GKI Training Program at Space2Earth Asia Summit 2025

Evolving Role of National Mapping Agencies – Transitioning towards Geospatial Knowledge Infrastructure

Date: July 7-July 8, 2025| Toranomon Hills Forum, Tokyo, Japan

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BACKGROUND

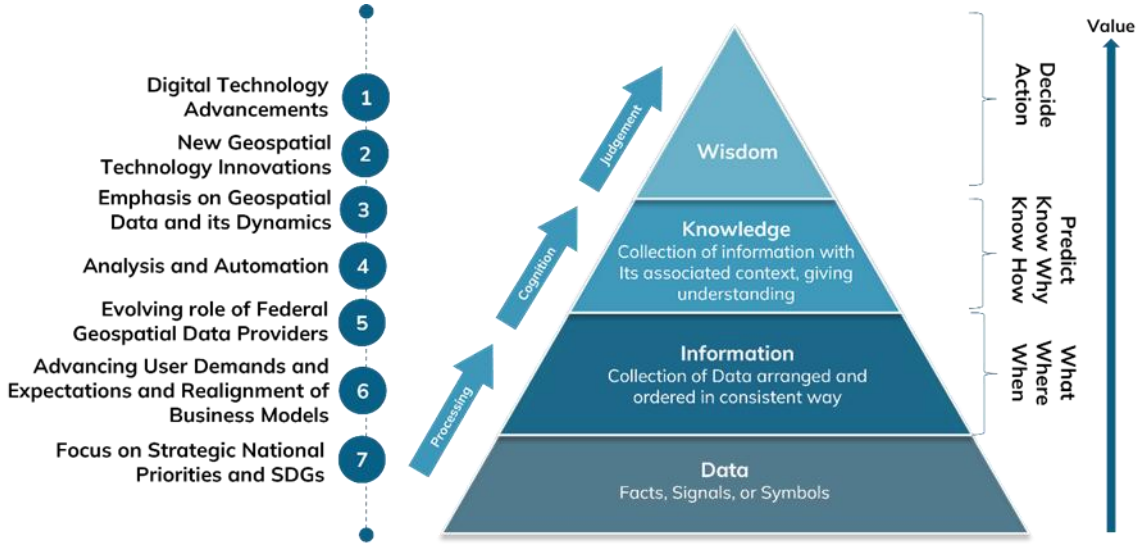
The global geospatial landscape is undergoing a foundational shift—**from legacy Spatial Data Infrastructures (SDIs) to a more advanced, integrated paradigm known as Geospatial Knowledge Infrastructure (GKI).** This transformation is not merely technical; it marks a strategic evolution in how nations and institutions mobilize geospatial assets to derive actionable intelligence in an increasingly data-driven world.

GKI represents a next-generation framework that transcends the conventional mandates of data collection, storage, and dissemination. Anchored in the principles of the Fourth Industrial Revolution (4IR), it integrates geospatial technologies with AI, cloud computing, and IoT to enable real-time, predictive, and context-aware insights. In doing so, it moves the value chain decisively from data to decision—placing geospatial intelligence at the core of national digital infrastructure.

This evolution is propelled by the imperative to embed geospatial capabilities across public governance, industrial ecosystems, and the global digital economy. Whether enabling smart cities, climate resilience, or digital twin technologies, GKI offers a cohesive architecture for aligning policy, infrastructure, and innovation. It equips governments and enterprises alike to respond with agility to complex challenges—making decision-making not only smarter and faster, but more sustainable and systemically informed.

In an era where digital competitiveness is increasingly geospatial in nature, GKI is not just a technological upgrade—it is a strategic enabler of national resilience, economic opportunity, and global leadership.

