



DATA FOR GOOD

數據向善

2021/22

Hong Kong Open Data Index Report
香港開放數據指數報告

English Version 英文版

About the Hong Kong Open Data Index and Report

The Hong Kong Open Data Index (HKODI) is a project developed independently by the Internet Society Hong Kong Chapter (ISOC HK) to assess and monitor data openness in Hong Kong. The Index, built on 19 sets of open data standards and assessment tools at international or regional levels, was initially launched in 2020. This is the second assessment report, which also incorporates the results of Hong Kong from another global project - Global Data Barometer (GDB) - to further investigate data policies and practices in governance, release and use for the public good. ISOC HK is a regional partner of GDB.

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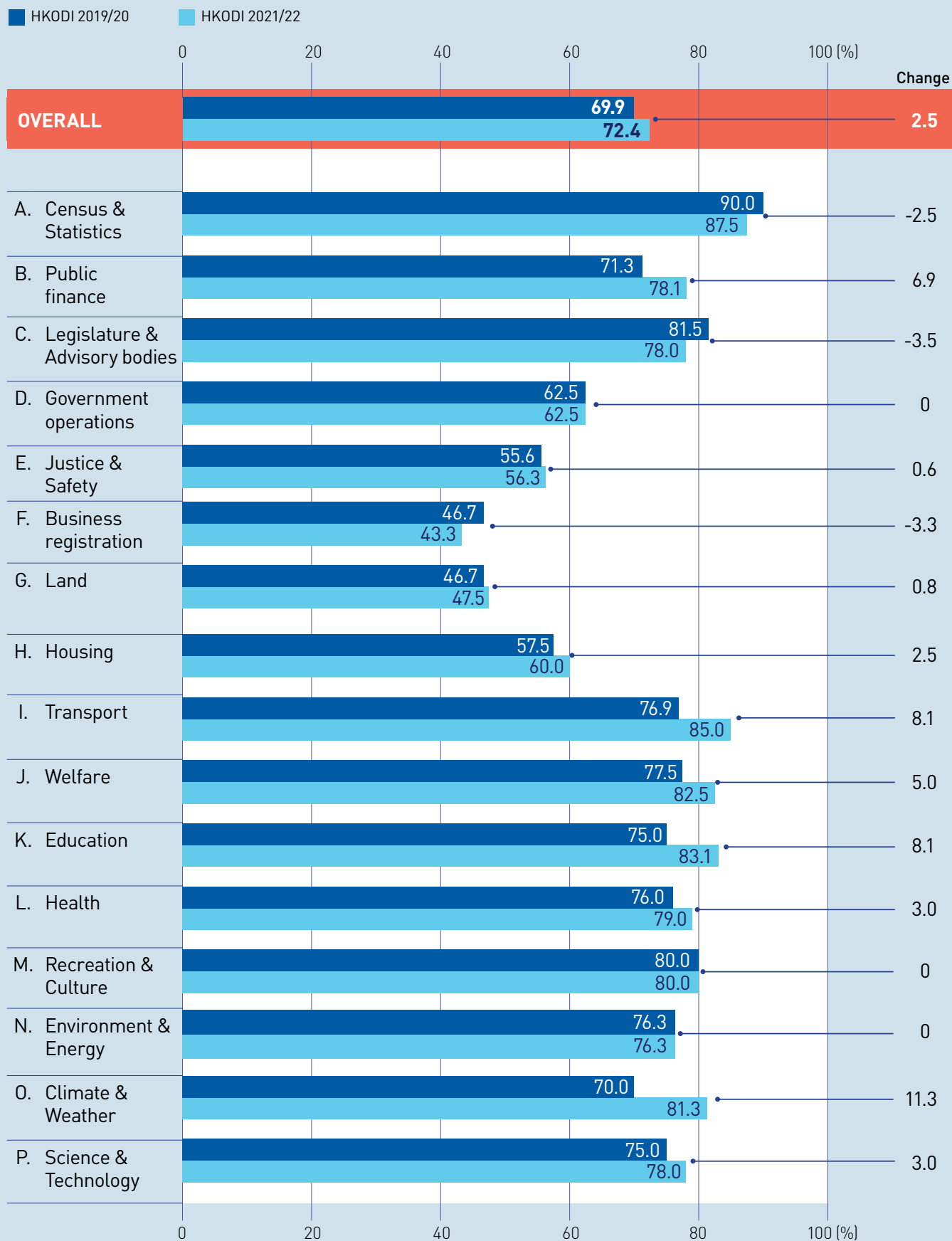
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ASSESSMENT RESULTS AT A GLANCE

HONG KONG OPEN DATA INDEX 2021/22

1. Scores of Data Categories 2019/20 vs. 2021/22



ASSESSMENT RESULTS AT A GLANCE

HONG KONG OPEN DATA INDEX 2021/22

2. Indicators Performance 2019/20 vs. 2021/22

Indicators	Sub-indicators (if any)	HKODI 2019/20	HKODI 2021/22	Change
Overall		69.90	72.40	2.50
1. Available online	1.1 No request required	4.51	4.58	0.08
	1.2 No registration required	4.62	4.66	0.04
2. Free of charge		9.24	9.32	0.08
3. Downloadable/API	3.1 Downloadable in bulk	3.74	3.96	0.21
	3.2 Application Programming Interface (API)	1.29	1.37	0.08
4. Open licensing	4.1 With an open licence	4.07	4.14	0.07
	4.2 Explicitness of the licence	0.00	0.00	0.00
5. Machine-readable	5.1 Machine-readable formats	3.68	3.85	0.17
	5.2 Structured or standardised data	3.53	3.54	0.02
6. Open format (non-proprietary)		8.51	8.73	0.22
7. Primary (finest granularity)		7.52	8.02	0.50
8. Timely		8.04	8.30	0.26
9. Metadata	9.1 Core metadata	2.57	2.54	-0.03
	9.2 Context	2.66	2.64	-0.03
10. Permanent (historical records)		6.38	6.74	0.36
(11) Identifier		4.15	6.13	1.98
(12) Human-readable		6.53	6.14	-0.39

HONG KONG IN THE GLOBAL DATA BAROMETER 2021

Pillar	Scores	Global ranking (109 jurisdictions)
Overall performance of Hong Kong	49.0	Medium high
Governance	37.5	Medium
- Data protection		
- Open data policy		
- Data sharing framework		
- Data management		
- Accessibility coverage		
- Language coverage		
Capability	59.4	High
- Open data initiative		
- Civil service		
- Government support for reuse		
Availability	53.1	High
- Company information		
- Land		
- Political integrity		
- Public finance		
- Health		
- Public procurement		
- Climate action		
Use and impact	30.1	Medium high

SUMMARY

INTRODUCTION

This is the second report by the **Hong Kong Open Data Index**, and for the first time incorporates the results from a new global study **Global Data Barometer**, going beyond open data and its technical standards to further investigate data policies and practices in its governance, release and use. By expanding the scope of assessment, we are exploring methods to answer a bigger question: how to govern data for the public good?

The **Hong Kong Open Data Index**, initially launched in 2020, was developed independently by the **Internet Society Hong Kong Chapter** (ISOC HK) as an assessment tool to examine the openness of public data for the city. Meanwhile, the **Global Data Barometer** is a new index covering 109 jurisdictions around the world to be published in 2022. The Barometer is organised around four pillars: data governance, capability, availability and use. ISOC HK is a regional partner of the GDB team.

KEY FINDINGS

From the HKODI

- The overall score of the HKODI 2021/22 is 72.4, slightly improved by 2.5 points from 69.9 in the 2019/20 assessment.
- Among the 16 categories of datasets, transport and weather data recorded substantial improvements thanks to new datasets published on the open data platform in 2021.
- The five data categories that scored the highest are: census and statistics, transport, education, welfare, climate and weather; the lowest ranking categories are the same as the previous assessment: business registration, land, justice and safety, housing and government operation.
- Indicators of bulk download, API, granularity (primary) and historical records (permanent) have each increased by slightly more than 5%.
- Copyright licences, metadata, API and historical records (permanent) are still the major weaknesses in data publication.

From the GDB

- The GDB consists of four pillars—governance, capability, availability, and use and impact— and governance is the weakest pillar for Hong Kong.
- The data governance module includes indicators of data protection, open data policy, data sharing frameworks, data management and accessibility; Hong Kong performed better on the data protection indicator as there is legislation in place, while policies regarding data sharing and data management were found to be barely publicly available.

Observations

Based on the two rounds of assessments of HKODI and the new GDB results, we found that Hong Kong has **better data availability** while **data governance policies are inadequate**.

In fact, we found that “data” is only an ingredient to realise other policy goals for the Hong Kong government, e.g. a smart city, innovation and technology, or privacy. The significance of data as a key resource or “asset” for the modern world has never been recognised. The city is still using a siloed, fragmented approach to govern data on an ad-hoc basis, without a vision, strategy, leadership or updated legislation. This reality for Hong Kong poses a huge contrast to other advanced economies in the world, as well as local governments in mainland China.

Experiences in other economies and mainland China

More advanced economies in the world have recognised the strategic importance of data, and some front-runner countries have developed or are developing holistic national data strategies. For example, **New Zealand** published the Government Data Strategy and Roadmap (2019) to provide a direction and plan for the government data system, while the **United Kingdom** made a more ambitious National Data Strategy (2020) to build a world-leading data economy and data ecosystem. It is noteworthy that the education on data literacy and skills is also a key aspect in many countries’ strategies.

“As data governance encompasses much more than technical functions, governments must employ a holistic, whole-of-government approach in developing an overarching data governance framework supported by a national data strategy, strong data leadership and a data ecosystem.”

– UN E-Government Survey 2020, United Nations

In mainland China, a number of local governments have been actively making local legislations on data. **Zhejiang** province passed the first law on public data in the country in early 2022, and **Shenzhen** city made the first overarching legislation on data in mid 2021.

Also, international organisations such as the OECD and UN have been building data governance frameworks based on experiences of their member countries in recent years.

