

Maps are used for public administration, town planning, housing, land management and development, as well as leisure purposes by the Government, private sector and the general public. The Survey and Mapping Office (SMO) of the Lands Department (LandsD) is the survey, mapping and geospatial data agency of the Government. It is committed to the provision of accurate and up-to-date two-dimensional (2D) paper and digital maps, three-dimensional (3D) Digital Map and geospatial data to support the rapid development of Hong Kong. The SMO has developed a range of geospatial portals to facilitate the sharing of geospatial data. It also provides technical support for the operation of the Common Spatial Data Infrastructure (CSDI) so as to help develop Hong Kong as a Smart City.

Hong Kong Geodetic Datum: The Hong Kong 1980 (HK1980) Grid coordinates based on the Hong Kong 1980 Geodetic Datum are shown on most topographic maps. Geodetic coordinates (latitude and longitude) and the Universal Transverse Mercator (UTM) Grid coordinates based on the World Geodetic System 1984 (WGS84) are also shown on small-scale topographic maps. The “Explanatory Notes on Geodetic Datums in Hong Kong” booklet published by the SMO describes the map projection formulae and datum conversion parameters. It can be downloaded from the SMO Geodetic Survey webpage (www.geodetic.gov.hk/en/gi/refdoc.htm). In addition, the web-based transformation tools on the website (www.geodetic.gov.hk/en/gi/transformation.htm) and the Coordinates Transformation Application Programming Interface (API) via the Open Data Portal (data.gov.hk/en-data/dataset/hk-landspd-openmap-coordinates-transformation-api) provide instant conversion services among different geodetic datums.

Positioning Infrastructure: The SMO operates the “Hong Kong Satellite Positioning Reference Station Network” (SatRef) (www.geodetic.gov.hk/en/satref/satref.htm), utilising the Global Navigation Satellite System (GNSS). The network consists of 19 Continuously Operating Reference Stations (CORS) strategically located across Hong Kong. These stations continuously collect GNSS satellite data and transmit them to the data centre for processing. Both raw and processed data are made available to users, supporting high-precision positioning for a diverse range of applications.

Early Topographic Mapping: The early urban areas in Hong Kong and Kowloon were mapped at a scale of 1:600 with no contour or height information. In the 1950s, the New Territories areas were mapped at a scale of 1:1 200 with the intention to replace the old Demarcation District sheets

produced in the early 1900s. These maps eventually evolved into a predominant planimetric record, though they only supplemented rather than replaced the Demarcation District sheets.

Mapping for the whole territory by aerial photography and photogrammetric plotting commenced in 1962 and was completed in 1971. It provided maps at 1:600 scale, with contours at five-foot intervals, covering the then Hong Kong Island, Kowloon and New Kowloon. All but the hilly areas and outlying islands of the New Territories were also mapped at 1:1 200 scale, with contours at 10-foot intervals.

Following the adoption of the metrication policy in the early 1970s, the SMO converted about 3 000 sheets of the topographic map to 1:1 000, with metric contours and spot levels. From 1994 to early 1997, the SMO embarked on a mapping programme to survey those previously unmapped hilly areas and remote islands by the photogrammetric method.

SMO Map Products and Services: The SMO produces various types of map products in both digital and paper forms. The 1:1 000 topographic map covering the entire territory of Hong Kong is the most popular map series. It is commonly used in city planning, land administration and construction development. Based on the 1:1 000 topographic map, other medium to small scale topographic maps, such as 1:5 000, 1:20 000, 1:50 000 and 1:200 000 are also produced by means of cartographic generalisation and symbolisation. Digital versions of the 1:1 000, 1:5 000, 1:10 000, 1:20 000, 1:50 000 and 1:200 000 topographic maps have become open data and the public can use them free of charge.

Apart from topographic maps, the SMO also produces various special maps such as the electronic map book e-HongKongGuide, (www.landspd.gov.hk/en/resources/mapping-information/ehkg.html), Countryside Map, Satellite Image Map, and Orthophoto Map. There are also other special maps prepared with information from other government departments, such as the 1:5 000 Airport Height Restriction Plan, 1:50 000 Hong Kong Helicopter Flying Chart and the 1:100 000 Hong Kong Local Flying Chart showing civil aviation information.

Moreover, the SMO produces plans for government departments/bureaux to support their statutory functions and daily operations such as elections, expressways, Low-altitude Economy Regulatory Sandbox and Primary One Admission exercise.

For more information about the SMO’s map products and services, please visit www.landspd.gov.hk/en/survey-mapping/mapping.html.

Sale and Dissemination of Map Products: Members of the public can search and order different types of map products online through the **Hong Kong Map Service 2.0 (HKMS 2.0)** (www.hkmapservice.gov.hk/), including digital Cadastral Survey Records and map products other than those mentioned above, or order through the SMO Map Sales Outlets (www.landsd.gov.hk/en/about-us/sales-outlets.html). The Map Publications Centre, Hong Kong, also features a Map Library for the public to browse and purchase historical maps.

