

AI @ Cyclomedia

Auke Orsel
Niels van den Kieboom

cyclomedia



WHY
we exist

PURPOSE

Our purpose is to help **make impactful changes** to our world through **valuable insights** derived from **highly accurate digital representations** of the outdoors

MISSION

Our mission is to **digitize the outside world** on a **large scale**, with **high accuracy** and in **3D** to help **public sector organizations and businesses assess outdoor infrastructure** and **plan improvements** more **efficiently**, more **effectively**, more **safely** and more **sustainably**



Cyclomedia's solutions are created in three steps



Data Capture

Recording vehicles, camera systems and LiDAR scanners



Data Visualization

Enormous amount of rich visual data quickly and easily accessible



Data Insights

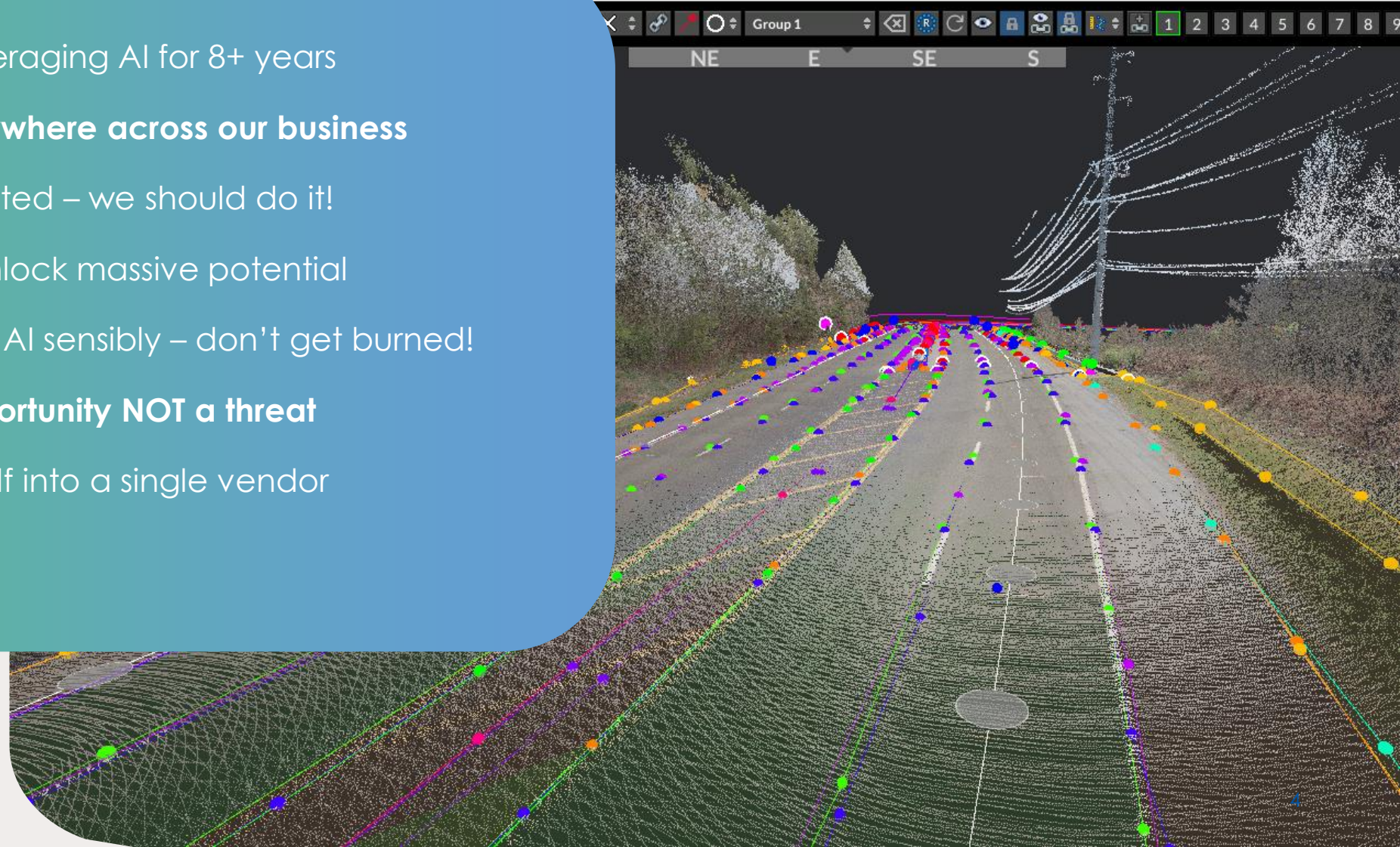
Explore data insights to create a better world tomorrow

Create valuable insights and understand the complexities and the context of the world around you.

