Geospatial Knowledge Infrastructure (GKI) and National Development

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AGENDA

3:00 pm – 3: 05 pm	**Welcome Note** By Mr. Sanjay Kumar, CEO, Geospatial World
3:05 pm – 3:15 pm	**Opening Remarks and Introductory Presentation** By Ms. Ananya Narain, Director – Consulting, Geospatial World
3:15 pm – 3:40 pm	**Geospatial Knowledge Infrastructure and Readiness Index** Panellists: • Mr. Greg Scott, Inter-regional Advisor, UN-GGIM • Mr. John Kedar, Strategic Advisor, Geospatial Knowledge Infrastructure (GKI), Geospatial World
3:40 pm – 4: 00pm	**Technology Innovations and Standards for National Mapping Organizations** Panellists: • Mr. David Henderson, Chief Geospatial Officer, Ordnance Survey • Ms. Jill Saligoe-Simmel, Principal Product Manager, Esri • Mr. Trevor Taylor, Senior Director, Member – Success and Development, OGC
4:00 pm – 4:20 pm	**The Role and Relevance of Geospatial Knowledge Infrastructure (GKI) in National Development** Panellists: • Mr. Pankaj Mishra, Deputy Surveyor General of India, Survey of India • Dr. Saad Alhamlan, CEO, Gravity Geospatial Services, Saudi Arabia
4:20 pm – 4:25 pm	**Concluding Remarks** By Ms. Ananya Narain, Director – Consulting, Geospatial World

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Ananyaa Narain

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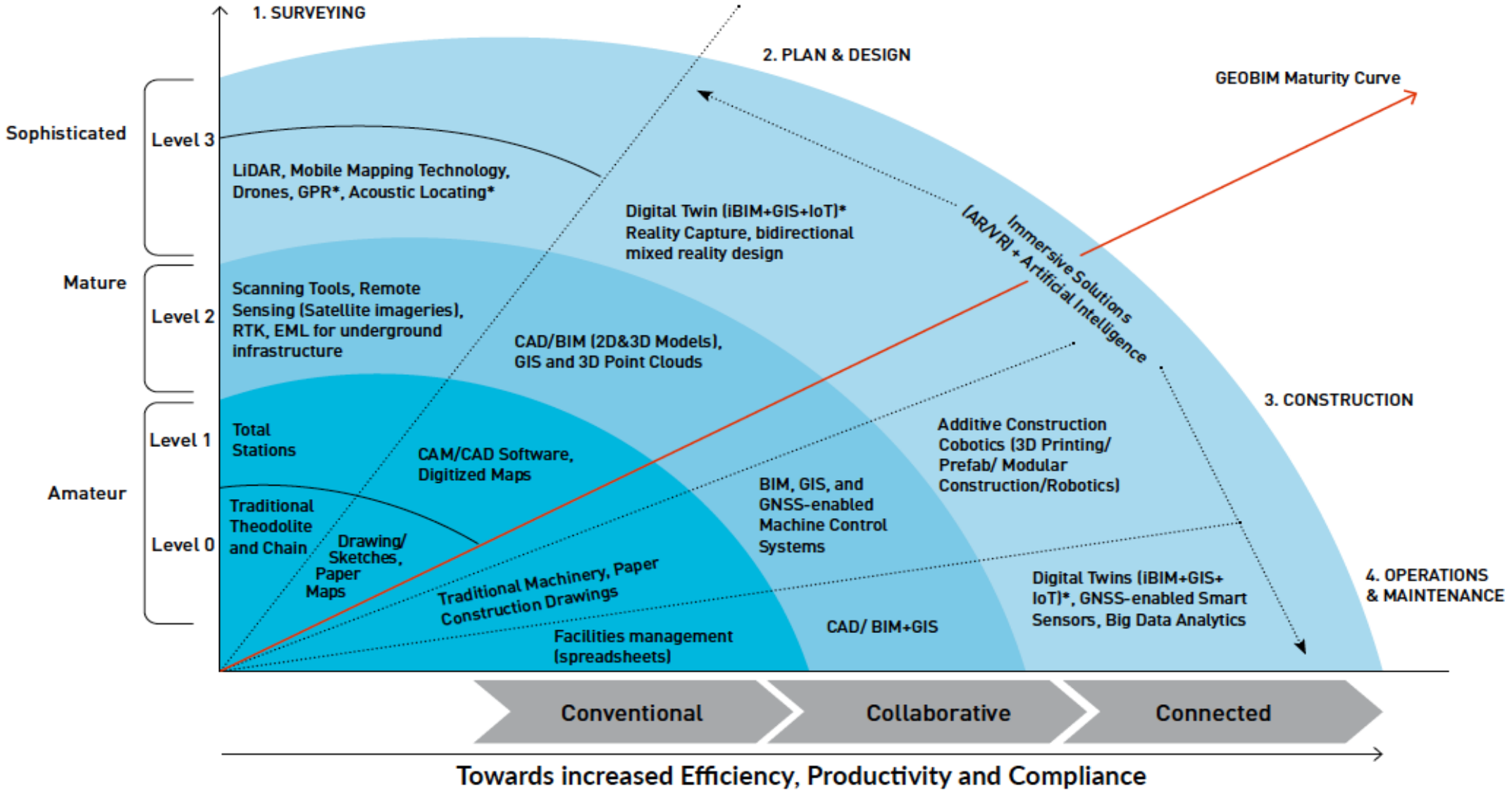
“Geospatial lies at the heart of Digital Transformation, as the next **“BIG Opportunity”**

