



Information Sheet on 3D Visualisation Map (Individualised models)

Introduction

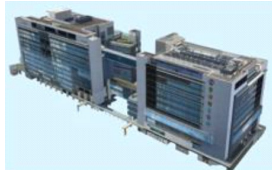
The 3D digital map forms a major building block of the Common Spatial Data Infrastructure (CSDI), facilitating the sharing and opening of government geospatial data and meeting digital map applications' needs. To meet the increasing needs of 3D digital map applications and enhance a better understanding of multilevel spaces of a modern city like Hong Kong, the Lands Department of the Hong Kong SAR Government (LandsD) has been actively developing a set of high-quality 3D Digital Map covering the whole territory of Hong Kong since 2020.


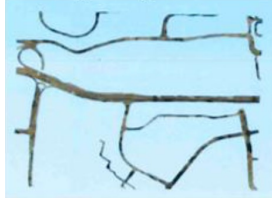
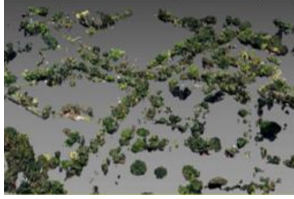

The 3D digital map project comprises the generation of a set of high-quality 3D visualisation map showing topographical and exterior features of terrain, buildings and infrastructures over the territory; 3D indoor map showing the accessible interior of buildings and structures for 1 250 buildings; and 3D pedestrian network data over the territory.


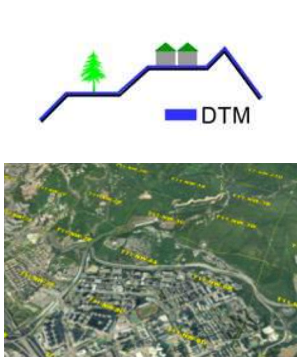

The 3D Visualisation Map (Individualised models) is a set of digital data of 3D models featuring geometry models and texture maps to represent the geometrical shape, appearance and position of different types of ground objects, including building, infrastructure, vegetation, site, waterbody, terrain and generic (others). Following the release of the 3D Visualisation Map of the whole territory of Hong Kong in March 2025, the LandsD will continuously update the 3D Visualisation Map to provide up-to-date information with a view to promoting smart city development.

Classification

The 3D Visualisation Map (Individualised models) are classified into seven (7) types, namely Building, Infrastructure, Vegetation, Site, Waterbody, Terrain and Generic (Others). Building, Infrastructure (e.g. flyovers / bridges / footbridges), Site and Waterbody are individualized on feature basis. Vegetation, Infrastructure (e.g. road), Terrain and Generic (Others) are individualized on tile basis.

Types	Individualized	Level of Detail (LOD)	Description	Examples
Building (e.g. building and podium)	Feature basis	LOD1	A uniform prism to represent the general footprint and the overall height. No texture images are applied.	-
		LOD2	A polyhedron to represent the general footprint and roof top structures. Photorealistic textures are added if available.	-
		LOD3	A polyhedron to represent a miniature of a building. Photorealistic textures are added if available.	

Infrastructure (e.g. flyovers / bridges / footbridges)	Feature basis	LOD1	A polyhedron to represent the general outline of an infrastructure. No texture images are applied.	-
		LOD2	A polyhedron to represent the general outline and major ancillary features of an infrastructure e.g. noise barrier and sign gantries on highways. Photorealistic textures are added if available.	-
		LOD3	A polyhedron to represent a miniature of an infrastructure with all ancillary features e.g. sign boards on highways. Photorealistic textures are added if available.	
Infrastructure (e.g. road)	Tile basis	LOD2	Infrastructure Model is sub-divided into standard tiles and referenced in the same manner as the LandsD's 1:1,000 topographic map tiles (i.e. 750m x 600m).	
Vegetation	Tile basis	LOD2	Vegetation Model is generated based mainly on the mesh model made from the oblique aerial images. Vegetation Model is sub-divided into standard tiles and referenced in the same manner as the LandsD's 1:1,000 topographic map tiles (i.e. 750m x 600m).	
Site	Feature basis	LOD2	<p>Site Model is generated based mainly on the mesh model made from the oblique aerial images. A Site is an area of development, which may or may not be delineated by physical features. It can be a large enclosure of a private or public estate, a park, a complex of industrial or commercial, residential or educational property etc.</p> <p>Some Site Models may share same usages with other types of the 3D Visualisation Map (Individualised models), for example refuse collection station in Building Model and car park in Building Model, etc. These features shall be created both in Site Model and in other types of</p>	

