Digital Monitoring

A picture containing sky, outdoor, air

Description automatically generated

## Drones & Data Optimization

By leveraging drone technology, organizations can mitigate risk through innovative data collection, management and visualization. From site surveying and evaluation, construction project monitoring, site safety audits and volumetric analysis, Arcadis’ drone and data optimization capabilities have incredible potential in the engineering and consultancy industry.

Surveying large areas of land, property or industrial sites can be time consuming and costly. Arcadis’ drone and data optimization capabilities in Southeast Asia reshapes the realities of site surveying, inspections and analysis while improving productivity and reporting.

Small unmanned aircraft systems (sUAS), commonly known as drones serve as a first step in more efficient, cost-effective and thorough data collection. Arcadis’ comprehensive and scalable approach towards data collection, management and visualization works together to unlock the full potential of digital for our clients’ projects. When used correctly, digital solutions like drones enable faster, safer, simpler and more informed management of your natural and built assets.

Combining our industry expertise, state-of-the-art equipment and software, and CAAS certified drone pilots, we deliver accurate and timely data to enable our clients to achieve better business outcomes. Our digital innovations focus on harnessing high-quality data and turning it into actionable insights using innovative technology and methodology to optimize value for our clients.

Some of the areas we are already making a difference:

* Automated Road Inspection & Analysis
* Automated Building Systems Analysis
* Technical Due Diligence and Asset Management
* Aerial Façade Inspection & Analysis
* Site Monitoring & Analysis
* Vessel Volumetric Analysis.

Our in-house developed software enables the automation of detecting defects and deformations in roads, bridges, and facades through machine learning capabilities and drones, thereby allowing clients to have increased accuracy in reporting, prioritise rectification works and carry out preventive maintenance. Our solutions also provide efficiencies in volumetric computations, site safety inspections and progress monitoring through model generation software and drones. The data captured can form documentations useful for site control and dispute resolution.

KEY OUTCOMES

* Enhanced health & safety
* Significant cost and time savings
* Increased density of data points gathered
* Quick and accurate data turnaround

Using drone technology, a major landfill project was able to better manage project progress and protect the health and safety of employees on-site. Check out this video to learn more about how drones can help transform the client experience.

To learn more about our drone and data optimization solutions, feel free to contact [the team](le.nam@arcadis.com)

A picture containing sky, light, outdoor, weapon

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## High Definition Camera for Road Condition Detection

Automatic damage recognition makes road inspections faster, cheaper and more objective. With the aid of artificial intelligence (AI), road authorities can thus save hundreds of millions of euros in maintenance. What’s more, carrying out less maintenance and in good time means fewer traffic jams.

The model that Arcadis has employed for highways and roads authorities automatically recognizes the type of damage, type of repair and other assets on or alongside the road. For instance the type of road markings and street furniture. The images are analyzed at the push of a button using a software module developed in-house. As a result, visual inspections can be carried out cheaper and more safely, roads can be inspected faster and more easily and road authorities can intervene more quickly, preventing more major repairs.

A car parked on the side of a road

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### How does the method work?

Images are taken with a camera of a certain road section using annual images from CycloMedia or with a GoPro. These images are then read in to a custom developed software module, which is based on an image database that the Arcadis experts have filled with data on inspected roads. This is used by the deep neural network model to automatically recognize road defects and assets.

The model determines the exact location of the defect, the type of defect, the extent of the defect and ultimately the recommended maintenance measure. Based on the results visualized in GIS, the asset manager can take immediate action. The results and the internal properties (such as service life and use) and the external properties (such as type of soil and salinization) are the basis for a machine learning model. Using historical data, this model can calculate the deterioration of roads, allowing road authorities to draw up a predictive maintenance plan.

### More than 95% accuracy with visible defects

Automated road inspections reduce the manual inspection time by more than 80% and road analysis reports are available more quickly, because the inspector no longer wastes time assessing road sections that are in good condition. The program selects only the locations with damage that have to be examined by an inspector. Because we work with a self-learning model, it learns to recognize the requirements of the inspector or asset manager and can ultimately take decisions independently.

The image recognition model can recognize 95% or more of all road defects (such as transverse cracks, longitudinal cracks, raveling, craquelure and holes), repairs (such as expansion joints, junctions and bitumen), road wear (such as wheel rim marks), traffic signs, street lights and road markings. With clearly visible defects, this percentage is even higher.

A sign on the side of a road

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