For discussion
on 25 June 2019

Legislative Council Panel on Development

Development of Common Spatial Data Infrastructure and 3D Digital Map

PURPOSE

This paper seeks Members' support for our proposal to seek approval of LegCo's Finance Committee (FC) for non-recurrent funding of $300 million to develop a Common Spatial Data Infrastructure (CSDI) and three-dimensional (3D) digital map, which is one of the key components underpinning our smart city development.

BACKGROUND

2. Enhancing the use and sharing of spatial data (i.e. data with a location component such as geographical coordinates), which is believed to account for some 80% of the world's data, is increasingly recognised worldwide as the key to robust policy-making and driving innovation and value creation of society. Advanced economies such as Singapore, the United Kingdom and the United States have been promoting the concept of "spatial data infrastructure" that facilitates the availability of and access to spatial data for Government, businesses, not-for-profit bodies, academia and ordinary citizens. Acknowledging that spatial data infrastructure is vitally important to smart city development, we have committed in the Smart City Blueprint released in December 2017 to developing the CSDI and 3D digital map. With the $300 million funding earmarked in the 2019-20 Budget, we are aiming to advance the full operation of the CSDI portal to end 2022.

JUSTIFICATIONS

3. Bureaux/departments (B/Ds) hold considerable amount of spatial data such as locations of government facilities, census data, real-time traffic

information, etc. The general direction is for such data to be shared with the community and opened up with easy access. Throughout the years, B/Ds have been making wider use of Geographic Information System (GIS) to facilitate management of spatial data and/or development of map application platforms. Yet in the absence of common standards and guidelines, such spatial data is often maintained in different systems that cannot talk to each other, rendering data sharing across B/Ds or with external parties virtually impossible.

Roadmap for CSDI and 3D Digital Map

4. The CSDI portal seeks to overcome this data sharing hurdle by building a scalable and secured common sharing platform for exchange of quality and up-to-date spatial data and services in a readily accessible and convenient manner. It operates like a one-stop data "supermarket" where B/Ds and the public can come and visit not only to search and view a wide range of data but also to download the data as raw material and tap the data in innovative uses through value-added products. In terms of system architecture, data in the CSDI portal will be organised in the form of layers. The base layer will be the map of Hong Kong with built and natural features such as roads, buildings, community facilities, country parks, beaches, etc. Each subsequent layer (or dataset) then adds a unique dimension to the system. Intersecting different layers using GIS tools could, for example, facilitate property search by households and businesses, check which is the applicable school net for a residential block, as well as provide information on planned developments and demographics in the neighbourhood.

5. The Hong Kong GeoData Store launched by the Lands Department (LandsD) in December 2018 with 79 government datasets[1] will be used as the foundation for development of the CSDI portal. Between now and 2022, we will enhance and transform the Hong Kong GeoData Store into the CSDI portal with initial focus on spatial data held by Development Bureau's (DEVB) family of departments. We will roll out the CSDI portal with about 70 additional datasets in phases (on top of the above 79 datasets), first within Government by end 2021 and then to the public by end 2022. Subject to FC's approval of the funding application, we will launch between the latter half of 2019 and 2021 four quick win projects for use within and/or outside Government, viz Map Application Programming Interface (API)[2],

[1] These include government premises and facilities, schools, hospitals, clinics, community and social service facilities, cultural, leisure and sports facilities, postal service facilities and job centres.

[2] A web mapping service for the public and private sectors to support their web applications that require map display. It enables the community to build innovative applications enriching with the locational and other features such as virtual city navigation.

Geo-tagging Tool[3], Address Data Infrastructure[4] and District-based Spatial Information Dashboard[5]. Please refer to Table 1 of Annex A for the tentative implementation schedule.

6. B/Ds will be encouraged to make their data available for sharing through the CSDI portal for free, unless there are legitimate policy and/or operational reasons for not doing so. To ensure reliability, accessibility and interoperability of spatial data from different sources and for subsequent sharing with the public, we will adopt common data and technical standards for data management on the CSDI portal. We will formulate and promulgate such data and technical standards for compliance by B/Ds contributing to the CSDI development upon completion of a consultancy study commissioned by LandsD on standards in early 2020. The CSDI portal will release data in an open, standardised and machine-readable format and offer APIs so that the data can be easily shared, processed and used by different interest groups including application developers. Furthermore, the CSDI portal will be equipped with data discovery tools such as a metadata catalogue service, which is functionally similar to a library catalogue, providing details of the spatial data such as definition, standards, condition of use, level of restrictions, contact information and frequency of updating.

