

## Country wide 3D urban model of Denmark

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## About Blom

- One of Europe's largest aerial survey companies
- Offices in 12 countries in Europe
- More than 1,000 employees world wide
- Listed on Oslo Stock Exchange
- Primary business areas:
  - Aerial photography
  - Mapping & modelling
  - Laser-scanning (LiDAR)
  - Geospatial Databases
  - Pictometry®
  - Database applications
  - Other Activities

## Production of 3D urban models



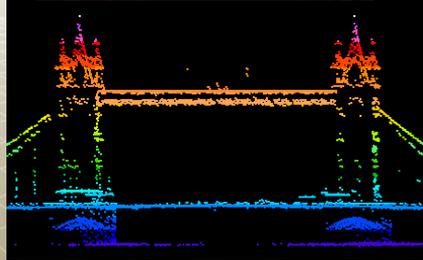
Extruded 2D maps



Photogrammetry



Laser scanning (LiDAR)



## Definitions – Level of Detail (LOD)



**3D-F:** Physical model

**3D-1:** Digital Block Model

Based on building polygons from maps  
Fully automated production processes

**3D-2:** Digital Block Model with simple (generalized) roof types

Based on building polygons from maps + LIDAR data  
Fully automated production processes

**3D-3:** Detailed models with precise roof types

Photogrammetric production processes

**3D-4:** Detailed models with precise roof types, textures, trees etc.

Photogrammetric production processes, facade photos etc.



