3. Local E-Government Development

3.1 Introduction

Our Common Agenda, a report presented by the Secretary-General to the General Assembly in 2021, highlights the importance of cities as "crucial and innovative drivers of global change today".[1] Cities play a central role in public life, and how they perform has a daily and direct impact on people. The Sustainable Development Goals (SDGs) recognize the transformative power of urbanization for development and the vital role local leaders play in driving global change from the bottom up. Local governments make policy and are catalysts for change. Most of the SDGs have targets that are directly or indirectly related to the daily operations of local and regional governments.

Opportunities to forge a strong connection between the SDGs and local communities exist primarily at the city or municipal level.[2] People interact more closely with local governments than with national authorities since the former deliver the vast majority of public services, making the provision of online services at the local level essential. Facilitating interaction and engagement with and within local communities is one of the main responsibilities of municipal authorities. The availability of public participation mechanisms is vital because genuine progress is impossible unless individuals have a way to express their needs, provide feedback, and influence the direction of local government policies and practices.

A growing number of people are living in cities. Urban populations are projected to increase in all regions, reaching 5.1 billion—or 60 per cent of the world population—by 2030.[3] In the coming decades, the rate of urbanization is expected to be higher in Africa and Asia than in other regions.[4] With urban expansion, more people will be accessing public services locally, so it is imperative that strong e-government structures are in place at this level to accommodate present and future demand.

Urban residents are twice as likely as those living in rural areas to use the Internet.[5] In Africa, the gap is even greater; half of the region's urban dwellers are online, compared with just 15 per cent of the rural population. In the least developed countries (LDCs), urban residents are almost four times as likely as rural residents to use the Internet (47 versus 13 per cent). The digital divide is also apparent within cities and regions, with wide internal disparities in Internet availability and use.

One of the most effective ways to improve e-government is to regularly assess and evaluate government portals.[6] As more people live in cities and access the Internet from urban areas, it follows that local government portals must be able to accommodate larger numbers of users. A well-functioning portal can make a city more liveable and local
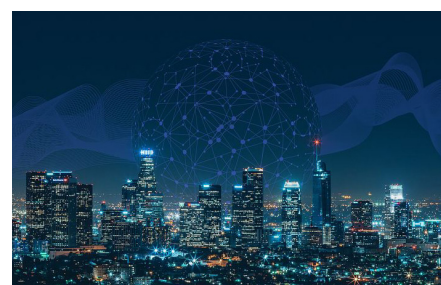

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Chapter 3

government more responsive, which can in turn make residents happier. UN DESA first integrated local e-government assessment in the *E-Government Survey* in 2018; the pilot study was limited to 40 cities evaluated on the basis of 60 indicators. In the 2020 edition, coverage expanded to 100 cities and 80 indicators. The 2022 edition features 86 indicators and assesses the most populous city in each of the 193 Member States of the United Nations in order to ensure the most extensive population coverage possible.

As noted in the UN-Habitat *World Cities Report 2020*,[7] "cities are rapidly deploying technology to address a wide range of urban challenges"; terms such as "smart solutions" and "smart cities" are often used to describe related efforts and objectives. Technology integration provides opportunities for cities to meet the SDGs, and progress in this area is accelerating; many innovative solutions have even been developed and implemented during the COVID-19 pandemic. The current Local Online Services Index (LOSI) study reveals how various information and communication technologies are being used, highlights challenges such as digital exclusion, and summarizes some ongoing trends.

The two previous editions of the LOSI study provided important information and insights on local e-government development around the world. Although overall trends have been encouraging, generally indicating steady growth and progress, there remains room for improvement. Problems with technology integration and content provision in local government websites need to be addressed, as do shortcomings in services provision and municipal participation. Overall conclusions point to the need for local governments to continue to work on strengthening e-government services in order to better serve their residents. The sections below highlight the results and major findings of the 2022 LOSI study.

3.2   Current status of local online services

3.2.1   Methodology

The 2022 LOSI comprises 86 indicators relating to five criteria: institutional framework (8), content provision (25), services provision (18), participation and engagement (17), and technology (18). The institutional framework dimension focuses on municipal e-government strategy, organizational structure, legislation governing access to information and privacy, and open data policy. For content provision, the aim is to identify the extent to which essential public information and resources are available online. The third criterion is services provision, focusing on the availability and delivery of targeted government services, and the fourth criterion is participation and engagement, which assesses the availability of mechanisms and initiatives for interaction and opportunities for public participation in local governance structures. The technology dimension focuses on technical features of the portals to specify how the site and content are made available for users; relevant indicators relate to factors such as accessibility, functionality, reliability, ease of navigation, visual appeal, and alignment with technology standards.

3.2.2   Current status of local e-government

The 2022 edition of the LOSI study is the first one to incorporate an assessment of e-government in the most populous city in each of the 193 Member States. Table 3.1 lists the cities in the very high category based on an analysis of 86 indicators (see annex I). Madrid and Berlin are ranked first, with nearly 98 per cent of the features assessed, followed by Tallinn and Copenhagen. Fifth place is shared by Dubai, Moscow, New York City and Paris, with Singapore and Shanghai ninth and tenth. It should be noted that even the cities ranked 11th to 20th have more than 85 per cent of the features assessed. The rankings are provided as a proxy for measuring and tracking local e-government development and show that many cities are very close to each other in terms of providing services online.

Among the 38 cities in the very high LOSI group, 20 are located in Europe, 10 in Asia, 6 in the Americas, and 2 in Oceania. None of the most populated cities in African countries are ranked

among the top 20. Madrid, New York, Tallinn, Moscow and Paris have ranked in the top 10 in the 2018, 2020 and 2022 editions, affirming the consistency of the LOSI methodology for the assessed cities over the years. Among other cities ranked in the top 10 this year, Copenhagen and Singapore are assessed for the first time in 2022 edition, while Berlin, Shanghai and Dubai were ranked in the top 20 in the previous edition.

Table 3.1   Cities in the very high LOSI category

City	Country	LOSI score	City	Country	LOSI score
Berlin	Germany	0.9767	Reykjavik	Iceland	0.8372
Madrid	Spain	0.9767	Helsinki	Finland	0.8256
Tallinn	Estonia	0.9535	Kiev	Ukraine	0.8256
Copenhagen	Denmark	0.9419	Riga	Latvia	0.8256
Dubai	United Arab Emirates	0.9186	Stockholm	Sweden	0.8256
Moscow	Russian Federation	0.9186	Manama	Bahrain	0.8140
New York	United States of America	0.9186	Almaty	Kazakhstan	0.8023
Paris	France	0.9186	Luxembourg City	Luxembourg	0.8023
Singapore	Singapore	0.9070	Vilnius	Lithuania	0.8023
Shanghai	China	0.8837	Montevideo	Uruguay	0.7907
Bogota	Colombia	0.8721	Seoul	Republic of Korea	0.7674
Buenos Aires	Argentina	0.8721	Tel Aviv	Israel	0.7674
Istanbul	Turkiye	0.8721	Toronto	Canada	0.7674
Tokyo	Japan	0.8605	Warsaw	Poland	0.7674
Zurich	Switzerland	0.8605	Brussels	Belgium	0.7558
Rome	Italy	0.8488	Oslo	Norway	0.7558
Sao Paulo	Brazil	0.8488	Riyadh	Saudi Arabia	0.7558
Vienna	Austria	0.8488	Sydney	Australia	0.7558
Auckland	New Zealand	0.8372	Zagreb	Croatia	0.7558

For the 2020 LOSI study, 100 cities were surveyed, and the 86 that had portals at the time were assessed; 83 of these cities are also included in the 2022 edition. Although comparing overall trends across different editions is complicated due to the substantial improvements in coverage, some straightforward comparisons can be made for the cities analysed in the two most recent editions. Figure 3.1 shows that notable progress has been achieved, with the number of cities in the very high and high categories increasing from 30 in 2020 to 46 in 2022—an indication of higher rates of implementation of the LOSI features over the past two years and improvements in government services provision. Cities in the middle and low categories decreased from 53 to 37, or by nearly 20 percentage points, during this period. Notably, Kiev and Riyadh moved from the middle to the very high LOSI level, and Minsk moved from the low to the high level, affirming that rapid progress— indicated here by the two-category leap in two years—is very possible.

Figure 3.1   Comparison of LOSI levels for 83 cities, 2020 and 2022 (Number of cities per category)
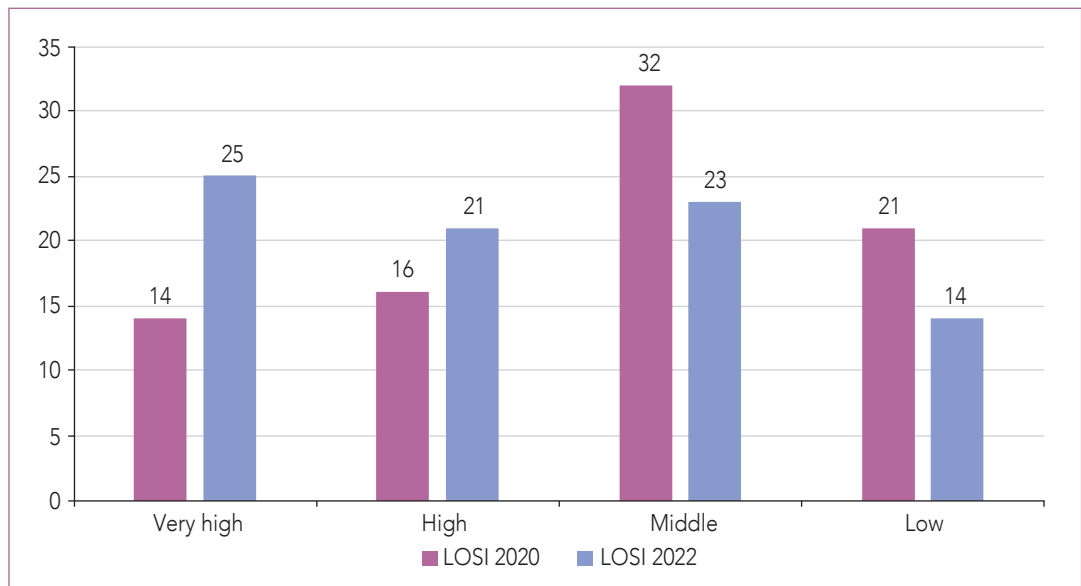
Among the 193 cities targeted for the 2022 LOSI survey, 146 have portals that are accessible and have been assessed. As in the previous edition, each city has been assigned to one of the four LOSI categories based on a final value. As shown in figure 3.2, 26 per cent of the cities surveyed meet more than 75 per cent of the indicators and are in the very high LOSI group, 25 per cent are in the high group, 31 per cent are in the middle group, and 18 per cent are in the low group. More robust comparisons of the digital development of municipal portals across the years will be carried out in the 2024 and successive LOSI editions.