7. While the CSDI portal will come into full operation and be opened up for public use by end 2022, the CSDI will continue to evolve and expand thereafter with the release of more government spatial data outside DEVB's regime. In the longer run, we should realise more fully the potential of CSDI by securing the co-operation of the non-governmental sector including public transport operators and utility companies to make available their spatial data for sharing through the CSDI portal.

8. Another building block of CSDI is a more detailed, realistic and true 3D digital map to facilitate the opening up and sharing of government data with geospatial dimension. To meet the increasing needs of 3D applications[6] and better understanding of multi-level spaces of a modern city like Hong

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[3] A tool to convert non-spatial data (e.g. demographic data) or ground features into spatial data.

[4] To standardise location identifiers across departments, to avoid confusion in identifying buildings/premises, allowing B/Ds to improve public services, such as postal delivery, assessment of rateable value, emergency services and management of complaint cases (e.g. calling by 1823).

[5] A web-based application that uses charts, gauges, maps, and other visual elements to provide public and private sectors with consistent, up-to-date and consolidated spatial information. In short, a dashboard assimilates different online information and provides data analytics. It has been commonly used for city management as well as an understanding of public sentiments and trends in other places.

[6] A strong demand of 3D digital map for 3D applications was highlighted in the Consultancy Study on Development Strategy of a CSDI which involved interviews with 21 Government agencies, three utility companies and four professional organisations. Some examples of applications of 3D digital map quoted by the stakeholders include 3D water network, monitoring and checking of illegal structures and wind direction modelling, etc.

Kong, we will further develop and upgrade the existing 2D digital map into a full-fledged 3D digital map as the basemap and container for CSDI covering the entire territory by end 2023. We also propose extending the 3D digital map to cover the accessible interior of buildings and structures for supporting indoor-based locational and navigation applications, and publish 3D digital map showing the interior layout for 1 250 buildings by end 2023. The tentative implementation schedule of 3D digital map is at Table 2 of Annex A.

Anticipated Benefits

9. The CSDI portal as a single, centralised sharing platform will make data sharing easier, more accessible and effective. It can minimise duplication of efforts and resources in maintaining, processing and updating spatial data among B/Ds. As many of the government data carry a spatial dimension and a considerable amount of data to be released under the Open Data Policy are expected to be spatial data, the CSDI will expedite and better support the implementation of the Open Data Policy. It is also conducive to improving information transparency[7].

10. More importantly, on a strategic level, the CSDI and 3D digital map are core components of the digital infrastructure underpinning Hong Kong's smart city development. By having the ability to integrate different datasets, analyse a large volume of data and present the data analysis in innovative and informative formats, they can open up a wide range of possibilities which would otherwise not materialise. We expect that the following benefits will accrue to the digital economy, the Government and the wider community: –

(a) Boosting digital economy

With the 3D digital map and the commonly available locational and navigational-based applications, B/Ds, public and private sectors can develop many new advanced 3D applications from realistic visualisations to better city management (e.g. 3D pedestrian network for defining the optimal walking routes between destinations), disaster management (e.g. real-time flooding simulation), as well as utilities and assets management. For better land use management, 3D digital map can support project planning in 3D space, land administration of stratum above ground and underground, 3D spatial analysis,

[7] The Task Force on Land Supply (TFLS) has in its report to the Government recommended the Government to enhance the transparency of information on land supply and demand and considered establishing a database. As such, early implementation of CSDI, which seeks to spatialise land and planning-related information, will help achieve the recommendation proposed by TFLS.

etc. In this era of autonomous applications, the capability of 3D digital map can be extended to support a wide range of applications (e.g. self-driving car and drones) and foster the creation of a digital twin[8] by leveraging the Internet of Things, building information modeling (BIM) technology and big data analytics. All the above can help boosting the development of digital economy in the community;

(b) Enhancing data-driven decision-making in the Government

A large proportion of government planning and decision-making is location-based. The improved access to high-quality and up-to-date spatial data and services through the CSDI portal is expected to substantially increase the Government's capacity to perform more sophisticated data analysis, understand social needs and trends, enhance the government intelligence to support better data-driven decision-making and deliver more responsive services to the public. A real-life example of how spatial data analysis can assist decision-making is the Dengue Fever Risk Assessment. By collecting the Dengue Fever Ovitrap Index from 3 000 locations across the territory and presenting the index figures via an interactive map interface with trend data, the Food and Environmental Hygiene Department (FEHD) can readily identify the more affected areas and accordingly deploy manpower to tackle priority sites. We expect that more useful decision-making applications can be developed by B/Ds with the availability of the four quick-win solutions in paragraph 5 above. Examples of existing or potential spatial data applications benefiting the Government are at Annex B;