Real data. True understanding. Big impact.

AI Strategy

- We have been leveraging AI for 8+ years
- **AI will disrupt everywhere across our business**
- If it can be automated – we should do it!
- Our datasets will unlock massive potential
- We should invest in AI sensibly – don't get burned!
- **Let's treat it an opportunity NOT a threat**
- Let's not lock ourself into a single vendor



Reality Check

- G.AI is the convergence of data and computing power - on steroids!
- Google & Amazon have an advantage due to their huge exclusive data sets
- **Google spent €12B per quarter, Amazon & Microsoft €14B (each)**
- If the winner takes all – this could trigger antitrust issues
- Barrier to entry is high, the strong will get stronger (immense processing power & control of data)
- There is a highly concentrated use of capital and power (The Magnificent 7*)
- **Europe will never be a player in AI - it does too much to protect consumers**
- There's no corporate governance in big tech – watch out!
- The focus currently is on scale and not sustainability
- Social and economic questions will get bigger and challenging
- **AI is using ~10% of world energy**

How to compete on a global scale?

**America
innovates**



**China
replicates**



**Europe
regulates**



AI in our Data Insights Products

The current version of Insights 360 heavily relies on Image Segmentation to identify and place objects detected from our imagery into 3D space. Image Segmentation was chosen as it can represent almost every feature type using a singular model architecture – making training and inference simple and standardized.

Segment Anything

Open model provided by Meta that is able to pixel segment primary or all objects within an image based upon input key points or bounding boxes

Yolo v8

Extremely efficient object detection model that is accurate yet small and lightweight for performance

Unet Segmentation

UNet Image Segmentation allows for per pixel segmentation of the image to not only identify where in the image an object is but complex shape information.

Road Assets

Over 30 models have been created over the years in Insights 360 to detect most roadside assets such as Signs, Light Poles, Utility Poles, Paint Striping, RSA and more.

Model	Arena Score	MT-bench	MMLU	Organization	License
GPT-4o-2024-05-13	1287		88.7	OpenAI	Proprietary
					Proprietary
					Proprietary
					Proprietary
GPT-4o-2024-04-09	1257			OpenAI	Proprietary
Gemini-1.5-Pro-API-0409-Preview	1257		81.9	Google	Proprietary
					Proprietary
					Proprietary
					Proprietary
Gemini-1.5-Flash-API-0514	1228		78.9	Google	Proprietary
ViT-Large	1216			OpenAI	Proprietary

Usage in Data

Blurring Pipeline

Use of object detection models such as **Yolov8** and **Detectron 2** built on **Pytorch** Framework

NerFs

Realtime synthesis of 3D views from a series of 2D/2.5D imagery. Bridges gap between HD Imagery and LiDAR

Noise Removal

Automatically detect dynamic objects such as vehicles in our data and remove it to provide a cleaner data deliverable

Super Resolution

Use latest AI upscaling techniques to reduce storage costs by upscaling 25mpx tiles to 100mpx on demand. Train models using the 100mpx capture data