Table 3.2 reflects the convergence or divergence between city portal development and national portal development in the respective countries surveyed based on a comparison of LOSI and Online

**Figure 3.2   LOSI 2022 levels for the 146 cities assessed**
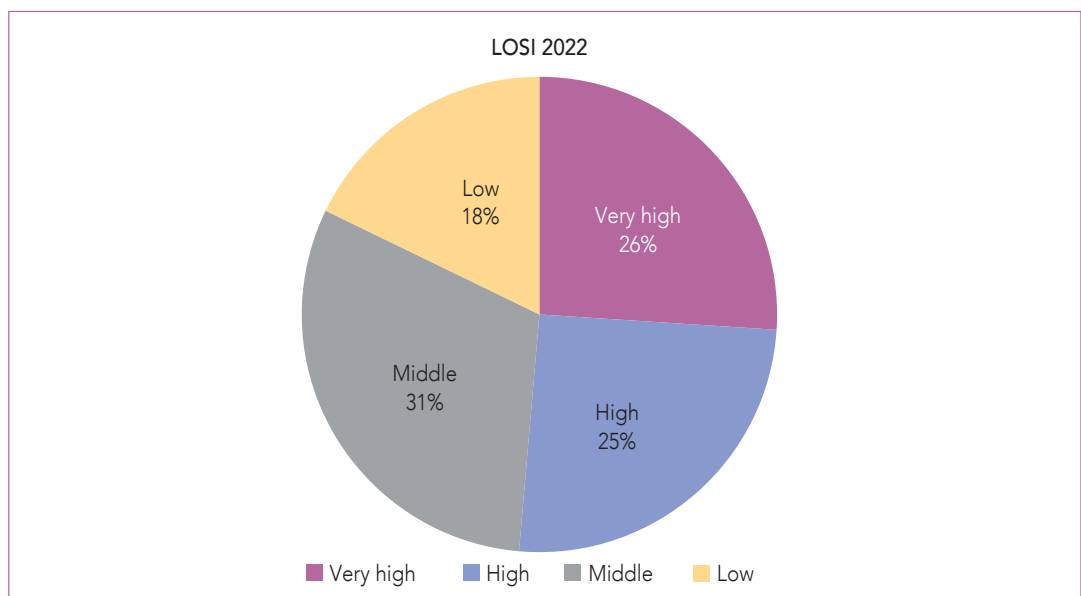
Service Index (OSI) values. The analysis does not include a direct comparison between LOSI and OSI indicators but highlights the discrepancies and concordances between the city websites and their national counterparts. Among the 146 city portals assessed in 2022, 81 are ranked at LOSI levels that correspond to their respective national levels, while 60 cities are ranked at LOSI levels lower than their respective countries' OSI levels. It is worth noting that five city portals are ranked at a level higher than their countries' OSI level; Moscow, Bogota and Brussels are at the very high LOSI level, Monaco is at the high level, and Brazzaville is at the middle level. In the 2020 edition, only one city (Berlin) was ranked higher than its national counterpart.

Table 3.2   LOSI and OSI levels for 2022: convergence and divergence (number and percentage of cities)

	Very high OSI 2022	High OSI 2022	Middle OSI 2022	Low OSI 2022
Very high LOSI 2022	35 (24.0%)	3 (2.1%)	None	None
High LOSI 2022	16 (11.0%)	20 (13.7%)	1 (0.7%)	None
Middle LOSI 2022	2 (1.4%)	19 (13.0%)	23 (15.8%)	1 (0.7%)
Low LOSI 2022	None	3 (2.1%)	20 (13.7%)	3 (2.1%)

The 146 cities assessed for the 2022 LOSI have a total of approximately 500 million residents. For the 2022 LOSI study, extensive population coverage was deemed essential given urbanization trends and the desire to cover the largest number of people possible. Against this backdrop, the LOSI 2022 results have been analysed based on the cities' population size (as determined by population and urban agglomeration data from the UN DESA Statistics Division[8] and Population Division,[9] respectively). Among the 146 cities surveyed for the 2022 LOSI, 11 are megacities of 10 million people or more, 17 are large cities with 5 million to 10 million, 56 are medium-sized cities with populations of 1 million to 5 million, 31 are cities with 500,000 to 1 million residents, and 31 are urban settlements with fewer than 500,000 people. Figure 3.3 illustrates average LOSI 2022 values by population size. It may be observed that the groupings of cities with larger populations have a higher average value than do those with smaller populations. This makes sense, as larger cities have to provide services efficiently to a larger population and are more likely to have the resources to do so effectively.

Figure 3.3   Average LOSI 2022 values by population size
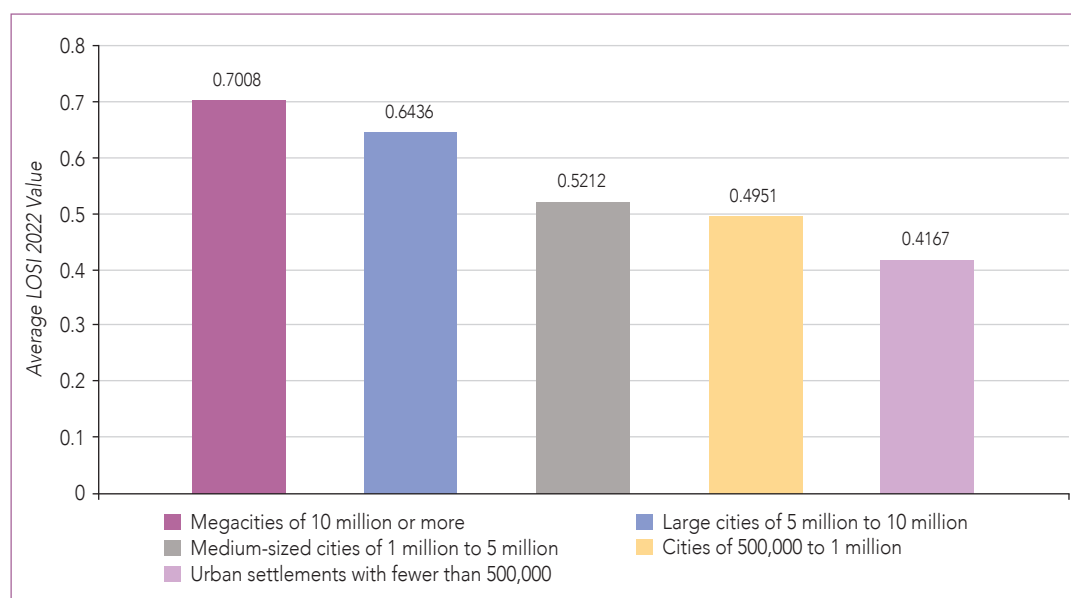
Implementation of LOSI indicators in city portals

As noted previously, institutional framework, content provision, services provision, participation and engagement, and technology are the five criteria featured in the 2022 LOSI. Some new indicators have been added and others have been reorganized to align with the OSI 2022 methodology. The newly introduced institutional framework criterion focuses on organizational structure and the legal and regulatory framework needed for local governments to develop an integrated institutional ecosystem.

As illustrated in figure 3.4, the highest compliance is observed for the institutional framework criterion, with the majority of cities meeting indicators such as providing contact information and clear information regarding the organizational structure. Similar to the LOSI 2020 findings, rates of compliance with content provision and technology indicators are also relatively high by virtue of the efforts made by municipalities to provide wide-ranging content relevant to local priorities such as health, environment, education and support for vulnerable groups and to extend access to portal functionality for all. Even for the services provision and participation and engagement criteria, where compliance is lower than for other criteria, concrete progress has been made since 2020. Cities are continuing to work on improving e-government performance and expanding service coverage, including through multi-channel service delivery. Many have developed targeted initiatives to strengthen interaction with the public, using social media and other means to increase e-participation.

Figure 3.4   Implementation of LOSI indicators in city e-government portals
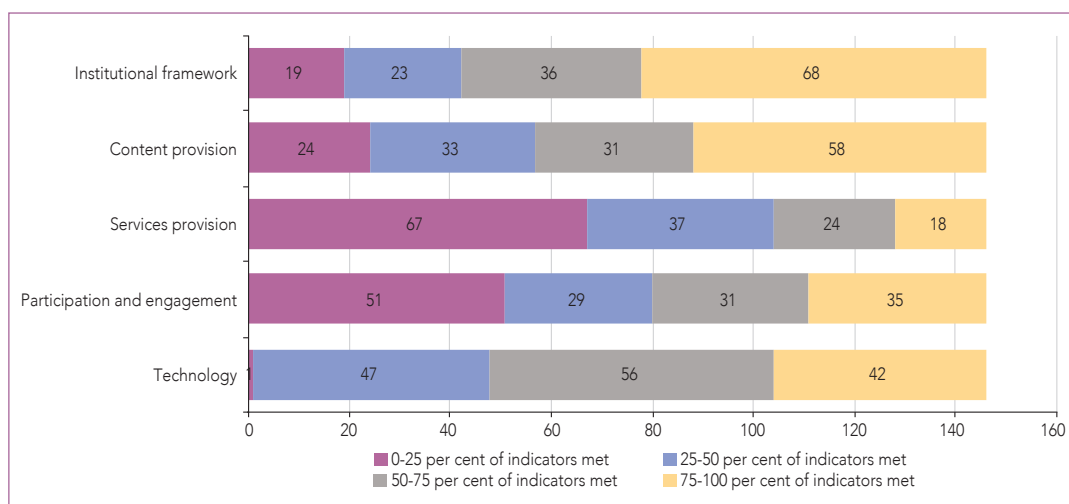
Highest ranked cities within each indicator category

The cities ranked highest for each indicator criterion are listed in table 3.3. In addition to highlighting the consistently high performance among the 10 cities with highest overall LOSI values for 2022 (see color coding), the table acknowledges the successes achieved by other cities assessed according to the five criteria.

