

Change Detection

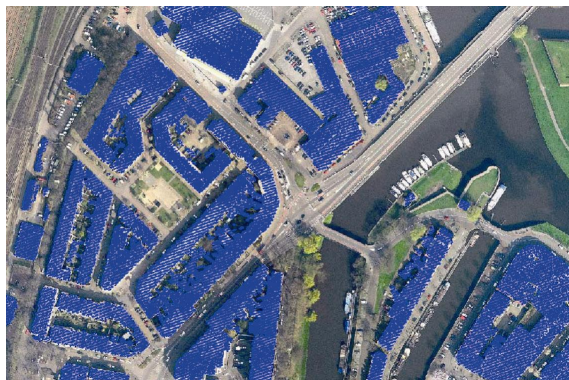
The number of advanced mapping applications relying on high-accuracy, high resolution elevation data is growing every year and now includes noise models, real estate valuations, line-of-sight analyses, building visibility, telecommunications grids, urban planning, disaster management and automobile navigation.

One application of growing importance is the ability to rapidly and efficiently map and detect changes in a given area of interest. Up-to-date and frequently revised baseline data is needed if change detection systems are to be effective. Traditionally, maintaining base maps has been highly time-consuming, costly and difficult, especially in urban areas. Change detection can assist in a variety of management tasks, from urban planning to forestry, but it is only effective if the data is timely and can easily be imported directly into administrative databases, existing digital maps, GIS or response models.

At TerraImaging, we have developed a method for monitoring and managing change detection that incorporates the advantages of laser scanning (Lidar) and elevation data captured together with high resolution digital orthophotos. Using these combined data sets, a rigorous baseline for change detection can rapidly be established. It is then possible to quickly and automatically determine changes and alterations in terrain cover, land class and elevation as often as desired. The result is a product, usually imported into a GIS, which highlights at a glance those areas where changes in development or infrastructure have taken place.

How It Works:

In-house software developed at TerraImaging compares a digital map with up-to-date image and height information collected over the area of interest. It automatically highlights the changes by comparing data sets collected on different dates.



Automated classified buildings

Alterations can be detected by analyzing the differences between the various data sets. The result is a highly detailed product – a difference map – which shows newly built or knocked down buildings, developed areas, even changes in the structure of single buildings (bay windows etc.)

These advanced change detection techniques can be adopted for:

- Updating of topographical maps
- Updating of 3D surface and terrain models for noise modelling, analyses of visibility, urban planning, telecommunications, disaster management, microclimate studies etc.
- Estimation of building surfaces and volumes for the tax assessments

Advantages of the approach include:

- High accuracy
- High efficiency
- Rapid updating
- Ground-based inventories of particular areas can be reduced or eliminated
- Complete and reliable object detection (also in areas difficult to access and under canopy)
- Complete coverage of area of investigation (incl. backyards)
- Automated determination of changes of surface and volume for objects/areas of interest

In addition to change detection applications, the raw height data and digital imagery are also delivered to the customer and can be used for other mapping applications. Cost-effective, accurate, rapid change detection is made possible by laser scanning and digital imagery.



Comparison of datasets from different years (Lidar and digital imagery)



TerraImaging B.V.

Groenewoudsedijk 40
3528 BK Utrecht
The Netherlands
Tel.: +31 (0)30 686 61 60
Fax: +31 (0)30 686 61 66
E-mail: info@terraimaging.nl
Web: www.terraimaging.nl

TerraImaging B.V. Berlin

Köpenicker Str. 10a
10997 Berlin
Germany
Tel.: +49 (0)30 53 21 77 20
Fax: +49 (0)30 53 21 77 26
E-mail: info@terraimaging.de
Web: www.terraimaging.de

TerraImaging B.V. France

99 bis avenue du Général Leclerc
Paris 75014
France
Tel.: +33 (0)686 511 463
E-mail: info@terraimaging.fr
Web: www.terraimaging.fr