

---

WGIC POLICY REPORT: 2019-02

# Policy Imperatives For A Data Economy



© WGICOUNCIL 2019

All WGIC reports are subject to a standard disclaimers.

- (1) The views and opinions expressed here are purely perspectives of the World Geospatial Industry Council (WGIC). They do not state or reflect the views of the members, patrons or partners.
- (2) Reasonable efforts have been made in the preparation of this report. The information in this report is based on thorough analysis and understanding of the subject.
- (3) All content in this report are that of WGIC and is protected. Any other use, including reproduction, modification and distribution, transmission, republication, display or performance, of the content in this report without the written consent from WGIC is strictly prohibited.



**Ron Bisino**

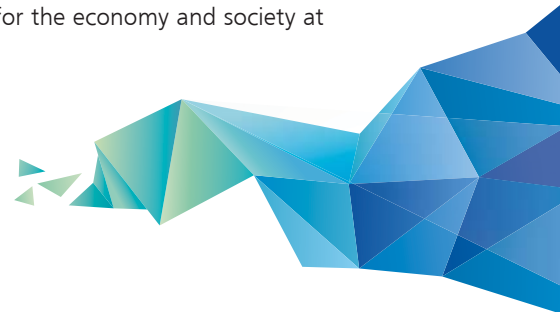
Senior Vice President, Trimble  
Chair, Policy Development and  
Advocacy Committee, WGIC

## MESSAGE FROM THE CHAIR

The digital age is all about data and its growing relevance in our society and economy. There is a tidal wave across much of the globe with regards to strategic value and the viability of a data economy. Geospatial data offers the foundation for broader data infrastructure adding the spatial and locational dimension, making it visually represented and easy to analyze and understand. The 4th industrial revolution, which is being driven by IOT, AI, and Big Data, geospatial and location data has found paramount importance across almost every walk of business, governance and security and is being considered a primary tool for implementation and monitoring of Sustainable Development Goals (SDGs). Thus, it is no surprise that the data economy, on the whole, is being challenged with inadequate existing policy mechanisms, and calling for social and political debates to develop new set of public policies, legislations, and ethical standards.

The influx of data-related policies over the past year, such as the EU's General Data Protection Regulation (GDPR) and the USA's Open Government Data Act, etc., are enacted to unlock the full potential of the data economy and bring about a participatory and balanced data-driven society. The existing fragmented policy environment is being revisited to develop integrated policy infrastructure that draws on a reasonable balance of privacy, data ownership rights, and innovative business models. Economies today are encompassing both micro-and macro imperatives in geospatial and associated policies to leverage its full benefits. Besides, the development of a collaborative approach, increasing investments in innovation and ICT infrastructure do constitute major components of data policies, enhancing its value for economy and society.

In the wake of data being the new oil; the geospatial industry has a crucial role to play. I am excited to share that WGIC has embarked on a collective journey to support data policy development and play its constructive role in shaping the data economy of tomorrow. It is not without challenges, but the journey ahead only gets better creating value for the economy and society at large.





**Barbara Ryan**  
Policy Advisor, WGIC

## EXECUTIVE SUMMARY

2018 was, in many ways, a remarkable year for geospatial policies globally, and the 2018-2019 issue of Geospatial Policy Outlook provides both context and content to support this claim.

While those of us in the geospatial community have long championed the role that geospatial data, and its associated tools and technologies can play in enhancing economic benefits, few of us would have estimated those benefits to be as high as McKenzie and Company reported of US \$3.2 trillion to \$5.4 trillion. In this data-driven economy, projections have data-driven applications creating an additional US \$13 trillion by 2030. These applications touch a wide range of economic sectors, including agriculture and food security, banking and finance, energy, health, infrastructure development, natural resources and transportation. In fact, it is difficult to think of a sector that is not enhanced by geospatial data.

The increasing value of data in the global economy is also accompanied by a response from many national and regional governments to formulate policies in an attempt to steer, and/or respond to, the impacts of this growth. This last year has been characterized by policy initiatives, strategy developments and increased investments in Information and Communication Technology (ICT) infrastructure across the globe. While much of this policy-related work is being done by governments, it is often linked to their industrial policy frameworks – a clear recognition of the importance of the commercial sector in this arena, including start-ups, Small and Medium-Sized Enterprises (SMEs) and the very large companies working across the globe.

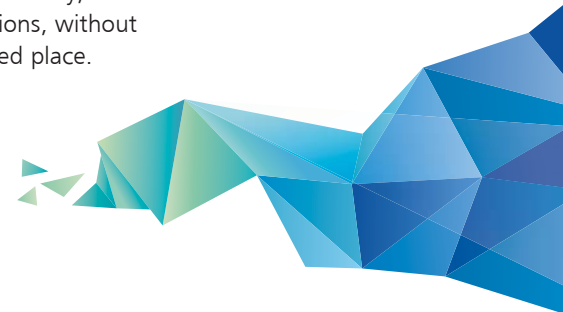
This last year has also been characterized by increased awareness and action, in two other related, and often conflicting, policy areas – Open Data, and Data Privacy and Protection. The first (open data) is based on the premise that data collected at taxpayer expense should be considered a public good, and therefore open to all. The second (data privacy and protection) is based on the premise that both governments and commercial entities, directly or indirectly, collect a lot of personal data that should be safeguarded, and therefore, not open. Examples of actions being taken at the Local, State, National and Regional levels, in both these policy domains, are contained herein.



To help assess one's journey through, what is deemed by many, to be a morass of policies, strategies, legislation, regulations and directives, a maturity model of geospatial policies has been put forth. This model ranges from geospatial governance policies and tools that are just being developed to a fully integrated geospatial strategy including technology adoption, innovation, community engagement, capacity development, resourcing and investment. A table is presented where this maturity model is applied for selected countries in four thematic areas – Geospatial, National Spatial Data Infrastructures (NSDIs), Remote Sensing, and Navigation. Also presented is a related table showing the relation between Policy Readiness Rank for the top ten ranked countries and Industrial Fabric Readiness Rank. While there are some exceptions, most (70%) of the countries are in the top ten with respect to both metrics.

After getting a glimpse of the Country-level rankings, the next part of the Policy Outlook scales up to the Regional level focusing on Africa, the Americas (North and South), Asia-Pacific and Europe. In addition to some descriptive material about where each Region may be along this policy spectrum, a table showing the major policy developments over the past year for each Region is presented.

Clearly, much of this report focuses on the substantial economic benefits that integrated geospatial policies generate. What should not be overlooked, however, is the significant impact that, governments, in collaboration with, and supported by, the commercial sector are having on global environmental and development agendas. Of particular note are the public private partnerships centered on the United Nations 2030 Agenda for Sustainable Development and their 17 Sustainable Development Goals (SDGs). If we have any chance of achieving these goals by 2030, it will only be done through the concerted efforts of both the public and private sectors. The World Geospatial Industry Council (WGIC), on behalf of the global geospatial industry, has exerted significant leadership in these international deliberations, without which the world would be a less-understood and less informed place.