(c) Spurring innovations and improving quality of life for the wider community

Businesses including start-ups can use spatial data to optimise investment decisions or add value for customers using geospatial technology. Consider the following scenario - a retail chain store is considering to open a new shop. Socio-economic data such as age, income and housing type of

[8] Digital twin is a digital replica of an actual city in 3D for designers, planners and policymaker to run simulations (e.g. real time flooding simulation) and explore future scenarios. Several cities such as Singapore are already implementing the digital twin.

residents, as well as information on traffic pattern, foot traffic and the number of residences in the area can be helpful when choosing a location. Furthermore, through the CSDI portal, ordinary citizens will be able to access detailed and authoritative map content, which can be customised to their daily contexts. This will empower citizens with improved access to location data and applications, and provide daily convenience, from finding the most optimal timing and routing to government services, shops and restaurants to locating the closest bus stops/vacant parking space with real-time traffic information. Examples of potential spatial data applications benefiting the wider community are at Annex C.

Implementation and Control Arrangements

11. To put in place proper institutional arrangement, a new Common Spatial Data Steering Committee (CSDSC)[9] co-chaired by DEVB and ITB and attended by key government spatial data owners will be set up to provide strategic directions for CSDI development, build an active data sharing and collaboration landscape within the Government, and oversee the progress of CSDI development and usage of the $300 million funding. The CSDSC will report to the Steering Committee on Innovation and Technology chaired by the Chief Executive and seek policy steer from this Committee on key policy issues that may arise from the CSDI implementation. This is to ensure that CSDI, being a key component and infrastructure facilitating smart city development, could dovetail with the latest strategy for promoting smart city and draw synergy with other Government initiatives contributing to the strategy.

12. At the initial stage during which the focus is infrastructure building and opening up of DEVB's spatial data, a Spatial Data Office (SDO) staffed by a multi-disciplinary team will be established under DEVB to serve as CSDSC's executive arm, mainly responsible for overseeing the building and management of the CSDI portal, identifying and prioritising spatial data to support the phased development of the CSDI, and monitoring the execution of capacity building, outreach and partnership initiatives. The Survey and Mapping Office of LandsD with its wealth of experience in mapping and surveying will provide strong technical support for the SDO. We will also engage the non-governmental sector and tap outside experts and

[9] CSDSC will be co-chaired by Deputy Secretary for Development and Deputy Secretary for Innovation and Technology. Other members include Head of Spatial Data Office and representatives at Directorate level from about 20 B/Ds.

stakeholders' advice on how best to develop the CSDI for full operation by end 2022 that can suit the needs of society and economy.

FINANCIAL IMPLICATIONS

Non-Recurrent Expenditure

13. We estimate the total non-recurrent expenditure of the proposed development of CSDI and 3D digital map to be $300 million over five years from 2019-20 to 2023-24, made up of -

(i) $150 million for DEVB and its family of departments to expedite the implementation of CSDI, including the development of a CSDI portal, the launch of quick-win projects, the establishment of spatial data standards and provision of training to B/Ds; and

(ii) $150 million for LandsD to develop the 3D digital map in a progressive manner, including the creation of 3D digital map showing topographical and exterior features of terrain, buildings and infrastructures, 3D pedestrian network and the accessible interior of some landmark buildings and structures.

14. The breakdown of the estimated non-recurrent expenditure for the implementation of CSDI is as follows: -

	($'000)					
Items	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**Total**
(i) Procurement of Cloud Services (Infrastructure-as-a-Service)	400	3,500	3,500	3,500	3,500	**14,400**
(ii) Procurement of Cloud Services (Software-as-a-Service)	360	5,300	5,300	5,300	5,300	**21,560**
(iii) Procurement of Implementation Services (for CSDI Development)	1,040	17,280	17,120	5,200	4,200	**44,840**
(iv) Procurement of Implementation Services (for B/Ds)	1,000	12,366	8,367	8,367	-	**30,100**
(v) Communication Network & Site Preparation	-	1,980	1,170	900	450	**4,500**

(vi) Promotion and Procurement of Training Service for B/Ds	200	1,700	3,900	1,900	1,900	**9,600**
(vii) Contingency	-	-	-	21,930	3,070	**25,000**
Total	**3,000**	**42,126**	**39,357**	**47,097**	**18,420**	**150,000**

15. On paragraph 14(i) above, the estimate of $14.4 million is for the procurement of Cloud Services (Infrastructure-as-a-Service) to support the development of the CSDI portal.

