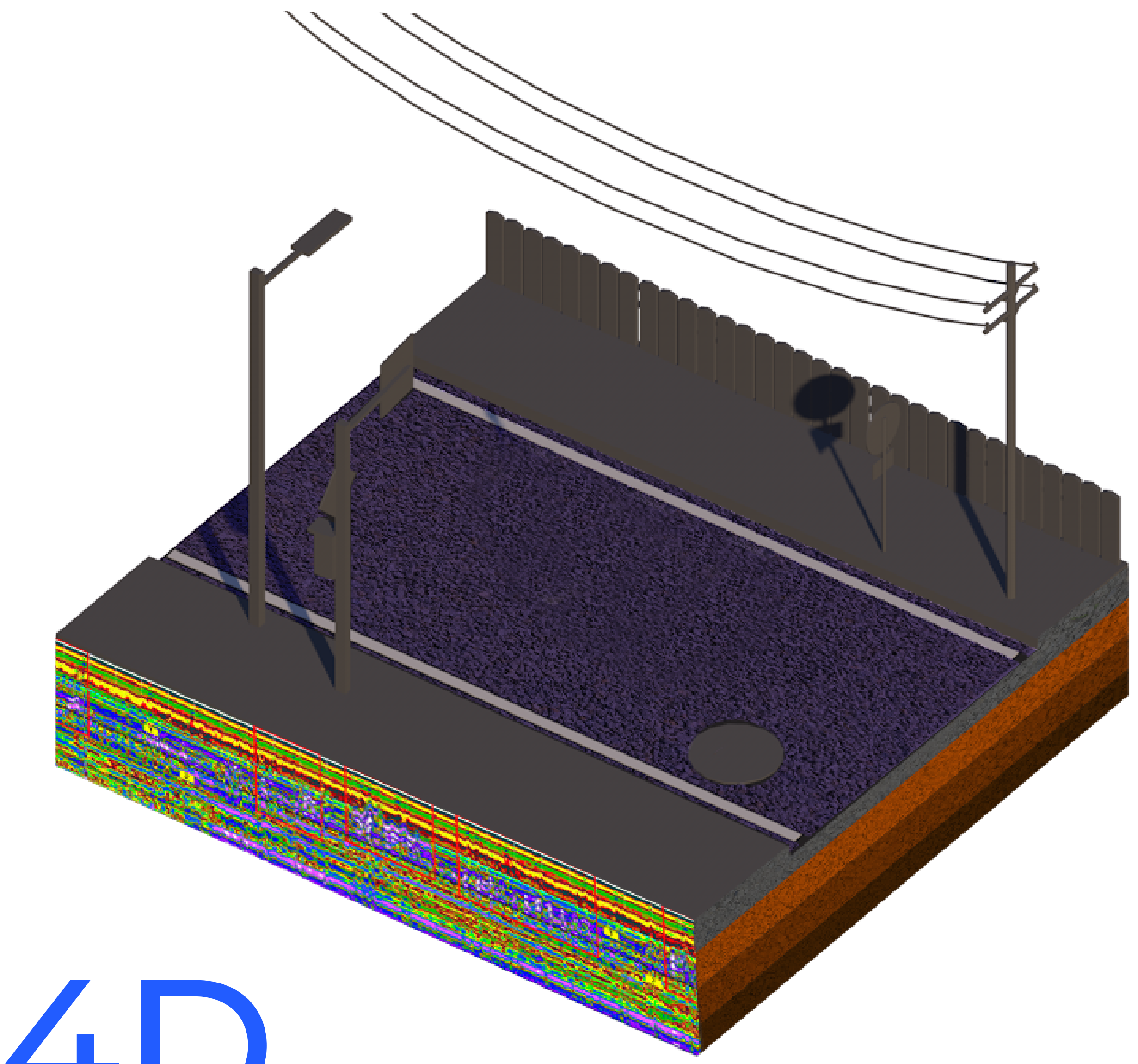
4D data merging starts - looking for partners in Nordics, Spain, Greece,