3D Digital Map: Developed and maintained by the SMO, the full-fledged 3D Digital Map comprises 3D Visualisation Map, 3D Indoor Map, and 3D Pedestrian Network. The 3D Digital Map enhances the understanding of multi-level spaces of a modern city, supports urban planning and land management, and promotes the development of various applications. Being one of the major datasets of the CSDI, the complete set of the 3D Digital Map can be previewed and downloaded from the **CSDI Portal** (portal.csd.gov.hk), as well as the Open3Dhk (3d.map.gov.hk) and the Open Data Portal (data.gov.hk).

Geospatial Data: Apart from the 3D Digital Map, the SMO provides various types of geospatial data, such as digital topographic and land boundary maps, aerial photographs, Geo-reference Database and GeoCommunity Database. Many utility companies, engineering consultants, IT practitioners, education institutes and government departments use these geospatial data in their daily business activities. The SMO has made most of the geospatial data available free of charge for commercial and non-commercial uses. Open geospatial data facilitates the development of digital economy, realising the visions of the Smart City Blueprint for Hong Kong 2.0 and enabling digital transformation of the whole society.

More open geospatial data can be downloaded from the LandsD's website (www.landsd.gov.hk/en/spatial-data/open-data.html), the CSDI Portal (portal.csd.gov.hk) and the Open Data Portal (data.gov.hk).

Geospatial Portals and Services: In view of the rising geospatial awareness and increasing public needs for open spatial data, the LandsD has developed and launched different geospatial portals and services.

Open3Dhk: The Open3Dhk (3d.map.gov.hk) is an online application platform showcasing applications of the latest 3D Digital Map of Hong Kong. It integrates 3D Indoor Map, 360-degree street-level panoramic images (Streetscape 360) and other spatial data available on the CSDI Portal with 3D Visualisation Map to provide land, weather, environment, and transportation-related information.

GeoInfo Map: The GeoInfo Map (www.map.gov.hk) is a common geospatial information platform with integrated geospatial data from different sources for convenient access by the public.

MyMapHK: MyMapHK is the first SMO mobile map application that supports iOS, Android and Huawei devices. This all-in-one application integrates over 300 types of spatial data related to public facilities, providing users with up-to-date

trilingual base maps of Hong Kong along with a variety of mapping tools.

VoiceMapHK: VoiceMapHK is a digital inclusion mobile map application making use of the voice-over feature of smartphones to facilitate the use of geographic information by visually impaired users.

Map Application Programming Interface (Map API): Utilising the map data maintained by the LandsD, the Map API (portal.csd.gov.hk/csd-webpage/apilist) enables the public to access the latest map services, expediting the development of innovative map applications to support the development of Smart City. The coverage of the 3D Visualisation Map API and the Streetscape 360 API has been expanded to encompass the entire Hong Kong, while the 3D Indoor Map API now covers all MTR stations.

Underground Utilities Information System (UUIS): The UUIS (www.uuis.gov.hk) is a comprehensive 3D digital platform that encompasses underground utility data across Hong Kong. Developed in collaboration with utility companies in phases, the UUIS aims to gradually enhance the management and planning of underground utilities in Hong Kong. It supports 2D and 3D visualisation of extensive utility data, and provides analytical tools and reference data to streamline underground design and construction processes.

CSDI Portal: The CSDI Portal is an entry point under the CSDI initiative led and implemented respectively by the Development Bureau and the LandsD for supporting smart city development in Hong Kong. The Portal serves as a one-stop platform to open and share the Government's geospatial data. Users may explore and download from the Portal numerous types of geospatial datasets in different themes provided by various government departments and organisations. The Portal also provides various types of applications and tools to facilitate analyses and use of geospatial data by the public.

The CSDI Use Cases (usecases.csd.gov.hk) showcase applications of geospatial data through storytelling and dashboard applications. These include the Storytelling Application and District-based Spatial Information Dashboard, which demonstrate the practical value of open spatial data by transforming it into actionable insights. These examples utilise 2D and 3D geospatial datasets to deliver interactive, district-level analyses and scenic visualisations. Through intuitive and engaging narratives, the public gains a deeper understanding of geospatial data.

The Geo-tagging Tool can convert textual and non-spatial data, allowing members of the public to use the tool without advanced technical skills in operating geographic information systems. Members of the public can integrate their own geospatial data to create personalised geospatial data.

The GeoAddress Finder aims to assist in location search and locating GeoAddress, facilitating the interoperability of address information across both government and community systems. Based on a building name, a facility name or an address, users can obtain a GeoAddress QR code and share it with others through various social media channels.

The GeoSpatialiser provides location search and address lookup services for users to geo-code multiple address records.

For more information about the geospatial portals and services, please visit (www.landsd.gov.hk/en/spatial-data/geospatial-information-services/geospatial-portals.html).

Enquiry: Enquiries about the map products and services provided by the SMO can be made on 2231 3187, or through e-mail at: smohq@landsd.gov.hk. For more information, please visit the LandsD's website (www.landsd.gov.hk).