Table 3.3   Leading cities assessed according to each LOSI 2022 criterion

Institutional framework		Content provision		Services provision		Participation and engagement		Technology	
City	Rank	City	Rank	City	Rank	City	Rank	City	Rank
Berlin	1	Berlin	1	Madrid	1	Berlin	1	Madrid	1
Madrid	1	Copenhagen	1	Copenhagen	1	Madrid	1	Tallinn	1
Tallinn	1	Dubai	1	Dubai	1	Paris	1	Tokyo	1
Copenhagen	1	New York	1	Berlin	4	Istanbul	1	Berlin	4
Dubai	1	Reykjavik	1	Moscow	4	Reykjavik	1	Dubai	4
Moscow	1	Tallinn	6	New York	4	Tallinn	6	Paris	4
New York	1	Moscow	6	Singapore	4	Helsinki	6	Shanghai	4
Paris	1	Istanbul	6	Shanghai	4	Kiev	6	Sao Paulo	4
Bogota	1	Tokyo	6	Tallinn	9	Copenhagen	9	Helsinki	4
Buenos Aires	1	Zurich	6	Santo Domingo	9	Singapore	9	Riga	4
Istanbul	1	Sao Paulo	6	Buenos Aires	11	Bogota	9	Stockholm	4
Zurich	1	Auckland	6	Vienna	11	Buenos Aires	9	Riyadh	4
Rome	1	Vilnius	6	Manama	11	Zurich	9	Monaco	4
Sao Paulo	1	Seoul	6	Almaty	11	Sao Paulo	9	Moscow	14
Vienna	1	Tel Aviv	6	Nairobi	11	Vienna	9	New York	14
Auckland	1	Toronto	6	Paris	16	Lisbon	9	Singapore	14
Reykjavik	1	Brussels	6	Bogota	16	Moscow	17	Istanbul	14
Helsinki	1	Madrid	18	Zurich	16	Tokyo	17	Rome	14
Stockholm	1	Paris	18			Rome	17	Lisbon	14
Montevideo	1	Singapore	18			Auckland	17	Amman	14
Seoul	1	Shanghai	18			Luxembourg City	17	Copenhagen	21
Tel Aviv	1	Bogota	18			Seoul	17	Bogota	21
Toronto	1	Rome	18			Toronto	17	Buenos Aires	21
Oslo	1	Vienna	18			Warsaw	17	Auckland	21
Sydney	1	Helsinki	18			London	17	Reykjavik	21
Zagreb	1	Kiev	18			Dublin	17	Manama	21
London	1	Luxembourg City	18			Tirana	17	Luxembourg City	21
Prague	1	Oslo	18			Panama City	17	Montevideo	21
Sofia	1	Zagreb	18					Guayaquil	21
Lima	1	Jakarta	18					Dublin	21
Johannesburg	1	London	18					Johannesburg	21

Institutional framework

As illustrated in figure 3.5, the most frequently satisfied institutional framework indicators are those that are relatively straightforward and easy to implement, such as providing clear information on the organizational structure of the municipality (85 per cent), providing name and contact information for the heads of departments (79 per cent), and providing links to other government agencies (77 per cent). Most of the municipal portals require authentication (such as a digital ID, login credentials or a mobile key) to access online services and restricted-access areas, demonstrating an awareness of cybersecurity.

Other institutional framework indicators are linked to the legal framework; this is an area in which a significant amount of time is generally needed to achieve real progress, so many cities will likely achieve higher LOSI values as relevant goals are met. Within this context, specific indicators focus on whether privacy policy statements and information on citizens' rights to access government information (including legislation guaranteeing freedom of information and access to information) are provided on the city portal; 53 and 50 per cent of the city portals assessed satisfy these respective indicators. Almost half (47 per cent) of the city portals have published their e-government or digital government strategy or the equivalent. Budapest, for example, ensures that users have information on the development and implementation of the one-stop-shop initiative, through which all local government e-services from almost all of the 3,178 local municipalities in Hungary are incorporated in the same platform. Finally, 41 per cent of the city portals publish their open government data policy online.

Figure 3.5   Implementation of institutional framework indicators in city portals (percentage of cities)
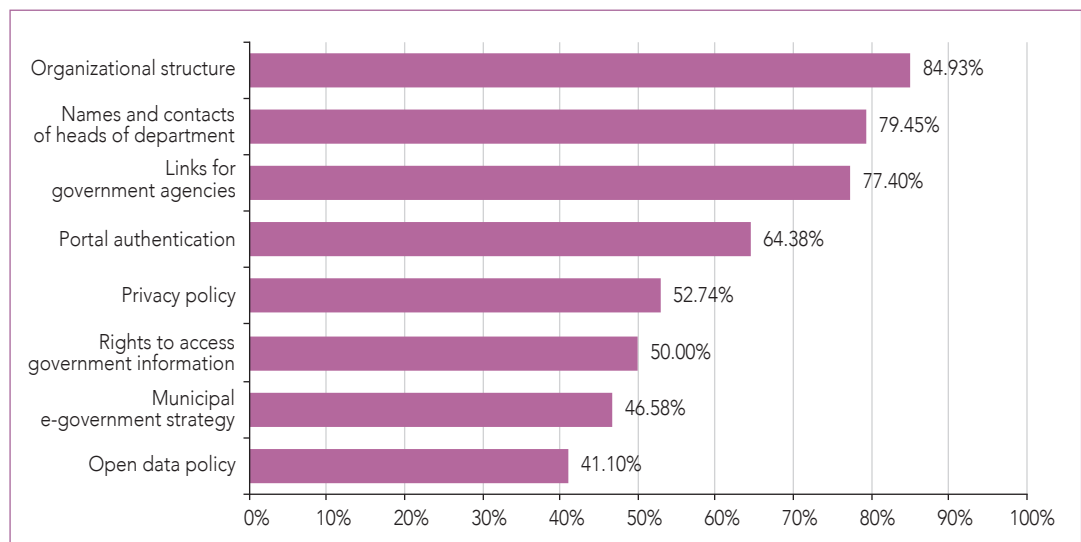
Content provision

Figure 3.6 highlights content provision indicators for specific sectors. Typically, the content that is of greatest relevance to residents at a particular point in time receives the most attention in city portals. For instance, the COVID-19 pandemic presently constitutes a public priority, so it is not surprising that health-related information is the most dominant feature in many city portals. The second most prevalent content relates to the environment. It is encouraging that nearly three quarters of the cities provide environment-related information focused on the potential contribution of cities to achieving the SDGs. Resident-oriented information linked to social welfare (71 per cent), education (68 per cent), employment (51 per cent) and justice (50 per cent) is also frequently found on city portals, showing that municipal strategies for online content provision are focused on the genuine needs of citizens.

Figure 3.6   Implementation of content provision indicators in city portals: sectoral information (percentage of cities)
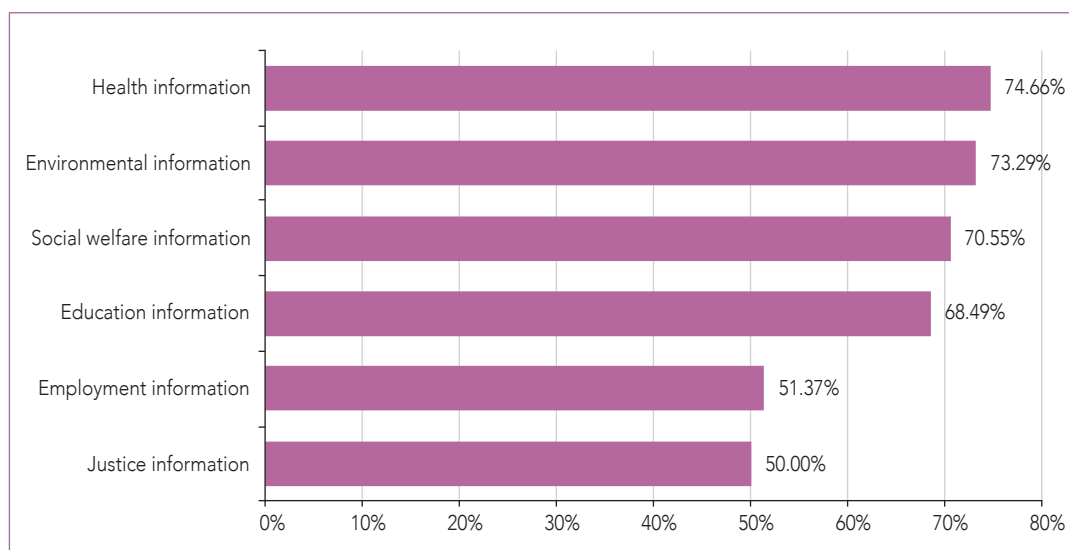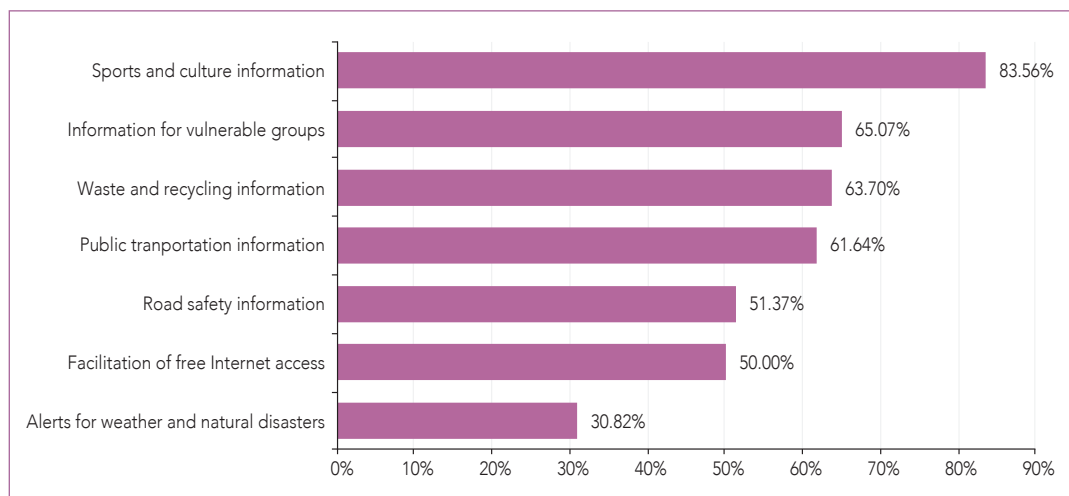

Figure 3.7 highlights the content provision indicators most closely related to day-to-day activities or everyday needs. With the higher population density in cities, interest and activity in the areas of employment, education, culture and entertainment are magnified. Cities offer spaces and opportunities for a wide range of social activities, so it is not surprising that sports and cultural information constitutes the content provided most frequently in the city portals surveyed. Some municipal authorities use their portals to promote and facilitate the implementation of public initiatives. In Iceland, for example, all parents who are legal residents of Reykjavík[10] receive a subsidy of 50,000 Icelandic króna for each child aged 6-18 to cover practice fees for sports and recreational activities. Cities are characterized by diversity, and it is important for municipal governments to address the needs of all members of the population; it is encouraging that 65 per cent of the cities surveyed provide information and access to services for vulnerable groups. City portals also have information on waste and recycling and on public transportation; the latter is particularly beneficial for visitors and third-party apps (such as Google Maps) that use transport information to provide services. As the digital divide is significant in many metropolitan areas, it is important that free Internet access be provided in public spaces. Among the cities surveyed in this edition, half share information about public Internet access points on their respective portals.