RECOMMENDATIONS

1. Establish a high level data governance committee for better coordination and leadership

- There is a growing consensus around the world that a holistic approach—instead of fragmented and siloed approaches—should be adopted for data governance, which usually requires a high-level leadership and governance structure comprising policy-makers and experts.
- We recommend the Hong Kong government establishes a data governance committee, with a mandate and resources to review and tackle institutional obstacles that restrict data from unleashing its value and break through the departmental and industrial segregation of data use, and with representative members to bring in new initiatives from the community.

2. Make a clear vision and goals for data governance with KPIs to track implementation

- The data governance committee should also be a mechanism for the authorities to review the state of data governance, including the priority of values to achieve and datasets to open or share, legislations, administrative adjustment, data infrastructure, standards and rules.

- The government should consider setting up key performance indicators (KPI) to track the progress, and perhaps set up a data officer for each department to coordinate the internal and interdepartmental data management.

3. Build up a data ecosystem that encourages stakeholder and public engagement

- Engagement should not be limited to the data use stage—usually in the form of hackathons—but could be part of the data sharing or opening stage too, as previously exemplified by an initiative by e-commerce platform HKTVmall. Another example could be the sharing of consumer behaviour data collected by Octopus due to public interest, while the government could be an enabler to facilitate the industry building a trustworthy data sharing platform.
- The public should be engaged especially on data demand and privacy issues, and the authorities should set up a platform to consult the public in a more transparent manner.

4. Enhance education on data literacy and skills

- Data literacy is different from the current STEM and digital literacy education: though there is an overlap such as the skill of using computer techniques to process information including data, data literacy involves understanding the meaning of data, and there are a wider range of skills including using data to solve problems and communicate, and knowledge of data laws and ethics.
- Governmental measures to enhance education on data should be arranged for the general public and civil servants respectively: upgrading school courses and creating a culture of valuing data in the public sector.

1 HONG KONG OPEN DATA INDEX

ABOUT THE HKODI

The **Hong Kong Open Data Index** is a research-based initiative and assessment tool developed by the **Internet Society Hong Kong Chapter** to evaluate open data in Hong Kong. The Index focuses on public data, which includes data provided by the government and other public organisations, as well as data owned by private businesses but of public interest.

Drawing on 19 established open data standards at international and regional levels (see Appendix I: Methodology), the Index consists of 12 indicators to evaluate data across 16 categories covering 69 types of datasets. The assessment results and analysis are aimed to inform advocacy work by the civil society and business sector, to help the government improve open data policies and practices, and hence to benefit the well-being of people living in the city.

FIGURE 1.1 Methodology of the Hong Kong Open Data Index

HONG KONG OPEN DATA INDEX

INDICATORS

- | | |
|----------------------------------|------------------------------------|
| 1. Available online | 7. Primary (finest granularity) |
| 2. Free of charge | 8. Timely |
| 3. Downloadable/API | 9. Metadata |
| 4. Open licensing | 10. Permanent (historical records) |
| 5. Machine-readable | (11) Identifier |
| 6. Open format (non-proprietary) | (12) Human-readable |

DATA CATEGORIES

- | | |
|----------------------------------|-------------------------|
| A. Census & Statistics | I. Transport |
| B. Public finance | J. Welfare |
| C. Legislature & Advisory bodies | K. Education |
| D. Government operations | L. Health |
| E. Justice & Safety | M. Recreation & Culture |
| F. Business registration | N. Environment & Energy |
| G. Land | O. Climate & Weather |
| H. Housing | P. Science & Technology |

The HKODI 2021/22 is the second version of the Index, based on the assessment conducted from August 2021 to January 2022.

THE HKODI 2021/22 OVERVIEW

The overall score of the HKODI 2021/22 is 72.4, slightly improved by 2.5 points from 69.9 of the 2019/20 assessment.¹ Among the 16 categories, transport and weather data have recorded substantial improvements

thanks to new datasets published on the open data platform in 2021. Meanwhile, transport was found to be the most-used data by Hong Kong people according to the Hong Kong People's view on Open Data Survey Report² also published by the ISOC HK in July 2021, and weather data was the second most popular.

Some other data categories have changed their scores too, but either to a less significant degree, or because of methodology adjustment or correcting errors from the previous assessment.

FIGURE 1.2 Comparison of data categories 2019/20 vs. 2021/22

	HKODI 2019/20	HKODI 2021/22	Change
Overall	69.9	72.4	2.5
A. Census & Statistics	90.0	87.5	-2.5
B. Public finance	71.3	78.1	6.9
C. Legislature & Advisory bodies	81.5	78.0	-3.5
D. Government operations	62.5	62.5	0
E. Justice & Safety	55.6	56.3	0.6
F. Business registration	46.7	43.3	-3.3
G. Land	46.7	47.5	0.8
H. Housing	57.5	60.0	2.5
I. Transport	76.9	85.0	8.1
J. Welfare	77.5	82.5	5.0
K. Education	75.0	83.1	8.1
L. Health	76.0	79.0	3.0
M. Recreation & Culture	80.0	80.0	0
N. Environment & Energy	76.3	76.3	0
O. Climate & Weather	70.0	81.3	11.3
P. Science & Technology	75.0	78.0	3.0

Other major progress comes from the open data platform data.gov.hk, with the aggregated score increasing by 11% from 57.6 to 64.5. The platform is officially named the Public Service Information (PSI) Portal and is run by the Hong Kong government. The 2021/22 assessment found that more datasets have been published on the portal in the past two years, thanks to the new open data policy in 2018 that required all government departments to make annual open data plans.³

When we look at technical indicators of the HKODI, some other improvements emerge too, but they are rather minor compared with the major progress above.

Indicators of bulk download, API, granularity (primary) and historical records (permanent) have each increased by slightly more than 5%.

FIGURE 1.3
Comparison of platforms 2019/20 vs. 2021/22

Platforms	HKODI 2019/20	HKODI 2021/22	Change
PSI Portal (data.gov.hk)	57.6	64.5	6.9
Other official websites	55.5	56.6	1.2
Differences	2.1	7.9	/

FIGURE 1.4 Comparison of indicators 2019/20 vs. 2021/22

Indicators	Sub-indicators (if any)	HKODI 2019/20	HKODI 2021/22	Change
Overall		69.90	72.40	2.50
1. Available online	1.1 No request required	4.51	4.58	0.08
	1.2 No registration required	4.62	4.66	0.04
2. Free of charge		9.24	9.32	0.08
3. Downloadable/API	3.1 Downloadable in bulk	3.74	3.96	0.21
	3.2 Application Programming Interface (API)	1.29	1.37	0.08
4. Open licensing	4.1 With an open licence	4.07	4.14	0.07
	4.2 Explicitness of the licence	0.00	0.00	0.00
5. Machine-readable	5.1 Machine-readable formats	3.68	3.85	0.17
	5.2 Structured or standardised data	3.53	3.54	0.02
6. Open format (non-proprietary)		8.51	8.73	0.22
7. Primary (finest granularity)		7.52	8.02	0.50
8. Timely		8.04	8.30	0.26
9. Metadata	9.1 Core metadata	2.57	2.54	-0.03
	9.2 Context	2.66	2.70	0.03
10. Permanent (historical records)		6.38	6.74	0.36
(11) Identifier		4.15	6.13	1.98
(12) Human-readable		6.53	6.14	-0.39

MAJOR IMPROVEMENTS

Transport

The score of the transport data category has increased by 10% from 76.9 to 85, as more public transport service operators have joined the government initiative to release estimated time of arrival (ETA) data on the open data platform.

In 2021, the Transport Department released real-time bus arrival data for Kowloon Motor Bus (KMB)⁴ and green minibus⁵ on the PSI portal. Other public transport operators have opened up the data of their routes and ETA in machine-readable formats and on a real-time basis already, including Citybus/New World First Bus (2019), New Lantao Bus (2019) and MTR (2019). As of December 2021, the majority of the real-time public transport data is publicly shared, and therefore its availability increased from “partial” in the 2019/20 assessment to be regarded as mostly available now.

This is a major achievement of the open data movement in Hong Kong, considering that people from the information technology industry,⁶ civil society⁷ and the press have been calling for release of the data for many years because it would benefit the majority of people in the city who mainly rely on public transport for daily commuting and also because Hong Kong had been slower in releasing public transport data than other major cities in the world. The major obstacle to such data being opened up was that most operators in the city are private companies, and the Transport Department needs to make special arrangements with them, such as introducing new terms for data when granting franchises, or installing new systems for smaller operators such as minibus owners. As more ETA data is publicly available, mobile app developers can use it to create better services for commuters.

Weather

The climate and weather data category scored 16% higher than in the 2019/20 Index, rising from 70 to 81.3, as the Hong Kong Observatory has been releasing more real-time datasets including temperature and wind on the PSI portal in the past two years.⁸ However, some of these newly released and frequently updated (usually every 10 minutes) datasets do not come with any application programming interface (API), which is usual

for automated and real-time data access. The absence of the API function may prevent the data from being used more efficiently.

PSI portal

Platform wise, the score for the Public Service Information Portal has increased by 11% from 57.6 to 64.5, while the aggregated score of other official websites has only improved by 2% to 56.6 in the 2021/22 Index. The two types of data publication platforms are now displaying a significant difference from two years ago.

The Index was designed to examine datasets on the PSI portal data.gov.hk and other official websites respectively in order to monitor the changing patterns in the data opening process of Hong Kong. Though the PSI portal is a special platform developed for open data, the 2019/20 assessment revealed that the portal did not perform better than average governmental websites because the data reserve of the portal was not as abundant as traditional websites. However, as more datasets are being released on the portal,⁹ especially popular ones like public transport and weather data, the portal is finally showing an advantage over normal official websites.

REMAINING GAPS

Despite these improvements, there are still gaps initially found in the 2019/20 assessment that remain.

Datasets that are less open

The lowest-scored five categories of datasets are the same: business registration, land, justice & security, housing and government operations. No new datasets in these categories have been published since the 2019/20 assessment, and the platforms hosting such data are unchanged too.

