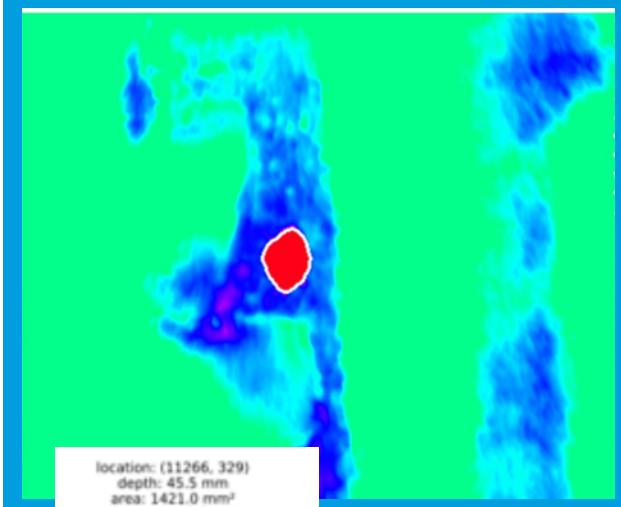
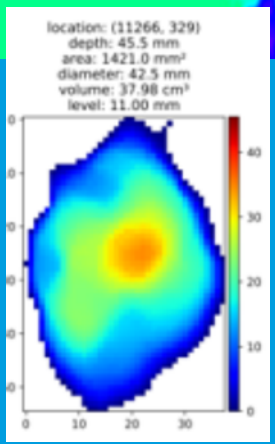
POTHOLE DETECTION

A module of Digital Road Plus









Analysis of potholes, includes surface area, depth, diameter and volume

Pothole Detection and Sizing

Potholes have a high impact on the quality rating of roads. PCI (Pavement Condition Index) gives high weight to potholes, not just because of the fast further road degradation, but also because they are very dangerous, especially for cyclists and bikers.

To correctly understand the severity of potholes, it is important to quantify their surface, depth and shape.
The pothole module (SW-DRP-1010) in the DRP software (*Digital Road Plus*) is extremely powerful in extracting and quantifying pothole dimensions from 3D road models, established with the XenoTrack road Lidar.

Input

The pothole module fully relies on XenoTrack Lidar data. XenoAsterX takes care of the precise georeferencing of the center of the pothole.

Output

For every road section an XML is generated listing all detected potholes with their key characteristics, as shown in the sample below.

Potholes can also be transferred to and visualized in a GIS system. The pothole locations and shape is specified by a list of georeferenced points, so a polyline shows the pothole shape in the GIS platform.

For every pothole, key dimensions are available for calculation of the severity score for PCI according to the ASTM D6433 table below. The software allows the user to set the thresholds according to their best practices.

Sample segment Start LatLon	
Sample segment End LatLon	
Road Id	<name of XT session>
IRI	
Speed	
Start Image nb	
End Image nb	
Distress Type	
Severity	
area	
LatLonAlt	
Xpos	
Ypos	
Polygon SHP	
AVG_Depth	
Max_depth	

Key Benefits

- **Consistent and precise detection every time.**
- **Millimeter-perfect quantification of surface, max depth, average depth, and volume.**
- **Accurate measurements regardless of light conditions, even in total darkness.**
- **Detects and classifies potholes accurately, even on uneven roads or amidst other defects.**

Why Solid State Lidar?

Camera-based pothole detection easily confuses potholes with patches or with stains. Since cameras lack depth information, they often confuse circular shaped color variations with potholes. Moreover, from a camera image, the pothole dimensions cannot be quantified well and the severity assessment is prone to errors.

TABLE X1.1 Levels of Severity for Potholes

Maximum Depth of Pothole	Average Diameter (mm) (in.) 100 to 200 mm (4 to 8 in.)	200 to 450 mm (8 to 18 in.)	450 to 750 mm (18 to 30 in.)
13 to ≤25 mm (½ to 1 in.)	L	L	M
>25 and ≤50 mm (1 to 2 in.)	L	M	H
>50 mm (2 in.)	M	M	H

Interested?

If you're a XenoTrack user, send us a brief measurement session to test the pothole module, and we'll send back the processed results. We guarantee over 95% accurate pothole detection based on the defined parameters.