Figure 3.7   Implementation of content provision indicators in city portals: addressing everyday needs (percentage of cities)

Category	Percentage
Sports and culture information	83.56%
Information for vulnerable groups	65.07%
Waste and recycling information	63.70%
Public tranportation information	61.64%
Road safety information	51.37%
Facilitation of free Internet access	50.00%
Alerts for weather and natural disasters	30.82%

Public procurement—the purchase of goods, services or works by government authorities or public institutions or enterprises—is an important aspect of local government operations. Public officials are tasked with making choices that confer the greatest benefit to society and ensuring the optimal allocation of limited resources. Procurement portals help local governments achieve maximum return on investment while also ensuring transparency, efficiency and accountability. Almost three quarters (71 per cent) of the city portals assessed share upcoming procurement or bidding processes, but only 53 per cent share the results of these processes (see figure 3.8). In the United Arab Emirates, the Digital Marketplace / Abu Dhabi Government Procurement Gate - Al Maqta'a Portal has been set up to engage micro, small and medium-sized enterprises in transparent and efficient public procurement processes.[11] All organizations interested in doing business with Abu Dhabi government entities must complete the registration process—a centralized, one-time activity—through the Procurement Gate. Once potential suppliers are registered, their profiles are visible to buyers from all entities operating through the portal. In Port Louis, Mauritius, all procurement-related announcements and results are published and archived to ensure public transparency.

Figure 3.8   Procurement information on city portals (percentage of cities)

| Category	Percentage
Procurement announcements	70.55%
Procurement results	53.42%
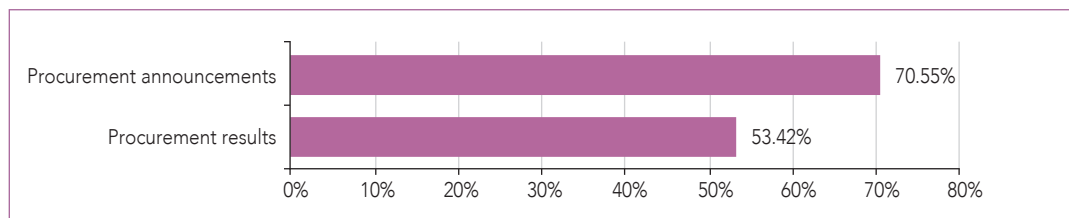
Services provision

The LOSI 2022 results indicate that services provision has the lowest level of compliance among the five criteria (see figure 3.4), echoing the trend observed in the 2020 findings. This suggests that city portals have not advanced much since the last survey or that most services are provided on the national portals, as is the case in Brazil. Although it is not necessary for city portals to replicate what is already incorporated in national portals, it is still worthwhile provide relevant links to national portals for the convenience of residents. Depending on the organizational structure and institutional framework for services provision at the national and subnational levels, local governments might have more or fewer responsibilities in terms of direct services administration through their own portals. The LOSI methodology accounted for this variability by specifying the scope of each indicator in the questionnaire, but the upshot here is that some services provision occurs at the national level, which is outside the bounds of the LOSI analysis.

Although complete comparability is impossible owing to the reorganization of some indicators in the most recent LOSI survey, parallels can be drawn between the questions that were analysed in this category across multiple editions. The proportion of cities providing an online payment system for municipal service fees and fines has increased from 47 to 58 per cent since 2020. Similar to the previous edition, 49 per cent of city portals include an online application system for government vacancies (see figure 3.9). Establishing e-procurement platforms for bidding processes and the submission of tenders has been one of the most consistent endeavours of municipal governments, with the share of city portals meeting this indicator rising from 35 to 48 per cent over the past two years.

Figure 3.9   Implementation of services provision indicators in city portals (percentage of cities)
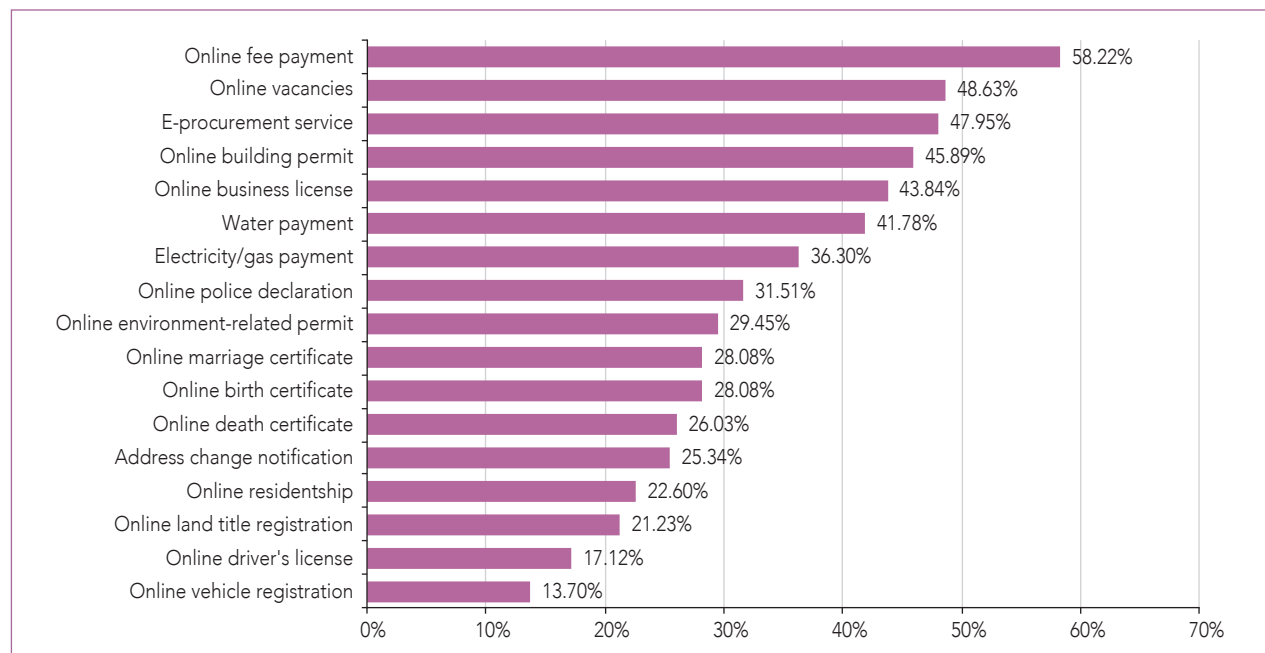
The provision of online building permits is now one of the most frequently met indicators, with compliance having jumped from 30 to 46 per cent between 2020 and 2022. The proportion of city portals providing online environment-related permits has also trended upward, rising from 23 to 29 per cent during this period. Those living in 42 per cent of the cities assessed can pay their water bills online, and 36 per cent of the city portals can be used by residents to pay their electricity and/or gas bills. The proportion of cities that allow their residents to make declarations to the police online has gone up from 27 to 32 per cent.

Just over a quarter of the cities surveyed provide online services linked to important life events; 28 per cent enable residents to obtain marriage and birth certificates through their local portals, while 26 per cent can supply death certificates. Around 25 per cent of the city portals allow residents to update their addresses, and 22 per cent are set up to process residence applications. Although some limited progress has been achieved since 2020, there are still relatively few local portals that allow residents to submit a driver's license application (17 per cent) or register a vehicle (14 per cent).

## Participation and engagement

As illustrated in figure 3.10, the most frequently met participation and engagement indicator relates to social networking. More than 86 per cent of the cities assessed have social media accounts and use them to interact with local residents and visitors. Cities that completed the most recent Local Government Questionnaire (LGQ) also affirm the importance of social media networks within the realm of public participation and engagement. In Addis Ababa, for instance, almost all major city administrative offices have Facebook and Twitter accounts that are regularly updated by municipal communication offices. Residents receive real-time information on meetings, consultations, public engagement opportunities and infrastructure development, along with other public announcements.

There are also e-participation initiatives that are implemented at the national level and adopted by local governments. In Saudi Arabia, a dedicated portal called Balady offers a wide array of e-participation functions (e-information, e-consultation and e-decision-making) and tools, and it is integrated with municipal services so that local feedback on e-services can be obtained and improvements made. The Malaysian Administrative Modernisation and Management Planning Unit, as the lead agency for public sector digitalization, provides support for all public sector entities—including local authorities—to facilitate the development and implementation of e-participation platforms and mechanisms. In Peru, the national Government provides support to more than 2,400 local government authorities through the cloud-based Plataforma Participa Perú and Facilita Perú; these two platforms offer municipalities a simple way to launch and manage citizen consultations. In Bangladesh, communication and collaboration are facilitated at the country, municipal and rural local government levels through e-participation tools available on the national portal. In Japan, local governments are using open dialogue platforms developed by the national Government and operated by private companies and some of these platforms use open source software.

Around 80 per cent of the city portals assessed for the most recent LOSI study allow local residents to file complaints or provide feedback online, and 53 per cent are set up for the reporting of occurrences in public spaces. The LOSI and LGQ analyses for 2022 reveal that an increasing number of local governments allow their residents to report incidents related to services provision through their websites or mobile applications.