03

## MESSAGES

Ron Bisio Chair  
Policy Development and Advocacy

04

## EXECUTIVE SUMMARY

by Barbara Ryan

07

## WORLD GEOSPATIAL INDUSTRY COUNCIL AND POLICY ADVOCACY

Objectives, WGIC's Scope for Policy Advocacy,  
WGIC's Activities for Policy Advocacy

13

## DATA ECONOMY

Defining the Data Economy,  
Data Economy Characteristics,  
Policy Imperatives

15

## COMMERCIALIZATION AND INDUSTRIALIZATION

Policy Imperatives

18

## POLICY MATURITY MODELS

20

## INDUSTRY GROWTH

Correlation between Policy Readiness & Industry Growth

20

## CONTEXT FOR GEOSPATIAL POLICY IN A COMMERCIAL CONTEXT

Global Trends  
Regional Trends  
Africa, Americas, Asia-Pacific, Europe

26

## COLLABORATIVE FRAMEWORK FOR POLICY DEVELOPMENT

Dental camps, satellite  
clinics, social outreach initiatives by MAIDS

27

## CONCLUSION

# Contents





## WORLD GEOSPATIAL INDUSTRY COUNCIL AND POLICY ADVOCACY

The World Geospatial Industry Council (WGIC), is a collaborative platform of the entire ecosystem of the geospatial industry with an aim to enhance the role of the geospatial industry and facilitating exchange of knowledge within the geospatial industry.

Formally launched at the UNGGIM 8th Session on the 1st August 2018, the association aims to demonstrate the larger value of geographic information to the world economy and society.

### OBJECTIVES

- Enhance the role of the geospatial industry and strengthen its contribution to the global economy and society;
- Facilitate exchange of knowledge within the geospatial industry and co-creation of larger business opportunities for the geospatial industry; and
- Represent business interests, share perspectives of the geospatial industry and undertake policy advocacy and dialogue with public authorities, multilateral agencies and other relevant bodies.

#### MISSION:

To be a catalyst for intra and inter industry knowledge exchange and co-creation of larger business opportunities for the geospatial industry enhancing its value impact through policy advocacy, business development and collaborative programs.

#### VISION:

To be a collaborative platform to advance role of geospatial industry and strengthen its contribution in world economy and society.

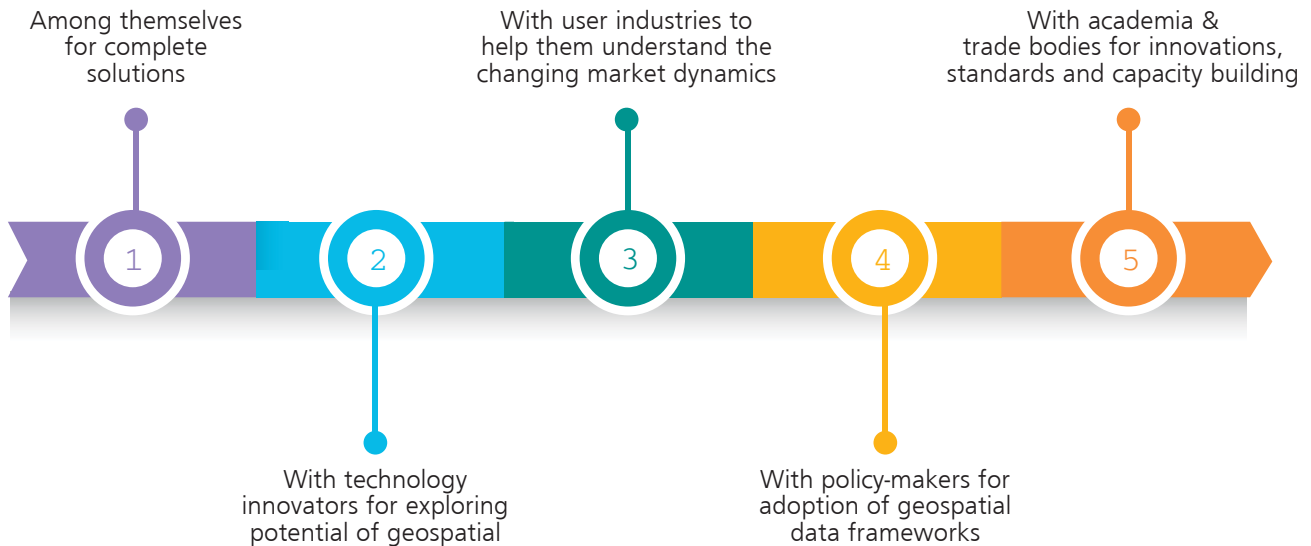




WGIC has further entered into discussions with multiple multi-lateral organizations, government bodies, and associations to enable discussions on policies and their implications on the growth of the geospatial industry. These institutions are:

- |  |   |
|--|---|
| <b>THE WORLD BANK</b>                                    | <b>WORLD ECONOMIC FORUM (WEF)</b>                   |
| <b>UNITED NATIONS</b>                                    | <b>WORLD ENERGY COUNCIL (WEC)</b>                   |
| <b>EUROPEAN COMMISSION</b>                               | <b>WORLD FARMERS' ORGANIZATION (WFO)</b>            |
| <b>US NATIONAL GEOSPATIAL ADVISORY COMMITTEE</b>         | <b>WORLD FEDERATION OF ENGINEERING ORGANIZATION</b> |
| <b>INTERNATIONAL PUBLIC TRANSPORT ASSOCIATION (UITP)</b> | <b>WORLD MINING CONGRESS (WMC)</b>                  |
| <b>INTERNATIONAL TELECOMMUNICATION UNION (ITU)</b>       | <b>WORLD TRADE ORGANIZATION (WTO)</b>               |
| <b>SMART CITIES COUNCIL</b>                              | <b>WORLD WATER COUNCIL</b>                          |
| <b>UNITED CITIES AND LOCAL GOVERNANCE</b>                | <b>WORLD WIDE WEB CONSORTIUM (W3C)</b>              |

**To harness comprehensive value of geospatial technologies, there is a need for geospatial industry to collaborate:**



## WGIC'S SCOPE FOR POLICY ADVOCACY



Developing working relationships with multi-lateral organizations, national governments, national industry associations, and user industry trade bodies



Developing white papers on geospatial policy frameworks and the interface with commercialization of the geospatial industry



Developing position papers on major policies that affect or influence the geospatial industry



Working towards developing the scope, mechanism and business models of relevant public private partnerships.



Organizing workshops and round tables to:

Sensitize its members about policy developments

Sharing knowledge and collaborating with industry members

Sharing and deliberating its positions and perspectives with policy makers

Creating opportunities for industry bodies to socialize and collaborate

## WGIC'S ACTIVITIES FOR POLICY ADVOCACY

- Publishing a monthly and quarterly newsletter. The Policy Watch -- on policy developments and changes across the world in geospatial and associated policies;
- Publishing an annual report; with yearly updates on WGIC activities and future steps;
- Signing an MoU with OGC to collaborate on promoting the power of geospatial and location-based technologies to governments, markets and industries worldwide;
- Signing an MoU with BuildingSMART to enhance the use of BIM standards in civil infrastructure; and
- Participating as Observer at the UNESCAP Ad Hoc ICC Plus Session for finalizing the draft Plan of Action and Declaration at the third Ministerial Conference on Space Applications for Sustainable Development in Asia and the Pacific in Bangkok, Thailand.