Business and land ownership datasets are not openly available because users have to make enquiries through a search system, and detailed information regarding ownership is not free of charge. Data about justice & security and government operations is largely not available on the open data portal but can be found on the government department websites. This drags down the openness of these categories, because government department websites are usually not designed for open

data. The housing sector fails to offer primary data at the finest granularity in the public domain—for example, data concerning public housing allocation.¹⁰

Copyright licences

Copyright licences are not only inconsistent across datasets and platforms, but also lack explicitness and clarity about the extent to which the public are authorised to use the data.

Users have to interpret legal phrases on their own in the lengthy “terms and conditions” or “important notices”—hidden in the corner of government websites—to understand whether they are allowed to use the data for their own work and then publish it. This may prevent the average person from making use of the data for fear of legal risks, and such risks do exist because a number of government websites claim in the TOC that their information is for internal use only.

A typical standardised licensing system is Creative Commons (CC), which features a range of visual icons to indicate different levels of openness. The Hong Kong government should consider introducing or developing a system like CC to facilitate data reuse by people for the public good.

Metadata

The metadata that summarises basic information of datasets is not comprehensive enough: the majority of the datasets are not noted with their initial publication date, coverage period, theme and key words, etc. Such information is also called “core metadata”, which should ideally include the dataset title, source, publication date, format, and others to support discoverability.¹¹

Also, the public data portal and websites in Hong Kong fail to provide information explaining the context of their datasets. Such information would help to prevent misunderstanding and misuse of a dataset by clarifying its nature and limitations.

Application Programming Interface (API)

Though increasing by 6% from the 2019/20 Index, the Application Programming Interface (API) still receives the lowest score among all indicators, 1.37 out of 5. An API is a mechanism that allows users to get a slice of the data by placing specific queries, and makes it possible for programmers to automate the data access process.

Making datasets accessible through bulk downloads and APIs are two major methods to open up data. The former is more common to the general public, while the latter is more for professional users with an information technology background. API is particularly valuable for time-sensitive data, such as traffic flow and weather. The provision of an API requires extra resources to upgrade the data management system. Nevertheless, APIs indicate a better data management and sharing capability, and therefore the extremely low score implies that the data infrastructure of the Hong Kong government is still far from “smart”.

Historical records

The score for the “permanent” indicator, which examines whether the historical records of published datasets are being kept publicly, recorded a 6% increase this year. It is a better improvement than other indicators, but the score of 6.74 out of 10 still makes it one of the lowest.

Making the historical records of a dataset available online will ensure that users can conduct comparative analyses over time, based on authentic documents rather than amended versions. However, many datasets in Hong Kong only provide the latest version without archiving the older versions or making them easy to access. It should be acknowledged that the PSI portal offers the function “Download Historical Data”, but it does not necessarily allow users to retrieve the historical copies of every dataset or do so in a user-friendly manner. It once again underscores the inconsistency in data management across departments.

2 HONG KONG IN THE GLOBAL DATA BAROMETER

ABOUT THE GDB

The Hong Kong Open Data Index project was initially formed to measure the state of open data in the local context using international standards—mostly technical indicators. The 2019/20 Index revealed that, while the availability was not a major issue, technical indicators vary between platforms and government departments, indicating an inconsistency of data management and publication within the government. Advancing open data involves not only pushing the government to publish more datasets, but also enhancing administrative coordination.

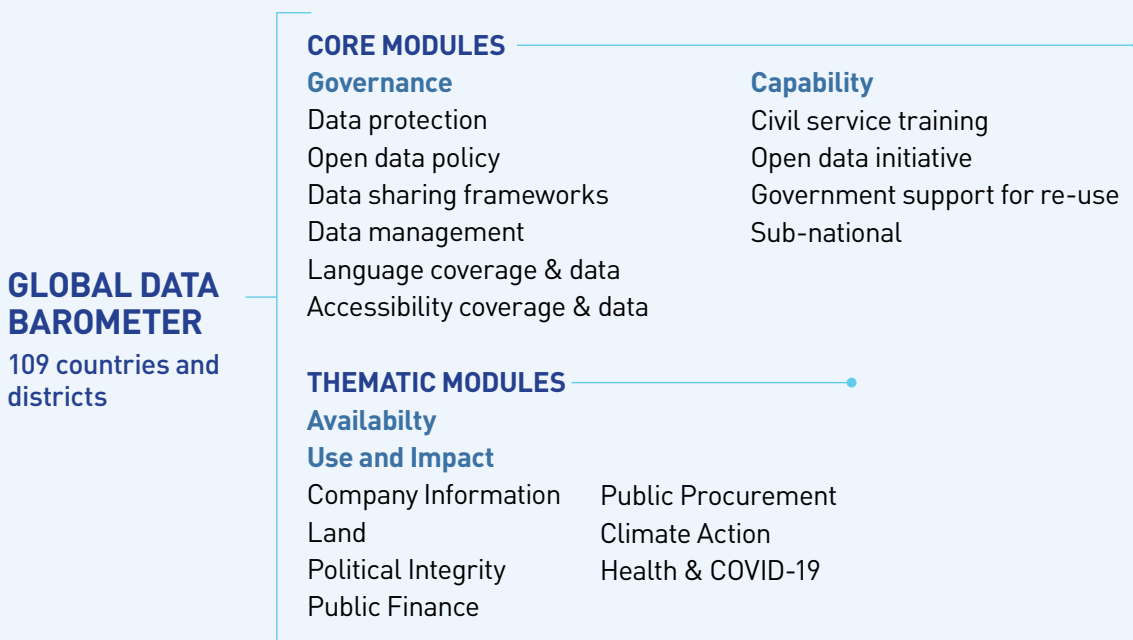
The 2019/20 findings prompted us to explore a more complex assessment tool to put open data in a larger policy context. A new initiative named Global Data Barometer was formed in 2020 to measure data from an overarching perspective. ISOC HK took the initiative to reach out and became one of the GDB’s regional hubs to prepare for the pilot assessment together.

The Global Data Barometer is developed on the previous Open Data Barometer (2013-2017), going beyond open data to investigate the policies and practices of governing,

releasing and using data for the public good. It consists of four pillars: governance, capability, availability, and use and impact.

- **Governance** is concerned with whether there are rules, processes and institutions in place to make data available for the public good and to safeguard that data against misuse. Governance indicators generally look at the legal and policy frameworks that support data ecosystems.
- **Capability** is concerned with whether a country or region has the means, connectivity, skills and institutional capacity to create, share and use data for the public good.
- **Availability** is the largest section of the survey and explores whether certain categories of data are available, shared and of adequate quality to allow reuse for the public good.
- **Use and impact** is concerned with finding evidence of particular uses of data and their impact.

FIGURE 2.1 Structure and methodology of the Global Data Barometer



Data governance and capability are **core modules** of the GDB, while availability and use are reflected in the assessment of seven **thematic modules**: company information, land, political integrity, public finance, procurement, climate action, health & covid-19. Note that these thematic modules have a large overlap with the Hong Kong Open Data Index, and thus this chapter will mainly focus on the governance and capability modules.

In 2021, 109 countries and districts around the world including Hong Kong participated in the pilot research, with results being published in the spring of 2022. The Internet Society Hong Kong Chapter conducted the assessment of Hong Kong for the GDB between August and November 2021.

The assessment results show that, among all four pillars of the GDB, **governance** is the weakest pillar for Hong Kong.

FIGURE 2.2
The GDB structure and results of Hong Kong at a glance

Modules	Pillars	Scores	Global ranking*
Hong Kong		49.0	Medium high
Core modules	Governance	37.5	Medium
	Capability	59.4	High
Thematic modules**	Availability	53.1	High
	Use and impact	30.1	Medium high

* 109 jurisdictions around the globe participated in the assessment
 ** Thematic modules are based on an assessment of seven categories of data: company information, land, political integrity, public finance, procurement, climate action, health & covid-19.

For the detailed GDB methodology and its global assessment results, please visit the website: globaldatabarometer.org

GOVERNANCE

Effective data governance involves developing and implementing rules, processes and structures to ensure that data is reliable, trustworthy and comprehensive. It is also critical to ensure that sensitive data is protected, while non-personal datasets are shared or opened for re-use. The governance module of GDB includes a number of indicators on the regulatory regimes for data protection, right to information and right to data, as well as identifying emerging frameworks for data sharing.

FIGURE 2.3
Scores of the indicators of the governance module

Governance indicators	Scores
Data protection	64
Open data policy	54
Data sharing frameworks	16.2
Data management	0
Language coverage & data	45
Accessibility coverage & data	40.5

The aggregated score and ranking of Hong Kong in governance is lower than other pillars, underscoring an urgent need for the city government to review its data governance structure and policies.

Among all indicators, only the data protection score is higher than 60%, reflecting Hong Kong’s Personal Data (Privacy) Ordinance with six Data Protection Principles. The ordinance was enacted in 1996 and underwent two major amendments: one in 2012 to mainly regulate direct marketing and another in 2021 to deal with doxxing on the internet.¹²

Regarding **open data policies**, the Hong Kong chief executive’s 2017 policy address¹³ and the Smart City Blueprint¹⁴ published later in the same year were together a milestone that led to the formulation of a high-level and interdepartmental Steering Committee on Innovation and Technology to tackle issues including open data. Following these initiatives, a new open data policy was introduced in 2018. However, the policy’s full text is not publicly available, while a summary prepared for the Legislative Council shows that it mainly requires government departments to make annual open data plans and ensure datasets published on the open data portal (data.gov.hk) fulfil a few criteria (i.e. machine-readable, timely, metadata and open licence). Without elaborating on its vision and governing structures, the open data policy for Hong Kong is rudimentary compared with major cities in mainland China and other advanced economies in the world.