Although 71 per cent of the city portals assessed provide information related to the municipal budget, only 35 per cent allow local residents to participate in the budgeting process. The proportion of city portals sharing information on public meetings of the municipal council increased from 43 to 53 per cent between 2020 and 2022, and the share of those announcing upcoming e-participation activities rose from 28 to 40 per cent during this period. Almost 38 per cent of the city portals assessed in the 2022 LOSI study support the online participation of residents in land-use planning

Figure 3.10   Implementation of participation and engagement indicators in city portals (percentage of cities)
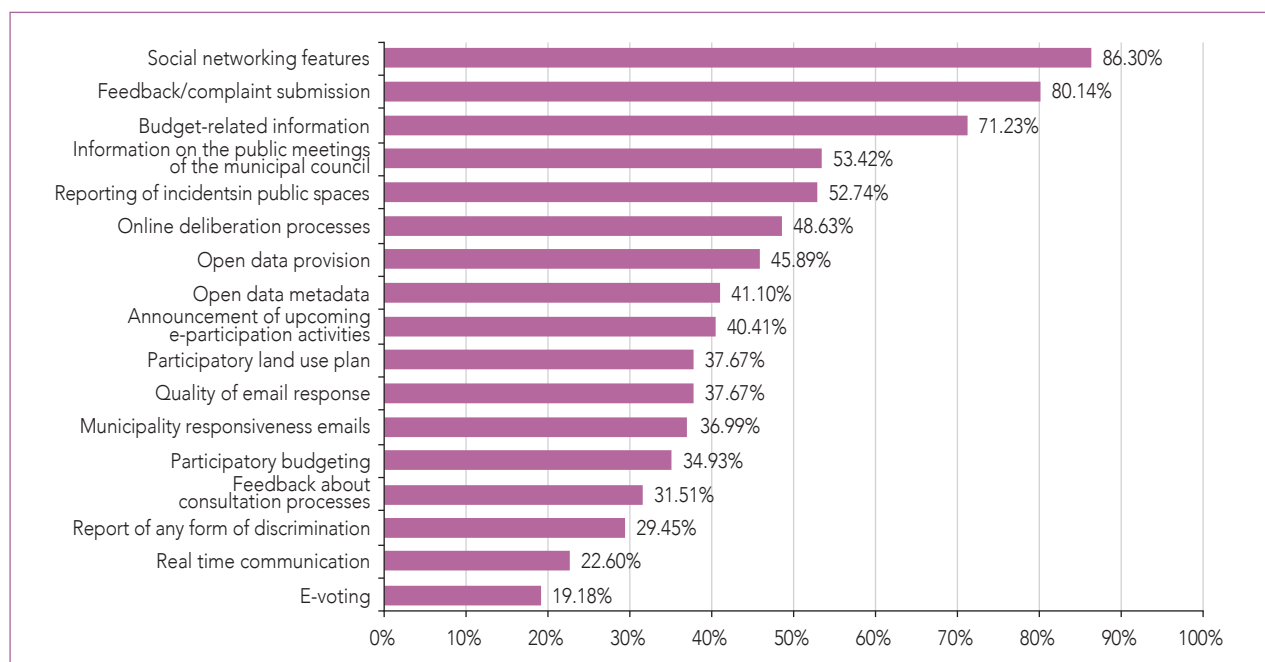
(territorial organization, land management, land conversions and revision processes). E-voting services still constitute the least successful indicator, with only 19 per cent of city portals meeting this criterion. LGQ responses within the participation and engagement subgroup highlight different initiatives designed to collect input from residents for policy deliberations. The Mayor of London has created a platform for public engagement in policy and programme development; most recently, residents have been given the opportunity to contribute to the development of COVID-19 recovery strategies for London.

Among the city portals studied, only 23 per cent offer live chat support functionality for users. Some cities make non-real-time communication options available, providing contact forms or email addresses on their portals; 38 per cent of the cities assessed for the 2022 LOSI study reported responding to email inquiries in a timely manner.

Open data provision is vital not only to allow local governments to strengthen transparency, accountability and value creation by making government data available to all, but also to enable residents to participate in decision-making processes. Tallinn is noteworthy in this regard; the city provides open data sets for residents, researchers and institutions and also involves these stakeholders in urban development planning processes. At this point, fewer than half (46 per cent) of the city portals assessed for the LOSI 2022 study provide open data, and 41 per cent provide the relevant metadata for these publicly available data sets. LGQ responses indicate that many cities working on establishing open data portals have multiple initiatives focusing on different sectors and topics.

Technology

As illustrated in figure 3.11, the most frequently met technology indicators are browser compatibility (99 per cent), the integration of contact functions in the portal (98 per cent), and the ease with which portals can be found by users (96 per cent). The proportion of city portals accessible on mobile devices has dropped slightly (from 97 to 92 per cent)—possibly because of the broader coverage in the 2022 edition—but this is still one of the most frequently met indicators. It is reported that 88

per cent of the city portals are compliant with markup validation or display standards and 84 per cent have an internal search function. Roughly four in five of the city portals are frequently updated to publicize events or to inform residents about services or e-government functions that have been added to the portal.

Among the portals assessed, 59 per cent provide a helpdesk call number to support residents who face difficulties in accessing services or completing tasks online or through other digital channels. A similar proportion of city portals (57 per cent) have a help feature or frequently asked questions section. Fewer municipal portals (45 per cent) offer guidance or tutorials for citizens to help them understand and use e-government services.

Most city portals still lack advanced search functions, with only 29 per cent satisfying this indicator. Compliance with Web Content Accessibility Guidelines (WCAG 2.0) is also relatively uncommon, with only 24 per cent of the city portals meeting the standards.

Figure 3.11   Implementation of technology indicators in city portals (percentage of cities)
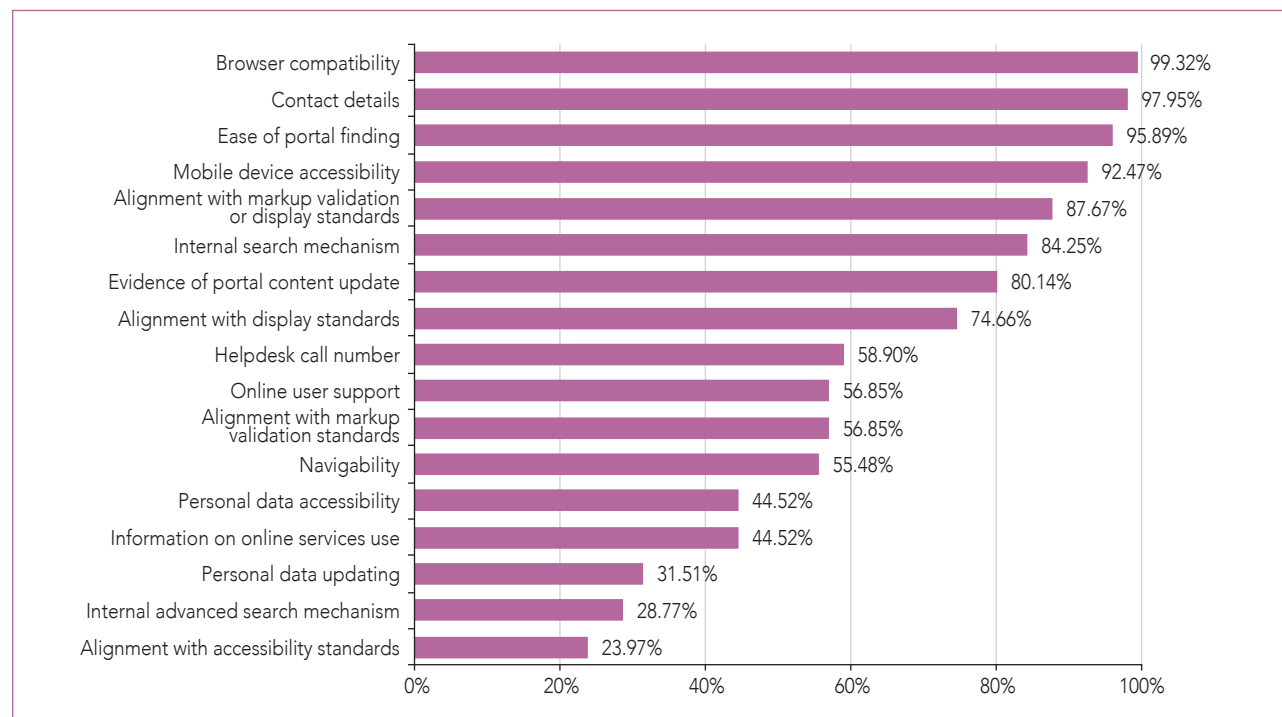
3.3   Local Government Questionnaire

The Local Government Questionnaire is a preparatory survey administered to support the LOSI process; the LGQ survey template may be found in the annex to the present publication. The Questionnaire was made available online in early 2021 and was also sent to municipalities. Only 42 cities—fewer than a third of those involved in the LOSI study—submitted responses, so the LGQ results do not represent the full picture for the LOSI-surveyed cities as a group. Any quantitative analysis mentioned in this section is based on the 42 submissions received. It is the expectation of UN DESA that more cities will participate in the LGQ over time, providing enriched input for future editions of the *E-Government Report*. The most recent LGQ incorporates eight sections: institutional framework, legal framework, strategy and implementation, usage of online services, user satisfaction, social media, COVID-19 measures, and smart city and new technologies for digital development in municipal governments.

3.3.1 Institutional framework

In the institutional framework section of the LGQ, cities were asked to provide links to major portals at the municipal level, including the official portal and any others that might be used for e-services, e-participation, open government data and procurement. The responses indicate that a significant number of the cities surveyed have dedicated portals for different services; about half use multiple official portals, while the other half prefer a one-stop-shop approach. Each strategy comes with pros and cons.

The LGQ asked whether the city has a chief information officer (CIO). Notably, 95 per cent of the respondents indicate that they have a municipal-level CIO who manages local e-government programmes and strategies. In most cases, the municipal CIO is linked to and works alongside the national CIO, which is important for local-national coordination. In some cases, municipal CIOs are linked to more than one ministry; in Indonesia, for example, they work with the Ministry of Administrative and Bureaucratic Reform for business processes and e-government services, with the Ministry of Communication and Information Technology for e-government infrastructure and applications, with the Ministry of National Development Planning for data and Information, and with the National Cyber and Crypto Agency for information security. In Bahrain, the CIO for the Capital Governorate (Manama) works closely with the national CIO in planning and implementing the national e-government strategy, which is closely aligned with the Government Action Plan (2019-2022) and the Bahrain Economic Vision 2030. In Quezon, Philippines, the city communicates with the Department of Information and Communications Technology regarding various programmes. In the United Arab Emirates, the Dubai Digital Authority (also referred to as Digital Dubai) was established in 2021 to develop strategies governing matters relating to information technology, data, digital transformation and cyber-security in coordination with the Smart Dubai Department, the Smart Dubai Government Establishment, the Dubai Data Establishment, the Dubai Electronic Security Center and the Dubai Statistics Center.