16. On paragraph 14(ii) above, the estimate of $21.6 million is for the procurement of Cloud Services (Software-as-a-Service) to support the development of the CSDI portal.

17. On paragraph 14(iii) above, the estimate of $44.8 million is for the procurement of implementation services for designing, developing and implementing the CSDI portal.

18. On paragraph 14(iv) above, the estimate of $30.1 million is for the procurement of goods/services for implementing the CSDI in B/Ds.

19. On paragraph 14(v) above, the estimate of $4.5 million is for the procurement of communication network, goods/services for site preparation and the related implementation services, etc. to support the development of the CSDI portal.

20. On paragraph 14(vi) above, the estimate of $9.6 million is for promotion of the CSDI and procurement of training service for B/Ds for the development of the CSDI.

21. On paragraph 14(vii) above, the estimate of $25.0 million represents 20% contingency on the items set out in paragraphs 14(i) to 14(vi).

22. The breakdown of the estimated non-recurrent expenditure for the proposed high-quality 3D digital map is as follows: -

	($'000)					
Items	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**Total**
(i) Service contracts on the enhancement on 3D mesh model	2,000	31,500	31,800	31,200	16,200	**112,700**

(ii) Service contract for capturing images for non-roadside buildings	-	2,000	2,000	2,000	-	**6,000**
(iii) Procurement of services for the development of 3D indoor map for 1 250 buildings with a height exceeding 10m in Hong Kong	-	11,000	6,600	6,700	7,000	**31,300**
Total	**2,000**	**44,500**	**40,400**	**39,900**	**23,200**	**150,000**

23. On paragraph 22(i) above, the estimate of $112.7 million is for the procurement of services for the enhancement of 3D mesh model including the post-processing of existing and newly captured image data and creation of individual 3D building models for the whole Hong Kong.

24. On paragraph 22(ii) above, the estimate of $6.0 million is for the procurement of services for capturing images for non-roadside buildings that are inaccessible by vehicle.

25. On paragraph 22(iii) above, the estimate of $31.3 million is for the procurement of services for the development of 3D indoor map for 1 250 (out of 53 000) buildings with a height exceeding 10m in Hong Kong.

Recurrent Expenditure

26. The on-going maintenance and support of the proposed CSDI and the high-quality 3D digital map will incur additional annual recurrent cost after its complete rollout in 2023-24, with breakdowns in the following tables -

Breakdown of estimated annual recurrent expenditure to be incurred by DEVB/ITB for the CSDI: -

Items	**2024-25 and onwards $'000**
(i) Cloud Services Subscription	8,800
(ii) Communication Network	450
(iii) CSDI Maintenance (Staff Expenses)	6,510
(iv) Training & Promotion	1,700
(v) Consumables	50
Total	**17,510**

Breakdown of estimated annual recurrent expenditure to be incurred by LandsD for 3D digital map: -

Items	**2024-25 and onwards $'000**
(i) On-going Updating and Maintenance (Staff Expenses)	18,500
(ii) Office Accommodation Cost	3,300
(iii) Training	200
(iv) Consumables	50
Total	**22,050**

If the above additional recurrent cost cannot be absorbed from existing provisions, additional resources will be sought in accordance with established procedures.

WAY FORWARD

27. Subject to Members' views, we will seek approval from the FC within 2019 for the $300 million funding to advance the development of 3D digital map and CSDI using spatial data managed by DEVB's family of departments at the initial stage.

ADVICE SOUGHT

28. Members are invited to render support to the proposal set out in this paper.

Development Bureau
June 2019

Annex A

Table 1: Implementation Schedule for Common Spatial Data Infrastructure (CSDI)

Rolled-out Time	Deliverables
For internal use within Government by end 2021	Releasing through the CSDI portal about 70 additional data sets under DEVB's family of departments on top of the 79 data sets already available on the Hong Kong GeoData Store.
Between the latter half of 2019 and 2021	Launching quick-win projects for use within and/or outside Government, including Map API, Geo-tagging Tool, Address Data Infrastructure and District-based Spatial Information Dashboard.
CSDI in full operation and for use by the public by end 2022	Opening up the above 70 + 79 data sets for free download and use by the public.
Beyond 2022	Releasing more data sets through the CSDI, subject to further discussion with B/D data owners on issues including data standardisation, availability of API data service, etc.

