

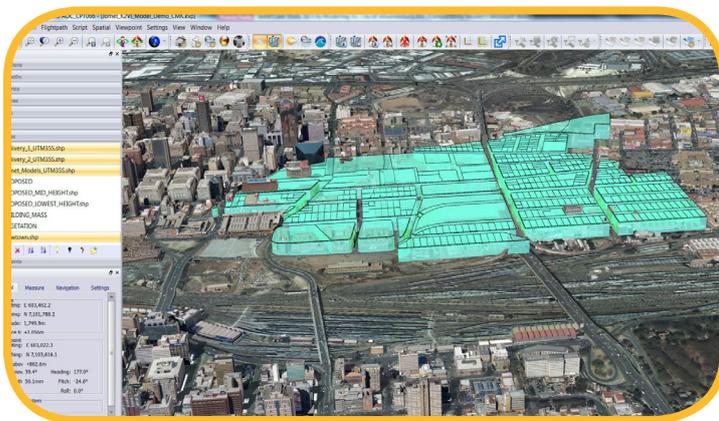


CASE STUDY:

3D City Model - Johannesburg

OVERVIEW

In March 2012, AAM was awarded a 3 year appointment to undertake Aerial LiDAR, A3 Digital Orthophoto Imagery, PICTOMETRY® Oblique Imagery, Rendered 3D Building Models and Building Footprints for the City of Johannesburg (CoJ) metropolitan area measuring 2950 Sq.km. AAM has provided previous PICTOMETRY® coverage of the Soccer World Cup Stadiums in 2010 and the full metro area for property valuations in 2011.



3D Building Models and Globe with zoning layer depicting height restrictions

SITUATION

The City of Johannesburg is the largest metro municipality in South Africa. All departments and functions require geo-spatial information for effective managing and decision making. The City Planning Directorate identified transport corridors, economic growth nodes and district redevelopments that required 3D modeling with GIS integration and visualisation. The city chose AAM's advanced 3D datasets and K2Vi visualisation software to meet these needs.

ACTION

AAM created 3D building models at 2 levels of detail (LOD). The CBD areas were captured using PICTOMETRY®, providing the geometry and detailed textures to create fully rendered 3D building models at LOD_3. Beyond the CBD areas, building footprints were digitised from the newly created digital orthophoto imagery. Height attributes were assigned to each building footprint, calculated from the ground and non-ground LiDAR datasets. The height attribute allowed simple building shapes to be extruded to their derived height attribute, thereby creating models at LOD_2.

AAM's K2Vi software was provided to visualise the buildings and other GIS layers. The K2Vi globe was built using the accurate and high resolution LiDAR derived terrain model (DEM) and the digital orthophoto base mapping. The 3D models, transport corridors, cadastral parcel data and other layers were added to enable highly interactive visualisation of the city with scenario and recorded fly through simulations.

RESULT

The AAM solution was innovative and advanced in that multiple sources of data were captured and used in clever combinations to provide a total solution. The PICTOMETRY® provided a solution in itself for viewing oblique imagery. It also provided the geometry and textures for the creation of the CBD building models. Similarly the Aerial LiDAR provided detailed Digital elevation models (DEM's) for contouring and input to the orthophoto generation.

The LiDAR datasets also provided a derived height that could be used to extrude building footprints which in turn were digitised from the digital orthophoto dataset.

The AAM 3D data and K2Vi software solution provided the city with the ability to provide fully rendered 3D building models for GIS users in the various directorates in the organisation.