3.3.2 Legal framework

The legal framework section of the LGQ requested information on legislation relating to digital government and applied at the local level. The survey results indicate that laws affecting local e-government focus primarily on the following:

- *Electronic government*. Relevant laws may affirm the public's right to digital services or establish guidelines for implementation; in the latter case, legal requirements may have to be taken into account in the design and implementation of new digital services.

- *Free access to information*. Laws may relate to the disclosure of public information or access to information. Some regulations establish procedures for the classification of public information. There is also legislation governing the re-use of public administration documents.

- *The protection of personal data*. Most of the municipalities surveyed make reference to existing data protection legislation and the adaptation of national laws to local contexts. Some municipalities have set up dedicated offices or entities that oversee the implementation and application of national and local policies governing the processing of data for personal, commercial or official purposes. Seoul has been proactive in this regard, issuing an ordinance guaranteeing the safe management of personal information and protection of the rights of identifiable individuals pursuant to the Personal Information Protection Act. The city established the Personal Information Protection Commission, an administrative agency that independently conducts activities aimed at safeguarding personal information. Composed of 15 internal and external experts, the Commission is involved in developing polices and legislation relating to personal information protection.

- Public administration information systems. Relevant legislation might relate, for example, to base registries, access to websites and mobile applications for public sector bodies, electronic identification and electronic signatures, information security, and electronic documents. Although municipalities regulate the local digital government platform for all sectors, the national public administration services infrastructure is generally used, along with shared services such as base registries. Digital identity laws define the framework in which digital identity can be deployed. Laws on information security are implemented to ensure a more coordinated and effective response to data incidents across the Government.

Laws relating to digital government are generally adopted at the national level and applied by public entities at the local level. However, evidence of some relevant local legislation also exists. In Moscow, for example, an experimental legal regime for artificial intelligence (AI) projects was introduced in mid-2020. The legislation sets out the goals, objectives and main principles associated with the establishment of legal frameworks for the development and use of AI, focusing on new technologies and applications that are often not covered by existing regulations. The main objectives of this experiment are to stimulate the integration of AI technologies in the market and explore how they might be applied, to identify which sectors of the economy and social interaction would benefit most from the implementation of such technologies, and to provide solid regulations for anonymized data. After the experiment is concluded, decisions will be made on amendments to existing legislation.

3.3.3 Strategy and implementation

The strategy and implementation section of the LGQ naturally focuses on e-government strategy and implementation but also examines budget allocations and the establishment of partnerships with other cities, civil society and the private sector to achieve digital development goals. Most of the respondents (34 of 42, or 81 per cent) affirm that they have adopted an e-government strategy or the equivalent at the municipal level. Notably, 71 per cent of municipal e-government strategies are aligned with national development strategies, SDGs, and national strategies for digital development. SDG-oriented strategies include improving education, welfare, health care, transportation, mobility, safety, and the quality of life, as well as monitoring and improving the environmental situation. A relatively smaller number of municipal e-government strategies make specific reference to mobile government, a local digital ID, or co-creation mechanisms for residents.

When designed and implemented well and supported by a forward-looking development strategy, local e-government can simplify people's lives, provide multiple channels of contact and communication, and increase administrative efficiency. In Bogotá, the Smart Territory Plan 2020-2024 "seeks to have a direct impact on the lives of all the people … in the city-region, regardless of where they live or their sociodemographic features. The smart territory takes advantage of technology, data and innovation to generate capacities and talent, opportunities, empowerment and quality of life for men and women of Bogotá. This will be achieved with four initiatives: Education for the 4RI, Economy 4.0, Bogotá Open Government and the Digital Transformation Agendas."[12] Similarly, Prague has a municipal strategy for public ICT development designed to meet the digital service needs of the capital city until 2025.

Among the 42 LGQ respondents, 34 (81 per cent) have municipal digital development initiatives that focus on sustainability issues or achieving a green economy, and 38 (90 per cent) are involved in partnerships with other cities, civil society organizations and the private sector.

#### Budgetary support for digital transformation

A full 86 per cent (36) of the LGQ respondents have a budget for digital government projects, with more than half earmarking special funding for e-government transformation; seven cities have appropriated under 1 per cent of their municipal budget for digital development, eight have allocated 1 to 3 per cent, and six have allocated 3 to 8 per cent.

In 38 municipalities (90 per cent), the city budget is published on the local government portal to provide residents with access to public fiscal information. In some cases, links to archived budget documents are available. Generally, city budget documentation includes income projections and information on expenditure prioritization and the organization and allocation of resources.

Correspondence between per capita GDP and LOSI values

In the present edition of the *E-Government Survey*, the assessment of the relationship between per capita gross domestic product (GDP) and LOSI values focuses on cities within countries that are part of the Organization for Economic Cooperation and Development (OECD). In the 2020 *Survey*, the results seemed to point to a positive correlation between cities' LOSI levels and real GDP per capita; however, a review of LOSI 2022 values for OECD cities shows that for those with reasonable levels of wealth, there is not necessarily a direct correspondence between GDP and LOSI values. Figure 3.12 shows no real relationship between OECD city GDP levels and LOSI values. The lack of a correlation is illustrated through an insignificant regression (high P-value) with a low R²-value, indicating that a higher GDP offers relatively little value in explaining high LOSI values. All OECD cities have a relatively high GDP per capita, and their LOSI values and levels are high or very high (0.5-1.0). However, some OECD cities on the lower end of the GDP spectrum have LOSI values that exceed those recorded for cities at the upper end of the GDP scale. In the very high LOSI category, for example, are Bogota, with per capita GDP of $21,318 and a 2022 LOSI value of 0.8721, and Riga, with GDP of $39,704 and a LOSI value of 0.8256. Conversely, some cities with a very high GDP, such as Dublin ($94,997) and Amsterdam ($71,490), are only in the high category, with respective LOSI values of 0.686 and 0.697.

Figure 3.12   Lacking/absent correlation between 2022 LOSI values and OECD cities' GDP per capita
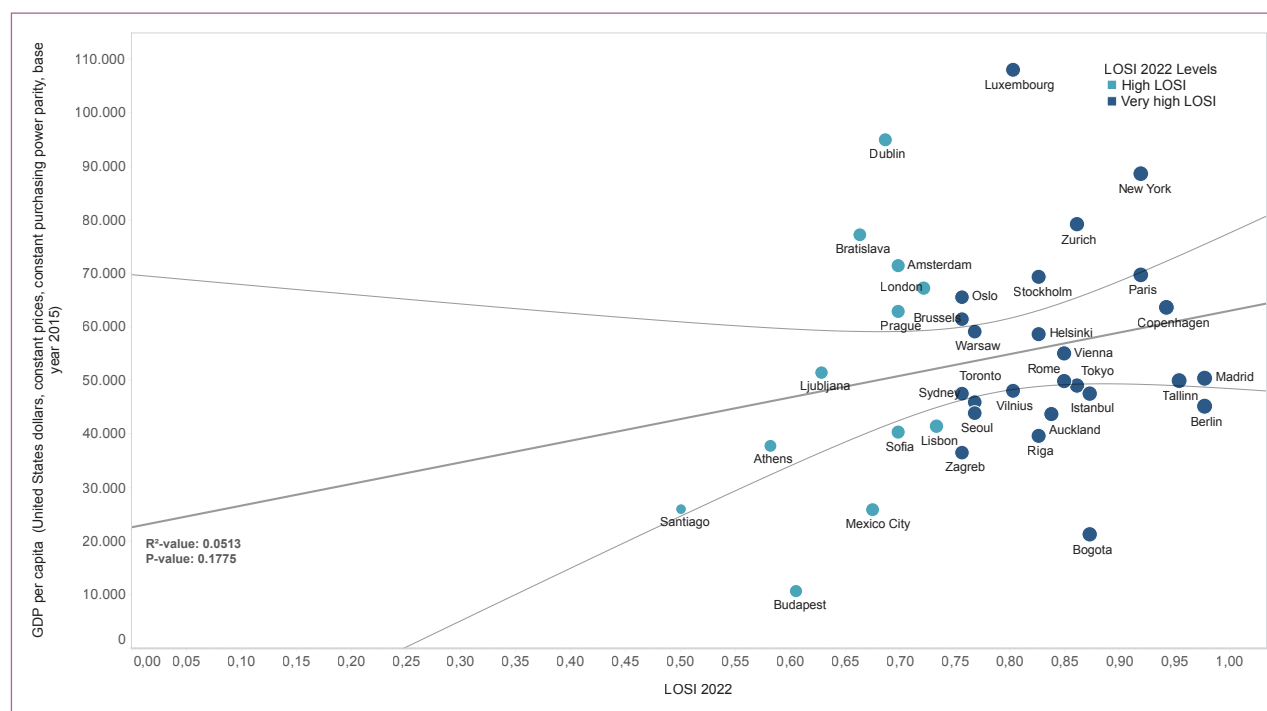
Sustainability issues and the pursuit of a green economy

A number of the cities that responded to the LGQ have launched digital initiatives; some of the primary objectives and specific areas of focus are as follows:

- Promoting the use of safer and cleaner energy for sustainable development (low greenhouse emissions and climate-resilient pathways, electronic emissions testing, power management, optimization of water and energy consumption in municipal buildings, meteorological data provision, air pollution measurement information, residential energy-saving programme);

- Supporting sustainable waste management (smart waste collection);

- Improving urban planning (eco-design of public buildings, green and revitalized cities, new land use modelling, green corridor grid development, and the adoption of Internet of Things (IoT) systems and other emerging technologies for urban farming, smart central markets for fruits and vegetables, digital twin city modelling, bicycle paths);

- Supporting sustainable urban transport (IoT-based traffic management, online traffic control system for public and special transport, e-ticketing system, interactive map allowing real-time public transport tracking, electrical car and motor vehicle plant, adaptive traffic light control system);

- Managing urban safety, security and crises (safety and security, crime control, crisis management, city resilience)

- Addressing educational needs (digitally enhanced education, facilitating educational continuity outside the classroom, strengthening the relationship between parents, children and teachers, supporting distance learning);

- Supporting vulnerable groups (digital tools to improve the quality of life and care for the elderly, digital resources to promote gender equality);

- Initiating and supporting innovation (implementation of innovation centre, online charity services);

- Promoting public engagement (platform for electronic voting on urban development issues).