Table 2: Implementation Schedule for Three-dimensional (3D) Digital Map

Rolled-out Time	Deliverables
By late 2019 /early 2020	Publish the 3D pedestrian network data covering the whole territory.
Between latter half of 2019 and 2023	Publish the 3D digital map showing topographical and exterior features of terrain, buildings and infrastructures, initially covering Hong Kong Island, Kowloon and some new town areas, and the other areas of the territory eventually.
By end 2023	Extend the 3D digital map to cover the accessible interior of buildings and structures and publish 3D digital map showing the interior layout for 1 250 buildings.

Annex B

Examples of Existing or Potential Applications Benefiting the Government

Smart Living

1. GeoAddress

The GeoAddress will contain geo-location information (in terms of the HK1980 Grid Easting and Northing coordinates) that can be extracted for locating the vicinity of the buildings without the need for advanced GIS support. As the GeoAddress can be associated with the corresponding textual address, it will enable B/Ds to share and exchange information relating to a particular address location more accurately and effectively. By opening up the GeoAddress to the public, it will also enable different parties to develop innovative applications over the use of local addresses for spatial data exchange, correlation and analysis, and in turn contribute to smart city development.

2. Linkage between Land Boundary Information and Land Registry (LR) Information

An enhancement was introduced in May 2017 to strengthen the interconnection between the land registration records of the LR and cadastral records of LandsD. Making use of the Property Reference Number (PRN - for unique identification of a lot register or a subdivision register) as the common key / identifier, LandsD and LR collaborate with each other to establish and launch a new system interface between the public web map application GeoInfo Map of LandsD and the Integrated Registration Information System (IRIS) website of LR. This new system interface between GeoInfo Map and IRIS websites facilitates public users to search and order property registration documents online by visiting either one of the websites. The CSDI will further facilitate linkage to other land records such as vacant government sites, short term tenancy, private lots, allowing users to retrieve land records in one place.

3. Prediction of Area Affected by Flooding

GIS can be applied for carrying out a flood risk assessment before occurrence and making a response after the incident. For flood disaster in the city, 3D digital map, flood data and rainfall figures are required to provide a more effective approach to calculate water depth, assess

physical damage to buildings, quantify risks and perform 3D visualization of flood damage.

Types of spatial data required may include:

- To show affected area: 3D digital map;
- To analyse the affected area by the flood: flood data and rainfall figures.

Smart Government

4. Dengue Fever Risk Assessment

FEHD has released the Dengue Fever Ovitrap Index and Dengue Fever Case information to different government departments via the Geospatial Information Hub (GIH) and established an effective data updating mechanism with the LandsD since 2005. Currently, there are about 3 000 locations installed with ovitrap across the territory. Advanced functions in the GIH, including spatial analysis and trend display functions, were developed by the LandsD to facilitate efficient visualization and retrieval of ovitrap survey summary by officers in the FEHD as well as those in other government departments. By sharing information and the spatial analysis results via an interactive map interface, relevant government departments could therefore provide swift responses in pest control actions.

Types of spatial data required may include:

- To show location and index of ovitraps from FEHD: topographic maps;
- To analyse the affected facilities (e.g. schools, centre for elderly and hospitals) in the vicinity of the high ovitrap index.

5. Identification of Heritage Site

GIH is disseminating five types of heritage data to all concerned B/Ds: Sites of Archaeological Interest, Government Historic Sites Identified by Antiquities and Monuments Office (AMO), Graded Historic Buildings and Sites (Grade 1 to 3), Declared Monuments and Proposed Monuments (only available in LandsD). Concerned departments can, therefore, access the GIH for maintaining the heritage data in their daily operations to safeguard the heritage features. The combination of heritage data and other relevant spatial data, such as 3D pedestrian network, in CSDI will enable application developers to devise more innovative apps in relation to heritage tourism and conservation.

Types of spatial data required may include:

- To show the location of heritage sites from AMO and project boundary from works departments: topographic maps;
- To analyse the affected heritage sites within the project boundary.