Data sharing frameworks are to govern and support the wider use of sensitive, proprietary or otherwise non-open data for public benefit. It involves making data accessible to a defined group of stakeholders, such as between government agencies, government and outside parties, or business entities, with certain controls and restrictions on use. In Hong Kong, we have not found any framework or policy facilitating or regulating data sharing. However, a few sector-wide data sharing initiatives and practices have emerged. For example, the Hospital Authority created a data sharing portal for handling external data requests for academic research.¹⁵

Data management policies, regardless of whether it is open data or not, are to ensure data is quality controlled and made available for reuse in consistent, reliable ways. Governments may promote consistent and high-quality data management by formulating data strategies, guidance or standards. However, none of these has been found publicly available in Hong Kong, except for a few technical requirements or standards in broader policies such as Smart City Blueprint or open data policy.

Language and accessibility guidelines for digital platforms and data are somewhat available in Hong Kong.¹⁶

CAPABILITY

Merely making data available or setting rules for governing data will not lead to significant public good if there is a lack of capability to create, manage, and use data effectively. Capabilities involve having the opportunity to do something of value and relate to issues of access, skills, infrastructure, institutions and intermediaries.

FIGURE 2.4
Scores of the indicators of the capability module

Capability indicators	Scores
Civil service training	39.6
Open data initiative	90
Government support for re-use	40
Sub-national	39.4

Civil service training in data literacy and skills is a key aspect of capabilities for the government to manage data, because the institutional readiness to govern, work with and publish or share data depends significantly on the involvement of motivated and skilled public servants. Public servants in data-centred positions should have strong data skills, while those in more general positions should meet at least a minimum level of data literacy. In Hong Kong, the Civil Service Training and Development Institute (CSTDI) provides programmes on innovation and technology applications, including workshops and seminars on big data and open data.¹⁷ However, people outside the government can only get a glimpse of such training through papers prepared for the Legislative Council, which usually do not provide enough details.

An **open data initiative** is a programme for the government to release data online to the public. In Hong Kong, such an initiative is the Public Service Information (PSI) Portal data.gov.hk established in 2011 as a pilot scheme initially and later became a formal platform to release public datasets. Now, according to the 2018 open data policy, all government agencies are required to publish open data in the portal, while a few private institutions also participate in the initiative voluntarily. As of November 2021, more than 110 organisations in Hong Kong had released over 4,820 datasets in the PSI portal.¹⁸

User engagement with data is crucial for ensuring positive outcomes and impacts that justify policies and initiatives. Data reuse is a complex process in which many different stakeholders interact. The **government support for reuse** may come in the form of different actions: challenges, hackathons, virtual events, communication strategies, information sessions and financial programmes. In Hong Kong, the government is supportive of data reuse, particularly for industries to make use of public data for economic purposes, which is reflected in the umbrella strategy Smart City Blueprint. Events such as conferences and hackathons that mainly attract stakeholders from the tech industry have been organised and funded by the government in the past few years, including a recent hackathon in November 2021.

The **sub-national indicator** is generally not applicable to Hong Kong, but a few elements have an overlap with other indicators in the governance module and therefore Hong Kong won a few points.

AVAILABILITY & USE

There are seven categories of data required to be examined by the GDB, also called thematic modules: company information, land, political integrity, public finance, procurement, climate action health & covid-19. Under each module, a few designated datasets are required to be assessed.

FIGURE 2.5
Scores of the indicators of the thematic module

Thematic modules	Scores
Company Information	30.97
- Beneficial ownership	
- Company register	
- [Use] Corporate due diligence	
Land	60.8
- Land tenure	
- Existing land use	
Political Integrity	34.5
- Political finance	
- Asset declaration	
- Lobbying	
- Public consultation	
- RTI performance	
- [Use] Accountability uses of PI	
Public Finance	63.2
Public Procurement	58.9
Climate Action	67.1
- Emission	
- Biodiversity	
- Vulnerability	
Health & COVID-19	62.0
- Vital statistics	
- Real-time healthcare system capacity	
- Vaccination (COVID-19)	

Most of these datasets on the checklist are available in Hong Kong to some extent, though may not fulfil the standards perfectly, except for three that are completely unavailable: beneficial ownership (Company information), lobbying and political finance (Political integrity).

The **beneficial ownership** indicator in the company information module scores zero as Hong Kong's Companies Ordinance, which in its 2018 amendment requires companies to maintain information of their significant controllers, does not mandate the government to set up a centralised beneficial ownership register for public inquiry.¹⁹ Maintained by each company on their own, such information is only subject to inspection by law enforcement.

Hong Kong also fails to receive credit on **lobbying and political finance** indicators in the political integrity module because the city has no legislation in place regulating political parties including their financing, although the issue has been debated on and off for many years.²⁰ Except that election expenses are subject to mandatory disclosure, data of political finance has never been available from the government or any authorised third party, but from some political parties' voluntary disclosure.

Hong Kong's data availability of the seven designated data categories is at a higher level than most other jurisdictions in the GDB assessment. For detailed analysis of the openness of public datasets in Hong Kong, please refer to the Hong Kong Open Data Index 2019/20.

Note that the GDB also seeks to measure the **use and impact** of data with a few indicators, for example, to see if open data has contributed to corporate due diligence and political accountability. However, such an assessment is more challenging because it involves a wider search of evidence than seeking information from the authorities. The quality of evidence varies, depending on a researcher's network within a region, and the research work is unlikely to be thorough due to the constraints of time and resources. Therefore, this report will not elaborate findings in this regard.

3 OBSERVATIONS

FINDINGS FROM THE HKODI AND GDB

The Internet Society Hong Kong Chapter developed the Hong Kong Open Data Index in 2019 using technical indicators to measure the data openness of Hong Kong. Meanwhile, the newly established Global Data Barometer was introduced to the world with a pilot assessment in 2021 to explore a more overarching perspective than open data: policies and practices of governing, releasing and using data. The two initiatives were created at local and global levels respectively, but driven by the same vision that data is increasingly a key resource that should be properly managed and used to generate public value for people. We call it “data for good.”

Based on the two rounds of assessments of HKODI and the new GDB results, we have drawn two major observations of Hong Kong.

Better data availability

The 2019/20 Index report observed that “the Hong Kong government and other public organisations have released online most types of data set out by major international open data initiatives and expected by local stakeholders.” In the 2021/22 assessment, the data availability continued to improve. More datasets are being published as open data, including real-time public transport and weather data, which are also most frequently used by Hong Kong people according to another survey under the HKODI in 2021. The findings about better data availability in Hong Kong are also evidenced by the GDB assessment results and global ranking.²¹

According to the Hong Kong government, the volume of datasets released on the official open data platform, Public Service Information Portal, increased from some 3,300 in December 2018 to 4,820 in November 2021, a 46% increase over a three-year period. Such progress should be attributed to a few policies announced since 2017, including the Smart City Blueprint (2017, 2020) and the new open data policy (2018), requiring government departments to open up datasets on the PSI portal every year until 2024. It is noteworthy that the city’s open data

policies came later than many other advanced economies in the world, and years after local advocacy from industry and civil society. Also, we still don’t see a mechanism to consult people on what data they need, and no vision on what exact values the government hopes to achieve by releasing these datasets.

Meanwhile, a few government departments initiated programmes of their own to release or share data. For example, the Lands Department is developing the Common Spatial Data Infrastructure (CSDI) as a platform to integrate and share geographic spatial data provided by other departments. In fact, the platform has met open data standards well, according to the HKODI assessment. Another example is the Transport Department, whose project to install location detectors on some 3,300 green minibuses to generate estimated time of arrival (ETA) data also contributed to the availability of public transport data.

Inadequate data governance

Acknowledging the achievement of data availability in Hong Kong so far, the HKODI results in the meantime indicate the city’s lack of coordination between government departments and no consultation on data demand from the public. Therefore, the HKODI team joined the Global Data Barometer 2021 pilot assessment to explore more aspects than open data. The result was that the GDB assessment echoes what HKODI has indicated about Hong Kong: data governance is a weaker pillar than data availability.

According to the GDB, governance of data for the public good involves rules, processes and structures to ensure that data is reliable, trustworthy and comprehensive. We find that the Hong Kong government has barely addressed data governance or management in publicly available documents. For them, “data” is only an ingredient to realise other policy goals, e.g. a smart city, innovation and technology, or privacy. The significance of data as a key resource or “asset” for the modern world has never been recognised by the Hong Kong government. The city is still using a siloed, fragmented

approach to govern data on an ad-hoc basis, without a vision, strategy, leadership or updated legislation. This reality for Hong Kong poses a huge contrast to other advanced economies in the world, as well as local governments in mainland China.

DATA STRATEGIES IN ADVANCED ECONOMIES

More advanced economies in the world have recognised the strategic importance of data, and some front-runner countries have developed or are developing holistic national data strategies.

Some strategies were initially designed to govern the government data, such as **New Zealand's** Government Data Strategy and Roadmap; while some newer strategies

came with more ambitious plans using data to drive the economic growth for the whole country, like the National Data Strategy of the **United Kingdom**. A few years earlier than the western countries, Asian countries like **South Korea** and **Japan** already passed laws to promote the use of data, including the public and private sector data. Please see detailed nationwide data strategies in Appendix III.

The strategies usually include leadership, governance structure and enabling infrastructure and legislation, but the priorities may be different. It is noteworthy that education is also a common aspect in many countries' strategies, though their choices of words vary: literacy and skills (Canada, Singapore, United Kingdom), training (South Korea), learning (United States), investing in people and culture (Netherlands).