3.3.4   Usage of online services

This section of the LGQ focuses on the proportion of local e-government services offered online and through dedicated mobile channels and on the collection and publication on usage statistics. Among the cites that responded to the Questionnaire, five reported that they provide 25 to 50 per cent of their services online, seven cities provide 51 to 80 per cent, and eleven cities provide 81 to 100 per cent. A total of five cities provide 15 to 50 per cent of their services through mobile channels, two provide 51 to 80 per cent, and four provide 81 to 100 per cent. The numbers suggest that there is room for growth in mobile services delivery; relatively few of the LGQ respondents are currently providing mobile access to public services, and where such access is available, fewer services are provided. Most municipalities do not offer comparative statistics on the percentage of services provided online or through mobile channels versus the share of services provided through traditional means. It may be assumed that since this information is not included in the LGQ responses, it is not readily available, so cities may need to compile lists of the services they provide and to identify the various channels that can be used to access the sources and keep residents informed.

In Abu Dhabi, the unified TAMM online platform is used for 770 (or 99 per cent) of the 778 digital government services offered within the emirate. The TAMM initiative is designed to ensure that services are easily accessible through a single portal and strategically placed service centres; there are even mobile, drive-through and door-to-door services set up for senior citizens, rural residents, and other vulnerable and underserved populations. The TAMM system is highly efficient; for 519 (93 per

cent) of the government services, transactions can be completed in less than six minutes. In Vienna, around 250 of the 600 services offered by the municipal government can be accessed online through the mein.wien portal, which is designed to offer city residents maximum convenience and speed in their dealings with the authorities. This portal facilitates user interaction; a virtual agent, WienBot, is even available any time of the day or night to answer frequently asked questions.

Beyond moving more services online, governments endeavor to ensure that online services are people-centric, accessible, and user-friendly. The Beijing Municipal Government[13] has made remarkable achievements in this regard: it launched a series of smart and personalized services on its Online Governmental Service Platform, including the Guided Instruction (comprehensive operational manual), 24*7 Real-time Guiding Service, and the Customized User Space built on big data and user portrait, etc. The Guided Instruction provides a clear and concise "operation manual". To ensure that enterprises and people can understand policies and online services, specific guidance is context-interactive in the form of "ask and answer interchangeably". The Real-time Guiding Service creates a people-centric ("warm and kind") "online multi-service window". To ensure that enterprises and people can get clear answers and to avoid any confusion, the Platform provides a real-time support service, supported by an online team of proficient staff. The Unified User Space functions as a personalized, precise and intelligent "virtual assistant". To ensure that enterprises and people can find and access various policies and services, the Platform puts "unified user space" as a central carrier, deploying big data, block chain and other technologies to analyze user needs.

Around 75 per cent of the LGQ respondents report that they collect usage statistics for e-government services, with two thirds of this group sharing relevant results with the public and institutional stakeholders. In Da Nang, a city of 1.1 million residents in Viet Nam, government officials report that more than 180,000 digital personal accounts have been set up on the city's public portal. Zurich affirms that around a quarter of its population is registered on the Mein Konto (My Account) portal.

3.3.5   User satisfaction

Participating municipalities were asked whether they measure the satisfaction of those using e-government services and whether relevant survey results are published online and shared with public institutions.

Some cities administer satisfaction surveys to gather suggestions, feedback and recommendations that can help them improve the quality, accessibility and timeliness of their services and inform future policies and activities. There may be separate sections to allow users to report on specific aspects of their experience and express their level of satisfaction. Some municipal authorities elaborate the findings statistically, using web analytics to measure results relating to, for example, visitors, sessions, page views and time spent. Among the 15 cities that conducted surveys on users' most recent experience with online services provision, five reported satisfaction rates of 65 to 80 per cent, four cities reported rates ranging between 81 and 90 per cent, and six cities claimed that 91 to 100 per cent of the users surveyed were satisfied with their last online public service experience.

Municipalities may publish satisfaction survey results as open data, on social networks, on official government websites, or through traditional media. Some municipalities do not publish the data openly, but they may share the survey results with service providers and developers or with interested government authorities. More than half of the municipalities (55 per cent) confirm that they measure user satisfaction with the e-services they provide. Fewer municipalities (38 per cent) indicate that user satisfaction reports are shared publicly on their portals and social media accounts and with public institutions.

In Bogotá, the district directorate charged with monitoring and improving the quality of public services conducts user satisfaction surveys at on-site points and on the Bogotá te escucha (Bogotá

listens to you) platform, which manages petitions, inquiries and complaints. The city of Asuncion in Paraguay has a website that allows users to share their experience and level of satisfaction with multiple aspects of public services provision. The Seoul Metropolitan Government conducts an annual survey on user satisfaction and releases the results to the public; according to the most recent survey, 23.1 per cent are extremely satisfied, 62.3 per cent are satisfied, 10.3 per cent are dissatisfied, and 2.0 per cent are extremely dissatisfied with online government services provision in the capital city.

3.3.6   Social media

The social media section of the LGQ gathers information on whether and how participating municipalities use social media channels to interact with residents and engage them in e-government activities. Among the cities responding to the Questionnaire, 90 per cent actively use social media platforms for such purposes; this is aligned with LOSI 2022 results indicating that 86 per cent of the cities assessed have a social media presence.

According to the LGQ responses, social media are frequently used to share news and updates relating to local e-government services—though COVID-19 information has been a dominant feature since the pandemic started. Municipalities indicate varying levels of local government activity on different social media networks. Social media accounts are used both to broadcast information and to gather feedback from users. Some cities request that users log in to access the official social media account, while others do not. Local governments frequently use social media to inform the public about meetings and consultations, live-stream press conferences, invite users to public engagements and infrastructure inaugurations, issue public announcements, and answer queries. Residents also use social media pages to express opinions, concerns, complaints and appreciation.

Dedicated social media accounts are often created for specific entities or purposes, including local government departments, projects, initiatives, emergencies or crises. Social media accounts that allow residents to interact with the mayor's office or other high-level authorities can streamline communication and have a meaningful impact. In Bangladesh, Shobar Dhaka (Everyone's Dhaka) is a one-stop digital citizen engagement management platform developed by the Office of the Mayor of the Dhaka North City Corporation. City residents can download this application on virtually any mobile device to communicate directly with the mayor's office or report irregularities within the local government administration, sending messages with images and location information within eight specialized categories. In Muscat, various social media channels are used to raise awareness, share news and information, respond to inquiries and feedback, field suggestions, acknowledge observations, collect data, and promote e-services transformation. Many local authorities have responded to the mobility restrictions surrounding the COVID-19 pandemic by activating social media channels (such as WhatsApp) that have allowed users to submit inquiries about e-services and receive timely responses.

3.3.7   COVID-19 measures

Experience with the COVID-19 pandemic has underlined how important it is for municipal authorities to have the infrastructure and tools in place to provide public support during periods of difficulty and disruption. The present health crisis has exposed the challenges cities face and their vulnerability to crisis situations. Results for the relevant section of the LGQ indicate that all but two of the city portals (95 per cent) have a page or section dedicated to the pandemic and provide relevant information on municipal initiatives for COVID-19 response and recovery. The content includes articles, infographics or a link to the national portal or to a national health agency page for the pandemic, information about COVID-19 testing locations and the availability of health facilities, COVID-19 vaccine information, recent or current statistics (including daily case data and distribution maps), information on policies adopted and measures undertaken to address the crisis (and relevant public recommendations), and information on social assistance for communities affected by the pandemic.

A total of 35 municipalities (83 per cent) indicate that they have implemented digital strategies and solutions for COVID-19 response and recovery and have allocated the necessary budgetary resources to support these initiatives. The following are among the digital solutions adopted and services provided:

- Testing and vaccination appointments;
- Telemedicine services for COVID-19, including a 24-hour call centre with qualified doctors to provide information and assistance;
- GPS-based mobile application to monitor the movement of residents (a system for analysing the movement of residents based on data from mobile operators; facilitating the calculation and monitoring of social isolation indices);
- Targeted social and economic support for residents (providing financial assistance as part of charitable works and social initiatives implemented collaboratively with organizations and institutions; declaring total temporary layoffs; applying for small company grants; approving partial exemption from employer contributions);
- System of e-passes allowing residents to move around the city during the lockdown using individual vehicles or public transport;
- Park walk services (specific time slots assigned for walks in nearby parks; interactive map for parks and public spaces that change colour based on the number of visitors);
- Voluntary check-in system in public places (residents provide phone numbers and receive notifications if any others present in the same place at the same time later test positive for COVID-19);
- QR code system confirming COVID-19 immunity;
- AI algorithm that analyses scans of patients' lungs and uses colour coding to identify areas of concern for medical professionals.

3.3.8   Smart city and new technologies

This section of the LGQ examines strategies and plans for initiatives driven by new technologies such as AI, IoT, blockchain, smart cities, 5G, virtual reality, augmented reality, robotics and 3D printing.

Most of the LGQ respondents (36 municipalities, or 86 per cent) affirm that they have specific strategies in place for the adoption of new technologies. Several municipalities report that designs for smart city initiatives are based on emerging technologies and that development efforts typically involve partnerships with the private sector. Municipalities also coordinate with non-municipal stakeholders to leverage academic research capacities in the development of AI or other emerging technology applications. New technologies are integrated in the following areas:

- Transport monitoring and control, largely based on IoT interconnectivity (license plate recognition; traffic control cameras; traffic light regulation for priority vehicles; air quality sensors; sound and noise-level sensors; sports park and parking lot monitoring and control; real-time information on traffic flows);
- Urban planning (urban observatory centre; real-time control of street lighting; early warning system for floods; operational big data relating to demographics, traffic, air quality, natural phenomena and other key areas collected and analysed via AI and machine learning to provide municipal managers with data-driven insights for decision making);
- Administration (blockchain-based digital identity and digital resident-centric e-services platform; digital land transport services; cloud services for AI development; open data initiatives; AI-driven voice recognition);

- Health care (AI-powered web application helping the health ministry combat the spread of COVID-19);
- Economy (blockchain-based platform for raising venture capital);
- Infrastructure (partnering with broadband companies for 5G commercial network and fiber network development; digital twin technology for operational simulations);
- Environment and weather (sensors measuring temperature, humidity, dust and pollution; green smart offices; IoT-driven solar-powered open areas such as beaches and parks; electric car charging system; IoT-driven collection, distribution and analysis of environmental data);
- Safety, security and crime control;
- Public services and community engagement (using WhatsApp and chatbot application programming interfaces to expand options for e-services provision; m-voting using blockchain; monitoring incident reporting by residents);
- Research and innovation (innovation laboratories).