6. Tracking of Pavement and Road Repair Work

Through regular inspections, the conditions of roads and pavements can be collected and linked to the CSDI portal, allowing relevant departments to make use of operational dashboards to monitor the maintenance/repair work progress more effectively. In addition, accumulation of consistent and quality pavement and road condition data over time will also allow departments to predict future pavement performance trends more accurately, enabling departments to more efficiently manage the pavement and road assets. It will also help departments measure maintenance cost effectiveness, and study the influence of new construction materials on pavement and road performance.

Types of spatial data required may include:

- To show pavement and road condition and their repair work: topographic map;
- Pavement and road condition data;
- Location, extent and construction time of the pavement and road repair work.

Annex C

Examples of Potential Applications Benefiting the Wider Community

Smart Mobility

1. Door-to-door Journey Planning and Navigation

In order to decide whether to drive or travel by public transport to workplace, a person can retrieve the real-time parking vacancy data, traffic data, estimated time of arrival of public transport services and internal layout of major buildings all at once on the CSDI portal and 3D digital map. In so doing, he can also estimate the total duration of journeys, and receive information on indoor positioning and navigation.

Types of spatial data required may include:

- To show home and work locations: topographic maps;
- To analyse the optimal route: road and railway network, including road centreline, traffic direction, real-time traffic condition, etc.; public transportation, including route, availability, real-time condition on the estimated time of arrival and capacity, etc.; carpark, including operating hours, capacity, real-time vacancy, fees, etc.;
- To enable indoor navigation: Map API, 3D digital map for unit-based indoor applications.

2. Contingency Traffic Management

Relevant government departments and public transport operators can improve traffic management when traffic accidents or road blockage occur after severe weather by alerting drivers and passengers about the accurate locations of incident, possible duration of clearance, nearby parking space, nearby public transport facilities, traffic conditions of alternative routes to enable drivers to make their alternative travel plan more effectively. Application developers may also develop apps to perform similar and other innovative functions with these spatial information available on the CSDI portal.

In this application, carpark data, traffic data, routing data, positioning data are used in an integrated manner.

3. Parking Space Finding System

The community may develop web apps for finding vacant parking spaces

in major carparks, particularly the Park-and-Ride carpark, to enable commuters to make better planning of their journeys. Upon extensive coverage of the majority of carparks in the territory, it is also possible to upgrade the application into a parking space reservation system, subject to collaboration among different stakeholders. When demand is high, parking spaces could be allocated by rating with reference to the vehicles' distances from the carpark and the traffic conditions on the way.

In this application, positioning data, carpark data and traffic data are used.

Smart Living

4. Optimising Food Bank Services

With GIS and spatial data, it is possible to geographically match different stakeholders of the food support services sector and the beneficiaries to alleviate the lack of information and shortage of operating resources such as warehouses, kitchens, logistics etc., to tackle the difficulties in food storage, hot meal production and food distribution, and to encourage volunteers to participate in the services.

Such platform may tap available data on CSDI to extend and expand the scope of service. Types of spatial data required may include:

- To show spatial distribution: topographic maps;
- To locate the general distribution of households in need by analysing population census statistics, including age composition, non-working population, monthly income from primary employment (median and lower quartile), usual weekly hours of work (median and lower quartile), household floor area of accommodation, etc.;
- To locate service/collection points of food banks and their service areas: Service providers' location, service provided and their vehicle fleet service coverage; and
- To analyse the optimal route for fleet management: road and railway network, including road centreline, traffic direction, real-time traffic condition, etc.

5. Optimum Time and Location for Accessing Businesses and Services

CSDI consolidates different types of up-to-date information of government services (e.g. waiting time in general/specialist outpatient clinics and hospital emergencies, opening hours of wet markets, facilities of sports centres, locations of HKID/passport replacement centres, etc.) and private businesses (e.g. types and opening hours of restaurants, supermarkets, cinemas and department stores, etc.) in one single

platform, allowing B/Ds and the private sector to develop smart applications, such as planning of the optimum time and location for a specific sport facility (in terms of opening hours, and public transport information, etc.).

Smart Economy

6. Spatial Market Research by Start-ups

Assume a start-up company wants to identify the most suitable district and type of premises for setting up its business of a specific industry. Apart from the demographic and population data by geographical demarcation areas, it may also make reference to a range of planning data (e.g. projection of population distribution) for conducting market research on the demand and supply in different geographical areas, the future growth areas for business, as well as the connection with the same trade and supporting industries.

Types of spatial data required may include:

- 3D digital map;
- Demographic and population data; and
- Geo-tagged planning data.