### A

#### Special Interest Group on Data Privacy formed

Formally created at the 3rd board meeting at San Francisco in January 2019. The key objective of the group is to develop industry opinion on data privacy and relevant legislations such as GDPR. Led by the Committee Chair on Policy Development and Advocacy, the special group will invite key executives from the government and the industry to deliberate upon the theme of data privacy policy.

### B

#### India to look into certification for surveyors and GIS professionals

The Indian Ministry of Skill Development has set up a special committee to look into formal certifications for surveyors and GIS professionals. The move was a direct outcome of the discussions and deliberations at the India Geospatial Leadership Summit held in Dehradun in December 2018. WGIC was a Strategic Partner of this event and also made appropriate presentations.

### C

#### WGIC Round-table titled Integrated Geospatial Policy Framework

Representatives from the entire geospatial value-chain met to discuss Integrated Geospatial Policy Frameworks in January during the GeoBuiz Summit in San Francisco. Government officials from the United Nations, the European Commission, Mexico and Singapore discussed their past, present and future actions to create integrated geospatial frameworks in their respective domains. Compliance with and impacts of the GDPR was also discussed.

## DATA ECONOMY



In today's data-driven economy, data is the most valuable economic asset, and data explosion is the new value-shift. The enormous value and potential of data across various economic sectors such as banking and finance, food security, energy efficiency, health, infrastructure development (smart cities), natural resources including oil and gas, and transportation, are crucial to benefit both the global economy and society at large. Foreseen to be an essential resource for stimulating economic growth, fostering research and innovation, accelerating societal benefits and increasing job creation, a report by McKinsey and Company estimates that data can help unlock US\$3.2 trillion to US\$5.4 trillion annually in economic value across a variety of economic domains. The report further solidifies the need for good governance to support the growth of, and dependence on, data. Development and implementation of efficient policies in this area and other associated areas will help prevent any misuse of data, and help define asset standards that will lead to the full realization of the potential economic value. ■

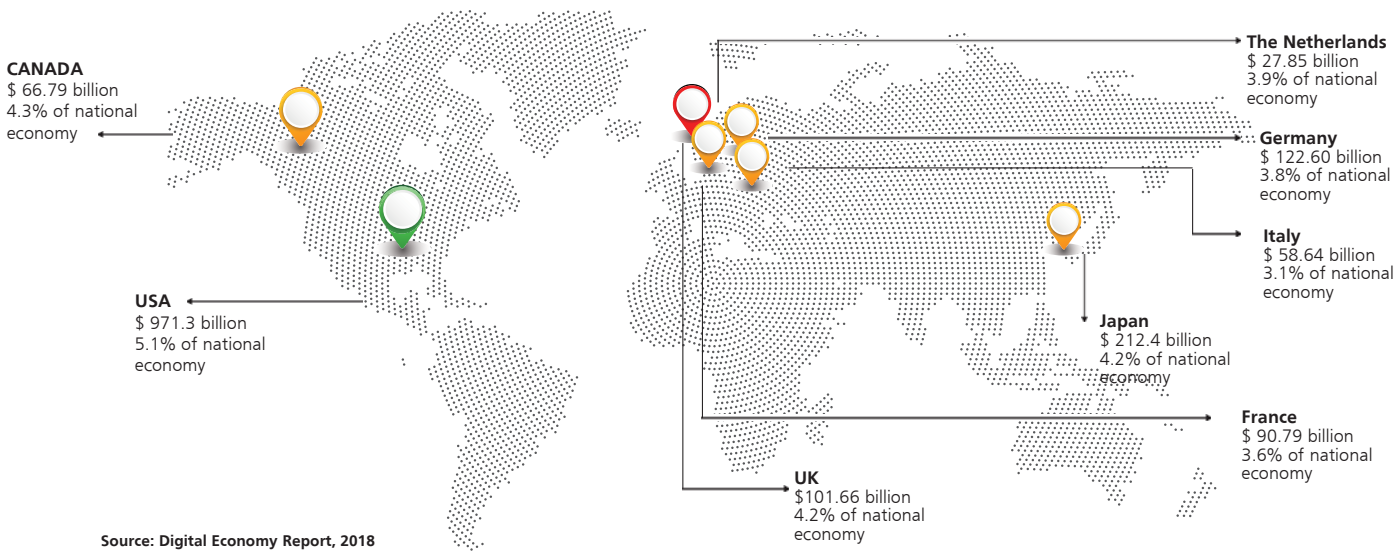


# DEFINING THE DATA ECONOMY

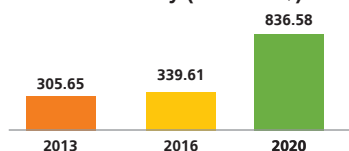
Comprised of both spatial, and non-spatial data, the data economy is understood to be the capability of organizations to leverage big data and analytics to derive strategic insights, improve operational efficiencies, develop innovative business models and drive revenue growth. The very concept that 'information creates economic value' relies on harnessing data for informed decision-making and creating new products and services for higher returns across all value-chains. Moreover, data-analytics is soon expected to be indispensable to the decision-making process for any economic activity as market authorities and decision makers grasp the shifting realities.

In today's digital world, data-fueled applications are expected to create an additional value of approximately US \$13 trillion in new global economic activity by 2030. The International Data Corporation (IDC) in 2014 predicted that by 2020 – approximately 44 zettabytes of data would be created – almost ten times as much as created in 2013. A report on data economy for G7 countries, highlights that data adds more than US\$1.7 trillion to the seven wealthiest economies of the world, with to the highest being in the United States (US\$1.1 trillion). The European Commission, as reported in a study on the European Union Data Economy, shows the economic value of EU data to have risen from € 247 billion in 2013 to € 300 billion in 2016 which is further expected to increase to € 739 billion. In 2016, the share of the data economy in the EU was approximately 2% of the EU GDP which is estimated to grow to 4% of the total EU GDP in 2020.