Figure 1: GKI: The Blueprint for the Future Geospatial Ecosystem



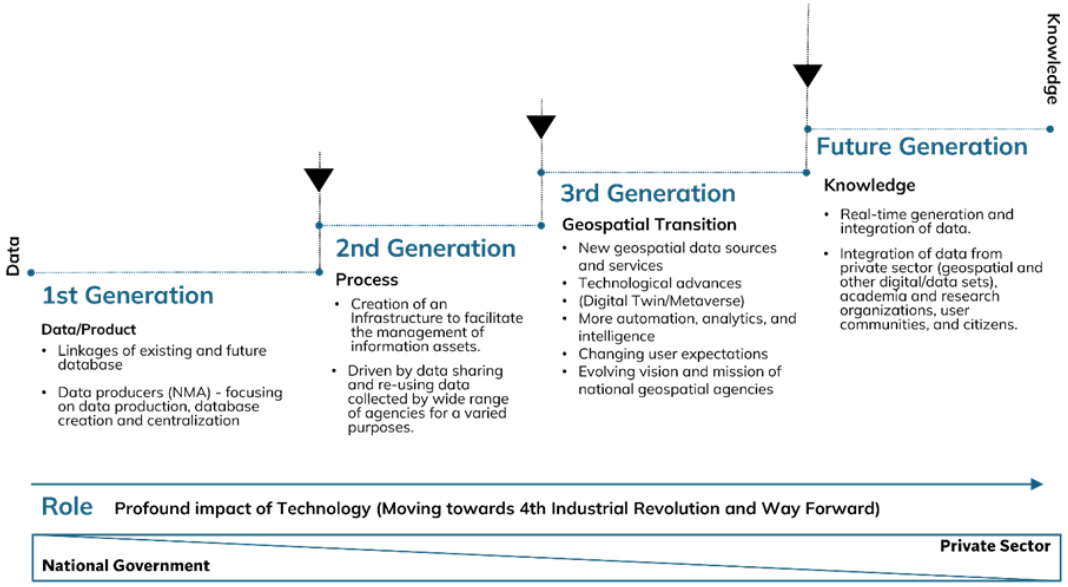
Source: Geospatial World Consulting

The transition to Geospatial Knowledge Infrastructure (GKI) signals the emergence of a third generation in the evolution of geospatial systems. The first generation was data-centric, focused on building the foundational capacity to collect, manage, and store spatial data. This was followed by

the second generation, characterized by process-driven frameworks that integrated geospatial data into specific workflows, enhancing decision-making within siloed applications.

Today, the shift toward a knowledge-powered paradigm reflects a broader imperative: to generate actionable insights that inform real-time, system-level decisions. GKI embodies this transformation by leveraging advanced analytics, AI, and interoperability to convert data into strategic knowledge. It positions geospatial systems not merely as repositories or tools, but as critical infrastructure for national resilience, digital governance, and economic competitiveness.

Figure 2: GKI: Establishing the Geospatial Knowledge Infrastructure – Towards the Future Generation



Source: Geospatial World Consulting

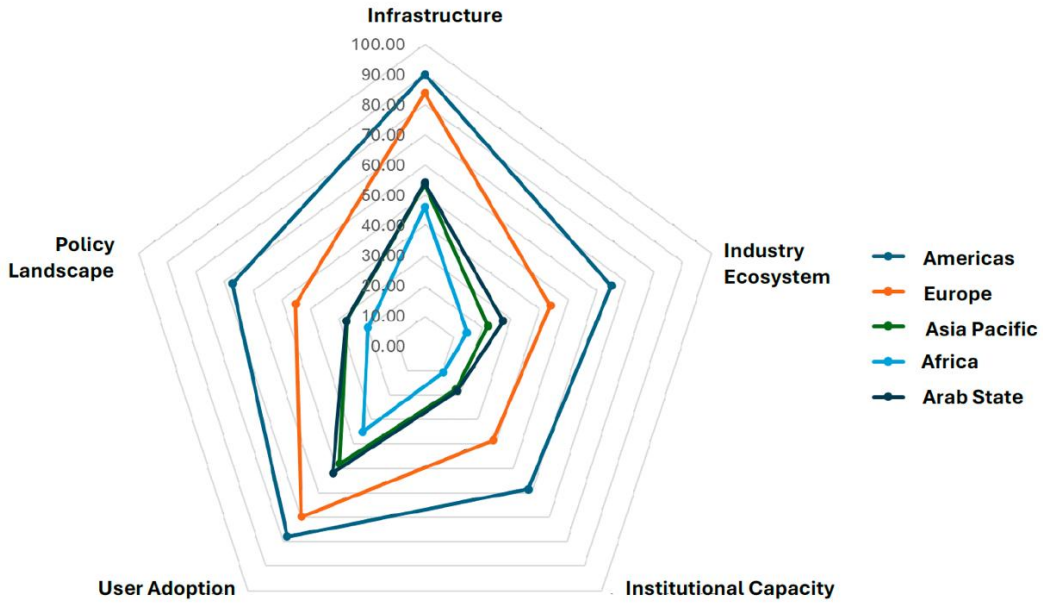
A knowledge-powered geospatial paradigm enables the transition from merely observing patterns to actively shaping outcomes—through prescriptive analytics, adaptive systems, and autonomous decision-making. Yet, this shift requires more than technological innovation; it calls for the holistic integration of people, processes, policies, and platforms. Only by building such an ecosystem can geospatial knowledge be transformed into operational wisdom capable of addressing complex, interlinked global challenges.