3D

Visual intelligence

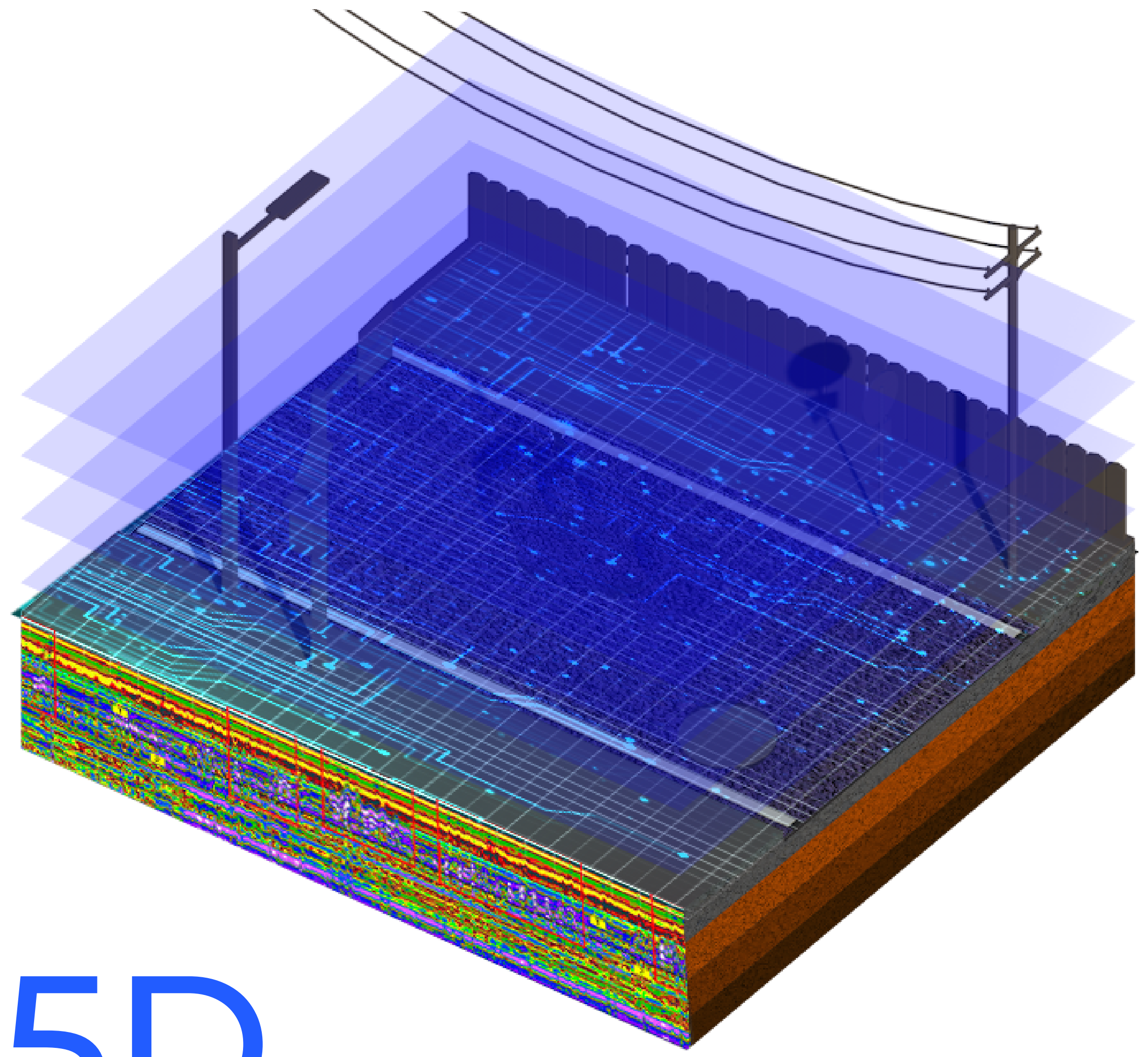
Looking for data partners and customers to build 3D on large scale