## Data Economy GVA (in 2016 prices - US \$ Billion and as % of National Economy)



### EU Data Economy (In bn US \$)



### Enabling Technologies of Data Economy



## DATA ECONOMY CHARACTERISTICS

Data is being generated from multiple sources, all over the globe, at many different speeds, and in many different formats. In all of this, open data, and open data sources, augment the value created in the data-driven digital economy. Key characteristics of the data economy are:

- An explosion in collection and dissemination of granular level spatial, non-spatial and personal data;
- An increased use of value-based situational, contextual, historical, temporal, and spatial context data, metadata and derived data;
- Increased data sharing at organizational, enterprise and government levels to derive data-based insights to create high returns and contribute to economic growth;
- A reformulation of existing economic models, and policy frameworks governing data; and
- An accelerated use of Artificial Intelligence, Machine Learning and Big Data Analytics to industrialize learning. ■

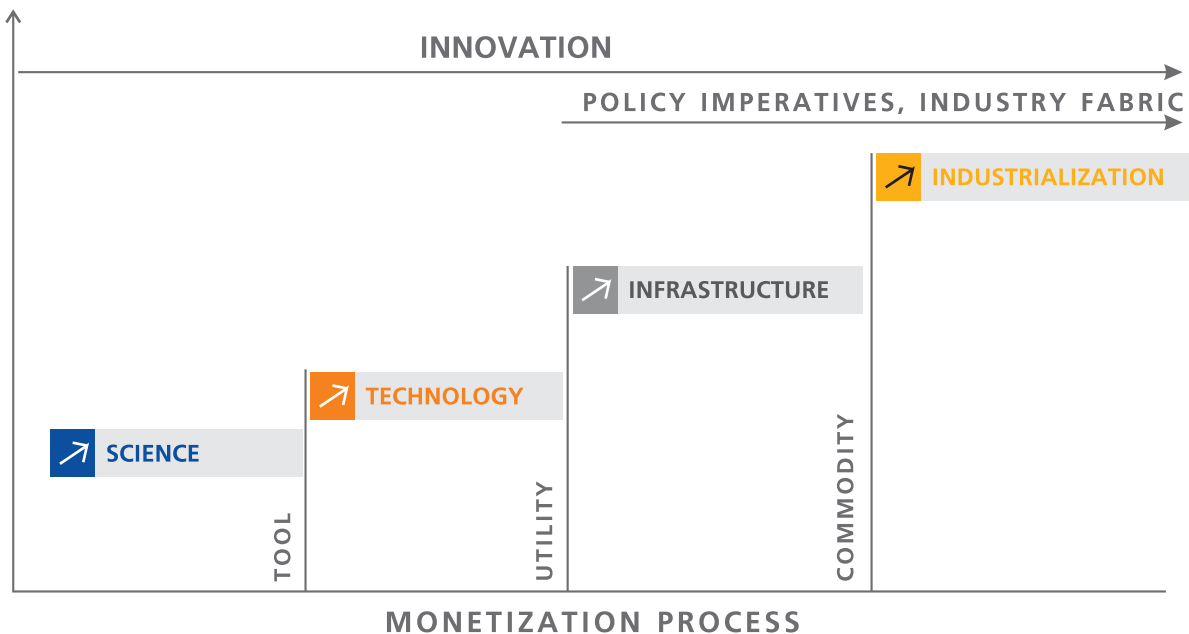
## DATA ECONOMY POLICY IMPERATIVES

The rising value of data in the global economy is characterized by a strong push by national governments to the digital economy, innovation, data infrastructure capabilities, policy initiatives and overall higher investments in ICT infrastructure. While all these aspects are critical to the development of the data-driven economy; the influx of data-related policies over the past one year has begun to have tremendous implications on how data is to be used and deployed for economic purposes. To unlock the full potential of the data economy, and pursue a balanced and participative data-driven society, several policy measures such as the **EU's General Data Protection Regulation (GDPR), Open Data Policies, Open European Location Services Data Policy, USA's Open Government Data Act, Kenya's Data Privacy Bill, and Sri Lanka's National Data Sharing Policy** have been developed and are being enacted.

The policy frameworks associated with data economy help ensure that

for the data-driven economy to thrive, it is necessary to replace the current fragmented policy environment with a foundational policy infrastructure that draws on a reasonable balance of privacy, data ownership rights, and data innovation. Europe's evolving regulatory environment around data privacy, open data, and a Digital Single Market – is enabling the rest of the world to adopt a more dynamic, and progressive approach to the creation of policies to better support the data economy. For economies to leverage the benefit that can be derived from the data economy, enabling-policies have to be defined which encompass both micro - and macro-economic imperatives. Additionally, to significantly benefit from the new economy, it is essential for each country to adopt best-policy practices, develop a public-private collaborative approach, and focus investments in innovation, research and development, and ICT infrastructure. The formulated policies need to offer comprehensive solutions to complex data-economy related problems and address challenges of data privacy and data ownership, and help businesses identify and facilitate novel commercial opportunities. ■

# COMMERCIALIZATION AND INDUSTRIALIZATION



SOURCE: GEOSPATIAL MEDIA

The digital era has introduced a revolution in the technology ecosystem enabling geospatial technologies to be increasingly embedded in multiple aspects of governance, user adoption, and commercial application. Today, the use of geospatial technologies is ubiquitous owing to factors such as the democratization of maps, miniaturization of sensors, the proliferation of mobile-based geospatial sensors, advances in computing capacities, among many others. Going forward, the shift from

data to analysis-ready data, and value-based services (applications) will have a substantial impact on the socio-economic sectors of a country.

The foundation of all things, geospatial lies in the science of geography, which has led to the development of spatial technologies (value-added applications and services), further enabled by an established infrastructure. Furthermore, the evolution of geospatial workflows and their ability to create solutions for government and business enterprises

has led to industrialization in the sector. The expanding geospatial technology user base has resulted in the creation of tremendous opportunities in the domains of agriculture, construction and engineering, data analytics, disaster management, mining and telecommunications. Additionally, in the process of industrialization of the sector, monetization is critical to enhance the value of geospatial information, technology, products and services for the long run. ■

## INDUSTRIAL POLICY

Geospatial industrialization is essential for socio-economic development for a country's progress, which has to be duly supported by enabling policy frameworks. Over the past decade, numerous countries have undertaken initiatives to establish Industrial Policy, outlining general policies for industries. In the past year, countries have brought geospatial under the aegis of their industrial policy and strategy. For instance, the UK's modern industrial strategy is focused on location and spatial data revolution, and the combination of geospatial technologies with enabling technologies. The strategy stresses on building the location data economy, and in order to take its vision forward, the UK government has established the UK Geospatial Commission. The Commission aims to promote the use of geospatial data while at the same time establish a conducive environment for small businesses.

## DATA PRIVACY AND PROTECTION LAW/POLICY

To enhance innovation, commercialization and industrialization in the geospatial domain, countries have begun to give due attention to the development and implementation of data privacy laws and guidelines. Since data privacy has become largely entangled with geospatial technology, governments have

established standards and rules, to help safeguard the collection and sharing of data while simultaneously ensuring codes of ethical behavior. Additionally, data privacy policies enable the integration of appropriate location data into a holistic reference system to improve decision-making by governments.