As the geospatial ecosystem advances, GKI is redefining the interplay between data, algorithms, and human insight—positioning geospatial intelligence as a cornerstone of digital economies. It offers a strategic roadmap for governments, enterprises, and geospatial institutions to move up the value chain, unlocking the full potential of location-based intelligence. By fostering multi-stakeholder collaboration, GKI enables real-time decision-making and automated solutions that will shape the trajectory of future-ready societies.

GKI FOR ASIA-PACIFIC REGION

The Asia-Pacific region is navigating a complex transformation marked by rapid urbanisation, increasing climate volatility, natural disaster exposure, and escalating geopolitical tensions. These dynamics place immense pressure on governments and institutions to deliver faster, more coordinated, and more resilient responses. Yet, much of the region's geospatial infrastructure remains fragmented, limiting its ability to translate spatial data into integrated, real-time decision-making. Against this backdrop, Geospatial Knowledge Infrastructure (GKI) emerges not merely as a technological upgrade, but as a strategic necessity—enabling countries to embed geospatial intelligence into the fabric of digital governance, national resilience, and economic competitiveness.

Figure 3: Comparative Analysis of GKI Readiness Index Pillars Across Regional Economies (as per UNGGIM Classification)



For National Mapping Agencies (NMAs) and key user stakeholders—including the AEC sector, agriculture ministries, and infrastructure regulators—the shift to GKI represents a pivotal opportunity. GKI enables a seamless interface between authoritative geospatial data and domain-specific applications, allowing for smart urban design, precision agriculture, resilient infrastructure development, and predictive risk modelling. By investing in GKI training and institutional capacity, NMAs can position themselves as system integrators—facilitating cross-sectoral collaboration and powering automated, knowledge-based services. This evolution not only enhances national preparedness and sustainability, but also creates a shared platform for engaging industry, academia, and civil society in shaping the region's digital future.

GKI TRAINING PROGRAM

Title: Evolving Role of National Mapping Agencies - Transitioning to Geospatial Knowledge Infrastructure

Event Details:

- **Dates**: July 7–8, 2025
- **Location**: Toranomon Hills Forum in Tokyo, Japan

Training Outline:

The 2-days GKI Training Program will commence with a focused internal training organized by Geospatial World and the following 3 days include Industry Engagement and Collaborative Ecosystem at the at the Space2Earth Asia Summit on July 9–10, 2025, and Australia – India – Japan – United States (AIJUS) Summit on July 11, 2025. The training program aims to equip stakeholders with the tools and knowledge to build and manage geospatial knowledge infrastructures that are adaptive, resilient, and inclusive. It is meticulously designed to equip stakeholders from government bodies, national mapping agencies, the geospatial industry, academia, and the private sector with the expertise needed to fully harness GKI for building sustainable, innovative, and competitive economies.

The program will focus on advancing geospatial knowledge in the Asia-Pacific region by exploring how emerging technologies—AI, Big Data, Cloud Computing, and Digital Twins—are transforming user demands in sectors such as AEC, agriculture, and infrastructure. It will emphasize the strategic shift from data to knowledge as a driver of national development, while strengthening the capacity of National Mapping Agencies to modernize geospatial infrastructure, enhance data interoperability, and deliver actionable intelligence through cross-sector collaboration.

Learning Outcomes

- **Comprehensive Understanding of the GKI Framework**: Participants will gain a clear understanding of the foundational principles of Geospatial Knowledge Infrastructure (GKI) and its critical role in driving national development and policymaking.
- **Proficiency in Utilizing 4IR Technologies and Geospatial Platforms**: Participants will learn how to integrate 4IR technologies (such as AI, IoT, and Big Data) with GKI, leveraging these tools to address global challenges like climate change, urbanization, and public health issues.
- **Strategic Approach to Multi-Stakeholder Partnerships and Business Models**: Participants will be able to design and implement innovative business models and develop effective partnerships (including public-private collaborations) that enhance the successful deployment of GKI projects.
- **Practical Application of GKI in Sectoral Workflows**: Participants will be able to apply GKI concepts and technologies to key sectors such as public infrastructure, health, disaster management, and land management, improving sector-specific workflows and decision-making processes.