FIGURE 3.1 Data strategies and legislations in some advanced economies

Country	Strategy/Policy	Leadership/Coordination	Year
New Zealand	Government Data Strategy and Roadmap	Government Chief Data Steward/Stats NZ Chief Executive	2018, 2021
United Kingdom	National Data Strategy	Department for Digital, Culture, Media & Sport	2021
Canada	A Data Strategy Roadmap for the Federal Public Service	The Privy Council -Chief Statistician -Chief Information Officer -Deputy Secretary to the Cabinet	2018
Singapore	Government Data Strategy	Smart Nation and Digital Government Office - Government Data Office	2018
Netherlands	Data Agenda Government	Ministry of the Interior and Kingdom Relations	2019
United States	Federal Data Strategy	Chief Data Officer (CDO) Council / General Services Administration & Office of Management and Budget	2019
Japan	官民データ活用推進基本法 Basic Act on the Advancement of Public and Private Sector Data Utilisation	Strategic Conference for the Advancement of Public and Private Sector Data Utilisation	2016
Korea	공공데이터의 제공 및 이용 활성화에 관한 법률 Act on the Promotion of Provision and Use of Public Data	Public Data Strategy Committee	2013

DATA LEGISLATIONS IN MAINLAND CHINA

In mainland China, a number of local governments have been actively experimenting with data governance approaches, driven by the big data vision, as well as security and privacy concerns. These local initiatives are also contributing to the nationwide framework in the making. A key feature we have observed so far is the increasing number of local legislations on data.

This wave of local legislations started in **Guiyang**, the capital city of Guizhou Province, which passed the first open data law at the local level in China in 2017. The city legislation was later absorbed into the provincial legislation of Guizhou with almost the same title.

Another example is **Shanghai**, which also started with open data policies, but then evolved incrementally to a comprehensive data legislation in late 2021, regulating personal data, public data, data exchange between private businesses and data security. The local law mandates the Shanghai Government Office (equivalent to the CE's Office in Hong Kong) to plan and coordinate "citywide data development and coordination", and establishes a "data experts committee" to advise the government. Meanwhile, **Shenzhen** passed a similar law a few months earlier than Shanghai, after thorough multi-stage consultations. In early 2022, Zhejiang province completed the first local legislation on public data. Please see the detailed list of China's state and local legislations on data in Appendix IV.

FIGURE 3.2 China's local legislations and regulations on data in recent years

Title	Place	Types	Year	Remarks
浙江省公共數據條例 Regulations on Public Data in Zhejiang Province	Zhejiang Province	Local legislation	2022	First local legislation on public data
深圳經濟特區數據條例 Shenzhen Special Economic Zone Data Regulations	Shenzhen City	Local legislation	2021	First local legislation on data governance
上海市數據條例 Shanghai Data Regulations	Shanghai City	Local legislation	2021	
上海市公共數據開放暫行辦法 Interim Measures of Shanghai Municipality for the Opening of Public Data	Shanghai City	Local legislation	2019	
上海市公共數據和一網通辦管理辦法 Management Measures on Public Data and Unified Government Online Service Platform of Shanghai	Shanghai City	Local regulation	2018	
貴陽市政府數據共享開放條例 Regulations on Data Sharing and Opening of Guiyang	Guiyang City	Local regulation	2017	First local legislation on open data

DATA GOVERNANCE FRAMEWORKS

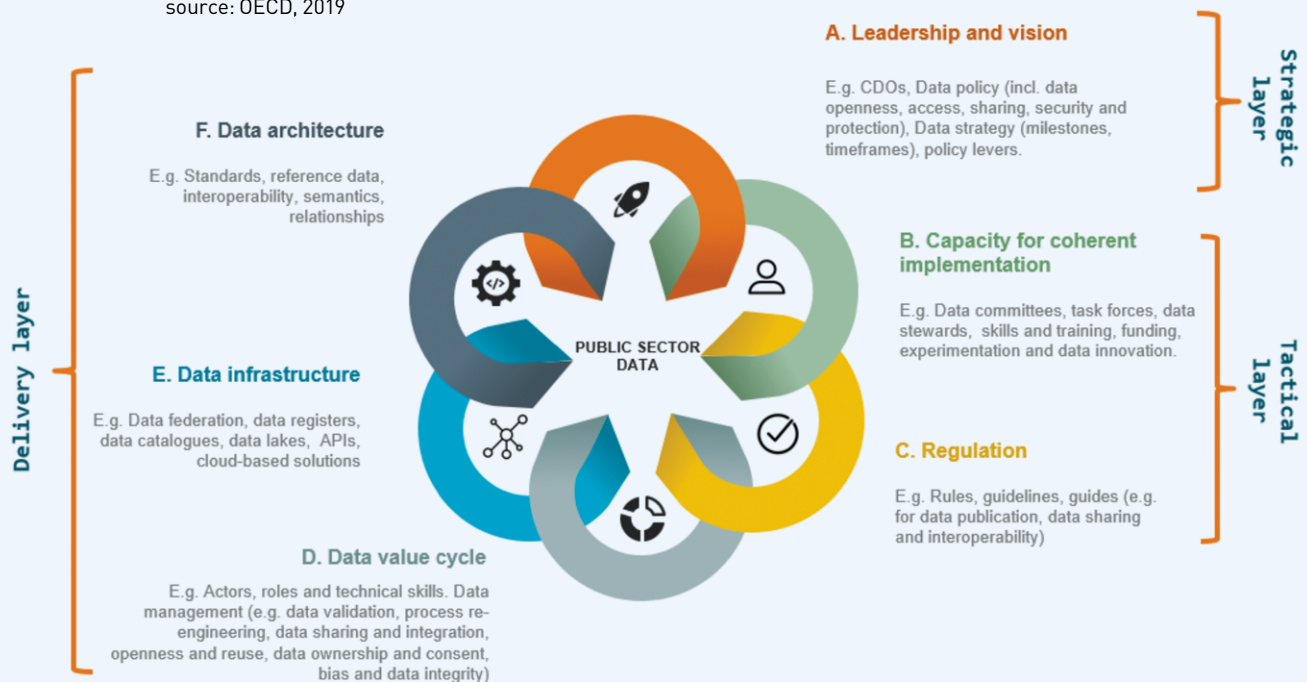
Data governance is a concept initially referring to the process of managing data for a company, but now it is increasingly used to describe how a government manages public data or all data in the society at large to cope with increasing challenges and risks in the big data era. However, there is no universal definition of data governance yet, while a few organisations of global influence are developing frameworks based on national practices around the world. The Organisation for Economic Co-operation and Development (OECD) has made recognised achievements based on its work on digital government and government data for years.

The OECD proposed a holistic model for data governance in the public sector.²² The model consists of six groups of elements arranged under three core layers:

- **Strategic layer:** (a) Leadership and vision;
- **Tactical layer:** (b) Capacities for coherent implementation and (c) Legal and regulatory frameworks;
- **Delivery layer:** (d) Integration of the data value cycle, (e) Data infrastructure and (f) Data architecture.

FIGURE 3.3 The model for data governance in the public sector

source: OECD, 2019



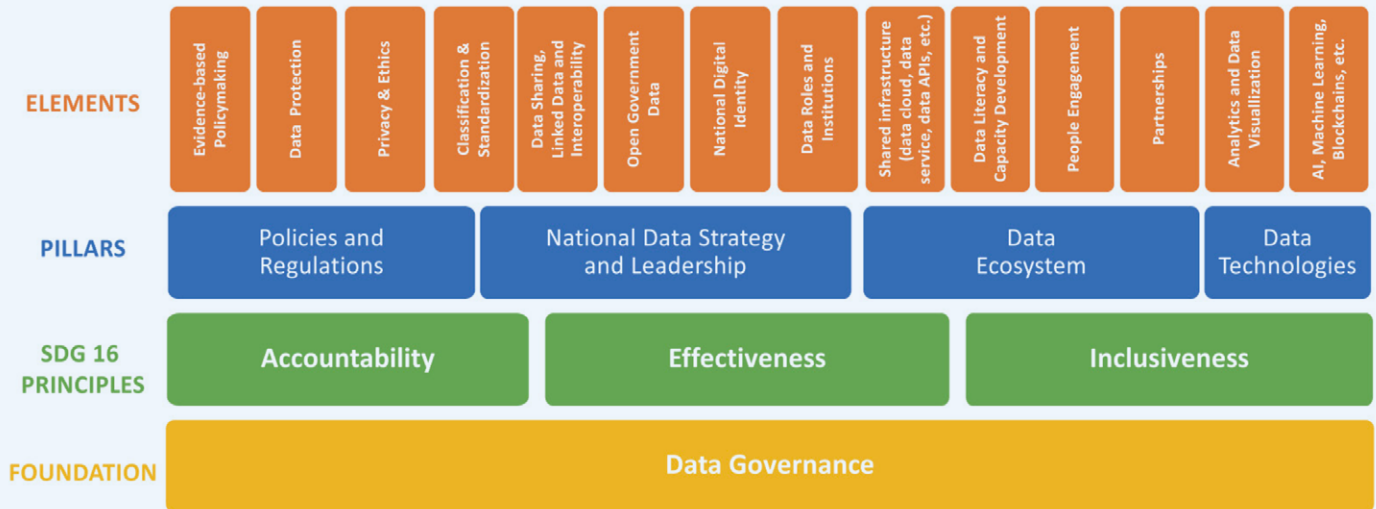
The 2019 OECD report *The Path to Become a Data-driven Public Sector* reminded governments that they should not limit data governance to the information technology regime, but to adopt an holistic approach:

“Policy makers can misunderstand data governance as the exclusive responsibility of IT departments, but it also implies transformation and coherence of capacities, policies, regulatory frameworks, leadership and organisational culture. There is therefore a need for more strategic approaches to data governance in the public sector.”

The OECD work influenced the e-government initiative of the United Nations, which has been surveying member countries every two years since 2001. In the most recent UN E-Government Survey 2020, data-centric government was one of the major topics. Drawing on the biannual survey and other academic works, the UN developed a data governance framework for e-government.²³ It is underpinned by four pillars: policies and regulations, a national data strategy and leadership, a data ecosystem and investment in data technologies.

FIGURE 3.4 Data governance framework for e-government

source: UN, 2020



The UN e-government report also echoed OECD that data government should not be merely an IT issue, and continued to elaborate on the reason:

“One important reason data governance should not be part of IT governance is that a substantial amount of government data may be unusable or inaccessible because IT authorities may not be able to fix data problems or present data appropriately within the newer data frameworks and systems (including e-government platforms), and users may not be sure how to ask for or access the data they need.”