4D

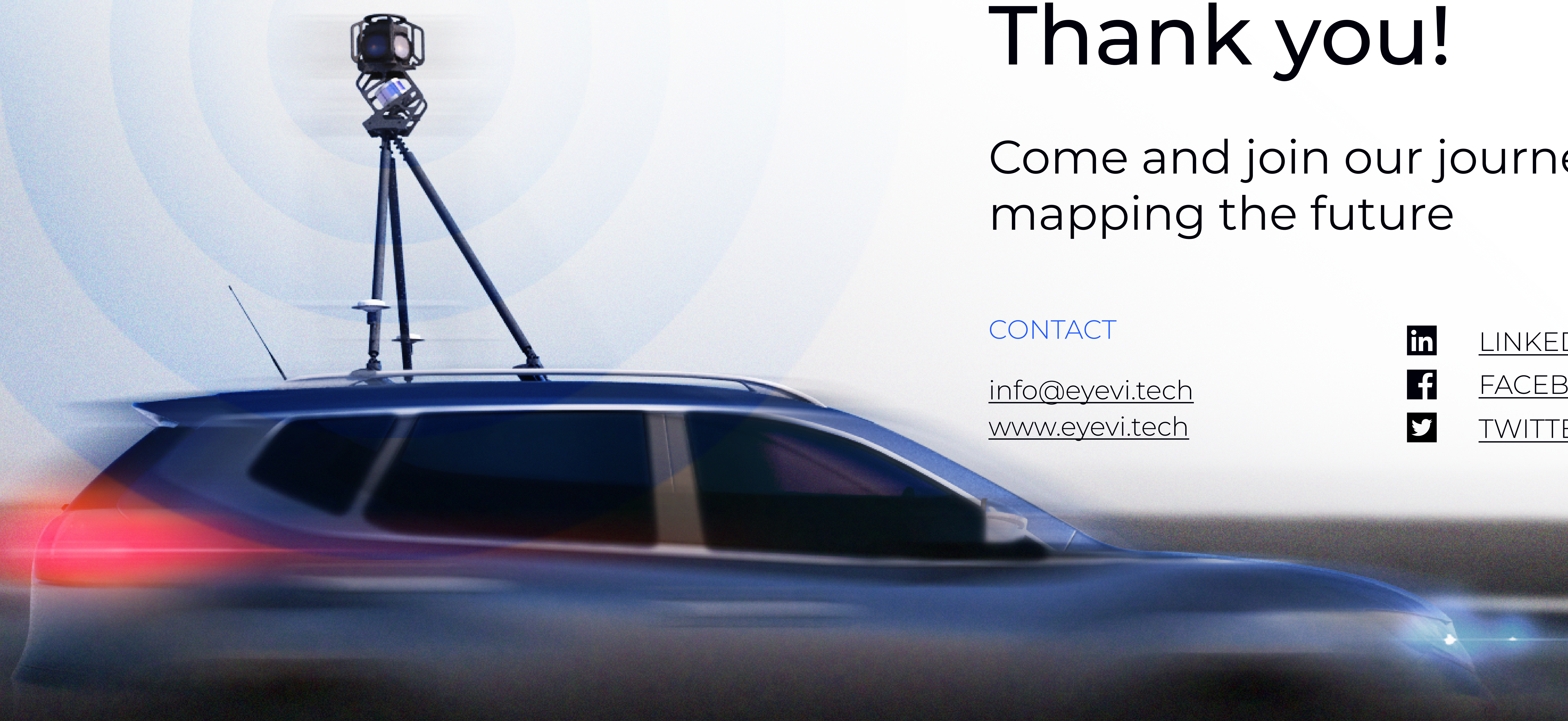
Sub-surface intelligence

Looking for data partners



5D

Predictive intelligence



Thank you!

Come and join our journey for mapping the future

CONTACT

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