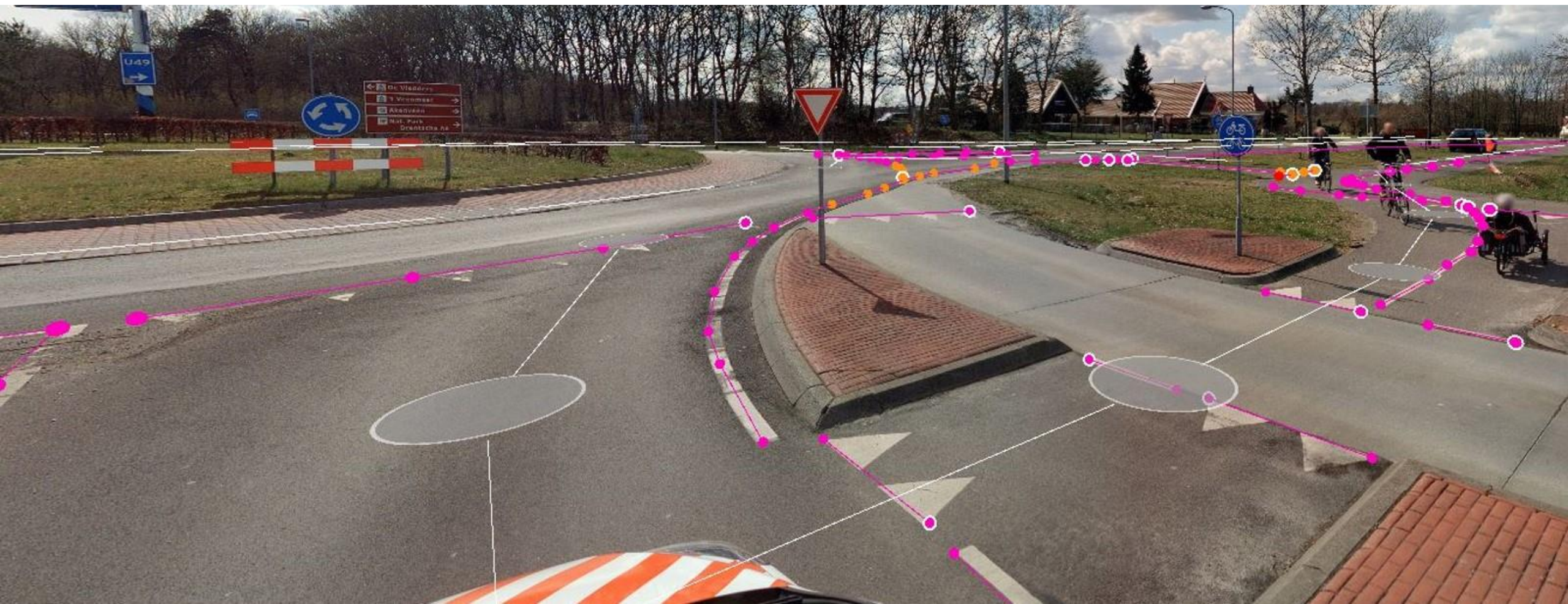
Super Efficient NerFs

Generating 3D Voxelized Photorealistic environments from a series of 2D imagery that performs at 60+ FPS on user end hardware (browser)



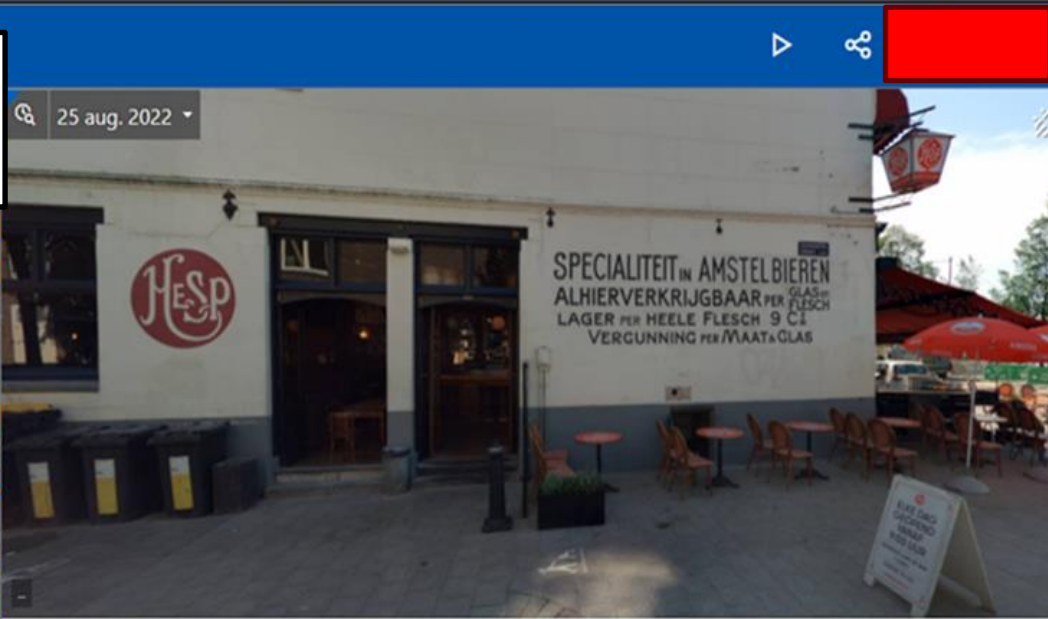
In practice?