The report therefore concluded a key message to governments around the world:

“As data governance encompasses much more than technical functions, governments must employ a holistic, whole-of-government approach in developing an overarching data governance framework supported by a national data strategy, strong data leadership and a data ecosystem.”

4 CONCLUSION AND RECOMMENDATIONS

CONCLUSION

The Hong Kong government recognised the potential values of open data, after years of advocacy from industry and civil society, and has made policies to accelerate the opening up of data since 2017. Therefore, the city's data availability has improved although there are still flaws by some technical standards. This is evidenced by both the findings of the Hong Kong Open Data Index and Global Data Barometer.

However, in order to deliver these potential values of data to people's lives in a trustworthy fashion, the scope of practices must go beyond open data. The importance of a holistic approach of data governance has been identified by international organisations such as the OECD and UN, which are also developing frameworks in this regard. Some non-governmental initiatives like the GDB participated in joint efforts to explore data governance and created an assessment tool. An examination of Hong Kong in the GDB's pilot version indicated a gap in data governance between Hong Kong and other advanced economies. Further research into data legislations in mainland China and strategies in other countries corroborate the existence of the gap. Hong Kong once again falls behind in the big data era.

It is understood that rethinking data policies may not have been a priority for Hong Kong in the past three years that have been dominated by social movements, a national security overhaul, and the covid-19 pandemic alongside other long-term unresolved issues like a shortage of land and housing. However, progress in improving data governance in other regions is the result of planning and practices implemented over a longer period. The current crisis in Hong Kong will pass and the city's people and leaders still need to make plans for the future, which should include how to govern data to deliver social good in the big data environment.

RECOMMENDATIONS

Based on the research findings, realities in Hong Kong and external experiences, we raise four recommendations for the government to consider.

1. Establish a high level data governance committee for better coordination and leadership

There is no doubt that data is increasingly a key resource or asset, but its potential value is yet to be realised. Meanwhile, risks and challenges have emerged and become intertwined through the data value cycle, i.e. generate, store, secure, process, share or open, and reuse.²⁴ We need better planning and coordination to unlock the benefits of these values while controlling the risks to prevent evil. We have observed a growing consensus around the world that a holistic approach should be adopted for data governance, which usually requires a high-level leadership and governance structure comprising policymakers and experts. The concept is actually becoming a reality in many places: from the Data Working Committee in Shenzhen, China, to the cross-agency Information Group in New Zealand.²⁵

Therefore, we recommend the Hong Kong government establishes a data governance committee with a mandate to strengthen coordination and leadership. Our 2019/20 report advised the government to set up an interdepartmental task force to coordinate technical standards for open data, but the 2021/22 research indicates that the technical level of coordination might not be sufficient to address the challenges today. We are aware that the government has set up the Steering Committee of Innovation and Technology chaired by the chief executive, tackling various matters including open data. However, data has a different scope than innovation and technology even though there is an overlap, not to mention that open data is subordinate to data governance. The data governance committee we recommend should be at a higher level, with power and resources to review and tackle institutional obstacles that restrict data from unleashing its value, and break through the departmental

and industrial segregation of data use. Committee members should be representative of the community with the vision and networks to bring in new initiatives.

2. Make a clear vision and goals for data governance with KPIs to track implementation

By recommending a data governance committee, we also hope it will provide a mechanism for the authorities of Hong Kong to review the state of data governance. The review should not be limited to local affairs. Hong Kong is an open economy which should always keep an eye on the legal and policy environment outside the city, including insights into mainland China—particularly other cities in the Greater Bay Area—and other jurisdictions that it has close economic relations with. The city should understand the implications of changes in external data governance, while also learning from their practices.

Based on the review, Hong Kong should draw up a plan with a clear vision and goals. There are a few questions that need to be answered: what values we want to achieve, what legislations should be made or amended, which part in the administration management should be streamlined, which datasets should be prioritised for opening up or sharing due to demand from industries and people, how to build or upgrade data infrastructure and what data standards and rules should be introduced?

To implement the vision and goals, the government should consider setting up key performance indicators (KPI) to track the progress. A good example is Singapore, which introduced a series of KPIs to monitor and advance its Digital Government Blueprint.²⁶ At the implementation level, the government may set up a data officer for each department to coordinate the internal and interdepartmental data management.

3. Build up a data ecosystem that encourages stakeholder and public engagement

Delivering social benefit with data does not only involve actions by the government, but also needs collaboration between stakeholders and extended engagement with the public, and hence building up a sustainable data ecosystem.

Hackathons have been one of the most popular forms of engagement to encourage innovative applications in the past few years for both government and non-governmental events, but those are only at the data use stage—one of the many stages across the data value cycle. Other stages should enable engagement too. For example, the data to be shared or released may not be limited to the public sector, but could be from a private business. Local e-commerce platform HKTVMall took the initiative to set up its own open data platform in 2020 to share anonymised consumer behaviour data, becoming an open data pioneer in the private sector. In fact, some consumer behaviour data,²⁷ such as records of people's commuting using Octopus cards during the covid-19 pandemic, would have enormous public interest implications. The good news is that Octopus Cards Limited has provided aggregated data to the medical faculty of The University of Hong Kong for research projects on the spread of the virus.²⁸ However, this should be more common rather than a case-by-case arrangement, and the government can be an enabler of it by encouraging more stakeholders to participate in data sharing, if not fully opening their data up, by establishing a secure and trustworthy mechanism, and removing potential legal and policy obstacles.

In addition to stakeholders, the public should be engaged too, especially regarding data demand and privacy issues. The authorities should set up a platform to consult the public in a more transparent manner.

4. Enhance education on data literacy and skills

Although an overhaul in data governance would be ideal, there is no solution to realise the “data for good” vision once and for all. One thing for certain is that data is increasingly essential in people's lives, and a key part to living with the change is education. In fact, the wave of information and technology starting some 20 years ago has made us put an emphasis on STEM education—science, technology, engineering and mathematics—and a more recent digital transformation movement has brought us an education on digital literacy. As we are embracing big data now, a number of countries have incorporated plans to enhance people's data literacy and skills in their national data strategies.

It is important to point out the distinction between data and digital literacy. They have a large overlap, such as the skill of using computer software or programming languages to process information including data, but data literacy involves understanding the meaning of data such as raising questions and drawing conclusions from a dataset. In addition to basic data literacy, there are a wide range of data skills: from database management, processing and visualisation, to problem solving and

communication, and knowledge of data laws and ethics.²⁹ Governmental measures to enhance education on data should be arranged for two groups: 1) general public via school, university and vocational education; and 2) civil servants to form an institutionalised data culture. In the end, we hope to have more passionate individuals equipped with skills to use data to its fullest potential to drive the public good.

“Effective data governance is essential, but the reality in many situations is that innovative data initiatives are driven and sustained not by the existence of relevant institutional frameworks but by passionate individuals.”

– UN E-Government Survey 2020, United Nations

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APPENDIX I: METHODOLOGY OF THE HONG KONG OPEN DATA INDEX

The Hong Kong Open Data Index is an assessment tool to test the openness of public data.

Assessment period (Index 2021/22):

September 2021 — January 2022

Methodology development

The Index is drafted based on a review of 19 established open data standards at international or regional levels, including 10 sets of standard-setting principles and nine assessment tools. A local stakeholder consultation was conducted from December 2018 to January 2019.

10 Standard-setting principles

- Open Definition (2005-)
- Eight Open Government Data Principles (2007)
- Ten Principles for Opening Up Government Information (2010)
- Five-Star Open Data (2010)
- Open Data Policy Guidelines (2012/13/14)
- Open Government Data: The Book (2012/14)
- Open Data Handbook (2012/15)
- G8 Open Data Charter (2013)
- International Open Data Charter (2015)
- Internet Universality (2018)

9 Assessment tools

- Global Open Data Index (2013-2017)
- Open Data Barometer (2013-2018)
- ePSI Platform Scoreboard (2013)
- G20 Anti-corruption Open Data Principles Assessment (2015)
- Open Data Inventory (2015-)
- OECD OURdata Index on Open Government Data (2017)
- Open Standards Directory (2017)
- Taiwan Open Government Report (2017)
- China Open Data Index (2017-)

Based on the review and consultation, the structure of Index has been firmed up: it consists of 12 indicators (including two non-scoring indicators) to evaluate the datasets in Hong Kong across 16 categories covering 69 types of datasets.

Indicators

The Index consists of 12 indicators (see I. Indicators below), including 10 primary indicators, and two secondary indicators for reference only. The scores of the secondary indicators are not incorporated into the final overall scores, because they are less clearly defined and recognised by the international open data community. Please refer to *Appendix III: Indicator description for the rationale of each indicator*.

Types of datasets

The public data that the Index examines is the data produced by the government, organisations funded by public budgets, and the data owned by private businesses but of public interest. For example, bus services are operated by private companies in Hong Kong, but their operational data such as estimated arrival time should be regarded as public data and therefore falls into the scope of the Index assessment.

For research purposes, we divide the public data in Hong Kong into 16 categories that cover 69 types of datasets (see II. Datasets below). The categorisation is also based on the 19 international standards, as well as a “potential priority list” in the consultancy study for the smart city blueprint.²⁴ Each type of dataset is examined from two types of sources separately: the open data portal data.gov.hk and individual websites of the organisations that produce the data.

Scoring

Each type of dataset is scored against 10 primary indicators respectively in increments of 0/5/10, based on one of the possible answers: “No”, “Partial”, or “Yes”.

The score of each dataset type is calculated as the sum of the scores on 10 indicators, and the final score for the HKODI is the average score of all 16 dataset types. The scoring for each dataset type is also determined based on the two types of sources separately—the website data.gov.hk and other public websites. We compare the scores of each dataset type of the two sources, from which we choose the higher one to be aggregated into the calculation of the overall score for Hong Kong.