The LGQ section on big data explores the integration of big data analytics in municipal decision-making processes. When asked whether they plan to use or are presently using big data analytics to guide decision-making, 33 municipalities (79 per cent) responded positively and provided examples. The following illustrates how various city governments use big data for specific purposes:

- Supporting informed decision-making in areas such as tourism, health, anti-corruption, and improving the quality of life for residents;
- Using data to create predictive models for strengthening security (for example, optimizing the placement of city cameras to fight crime);
- Flood management (tracking water levels);
- Vaccination policy prioritization;
- Urban planning and projections (utilizing data on population, households, socio-economic status and other factors to predict and address the needs of city residents);
- Personalizing service provision (assessing resident needs through data consolidation, identifying bottlenecks and operational barriers in providing resident services and improving resident satisfaction);
- Public transportation (identifying optimal bus routes, AI detector placement and video surveillance for traffic);
- Tax policy (using data analysis and AI to determine optimal tax rates for stimulating economic development).

In Kuala Lumpur, the Smart City Strategic Framework is structured around seven outcomes relating to the economy, living conditions, the environment, people, government, mobility, and the digital infrastructure. In Belgrade, the smart city concept encompasses six areas of development: traffic and mobility, public administration, housing, environment, economy, and social and human capital. In Rwanda, different smart city solutions are being piloted and implemented as part of the Smart City Masterplan and are supported by the ICT Sector Strategic Plan. In Monaco, big data analytics are currently being used to inform the smart city strategy; an urban hyper vision system contributes to the optimal monitoring and management of all major urban municipal functions, and an urban digital twin (a virtual 3D digital representation of the Principality) allows the municipality to collect and aggregate urban data that can then be used to make smarter decisions. In concrete terms, these data can be used, for example, to carry out simulations and produce forecasts of the impact of urban works on traffic and to take steps to minimize this impact. Almaty also reports increased reliance on big data analytics for municipal development; local authorities have used the information obtained to set up Sergek, a video surveillance system for traffic management and, working together with the International Finance Corporation (IFC) and Habidatum, have captured and analysed GPS data

for Almaty to upgrade the cycling infrastructure. It is worth mentioning that all data and analyses are published and available to the public in Almaty; the information provided can help businesses identify potential growth opportunities and be used in academia for scientific purposes.

3.4   Partnerships and application of LOSI methodology in countries

Technology and municipal e-government development in global forums

The integration of technology in city development and administration has received priority attention in many international forums. Particular attention has been given to locally driven needs assessments and development efforts that reflect an understanding of and direct experience with the dynamics in a particular area. Global forums offer a space in which successful local initiatives can be shared and where countries in the early stages of e-government development can gather information and receive assistance. The biennial World Urban Forum serves as a platform for the sharing of best practices and innovation; in documentation prepared for the eleventh session of the Forum (to be held in June 2022), it is noted that putting people at the centre of local digitalization efforts can stimulate the development of homegrown innovation systems that generate contextual solutions in urban areas. For the past three years, each G20 Presidency has promoted the integration of technology at the city level. In 2019, the G20 Presidency of Japan launched the Global Smart Cities Alliance to highlight the importance of open, interoperable, standards-based digital urban platforms. In 2020, Saudi Arabia further encouraged the advancement and wider adoption of smart cities and communities. In 2021, the Presidency of Italy produced the *G20 Report on Practices of Innovative Public Procurement for Smart Cities and Communities*, a shared tool that can be used by government authorities at all levels to inform the development and implementation of smart city initiatives. To facilitate progress towards the SDGs, in particular Goal 11, several forums have addressed sustainable urban planning and the pursuit of a more sustainable future, focusing on a number of different areas. The 2021-2022 International Mayors Forum, hosted by UN DESA and the United Nations Office for Sustainable Development together with the United Nations Centre for Regional Development (UNCRD), aimed at providing a knowledge-sharing platform to help cities initiate smart transformations towards more sustainable, resilient, safe and inclusive societies, with particular emphasis on addressing pandemic-related challenges. The second Forum for Mayors, held in April 2022, focused on exchanging urban development solutions around climate-neutral housing, green cities, and sustainable urban transport. The C40 World Mayors Summit in 2019 launched the Global Green New Deal, with mayors from nearly 100 major cities making new commitments to achieve 2030 targets for sustainable, healthy food systems and clean air. In *Our Common Agenda*, the Secretary-General states that the United Nations system will strengthen its collaboration with subnational authorities through the creation of an Advisory Group on Local and Regional Governments.

Other partnerships

The cities responding to the LGQ highlight other types of partnership arrangements. Some cities cooperate with sister cities through mechanisms such as twinning agreements or with partner cities based on contractual or informal arrangements. Some use interactive platforms that allow municipal authorities to build relationships with residents and bring them in as equal partners in discussions and decisions relating to local priorities or activities such as environmental and social assessments for urban planning, smart city concepts, and improving the quality of life. City authorities also collaborate with the private sector (including industries) and academia to share knowledge, promote innovation, and facilitate e-government and smart city development.

A number of cities are actively engaged in networking, forging connections that allow them to exchange ideas, strategies and resources with other cities and development partners. Some promote dialogue between their CIOs and representatives of cities that are leaders in digital government and smart city development. Many cities are members of national or international organizations

such as Eurocities, the Polis network, European Mozart Ways, the League of Historical Cities, the Organization of World Heritage Cities, the Council of Global City CIOs, Green Legacy, the ASEAN Smart Cities Network, Innovative Governance of Large Urban Systems, the Spanish Federation of Municipalities and Provinces, the Ibero-American Organization for Intermunicipal Cooperation, the C40 Cities Climate Leadership Group, Madrid Futuro, and the Cities Coalition for Digital Rights. Cities also collaborate with local and international entities (including governmental, non-governmental and non-profit agencies) in formulating and implementing municipal development initiatives. Such partners may offer expertise in a specialized area (such as migration) or share development priorities with a city or group of cities; some of those mentioned in the LGQ include Deutsche Gesellschaft für Internationale Zusammenarbeit, British Embassy Jakarta, and OCTA Research.

LOSI network

Owing to resource limitations, UN DESA was able to include only the most populous cities in the 193 Member States to participate in the 2022 LOSI survey and related activities. These cities were selected to cover as many residents as possible. However, there was strong interest in applying the LOSI methodology to assess e-government in more cities in individual countries, and UN DESA was able to sign memorandums of understanding and partner with various institutions to run LOSI pilots in multiple cities within selected countries. At the time of writing, pilot studies have been carried out in Brazil, Jordan and the State of Palestine; the findings are available at https://publicadministration. un.org/egovkb/en-us/About/LOSI-PILOTS.

Independent studies have been undertaken by academics in China and Ecuador using the LOSI methodology elaborated in previous editions of the *United Nations E-Government Survey*. It is expected that a growing number of cities will utilize the LOSI methodology, become part of the LOSI network, and help other cities that may be experiencing similar challenges in e-government development. UN DESA welcomes opportunities for collaboration in applying the LOSI methodology in different countries; interested parties are encouraged to contact the Division for Public Institutions and Digital Government at dpidg@un.org.

3.5 Conclusion

- In 2022, as in 2020, the LOSI findings indicate that city portals do not perform as well as their national counterparts. Continued monitoring and assessment of local and national e-government development is essential to close the gaps and to support public sector digitalization at all levels.

- The average LOSI value increased from 0.43 to 0.51 between 2020 and 2022. While the halfway point has been surpassed by the surveyed group as a whole in terms of meeting development indicators, there remains much room for growth.

- The more populous cities tend to have a higher overall LOSI value. This is an important finding given the increasing rate of urbanization worldwide. The correlation between population size and LOSI level may be linked to the greater access of the more populous cities to important resources such as a highly skilled workforce, a broad knowledge and skill base, and a large public budget.

- Among the five criteria assessed for the 2022 LOSI, the institutional framework subgroup reflects the highest level of compliance, with 47 per cent of the city portals meeting 75 to 100 per cent of the indicators listed. Content provision is ranked second, with 40 per cent of the portals assessed satisfying 75 to 100 per cent of the indicators.

- As was the case in 2020, the lowest rate of compliance is in services provision, with only 12 per cent of the city portals implementing 75 to 100 per cent of the indicators.

- Most city portals have a dedicated COVID-19 page or section serving as a hub for pandemic-related information, contributing to recovery efforts. Many cities have formulated specific strategies and implemented targeted digital technology solutions for COVID-19 response and recovery.

- New technologies are integrated in the e-government development strategies and activities of various cities. Many of the advanced technology applications are being used to support evidence-based decision-making.

- Local governments must consider the opinions of residents, taking into account the needs and preferences not only in services provision but also in decision-making processes.

- A properly formulated local e-government strategy can facilitate the consolidation of a sustainable local administration model with the SDGs as its fundamental pillars.

- It is essential to support the development of cities worldwide. Pilot initiatives have been carried out in a limited number of smaller cities, but much broader LOSI coverage would allow needs to be identified and targeted solutions developed in line with local priorities and budgets. The more populous cities often have more resources and can develop advanced portals and smart city applications, but smaller-scale solutions are needed for other cities. Collaboration between cities of similar size and with similar needs would be very beneficial. The LOSI network can support these efforts and others aimed at strengthening e-government at the level closest to the population it serves.

Endnotes

1   United Nations, Our Common Agenda: Report of the Secretary-General (Sales No. E.21.I.8), para. 119, available at https://www.un.org/en/content/common-agenda-report/assets/pdf/Common_Agenda_Report_English.pdf.

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