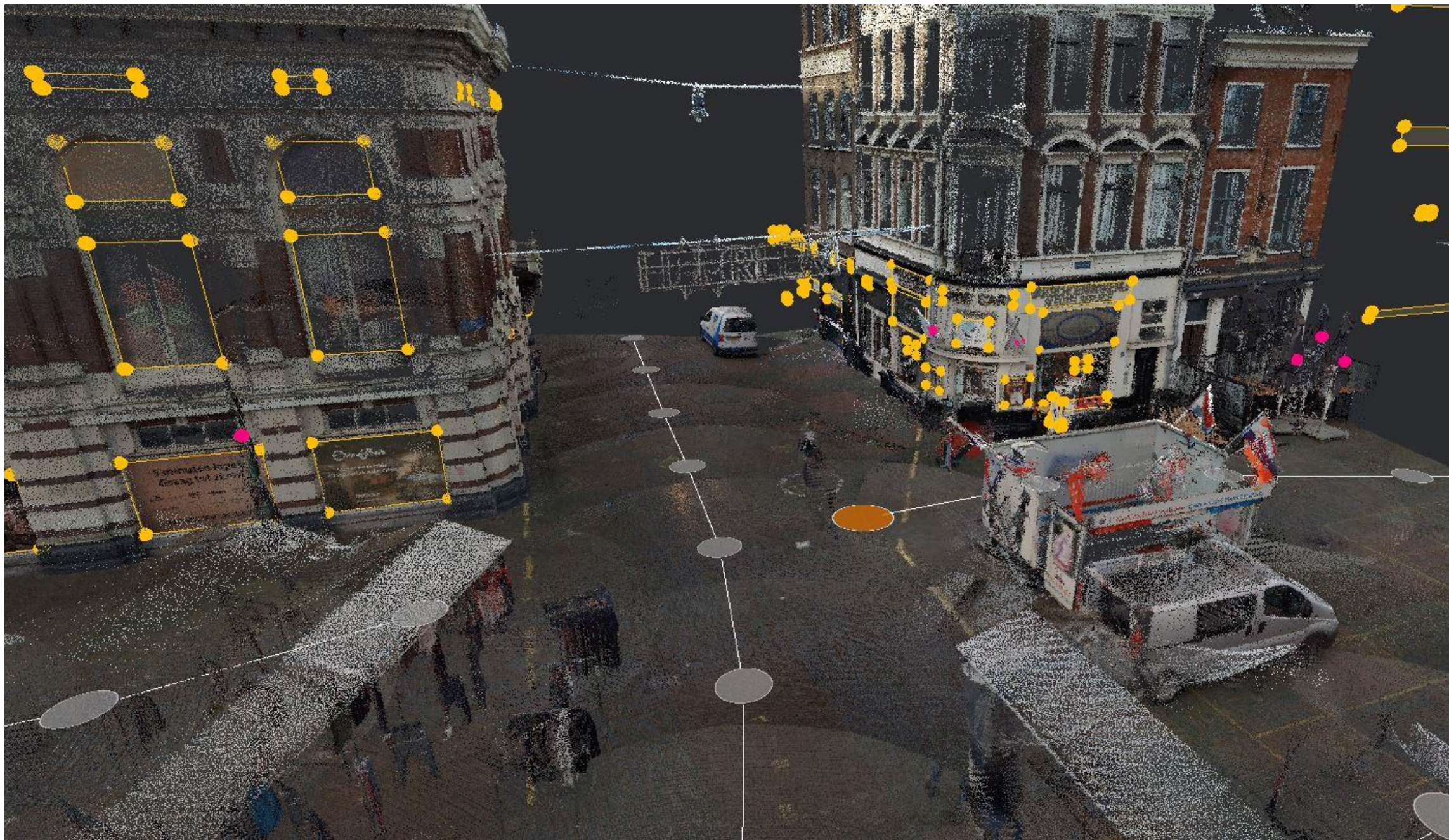
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