Studies show that the data privacy and protection market is large, and is expected to grow from US\$57.22 billion in 2017 to US\$119.95 billion by 2022. Associated with the growth in the data privacy market comes high legal and economic costs. While these costs may be negligible for large organizations, that may not be the case for smaller companies. In long run, stringent data privacy laws could also hinder the growth of small and medium enterprises, and the influx of multiple sensors will complicate the task of defining what is, and what is not personal data. The EU's GDPR, the UK's Data Protection Act 2018, California's Consumer Privacy Act, Kenya's Data Protection Bill 2018, and India's Data Protection Bill are a few examples of the sustained efforts of regional and/or national governments to ensure ethical industrialization in the sector. Additionally, with the understanding that location is an important aspect from the purview of governance and cannot be entwined with data laws, the EU established the Open European Location Services (ELS) project. The focus of the project is on improving the quality, availability and interoperability of geospatial and

**Since data privacy has become largely entangled with geospatial technology, governments have established standards and rules, to help safeguard the collection and sharing of data while simultaneously ensuring codes of ethical behavior.**

location data among different, cross-border authorities, facilitating access to, and encouraging the uptake of, location information.

## GEOSPATIAL POLICIES

Lately, selected national governments have created enormous opportunities for the geospatial industry. To optimally leverage the benefits of geospatial technologies, an enabling geospatial policy and strategy will act as a catalyst



in embedding these technologies in government workflow processes and decision support systems. The need for an integrated and holistic geospatial policy framework is critical to support economic growth and productivity. In 2018-2019, the USA and the UK have made tremendous advancements in formulating national geospatial strategies namely, the Geospatial Data Act of 2018 for the USA (part of the FAA Reauthorization Act of 2018) and the National Geospatial Strategy for the UK. Geospatial policies like these are crucial for industrialization as they provide context for a collaborative approach that drives growth in the geospatial industry in these countries. It should also be noted that core geospatial policies are not limited to national geospatial policies; but also, to space policies. In the past year, Vietnam's National Remote Sensing Development Strategy for 2030 and the UK's establishment of its own space program and LaunchUK portal with the focus of industrializing the space sector for manufacturing launch vehicle capabilities, and space-based value-based applications and services, among other things. Additionally, 2018 saw a number of countries initiating

policies and procedures to augment their drone sector. This has now resulted in drones not only serving as platforms for geospatial technologies like scanning, surveying and mapping, but also for positioning and navigation – all of which has contributed to the increasing market share of drones. Therefore, to truly expand the industry, initiatives like those mentioned above have begun at the governance level, which required governments to initiate innovative policy-making and develop regulations that lead to effective growth in the sector. ■

## POLICY: MATURITY MODELS

The geospatial industry has grown from being a segment of scientific innovation to spearheading technological development, to an industry that has evolved into multiple aspects of commerce and governance. This growth requires a perpetual flow from innovation to application. National investment and governance tools are an important aspect of the infrastructure that creates a conducive environment for the consistent growth of this industry. Understanding the governance of a country is key to understanding the capacity for growth in the industry in this region. For understanding the development of the geospatial industry in the geospatial economy, the core geospatial policies and its associated policies need to be outlined and assessed. For the purposes of this discussion, core geospatial policies include geospatial data acts, space related policies, inclusive but not limited to remote sensing and navigation policies, and UAV/ drone policies. To objectively assess the policy maturity of a country, the following four-level maturity pyramid has been developed:

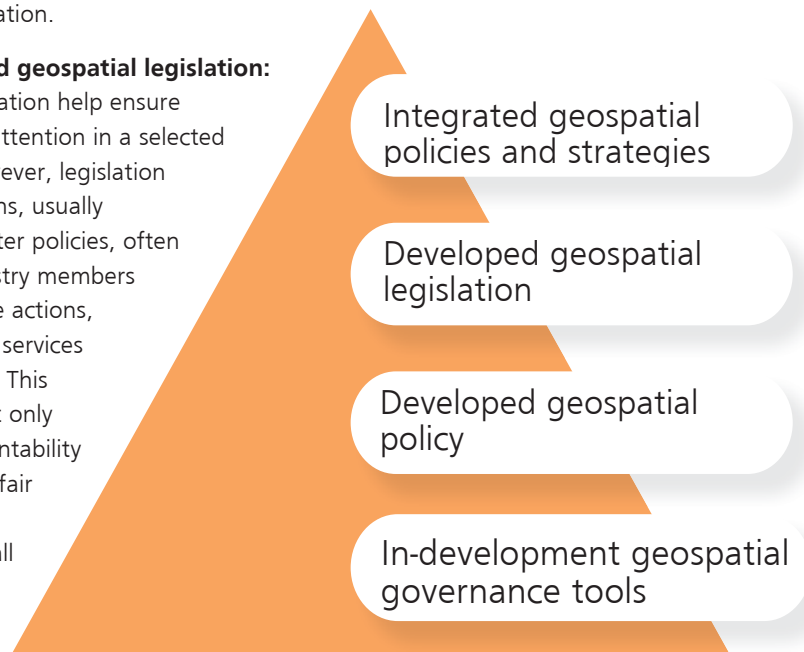
→ **In-development geospatial governance tools:** Evaluating the governance scenarios in each of the five regions, most of the emerging economies of Africa and Asia have only recently undertaken work to determine the value of having a geospatial policy. Though these countries may have limited

governance capacity, they have begun to formulate the required governance tools to help foster innovation, investments and industrial growth.

→ **Developed geospatial policies:** In the evolution of geospatial trends, few countries established the necessary governance infrastructure early on by investing in, and developing the necessary geospatial policies and legislations. To assess maturity, policies are classified as government documents that recommend actions and activities that can lead to an inter-industry and intra-industry interaction, as well as strengthening a young industry-formation.

→ **Developed geospatial legislation:** Policies in isolation help ensure government attention in a selected industry. However, legislation and regulations, usually introduced after policies, often obligate industry members to standardize actions, performance, services and products. This obligation not only creates accountability but creates a fair economy for large and small enterprises.

→ **Integrated geospatial policies and strategy:** An integrated geospatial strategy, ensures that core geospatial policies and legislation are integrated for governance, technology adoption, innovation, community engagement, capacity development, resourcing, funding and investment. Additionally, an integrated strategy often provides a roadmap for countries to increase both scope and impact of the adoption. ■