Indicators

Indicator	Questions for evaluation	Score	Chaining logic
1. Available online to anyone	1.1 Can users access the dataset online without submitting requests?	5	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial THEN 2.5 ELSE IF "1.1" = Yes THEN 5
	1.2 Can users access the dataset without being required to register or identify themselves?	5	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "1.2" = Partial OR "1.2" = Yes) THEN 2.5 ELSE IF "1.1" = Yes AND (IF "1.2" = No THEN 0 ELSE IF "1.2" = Partial THEN 2.5 ELSE IF "1.2" = Yes THEN 5)
2. Free of charge	Is the dataset available free of charge?	10	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "2" = Partial OR "2" = Yes) THEN 5 ELSE IF "1.1" = Yes AND (IF "2" = No THEN 0 ELSE IF "2" = Partial THEN 5 ELSE IF "2" = Yes THEN 10)
3. In Bulk/API	3.1 Is the dataset downloadable in bulk?	5	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "3.1" = Partial OR "3.1" = Yes) THEN 2.5 ELSE IF "1.1" = Yes AND (IF "3.1" = No THEN 0 ELSE IF "3.1" = Partial THEN 2.5 ELSE IF "3.1" = Yes THEN 5)
	3.2 Is the dataset provided with an Application Programming Interface (API) when applicable?	5	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "3.2" = Partial OR "3.2" = Yes) THEN 2.5 ELSE IF "1.1" = Yes AND (IF "3.2" = No THEN 0 ELSE IF "3.2" = Partial THEN 2.5 ELSE IF "3.2" = Yes THEN 5)
4. Open licence	4.1 Is the dataset released under an open licence?	5	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "4.1" = Partial OR "4.1" = Yes) THEN 2.5 ELSE IF "1.1" = Yes AND (IF "4.1" = No THEN 0 ELSE IF "4.1" = Partial THEN 2.5 ELSE IF "4.1" = Yes THEN 5)
	4.2 Is the open licence presented in an explicit manner?	5	IF "4.1" = No THEN 0 ELSE IF "4.1" = Partial AND (IF "4.2" = Partial OR "4.2" = Yes) THEN 2.5 ELSE IF "4.1" = Yes AND (IF "4.2" = No THEN 0 ELSE IF "4.2" = Partial THEN 2.5 ELSE IF "4.2" = Yes THEN 5)
5. Machine-readable	5.1 Is the dataset provided in machine-readable formats?	5	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "5.1" = Partial OR "5.1" = Yes) THEN 2.5 ELSE IF "1.1" = Yes AND (IF "5.1" = No THEN 0 ELSE IF "5.1" = Partial THEN 2.5 ELSE IF "5.1" = Yes THEN 5)
	5.2 Is the data organised in a structured or standardised manner?	5	IF "5.1" = No THEN 0 ELSE IF "5.1" = Partial AND (IF "5.2" = Partial OR "5.2" = Yes) THEN 2.5 ELSE IF "5.1" = Yes AND (IF "5.2" = No THEN 0 ELSE IF "5.2" = Partial THEN 2.5 ELSE IF "5.2" = Yes THEN 5)
6. Open format	Is the dataset provided in an open format, which can be processed with at least one non-proprietary application?	10	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "6" = Partial OR "6" = Yes) THEN 5 ELSE IF "1.1" = Yes AND (IF "6" = No THEN 0 ELSE IF "6" = Partial THEN 5 ELSE IF "6" = Yes THEN 10)

Indicator	Questions for evaluation	Score	Chaining logic
7. Primary	Is the dataset released at the finest possible level of granularity available, not in aggregate or modified	10	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "7" = Partial OR "7" = Yes) THEN 5 ELSE IF "1.1" = Yes AND (IF "7" = No THEN 0 ELSE IF "7" = Partial THEN 5 ELSE IF "7" = Yes THEN 10)
8. Timely	Is the dataset up to date?	10	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "8" = Partial OR "8" = Yes) THEN 5 ELSE IF "1.1" = Yes AND (IF "8" = No THEN 0 ELSE IF "8" = Partial THEN 5 ELSE IF "8" = Yes THEN 10)
9. Metadata	9.1 Is the dataset provided with core metadata ?	5	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "9.1" = Partial OR "9.1" = Yes) THEN 2.5 ELSE IF "1.1" = Yes AND (IF "9.1" = No THEN 0 ELSE IF "9.1" = Partial THEN 2.5 ELSE IF "9.1" = Yes THEN 5)
	9.2 Is the dataset provided with accompanying documentation describing the context?	5	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "9.2" = Partial OR "9.2" = Yes) THEN 2.5 ELSE IF "1.1" = Yes AND (IF "9.2" = No THEN 0 ELSE IF "9.2" = Partial THEN 2.5 ELSE IF "9.2" = Yes THEN 5)
10. Permanent	Are historical copies of the dataset kept accessible at a stable online location?	10	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "10" = Partial OR "10" = Yes) THEN 5 ELSE IF "1.1" = Yes AND (IF "10" = No THEN 0 ELSE IF "10" = Partial THEN 5 ELSE IF "10" = Yes THEN 10)
(11) Identifier	Is the dataset provided with Uniform Resources Identifiers (URIs) to denote its key elements.	(10)	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "11" = Partial OR "11" = Yes) THEN 5 ELSE IF "1.1" = Yes AND (IF "11" = No THEN 0 ELSE IF "11" = Partial THEN 5 ELSE IF "11" = Yes THEN 10)
(12) Human-readable	Is the data written in plain and clear language that could be understood by the general public?	(10)	IF "1.1" = No THEN 0 ELSE IF "1.1" = Partial AND (IF "11" = Partial OR "11" = Yes) THEN 5 ELSE IF "1.1" = Yes AND (IF "11" = No THEN 0 ELSE IF "11" = Partial THEN 5 ELSE IF "11" = Yes THEN 10)

APPENDIX II: ASSESSMENT RESULTS OF THE HONG KONG OPEN DATA INDEX 2021/22

	2021/22 Index			2019/20 Index Overall Scores	Biannual changes
	data.gov.hk	Other official websites	2021/22 Overall Scores		
Hong Kong	64.6	56.6	72.4	69.9	2.5
A. Census & Statistics	77.5	87.5	87.5	90	-2.5
A.1 Census (including language, population, location)	75	87.5	87.5	90	-2.5
A.2 Local income & Balance of payments	80	87.5	87.5	90	-2.5
A.3 Trade performance	80	87.5	87.5	90	-2.5
A.4 Economic performance (e.g., CPI, PPI)	75	87.5	87.5	90	-2.5
B. Public finance	72.5	71.3	78.1	71.3	6.9
B.1 Government budget	80	87.5	87.5	87.5	0
B.2 Government accounts	82.5	87.5	87.5	87.5	0
B.3 Call for tender	82.5	55	82.5	55	27.5
B.4 Contracts let	45	55	55	55	0
C. Legislature & Advisory bodies	66	70	78	81.5	-3.5
C.1 Laws & Regulations	80	47.5	80	72.5	7.5
C.2 Bills & Legislation	82.5	87.5	87.5	87.5	0
C.3 Election results	80	72.5	80	87.5	-7.5
C.4 Legislative Council (LegCo) meetings	47.5	87.5	87.5	87.5	0
C.5 District councils meetings	40	55	55	72.5	-17.5
D. Government operations	32.5	56.3	62.5	62.5	0
D.1 Government contact points	0	65	65	65	0
D.2 Government structure & personnel	42.5	50	50	50	0
D.3 Declarations of interest	0	47.5	47.5	47.5	0
D.4 Salaries (pay scales)	87.5	62.5	87.5	87.5	0
E. Justice & Safety	31.9	48.1	56.3	55.6	0.6
E.1 Judiciary & Judgement	0	35	35	35	0
E.2 Crimes	52.5	47.5	52.5	52.5	0
E.3 Emergency services (e.g., police stations, fire stations, temporary shelters)	75	47.5	75	72.5	2.5
E.4 Travel alerts	0	62.5	62.5	62.5	0
F. Business registration	43.3	29.2	43.3	46.7	-3.33
F.1 Company register (name, unique identifier, address)	42.5	37.5	42.5	47.5	-5
F.2 Licences	87.5	50	87.5	92.5	-5
F.3 Beneficial ownership	0	0	0	0	0
G. Land	42.5	36.7	47.5	46.7	0.8
G.1 Mapping	70	40	70	70	0
G.2 Boundaries	37.5	22.5	37.5	32.5	5
G.3 Land ownership	0	0	0	0	0
G.4 Land utilisation (utilised by both private parties and public bodies)	67.5	62.5	67.5	67.5	0
G.5 Natural features or resources (e.g., trees, rivers, streams, mountains)	45	30	45	45	0
G.6 Urban planning (e.g. zoning, enforcement cases)	35	65	65	65	0
H. Housing	50.6	46.9	60	57.5	2.5
H.1 Stock of flats	85	57.5	85	67.5	17.5
H.2 Building information	75	50	75	75	0
H.3 Rental & sale transactions	42.5	42.5	42.5	47.5	-5
H.4 Public housing (including waiting time and allocation status)	0	37.5	37.5	40	-2.5