## LOD 2 models with simple roof types

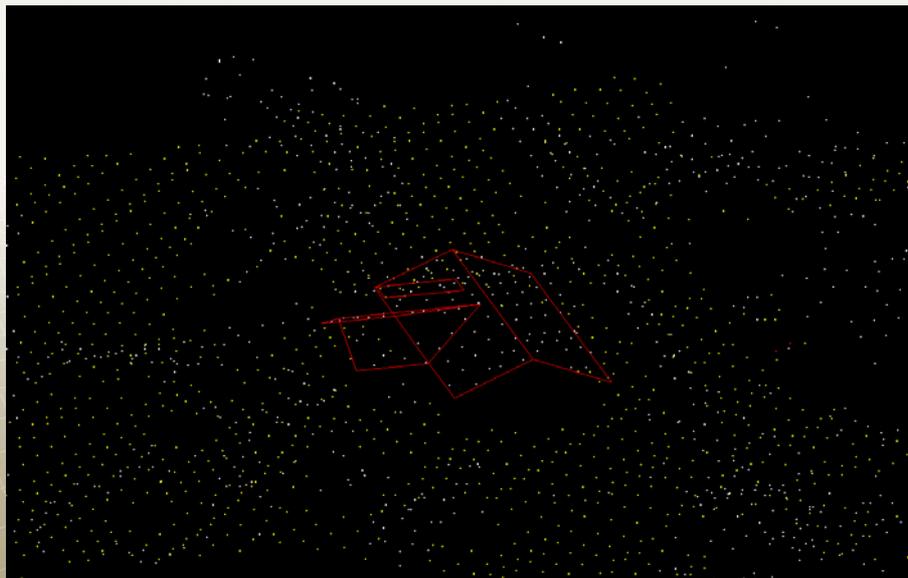


### INPUT DATA:

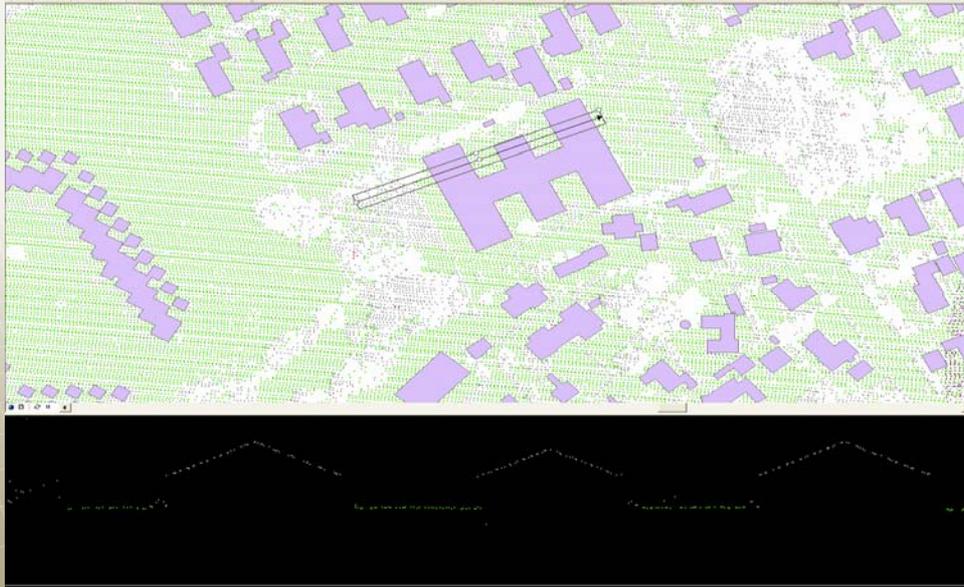
- Country wide DEM based on laser scanning from 2007
  - Accuracy app. 10 cm in 1.6 m grid
  - 43,000 km<sup>2</sup> (Denmark)
- Building polygons from base maps / topographical maps
- Country wide orthophoto from 2008 in 20 cm GSD + 10 cm GSD in urban areas
- Oblique images for facade texturing in urban areas



## Automated production from point cloud



## Software tools are developed



## LOD 2 Urban model



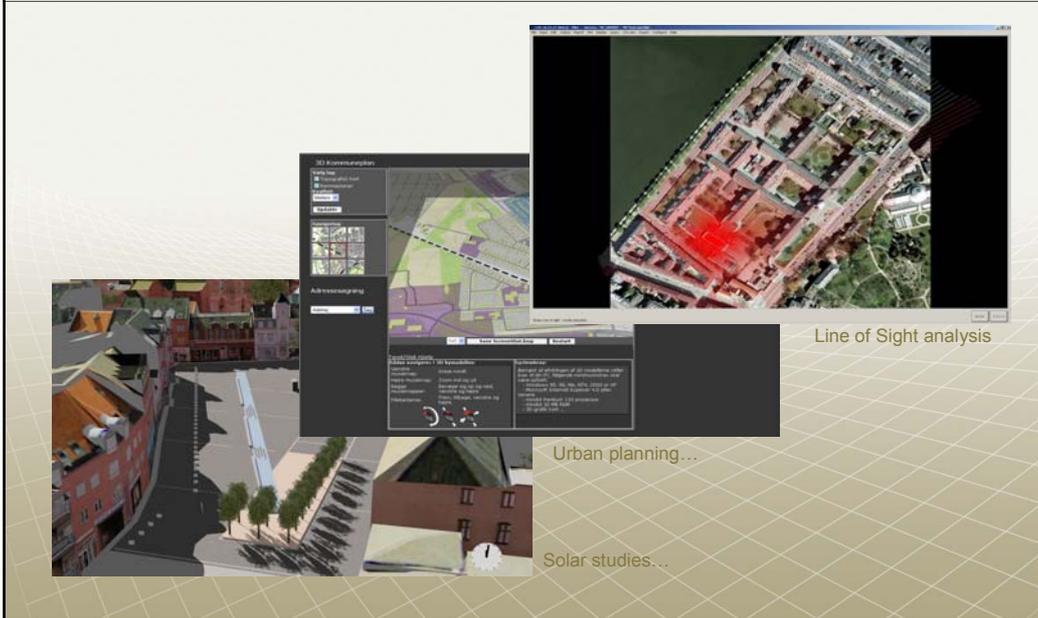
## Automated texturing – Blom oblique images