## GEOSPATIAL POLICY MATURITY 2018

	Geospatial	NSDI	Remote Sensing	Navigation
In-Development	<ul style="list-style-type: none"> <li>• Chile</li> <li>• Ghana</li> <li>• India</li> <li>• Malaysia</li> <li>• Nigeria</li> <li>• Sri Lanka</li> </ul>			
Developed Policies	<ul style="list-style-type: none"> <li>• Belgium</li> <li>• Canada</li> <li>• China</li> <li>• Denmark</li> <li>• Finland</li> <li>• Jamaica</li> <li>• Norway</li> <li>• UK</li> </ul>	<ul style="list-style-type: none"> <li>• Bahrain</li> <li>• Ethiopia</li> <li>• Namibia</li> <li>• Singapore</li> <li>• South Korea</li> <li>• UAE</li> </ul>	<ul style="list-style-type: none"> <li>• China</li> <li>• EU Member States and allies</li> <li>• India</li> <li>• Malaysia</li> <li>• Philippines</li> <li>• Poland</li> <li>• Russia</li> <li>• Thailand</li> <li>• UAE</li> <li>• USA</li> </ul>	<ul style="list-style-type: none"> <li>• New Zealand</li> <li>• Philippines</li> <li>• South Africa'</li> <li>• Sweden</li> <li>• Switzerland</li> <li>• Thailand</li> <li>• UK</li> <li>• USA</li> <li>• Vietnam</li> </ul>
Developed Legislations	<ul style="list-style-type: none"> <li>• Indonesia</li> <li>• Japan</li> <li>• Switzerland</li> <li>• USA</li> </ul>	<ul style="list-style-type: none"> <li>• Brazil</li> <li>• Bulgaria</li> <li>• Denmark</li> <li>• Estonia</li> <li>• France</li> <li>• Germany</li> <li>• Iran</li> <li>• Italy</li> <li>• Netherlands</li> <li>• Norway</li> <li>• Oman</li> <li>• Poland</li> <li>• Portugal</li> <li>• Russia</li> <li>• Spain</li> <li>• Sri Lanka</li> <li>• Sweden</li> <li>• Switzerland</li> <li>• Ukraine</li> </ul>	<ul style="list-style-type: none"> <li>• Indonesia</li> <li>• Japan</li> <li>• South Africa</li> <li>• South Korea</li> <li>• USA</li> </ul>	<ul style="list-style-type: none"> <li>• Australia</li> <li>• Canada</li> <li>• China</li> <li>• Russia</li> </ul>
Integrated Geospatial Policies and Strategies	<ul style="list-style-type: none"> <li>• Ireland</li> <li>• New Zealand</li> <li>• Sweden</li> </ul>			

# CORRELATION BETWEEN POLICY READINESS AND INDUSTRY GROWTH

The policy readiness of a country is defined according to the maturity level in a country for both geospatial and associated policies. The Countries Geospatial Readiness Index-19 assesses a country's geospatial preparedness on data infrastructure, policy, institutional capability, user adoption and state of the industry. The analysis finds a direct correlation among policy and industry, i.e. countries that are mature policy-wise, are also found to have a vibrant geospatial industrial ecosystem.

The assessment of the top 10 policy-ready countries highlights that with the exception of three countries (Austria, Finland and Sweden), countries are also found to be geospatial-industry ready, e.g. in the top 10. While it is not to be

Country	Policy Readiness Rank	Industry Fabric Readiness Rank
USA	1	1
UK	2	3
Switzerland	3	9
Germany	4	2
Sweden	5	14
Canada	6	4
France	7	6
Denmark	8	7
Austria	9	22
Finland	10	15

assumed that policy-readiness is the sole determinant for industrial readiness (incubation and other factors); however, it is one of the key determinants.

For example, the 2007 **European Space Policy** calls for establishing Europe as a world leader in space by encouraging small and medium-sized enterprises and start-ups to exploit space data for developing innovative solutions thus directly impacting the growth of space-based start-ups in the European Region. Similarly, the **Space Strategy for Europe** emphasizes providing support to the growth of the industry financially and by way of incubation. Conversely, a restrictive policy environment can have a detrimental impact on the growth of the industry. For instance, there is a possibility that GDPR, while ensuring an ethical code of conduct, may also act as a barrier to growth of small location-based companies.

## CONTEXT FOR GEOSPATIAL POLICY IN A COMMERCIAL ECONOMY

In recent years, data has become a more valued commodity than oil. The ongoing fourth industrial revolution or Industry 4.0, is defined as the fusion of new technologies that are core to all economic sectors, namely, artificial intelligence, sensors, Internet of Things

(IoT), big data and analytics, and the cloud. The increasing use of data for decision making has resulted in the creation of the data economy duly supported by both governance and policy frameworks.

From 2018 – 2019, the growth in usage of integrated spatial and non-spatial data has promulgated policies and legislation that affect the geospatial industry directly and indirectly. In this regard, one of the major topics that has attracted the interest of all stakeholders in the geospatial domain is in the context of data-privacy. Even though there is a global understanding that geospatial and location data are core to the data economy, governments all over the world have initiated discussion and debate resulting in the formulation of privacy and location policies. Additionally, there has been an increasing need within the geospatial community to have an integrated geospatial information policy framework which encompasses the different policies of the geospatial domain spread across, governance, technology and people.

## GLOBAL TRENDS

At a global level, the focus on data and geospatial information has accelerated. During the latter half of 2018, the United Nations Global Geographic Information Management (UN-GGIM) initiative

released a **Compendium on Licensing of Geospatial Information**. The Compendium is an initiative by UNGGIM to keep up with the evolving geospatial industry ecosystem wherein until now, geospatial information was only sold. As the industry begins to license its products to consumers, it is essential to allocate operational and legal risks between the two involved parties, i.e. the Licensor and Licensee. Additionally, open data also falls under the purview of the Compendium providing data via open geospatial information licenses. This policy, at a global level, manages to support data privacy and ensure safe utilization of data by authorized organizations.

The other major development at the global level is the collaborative effort between the United Nations and the World Bank to establish an **Integrated Geospatial Information Framework (IGIF)** for 30 countries of varying capacities across three years. The Framework provides strategic guidance to national-level governments to develop initiatives for national geospatial information management, develop evidence-based decision support systems, facilitate private sector development and capacity development for geospatial technology to bridge the geospatial divide existing between and among countries. Such global initiatives in the geospatial sector is instrumental for the development of focused national and regional initiatives for geospatial information management.

## REGIONAL TRENDS

**AFRICA:** Africa, the second largest continent, is undergoing a global geospatial information divide unable to exploit the real value of the geospatial sector and emerging technologies. Nonetheless, the African Union has developed a host of continental initiatives including; the **African Geodetic Reference Frame (AFREF)** initiative to develop a unified geodetic reference frame for Africa; the **African Regional Spatial Data Infrastructure (ARSDI)** to establish a common framework for spatial data infrastructures in the 55 Member countries; the **Fundamental Geospatial Datasets Project** to have a high quality repository of geospatial datasets; the **Mapping Africa for Africa initiative** to bring all mapping organizations closer; and **SERVIR Africa** to integrate satellite observations and predictive models with other geographic information. However, in all these initiatives, the involvement of the commercial geospatial industry remains limited.

Though the African region is still developing and finding its place in the geospatial industry, a few countries in the continent, like Ethiopia, Kenya and South Africa have taken initiative for the development of the geospatial sector. This is epitomized by a step taken by the Federal Democratic Republic of Ethiopia. The government of Ethiopia re-established the National Mapping Agency as the **Ethiopian Geospatial**

**Information Agency** to create a more level playing field for Ethiopia moving from just mapping to all aspects of the geospatial sector. The agency will focus on sponsoring research and innovation in the sector across the country, and has now increased its focus on data and its increasing value in the economy.

Kenya has made substantial efforts towards establishing itself in the continent as a leader in the geospatial sector. Kenya has established a Space Agency to lead the country's work with the Africa Regional Data Cube which is a US\$17 million project to address the big four priorities of the country – food security, urbanization, illegal mining and water. Additionally, Kenya rolled out the **Data Protection Bill in 2018** to protect personal data collected, processed, and used by both the private and public sectors. Though both these policy measures are progressive for a country that is still developing, the steps are foundational requisites that have allowed Kenya to be one of the countries the geospatial industry can target for outreach and expansion. South Africa is the most geospatially ready country of the African Continent ranking at 31 in CGRI - 2019. The country has recently launched official drone regulations addressing the many questions on use and licensing for both recreational and commercial users. This is particularly timely given the growing dependence on drones for scanning, surveying, and mapping purposes in construction, agriculture, and other economic sectors.