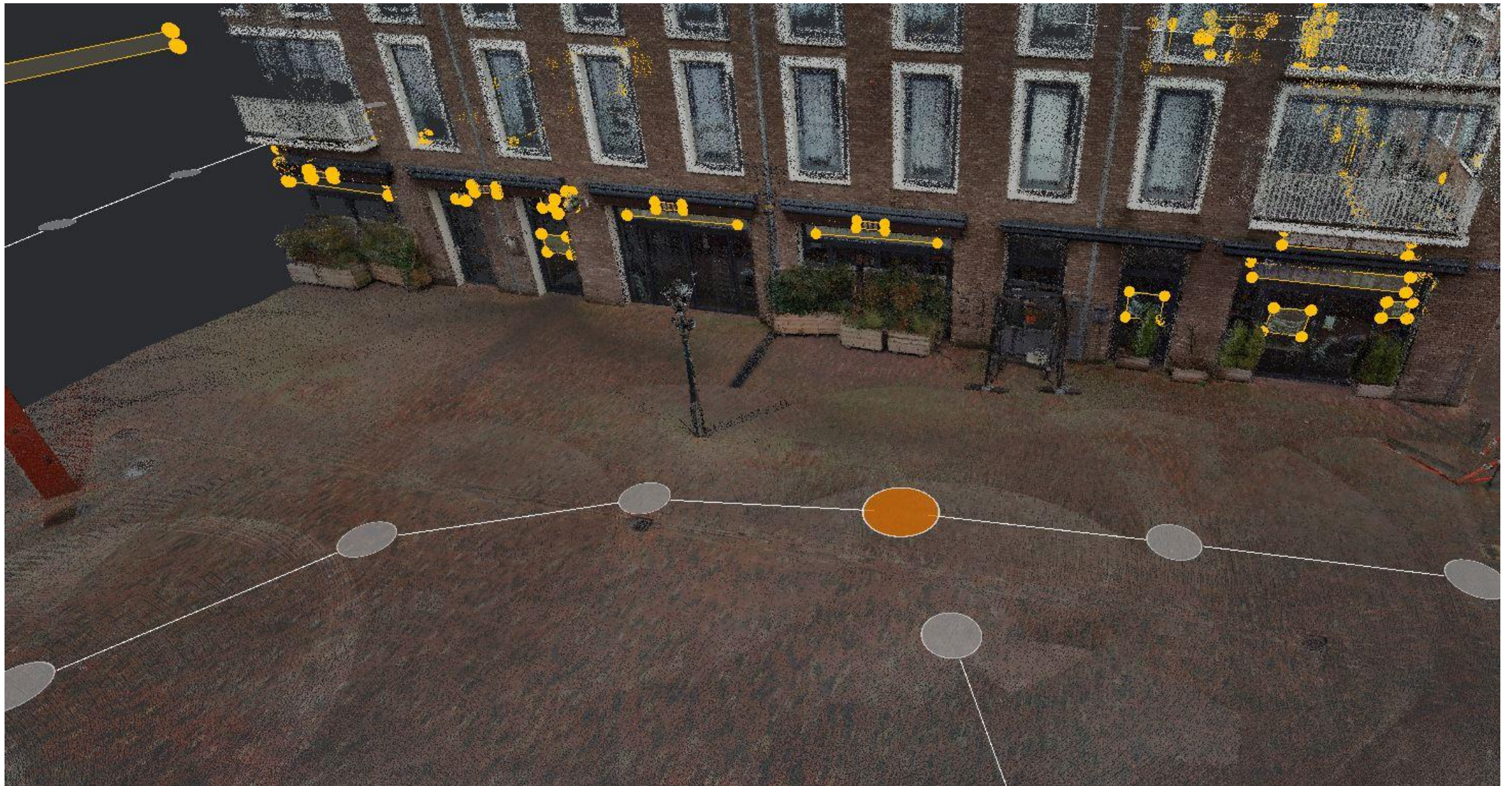