			<p>the 3D Visualisation Map (Individualised models) based on different criterion as follows:</p> <p>(i) If the Site Model is composed of a building block, it shall also be classified as Building Model;</p> <p>(ii) If the Site Model is composed of a road, it shall also be classified as Infrastructure Model; and</p> <p>(iii) If the Site Model is composed of a building, a road with ancillary area, create individual building as Building Model and road as Infrastructure Model and the enclosure including building and road as a Site Model.</p>	
Waterbody	Feature basis	LOD2	<p>Waterbody Model is generated based mainly on the mesh model made from the oblique aerial images.</p>	
Terrain	Tile basis	n.a.	<p>Terrain Model is in the form of Digital Terrain Model (DTM) which is a surface model to represent the elevation of the bare ground with an orthophoto draped on. Terrain Model is sub-divided into standard tiles and referenced in the same manner as the LandsD's 1:1,000 topographic map tiles (i.e. 750m x 600m).</p>	
Generic (Others)	Tile basis	LOD2	<p>Generic (Others) Model is generated based mainly on the mesh model made from the oblique aerial images. The remaining features not classified as the Building, Infrastructure, Vegetation, Waterbody and Terrain models shall be grouped as generic (others) model such as antenna, navigation light, incinerator and monument. Generic (Others) Model is sub-divided into standard tiles and referenced in the same manner as the LandsD's 1:1,000 topographic map tiles (i.e. 750m x 600m).</p>	

Data Structure

Data files

Each 3D model is identified by a unique model identity number (model ID) with 18 alphanumeric characters, and associated with a file folder storing the digital files of its 3D geometry model and texture image(s). The file folder and digital files are named according to the model ID.

Model Identity Number of 3D Model			
	Begin Column	Type	Remarks
Model Type	1st	String	“B” stands for building models, “I” stands for infrastructure models, “V” stands for vegetation models, “S” stands for site models, “W” stands for waterbody models, “T” stands for terrain models and “G” stands for generic (others) models
Geo-reference No.	2nd to 11th		10-digit geographic reference number
Sub-type	12th to 13th		Building Models: 01 = Tower, 02 = Podium Infrastructure Models: 01 = Road 02 = Bridge 03 = Footbridge 04 = Tunnel/Subway 05 = Railway 06 = Highway 07 = Elevated road/Flyover 08 = Tunnel portal 99 = Miscellaneous Vegetation Models:

		<p>01 = Vegetation 99 = Miscellaneous</p> <p>Site Models: 01 = Farm 02 = Accommodation 03 = Commerce 04 = Education&Training 05 = Health&MedicalService 06 = Leisure,Culture&Sports 07 = Organization 08 = Public&SocialService 09 = Religion 10 = Military 11 = Industry 12 = WorksArea 13 = Transportation 14 = Utilities 99 = Miscellaneous</p> <p>Waterbody Models: 01 = Breakwater 02 = Catchwater 03 = Culvert 04 = Dam 05 = Moat 06 = Nullah 07 = Pond 08 = Reservoir 09 = River/Stream 10 = Rocky Streambed 11 = Shaft 12 = Sluice 13 = Weir 99 = Miscellaneous</p> <p>Terrain Models: 01 = Terrain 99 = Miscellaneous</p> <p>Generic (Others) Models:</p>
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		01 = Generic (Others) 99 = Miscellaneous
Department Code	14th to 15th	“06” stands for the models created by the Lands Department
Level Code	16th to 17th	“2A” (LOD2) or “3A” (LOD3) if all exposed model (except terrain model) facades are attached with photo-realistic texture, “2D” (LOD2) or “3B” (LOD3) if portion of the exposed model (except terrain model) facades are attached with photo-realistic texture “E1” if all exposed terrain model facades are attached with photo-realistic texture, “E2” if none of the exposed terrain model facades are attached with photo-realistic texture
Version Code	18th	When the 3D Model or the Photorealistic Texture of the 3D Model is revised, Version Code shall be changed following the below sequence. A = 0,1,2,3,.....9,A, B,Z

File format

The 3D Visualisation Map (Individualised models) are available in the **MAX, FBX, DAE, gITF and KML** formats. The photo-realistic texture is a single texture image or multiple texture images used to map on the exposed faces of 3D geometry model with the JPEG format or PNG format.

Accuracy

Horizontal accuracy is assessed using root-mean-square-error (RMSE) statistics in the horizontal plane, i.e., RMSE_x, RMSE_y and RMSE_r. Vertical accuracy is assessed in the z dimension only. Absolute accuracy is a measure that accounts for all systematic and random errors in a dataset. Relative accuracy is a measure of variation in point-to-point accuracy in a dataset.

Absolute Accuracy			Relative Accuracy	
Horizontal		Vertical	Horizontal	Vertical
RMSE _x and RMSE _y	RMSE _r	RMSE _z		
≤ 0.30 m	≤ 1.414x0.30 m	≤ 0.50 m	≤ 0.20 m	≤ 0.20 m

Tile Reference

The 3D Visualisation Map (Individualised models) are supplied on tile basis. The whole set of data is sub-divided into standard tiles and referenced in the same manner as the 1:1000 topographic map tiles, i.e. the data of a tile, say No. 11-NE-17A, will include all 3D models which are partly (based on centroid) or completely located within the area as covered by this map tile.

Enquiries

For Enquiries, Tel: 2231 3390 or Email: smo3dmap@landsd.gov.hk