**AMERICAS:** The America's (including both North and South America) continue to be the most geospatial ready regions of the world, with the USA leading the readiness index. It is currently the focal country from the region for the industry and is predicted to continue being the largest geospatial market in the coming years..

The variety of geospatial facets targeted with governance tools in the USA is ample. The country's most important contribution has been the establishment of its **Geospatial Data Act**, that was rolled out as part of the Federal Aviation Authority (FAA) Reauthorization Act. The combination hopes to streamline the collection of data by both increasing efficiency and decreasing cost.

The USA has recently rolled out a three-part **Space Directive**, the most significant aspect of which is the inclusion of space traffic management. The country plans to create a ledger for all items sent into space, not only by the USA but for other countries as well. Additionally, the USA in collaboration on GNSS n with Galileo; has signed a cooperation treaty with Australia for space exploration, research, and utilization. Both these segments (Aerospace and Data) depended on other legislation that was rolled out in January 2019. The **National Timing and Resilience Act** will thus ensure terrestrial back-up for GPS as well as requiring infrastructure for the same. This act has enormous implications for the industry in both defense and timing.

The USA also has launched its **OPEN Government Data Act**. Under this Act, all Government agencies are mandated to share their data in a standardized and non-proprietary format, while simultaneously also excluding data that may breach privacy, security and confidentiality. The Act is also foreseen to have an additional impact on other sector-related policies such as the Geospatial Data Act and the **National Defense Authorization Act**, both of which require that data of organizations (Government and affiliated private and public agencies) to be available on an open platform for public use.

Another major stride unveiled this year is the launch of the **Artificial Intelligence Strategy**. The government has, in the past, faced considerable criticism for not having a strategy that will help incorporate AI in defense, a step forward already taken by Russia and China. The Artificial Intelligence Strategy aims to increase the accuracy of activities undertaken by defense authorities. The introduction of AI, however, does not mean no human intervention, but provides for human participation at a management and decision-making level. Other aspects of Aerospace in focus in the country are drone laws that cover both commercial and recreational use. The USA, like other countries, has augmented the law by adding requirements for drones to communicate their position and display their license plates for easy identification from all distances.

***"The benefits of geospatial technology are truly untold. However, when our federal agencies use geospatial data, different agencies can acquire duplicative information and waste precious taxpayer resources in the process. I am glad House leadership listened to industry stakeholders and included the Geospatial Data Act in the FAA Reauthorization Bill of 2018. This will streamline the collection of this data across the federal government while saving money, improving information accuracy, and providing a more modern system for collecting and sharing geospatial data."***

**- Rep. Bruce Westerman**  
Arizona, Introducing the Geospatial Data Act to the House of Representatives, 115th Congress

Under the **Federal Innovation Strategy**, Canada has continued to increase its focus on innovation, bringing Aerospace under its purview while simultaneously allocating funds to clusters of innovation in the Quebec region. Canada has also launched new drone laws that put a central focus on the aerospace industry.

In comparison to North America, South America has not been as vocal about the geospatial sector. The most prominent development in the region of late has been the draft **Space Program** which is being reworked by the Brazilian government. This Program will focus on civilian and defense satellites for optical remote sensing launch from 2021 to 2023 and radar sensing in 2026 .

While the continent has been an early adaptor of technologies and has strived to capitalize from the start, the governance tools are still limited in expansion and need suitable exploration for a well-functioning economy.

**ASIA – PACIFIC:** Asia-Pacific continues to enhance its geospatial readiness as many countries such as Australia, China, India, and Malaysia are establishing a multitude of geospatial and associated policies and strategies to support the growth of the sector. A survey to measure the data economy evolution in the Asia-Pacific region highlights that 55% of businesses are looking to use digital services to drive innovation across all facets of their organization and derive new business models. From 2018-2019, Australia made significant strides building the digital economy with state-level policies and strategies. State governments in the country have been actively creating **Digital Asset Strategy** (Victoria) and **BIM Directives** (Queensland) in perspective, while the development of these policies is solely for implementation at the state-level, the implications of the same extend to the national borders. The **New Digital Economy Strategy** launched in January of 2019, further punctuates the nation-wide movement towards a digital economy.

Asia-Pacific countries have also begun to take initiative to enhance their capabilities in remote sensing and geospatial activities. In February 2019,

Vietnam established a **National Remote Sensing Development Strategy for 2030**. The strategy provides an opportunity to the government and the private sector to co-develop the remote sensing sector. Australia, too has made significant strides in the geospatial domain beginning with the establishment of the **Australian Space Agency**.

Another aspect of space which is navigation has also seen growth in areas of governance with China's expansion of the Beidou Constellation.

To further its efforts in the geospatial domain, Sri Lanka released the **National Data Sharing Policy**, which aims to ensure accessibility in order to encourage seamless sharing of data, to integrate e-service delivery, and to promote open data and open government. Saudi Arabia's **First Cloud Policy** matches the world's direction on data sharing and involves classification of data that helps business entities understand the deployment models for relevant data.

In the past year, India has initiated multiple efforts to provide value to geospatial information and technology. India has followed suit combining its Geospatial Information Bill and rules regarding data localization with the **Data Protection Bill**. Additionally, India's **Drone Policy 1.0** came into effect in December 2018 with the aim to foster technology and innovation, and facilitate its use in the vast number of applications in the country ranging from agriculture to disaster management to construction.

The Asia Pacific region does not have

a unilateral focus like the African or European Region, and national governments have instead focused on creating a plethora of governance tools in the past year. The geospatial industry and all its components in the region are being promoted in all aspects of the value chain.

**EUROPE:** The institutions of the EU are the authoritative bodies for legislative and budgetary decisions for key policy areas with which the EU Member States are obligated to comply. During this past year the EU has taken a rigorous approach in the formulation of regional policies for furthering the data economy in the region. Technology areas like quantum computing, machine learning, and artificial intelligence have been in focus in the region by way of dedicated and progressive strategies and initiatives.

2018-2019 witnessed the EU lead the charge of addressing the biggest concerns with respect to data, i.e. data protection and data privacy by establishing the **General Data Protection Regulation (GDPR)** and

**ASIA - PACIFIC** A survey to measure the data economy evolution in the Asia-Pacific region highlights that **55%** of businesses are looking to use digital services to drive innovation across all facets of their organization and derive new business models.

**the Open European Location Services (ELS) Data Policy.** While the GDPR received both positive and negative reaction from the geospatial industry, it served as an exemplar for many countries to establish their national data-privacy and protection related policies. A case in point being the UK which created the **Data Protection Act of 2018** to implement the GDPR to ensure a smooth transition in data privacy given Brexit.

