

'3D City Model' through Quantum Geographic Information System: A Case Study of Gujarat International Finance Tec-City, Gujarat, India

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Abstract : Planning and drawing are the important aspects of civil engineering. For testing theories about spatial location and interaction between land uses and related activities the computer based solution of urban models are used. The planner's primary interest is in creation of 3D models of building and to obtain the terrain surface so that he can do urban morphological mappings, virtual reality, disaster management, fly through generation, visualization etc. 3D city models have a variety of applications in urban studies. Gujarat International Finance Tec-City (GIFT) is an ongoing construction site between Ahmedabad and Gandhinagar, Gujarat, India. It will be built on 3590000 m² having a geographical coordinates of North Latitude 23°9'5''N to 23°10'55'' and East Longitude 72°42'2''E to 72°42'16''E. Therefore to develop 3D city models of GIFT city, the base map of the city is collected from GIFT office. Differential Geographical Positioning System (DGPS) is used to collect the Ground Control Points (GCP) from the field. The GCP points are used for the registration of base map in QGIS. The registered map is projected in WGS 84/UTM zone 43N grid and digitized with the help of various shapefile tools in QGIS. The approximate height of the buildings that are going to build is collected from the GIFT office and placed on the attribute table of each layer created using shapefile tools. The Shuttle Radar Topography Mission (SRTM) 1 Arc-Second Global (30 m X 30 m) grid data is used to generate the terrain of GIFT city. The Google Satellite Map is used to place on the background to get the exact location of the GIFT city. Various plugins and tools in QGIS are used to convert the raster layer of the base map of GIFT city into 3D model. The fly through tool is used for capturing and viewing the entire area in 3D of the city. This paper discusses all techniques and their usefulness in 3D city model creation from the GCP, base map, SRTM and QGIS.

Keywords : 3D model, DGPS, GIFT City, QGIS, SRTM

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