Collecting data in Griffiersveld Apeldoorn

Organisations: Municipality of Apeldoorn and Saxion UAS
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Introducing the case

3000 m² of pavement, sidewalks, green space, and parking space along the residential street Griffiersveld in Apeldoorn will be redesigned and reconstructed in a circular way.
The top five requirements for a material passport are (Goselink, 2021):

1. Includes bill of materials (BOM) with quantities, material composition, and location (GIS) of the materials on site;

2. Includes inspection and maintenance history of the materials on site (ideally inspect more often when end of life approaches in order to repair at the right moment);

3. Includes technical lifetime expectancy of materials on site;

4. Includes ‘End of life options’ of the materials;

5. Complies with a uniform system (data stored for structured output).

In the field of road maintenance soil/sand, concrete, baked clinkers and asphalt (hot or cold) can be distinguished as the main streams.
Storing data

Apeldoorn has a project passport available in the form of a GIS-based asset management software GBI.

Approximately every two years a visual inspection is being conducted.

Every road section can be assessed by 53 characteristics and this number can be increased up to 200 characteristics.

The characteristics address a.o. the road section’s identity, location, typology, inspection date, year of origin, maintenance year, appearance, safety level, width, surface and perimeter.

The structure to store data is available, but not all data is collected.
Up to 53 indicators are already in place!
Collecting data

De Wegenscanners
Date scan 7\textsuperscript{th} of April 2020
Gamma spectrometer and IDS RIS Hi-Pave ground penetrating radar system
Output: digitally in PDF and in ArcGIS (shapefiles)
Costs: € 2750,- (excl. VAT)

InfraFocus
Data scan 17\textsuperscript{th} of June
LiDaR and panoramic hi-res camera
Output: report in PDF, quantities in Excel and GeoJSON, pointcloud LAS-file and digital panoramic images
Costs: € 6795,- (excl. VAT)
De Wegenscanners
De Wegenscanners
De Wegenscanners
## De Wegenscanners

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Cityloops Expert Workshop III
Deriving a CO$_2$-indicator

Based on Kellermann’s CO$_2$-indicator a Dutch version was developed. During the renovation of Griffiersveld the plan is to collect data.
When 535 m² of the current concrete pavers are going to be reused in parking spots, this could save 9,51 kg CO₂/m² (Biezemans, 2021) due to a lower virgin material demand and up to ±100 kg CO₂ (Hagen et al., 2021) by means of less transport.
Transport routes to the material depot of the municipality of Apeldoorn.
Transport

Transport routes to the waste processing plant of Attero.
Closure

We still think very much in terms of quantities of materials, but it is a challenge to find out what exactly makes up their quality and the expected remaining life span of a particular road section.

The structure to store data is available, but it is expensive and time consuming to keep this system up to date, to collect all data necessary to close material loops and to provide input to a platform that enables us to offer these products at a(n) (online) market.

What will happen or will be decided when actual pavers, tiles and curb-stones are going to be taken out of the street by experienced pavers?
Suggestions for further reading

Brinke, R.J. ten, et al., 2021. *Designing and realizing circular urban road renovation*

Entrop, A.G., 2021. *Developments to come to a circular construction economy; experiences in facilitating a local soil and sand depot.*

Entrop, A.G., 2021. *The road to circularity; a framework and experiences collecting road data in a circular renovation process (under review)*

Entrop, A.G., Hagen, L., Leeuwen J. van (Work in progress). *Aligning the actors in circular road renovation projects; a process journey in Apeldoorn*


Poutiainen, S., Willoughby, N., Otten, B., 2020. *Facultative educational exploration circular material usage Griffiersveld Apeldoorn*