With a special reference to 'location data', the GDPR addresses the complexities associated with collection, processing, and utilization of the location and personal data of citizens. For geospatial and location companies, this includes demonstrating integrity, confidentiality, accountability and security while simultaneously establishing trust-based relationships with the end consumer. Going forward, the GDPR can act as a barrier to the growth and development of small location-based companies. Given that data can come from multiple sources, there is always going to be a possibility of policy infringement likely resulting in legal complications. While large companies (e.g. Google) may more easily deal with such issues; small companies could be financially ruined by a data breach.

The Open ELS is highly user-focused and aims to develop authoritative, operational geospatial open data services for pan-European geospatial data with interlinkages to the European Data Portal. The Strategy seeks to improve the quality, availability and interoperability of

data made available to consumers. The Strategy also furthers Europe's initiative of the Digital Single Market by providing a digital-service infrastructure. The Strategy via its Small and Medium-sized Enterprises (SME) engagement program aims to encourage small companies to leverage Open ELS to create innovative solutions for the market.

From a national geospatial strategy point of view, the UK government has also begun planning a **National Geospatial Strategy** to realize the significant value that can be derived from geospatial data. The strategy broadly aims to define data, data identifiers and data sets, the standards and technologies used to curate and provide access to those data sets, and the organization that will be responsible for governing the data. The strategy presents a valuable economic opportunity for the UK-based geospatial companies to leverage open data, big data, Building Information Modeling (BIM) and AI to curate geospatial data for developing value-based applications. Space continues to be a strategic sector for Europe. Due to the European Space Agency (ESA), the European region has a well-established space segment. In the past year, the EU focused on the existing constellations of Galileo and Copernicus. This year, the EU and ESA allocated an additional €96 million (US\$108.45 million) to develop the Sentinel 6 mission of Copernicus, and ensure easy access to reliable and timely data to Copernicus users. In 2018, four more satellite launches extended Galileo's reach.

Additionally, Galileo established itself as a commercial-consumable navigation system, and has collaborated with USA's GPS to provide citizens of both regions with more accurate positioning and navigation. In addition to the dedicated initiatives by the EU and ESA, the various national governments of the European region have developed their own strategies. The UK Space Agency (UKSA), for instance, created the **'LaunchUK'** to strengthen the local space industry and to develop its commercial launch ambitions. Additionally, this new growth in the space sector is not limited to larger economies, but has also enabled smaller economies like Turkey to establish its own national space agency.

In terms of industry-specific initiatives, France released its **Resilient City Strategy** aiming to better prepare the cities of France for natural and human disasters through innovation and the use of technologies ranging from Earth observation to machine learning. UK's Maritime Strategy—2050 presents substantial scope for the geospatial industry to help unlock maritime economic potential. The Strategy includes the government's support and investment in the geospatial industry to develop technology for marine mapping. **Russia's AI strategy, UK's code of practice for IoT and Aerospace Strategy** are focused on regulations on data, cybersecurity and the use of emerging technologies to curate spatial and non-spatial information for economic growth. ■



MAJOR REGIONAL POLICY UPDATES 2018 – 2019				
	INDUSTRY SEGMENT	COUNTRY NAME	POLICY DEVELOPMENT	
Africa	Aerospace	South Africa	National Drone Regulations	
	Data Economy	Kenya	Data Privacy Bill	
Asia - Pacific	Aerospace	Australia	Mandatory Drone Registration Regulation	
		India	Rules and Requirements of Operating Remotely Piloted Aircraft Systems	
		UAE	National Space Investment Plan	
		Vietnam	National Remote Sensing Development Strategy	
	Data Economy	Australia		Telecommunication Bill, 2018 and its Bearing on Businesses
				Victorian Digital Asset Strategy
				New Digital Economy Strategy
		Dubai	Launches Guidelines for Ethical AI	
		India	Data Protection Bill (inclusive of the Geospatial Information Bill)	
		Saudi Arabia	Cloud First Policy	
Sri Lanka	National Data Sharing Policy			
Vietnam	Cybersecurity Law passed for 2019			
Americas	Aerospace	Canada	New Drone Law	
				Federal Innovation Strategy for Aerospace Innovation in Quebec
		USA	National Space Traffic Management Directive	
			National Timing and Resilience Act Drone Laws and Rules	
	Data Economy	USA	California Consumer Privacy Act	
			FAA Reauthorization Act and Geospatial Data	
			National Cyber Strategy and AI Strategy OPEN Government Data Act	
Europe	Aerospace	EU	Drone Regulatory Framework	
		UK	UKSA Prospectus for 'LaunchUK'	
			Maritime 2050 Strategy	
	Data Economy	EU	Open European Location Services Data Policy	
			General Data Protection Regulation	
	UK	Data Privacy Law		

## COLLABORATIVE FRAMEWORK FOR POLICY DEVELOPMENT

For the geospatial industry to thrive there is an imperative for massive investment, human resources support and governance tools. To create significant economic and non-economic benefits that accompany the use of geospatial information solutions in varied applications, a progressive and enabling policy is needed. In the formulation of policies and strategies, it is necessary to bring both the public and private sectors together in a collaborative environment. At present, there needs to be greater collaboration toward strengthening geospatial information infrastructure and policy frameworks at national, regional and global levels serving larger development goals and governance through mutual understanding and cooperation.

The private sector bears a significant amount of risk and management responsibility and therefore plays an important role in building the policy framework. Thus, to bridge the gap in understanding and implementation of geospatial solutions, it is necessary to proactively engage with both the public

and private sectors in various spheres of the geospatial domain for defining the value-proposition for the economy and society. While geospatial information infrastructure and policy frameworks are primarily the responsibility of national mapping and geospatial agencies; both the public and private sectors together can assist in identifying the challenges of transformation and capacities required to play an evolving role in the ever-increasing digital world. ■

## CONCLUSION

In the past year, the national governments participated in initiating policy frameworks to support innovation, enable emerging technology use, and promote the geospatial industry. From a global perspective, multilateral organizations such as the UN and World Bank and associations like the World Geospatial Industry Council are advocating for the integration of policies assigning due importance to geospatial information, while also increasing state-level adoption of standards and enhanced practices.

The importance of geospatial technology has been identified in each of these domains and regions, and the vast scope it holds in multiple segments has made the industry indispensable

to governments. The potential and caliber of the geospatial industry and the embedment of geospatial information and technology in other application areas such as agriculture, construction and engineering, disaster management, etc., has resulted in the (re)formulation of existing strategies and policies to not only keep up with, but advance economic development.

While most of the policies are still in their initial implementation and therefore their full effectiveness cannot yet be evaluated, the development of new policies for adopting new technologies in different economic sectors is indicative of the plethora of opportunities available for the

W



**World Geospatial Industry Council**

Business Center, Unit 3  
Barchman Wuytierslaan 10  
3818 LH Amersfoort  
The Netherlands

**Email:** [info@wgicouncil.org](mailto:info@wgicouncil.org)

**Website:** [www.wgicouncil.org](http://www.wgicouncil.org)