	2021/22 Index			2019/20 Index Overall Scores	Biannual changes
	data.gov.hk	Other official websites	2021/22 Overall Scores		
I. Transport	85	49.4	85	76.9	8.1
I.1 Public transport timetables (real-time)	77.5	45	77.5	42.5	35
I.2 Public transportation statistics	87.5	55	87.5	87.5	0
I.3 Parking lots & Charge stations	90	55	90	90	0
I.4 Traffic flow (road, highways, tunnels, etc.)	85	42.5	85	87.5	-2.5
J. Welfare	82.5	55.6	82.5	77.5	5
J.1 Unemployment benefits	75	65	75	70	5
J.2 Elderly benefits	87.5	42.5	87.5	85	2.5
J.3 Services for the elderly	82.5	57.5	82.5	77.5	5
J.4 Services for needy	85	57.5	85	77.5	7.5
K. Education	83.1	55.6	83.1	75	8.1
K.1 List of educational institutions	87.5	57.5	87.5	87.5	0
K.2 Education performance	82.5	55	82.5	60	22.5
K.3 Performance of higher education institutions	85	60	85	80	5
K.4 Budgets of educational institutions	77.5	50	77.5	72.5	5
L. Health	79	59	79	76	3
L.1 Healthcare facilities	75	50	75	70	5
L.2 Healthcare service performance	82.5	55	82.5	77.5	5
L.3 Hygiene inspection & Food safety	77.5	60	77.5	72.5	5
L.4 Healthcare practitioners (including register and declaration)	70	57.5	70	75	-5
L.5 Diseases	90	72.5	90	85	5
M. Recreation & Culture	70	56.5	80	80	0
M.1 Parks, zoos & gardens	87.5	57.5	87.5	87.5	0
M.2 Sports facilities	87.5	57.5	87.5	87.5	0
M.3 Museums and other cultural facilities	87.5	57.5	87.5	87.5	0
M.4 Libraries	87.5	60	87.5	87.5	0
M.5 Hiking trails	0	50	50	50	0
N. Environment & Energy	76.3	63.1	76.3	76.3	0
N.1 Air quality	80	75	80	80	0
N.2 Water quality	80	77.5	80	85	-5
N.3 Pollutant emissions	65	42.5	65	65	0
N.4 Energy consumption	80	57.5	80	75	5
O. Climate & Weather	62.5	65	81.3	70	11.3
O.1 Temperature	85	67.5	85	67.5	17.5
O.2 Wind	82.5	52.5	82.5	55	27.5
O.3 Rainfall	0	75	75	75	0
O.4 Lightning	82.5	65	82.5	82.5	0
P. Science & Technology	77.5	56	78	75	3
P.1 Research & development supports (funds, tax cut, etc.)	72.5	50	72.5	67.5	5
P.2 Wifi spots	92.5	47.5	92.5	87.5	5
P.3 Other telecommunications (broadband penetration, mobile usage, etc)	77.5	52.5	77.5	72.5	5
P.4 Patents	62.5	65	65	65	0
P.5 Granted projects and research reports	82.5	65	82.5	82.5	0

APPENDIX III: DATA STRATEGIES IN SOME ADVANCED ECONOMIES

Strategy/Policy	Time	Principles/Pillars/Framework	Leadership	Official link
New Zealand				
Government Data Strategy and Roadmap	2018, 2021	Goal: create an inclusive and integrated data system that supports innovation safely. Focus areas: 1. Data 2. Capability 3. Infrastructure 4. Leadership	Government Chief Data Steward (same as Stats NZ Chief Executive) - Information Group - Data System Leadership, Stats NZ	https://www.data.govt.nz/docs/data-strategy-and-roadmap-for-new-zealand-2021/
Canada				
A Data Strategy Roadmap for the Federal Public Service	2018	The recommendations are structured around four themes: 1. Stronger governance: a senior level decision-making body for horizontal data issues 2. Improved data literacy and skills 3. Enabling infrastructure and legislation 4. More focused treatment of data as a valuable asset	The Privy Council - Chief Statistician of Canada - Chief Information Officer of Canada - Deputy Secretary to the Cabinet, Results and Delivery	https://www.canada.ca/en/privy-council/corporate/clerk/publications/data-strategy.html
Singapore				
Government Data Strategy	2018	Four key thrusts: 1. Data Architecture: Single Sources of Truth (SSOTs) and Trusted Centres (TCs) 2. Digital Infrastructure: such as vault.gov.sg, a platform that lets all officers browse a meta data-catalogue 3. Data Education: data literacy and technical skill 4. Use Cases: partner with government agencies and companies to identify data projects	Smart Nation and Digital Government Office - Government Data Office	https://www.csc.gov.sg/articles/bring-data-in-the-heart-of-digital-government#notes
Netherlands				
Data Agenda Government	2019	1. Problem-solving with a data-driven approach 2. Focusing on legislation and public values 3. Improving the quality of government data and using it more efficiently 4. Collecting and sharing knowledge about a data-driven approach 5. Investing in people, organisations and changes in culture	Government-wide Policy Consultation on Digital Government	https://www.ndigitalgovernment.nl/dossiers/data-agenda-government/
United Kingdom				
National Data Strategy	2021	1. Data foundations 2. Data skills 3. Data availability 4. Responsible data	Department for Digital, Culture, Media & Sport	https://www.gov.uk/government/publications/uk-national-data-strategy/national-data-strategy
United States				
Federal Data Strategy	2019	Ethical Governance 1. Uphold Ethics 2. Exercise Responsibility 3. Promote Transparency Conscious Design 4. Ensure Relevance 5. Harness Existing Data 6. Anticipate Future Uses 7. Demonstrate Responsiveness Learning Culture 8. Invest in Learning 9. Develop Data Leaders 10. Practice Accountability	Chief Data Officer (CDO) Council / General Services Administration & Office of Management and Budget	https://strategy.data.gov/

Strategy/Policy	Time	Principles/Pillars/Framework	Leadership	Official link
Japan				
Basic Act on the Advancement of Public and Private Sector Data Utilisation	2016	Purpose of this Act: 1. Determine the responsibilities of the State, local public entities, and companies by providing for basic principles; 2. Provide for matters that form the basis of the formulation of the basic plan for the advancement of public and private sector data utilisation and other measures; 3. Establish the Strategic Conference for the Advancement of Public and Private Sector Data Utilisation 4. Contribute to the realisation of a society in which the citizens are able to live safely and free of anxiety and to a comfortable living environment.	Strategic Conference for the Advancement of Public and Private Sector Data Utilization	http://www.japaneselawtranslation.go.jp/law/detail/?printID=&id=2975&re=02&vm=02
Korea				
Act on the Promotion, Provision and Use of Public Data	2013	The Act has set out matters concerning: 1. Public Data Strategy Committee 2. Master plans and implementation plans 3. Evaluation 4. Surveys on demands for public data 5. Officers responsible for providing public data 6. Public Data Utilization Support Center 7. Public relations, cooperation with private sector, international cooperation 8. Registration of lists of public data 9. Public data portal 10. Quality control and standardization 11. Education and training 12. Suspending provision of public data	Public Data Strategy Committee	https://www.global-regulation.com/law/korea/644608/act-on-promotion-of-the-provision-and-use-of-public-data.html

APPENDIX IV: LEGISLATIONS AND POLICIES ON DATA IN CHINA

Topic	Organisation	Type	Promulgated	Effective	Hyperlink
关于构建更加完善的要素市场化配置体制机制的意见 Opinions on Improving the Systems and Mechanisms for Market-based Allocation of Factors of Production	中共中央, 国务院 CPC Central Committee and the State Council	中央文件 Central document	2020-03-30		http://www.gov.cn/zhengce/2020-04/09/content_5500622.htm
上海市公共数据开放暂行办法 Interim Measures of Shanghai Municipality for the Opening of Public Data	上海市政府 Shanghai Municipal People's Government	地方政府规章 Local regulation	2019-08-29	2019-10-01	http://www.shanghai.gov.cn/nw45024/20200824/0001-45024_62638.html
上海市公共数据和一网通办管理办法 Management Measures on Public Data and Unified Government Online Service Platform of Shanghai	上海市政府 Shanghai Municipal People's Government	地方政府规章 Local regulation	2018-09-30	2018-11-01	http://dlysj.sh.gov.cn/szfgz/20191125/0006-3778.html
贵州省政府数据共享开放条例 Regulations on Data Sharing and Opening of Guiyang	贵州省人大常委会 Standing Committee of People's Congress of Guizhou Province	地方性法规 Local legislation	2020-09-25	2020-12-01	http://www.gzic.gov.cn/dsjzsk/zcwj/202010/t20201013_64034517.html
贵阳市政府数据共享开放条例 Regulations on Data Sharing and Opening of Guiyang	贵阳市人大常委会 Standing Committee of People's Congress of Guiyang City	地方性法规 Local legislation	2017-04-11	2017-05-01	http://zyghj.guiyang.gov.cn/zfxgk/fdzdgnr/fggw/FLFG/201912/t20191211_29752172.html
浙江省公共数据开放与安全管理暂行办法 Interim Measures on Data Opening and Security of Zhejiang Province	浙江省政府 Zhejiang Provincial Government	地方政府规章 Local regulation	2020-06-12	2020-08-01	https://www.zj.gov.cn/art/2020/6/17/art_1229017137_557682.html
天津市公共数据资源开放管理暂行办法 Interim Measures on Opening-up of Public Data of Tianjin City	天津市网信办 Cyber Administration of Tianjin	地方部门规章 Local departmental regulation		2020-08-01	https://data.tj.gov.cn/kfzc/bd8e5ed73dba4b9f84da03a47eb275c3.htm
促进大数据发展行动纲要 Action Outline for Promoting the Development of Big Data	国务院 State Council	国务院文件 Document by the State Council	2015-08-31		http://www.gov.cn/zhengce/content/2015-09/05/content_10137.htm
深圳经济特区数据条例 Shenzhen Special Economic Zone Data Regulations	深圳市人大常委会 Standing Committee of People's Congress of Shenzhen City	地方性法规 Local legislation	2021-07-06	2022-01-01	http://www.sz.gov.cn/zfgb/2021/gb1218/content/post_9307139.html
上海市数据条例 Shanghai Data Regulations	上海市人大常委会 Standing Committee of People's Congress of Shanghai City	地方性法规 Local legislation	2021-11-25	2022-01-01	https://www.shanghai.gov.cn/nw12344/20211129/a1a38c3dfe8b4f8f8fcb5e79fbe9251.html
中华人民共和国数据安全法 Data Security Law of the People's Republic of China	全国人民代表大会常务委员会 Standing Committee of the National People's Congress	全国性法律 State legislation	2021-06-10	2021-09-01	http://www.npc.gov.cn/npc/c30834/202106/7c9af12f51334a73b56d7938f99a788a.shtml