Advertisement tax
Municipality of Amsterdam







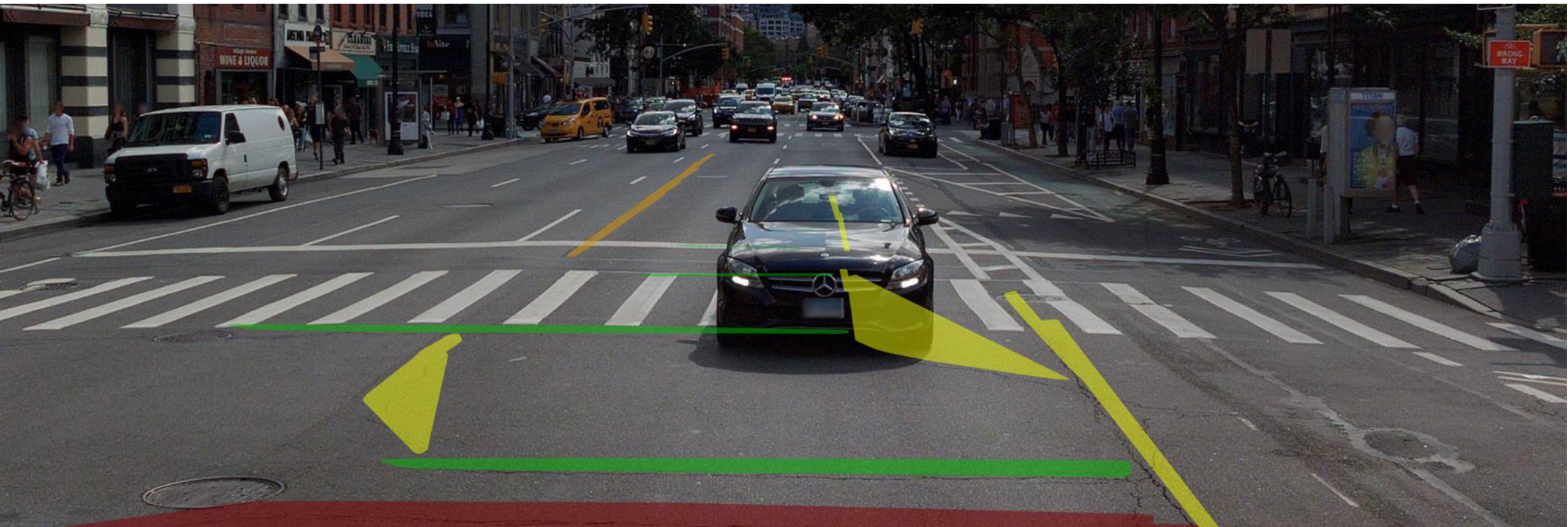
Road Surface Analysis

Automatic detection of road defects

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Geo Data Driven Insights

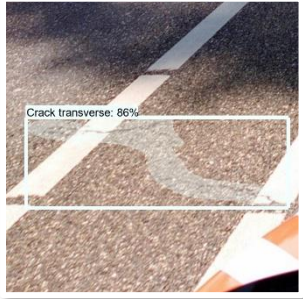
ARCADIS | Design & Consultancy
for natural and
built assets



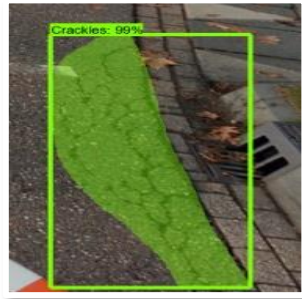
Examples of Some of the Detected Defects

Full list available in product specification

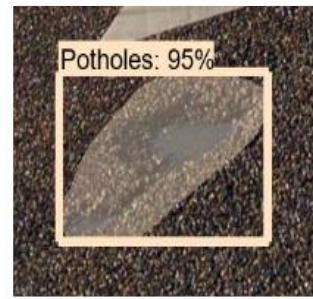
Transversal



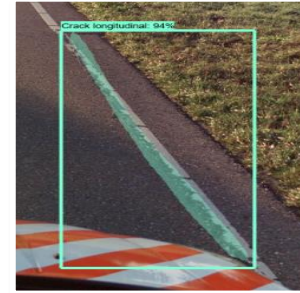
Crackles



Potholes



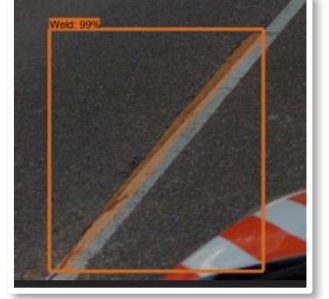
Longitudinal Crack



Reflection Crack



Welds & Joints



Rims



Scratches



Raveling



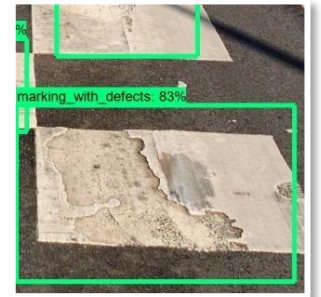
Patches



Bitumen Repair



Marking



Year-to Year Comparison

2016



2011



2014



2017



2012



2015



2018



GO+

GeoObjects+ offers an automated file with the geolocations (x, y, z) of the 5 most important management objects in the public space.

Including the mutations on an annual basis.

Public lights



Traffic signs



Trees



Drains



Manholes



Thank you!
Any questions?