Tentative Agenda:

DAY 1: 7th July 2025				
9:00 am – 10:00 am - Registration and Tea and Coffee				
10:00 am – 10:30 am	**Welcome and Introduction by Ananyaa Narain, Vice President Consulting, Geospatial World**			
10:30 am – 11:30 am	**Lesson 1**	**Geospatial Knowledge Infrastructure - The Framework for Future Geospatial Systems**	1. Introduction to Geospatial Knowledge Infrastructure Principles and Concepts 2. Evolving Roles of National Geospatial Agencies (NGAs) in the Digital Age 3. Role of Public-Private Partnerships and Collaborative Models 4. GKI Readiness Index – Assessing national preparedness and maturity 5. Challenges in Geospatial Knowledge Infrastructure Readiness in APAC Region 6. Strategic Roadmap of GKI for National Development in APAC Region	**Ananyaa Narain** – Vice President – Consulting Geospatial World
Coffee Break - 11:30 am – 11:45 am				
11:45 am – 1:00 pm	**Lesson 2**	**Building Geospatial Knowledge Infrastructure (GKI) for Global Challenges**	1. The Role of GKI in Addressing Global Challenges (Climate Change, Urbanization, Health, etc.) 2. Theories and Frameworks for Collaborative Geospatial Workflows 3. Leveraging Massive Geospatial Data for Knowledge Creation 4. Integrating Digital Twins into GKI for Real-Time Decision Making 5. Future Trends and Emerging Technologies Shaping GKI 6. Case Study: Successful GKI Implementation and Collaborative Models	**Dean Angelides** Corporate Director, Esri **Chris Fowler** National Government Team Lead, Esri
Lunch – 1:00 pm – 2:00 pm				
2:00 pm – 3:30 pm	**Lesson 3**	**Leveraging 4IR Technologies to Advance GKI**	1. Introduction 2. Significance of 4IR Technologies in Geospatial Infrastructure 3. Integration of AI, IoT, and Big Data with GKI; Exploration of New Technologies like Blockchain, AR, and VR in GKI	**Yasunori Yamamoto** Vice President of Development – Oracle

			4. Trends in Geospatial Technology Innovation Influencing National Mapping Efforts 5. Challenges and Considerations for Implementation 6. Case Studies and Applications	
Coffee Break - 3:30 pm – 4:00 pm				
4:00-pm – 4:30 pm	**Lesson 4 [online]**	Securing the Global Geodesy Supply Chain: A Foundational Enabler for Geospatial Knowledge Infrastructure (GKI)	1. Geodesy as Critical Infrastructure: Strengthening the Foundation of GKI 2. Resilience and Sovereignty in the Global Geodesy Supply Chain 3. Advancing Regional Collaboration and Capacity in Geodetic Infrastructure	**Nicholas Brown** Head of Office United Nations Global Geodetic Centre of Excellence
4:30-5:30 pm	**Lesson 5**	Collaborative Development of Geospatial Knowledge Infrastructure: Building Standards-Based, Interoperable, and Multi-Sectoral Ecosystems	1. Institutional Collaboration and Knowledge Co-Production 2. Standards, Interoperability and Metadata Governance 3. Importance of Infrastructure and Platforms for Knowledge Integration 4. Governance, Ethics and Sustainability of Geospatial Knowledge	**Len Kne,** Director U-Spatial, University of Minnesota
NETWORKING RECEPTION 5:30 pm – 7:30 pm				
Day 2: 8th July 2025				
9:00 am – 11:15 am	**Lesson 6**	**Leveraging Public and Open Data for Advancing Geospatial Platform**	1. Introduction to Overture Maps Foundation (OMF) 2. The Role of Public and Open Data in Geospatial Platforms 3. Collaborative Approaches for Developing Open Geospatial Platforms 4. Open Data Governance and Standards for Geospatial Platforms 5. Challenges and Opportunities in Scaling Open Geospatial Platforms 6. The Future of Open Geospatial Platforms	**Marc Prioleau** Executive Director Overture Maps Foundation
Coffee Break - 11:15-am – 11:45 am				
11:45 am – 1:00 pm	**Lesson 8**	**GKI Interface for AEC/ Infrastructure**	1. Leveraging GKI for Smarter Infrastructure Design and Development	**Prof. John. P. Wilson**

			2. Digital Twins in AEC: GKI's Role in Real-Time Data and Simulation 3. Integration of GKI with BIM for Streamlined Project Management 4. Enhancing Sustainability in AEC Projects through Geospatial Analysis 5. Case Studies: GKI Implementation in Large-Scale Construction and Urban Projects	USC Professor and Founding Director Spatial Sciences Institute, University of Southern California, USA
Lunch – 1:00 pm – 2:00 pm				
2:00 pm - 4:00 pm	**Assessment Workshop**		1. Evaluate Learning Outcomes 2. Training Assessment through surveys, quizzes, etc.	**Oaishik Bhattacharya,** Associate Director, GKI; Geospatial World
4:30 pm – 5:00 pm Closing Ceremony – Distribution of Certificates and Photograph				
9th July - 11th July 2025	**Industry Engagement and Collaborative Ecosystem at Space2Earth Asia Summit and Australia – India – Japan – United States (AIJUS) Summit**			