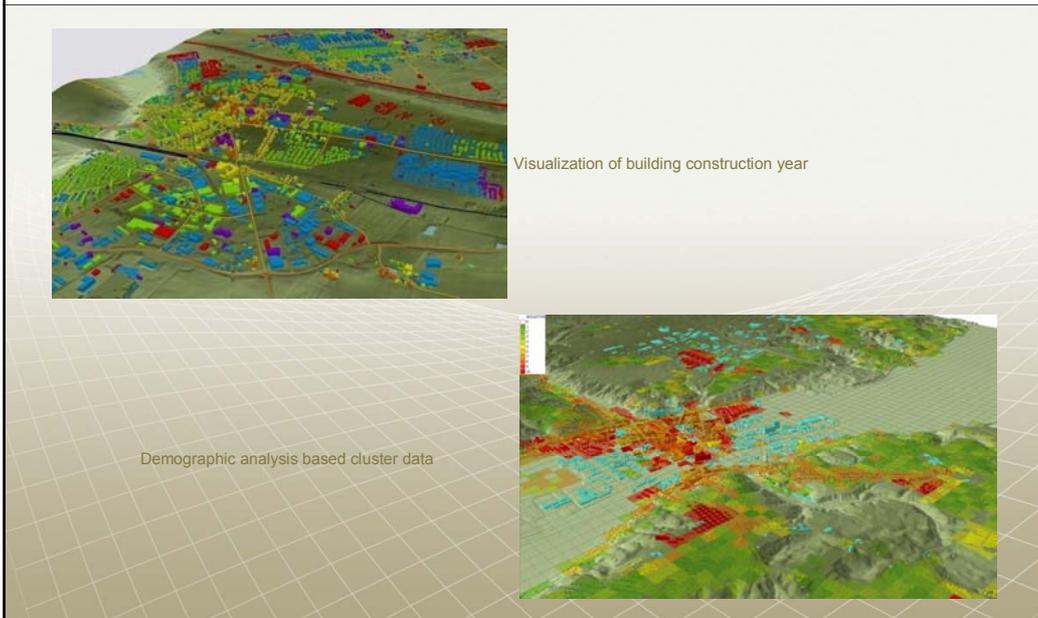
## Textured models from oblique images



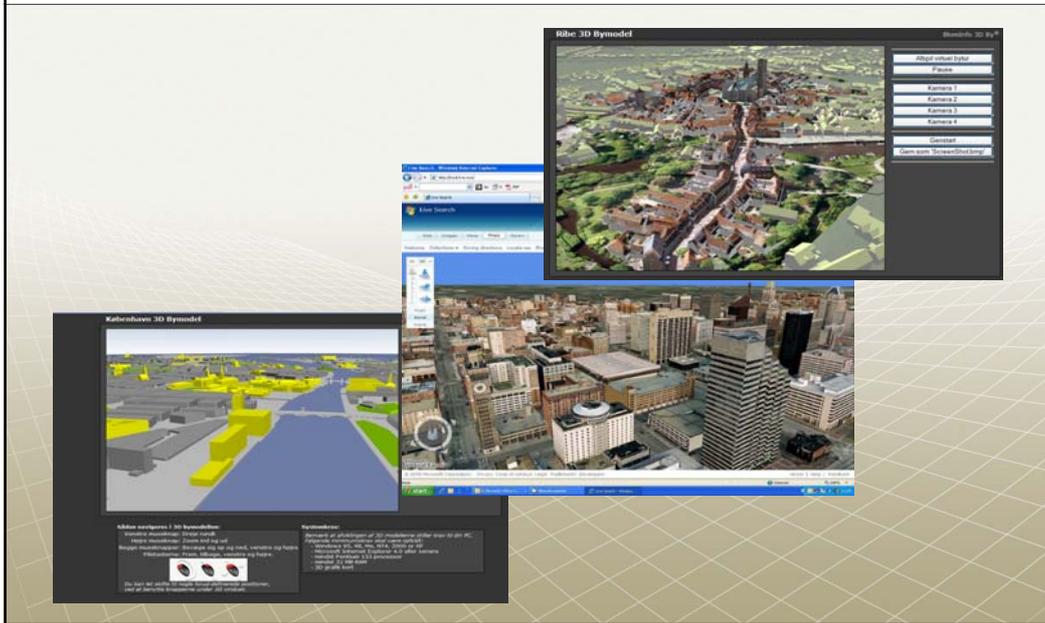
## Application areas



## 3D urban models and GIS analysis



# Urban models on the Internet



# Next Step: 3D, navigation and Local Based Services



**SMALL DEMO...**