“...Integration of geospatial technologies for advanced engineering applications and Digital Twins ”

Geospatial and BIM Convergence for the Architecture, Engineering and Construction Industry



Source: GEOBIM Market in AEC Industry Report 2020; a report by Geospatial World
For Caveats of analysis – please refer to the report.

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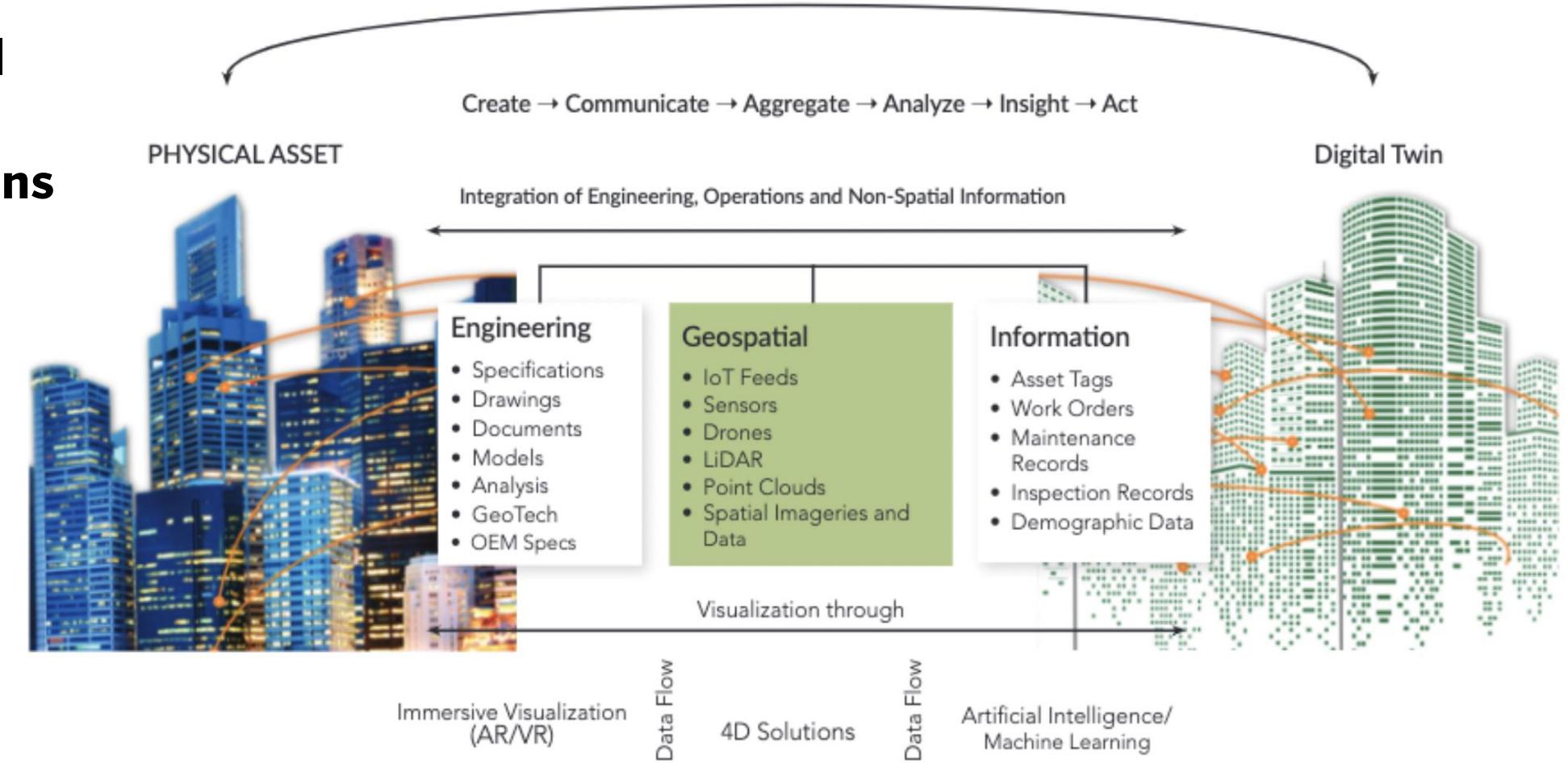
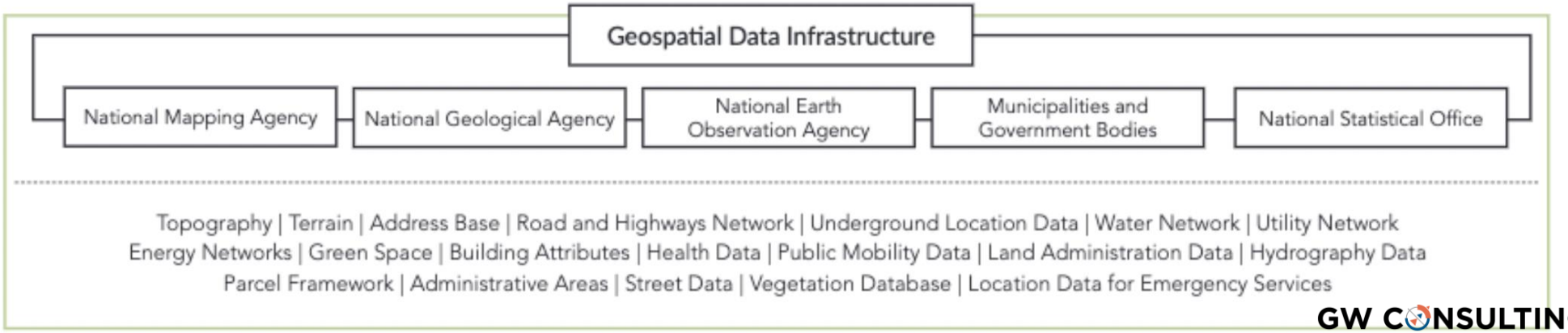
Role of Geospatial Infrastructure to Create Digital Twins





Source: Netherlands Geolocation Economy Report; a report by GW Consulting; Geospatial World
For Caveats of analysis – please refer to the report.

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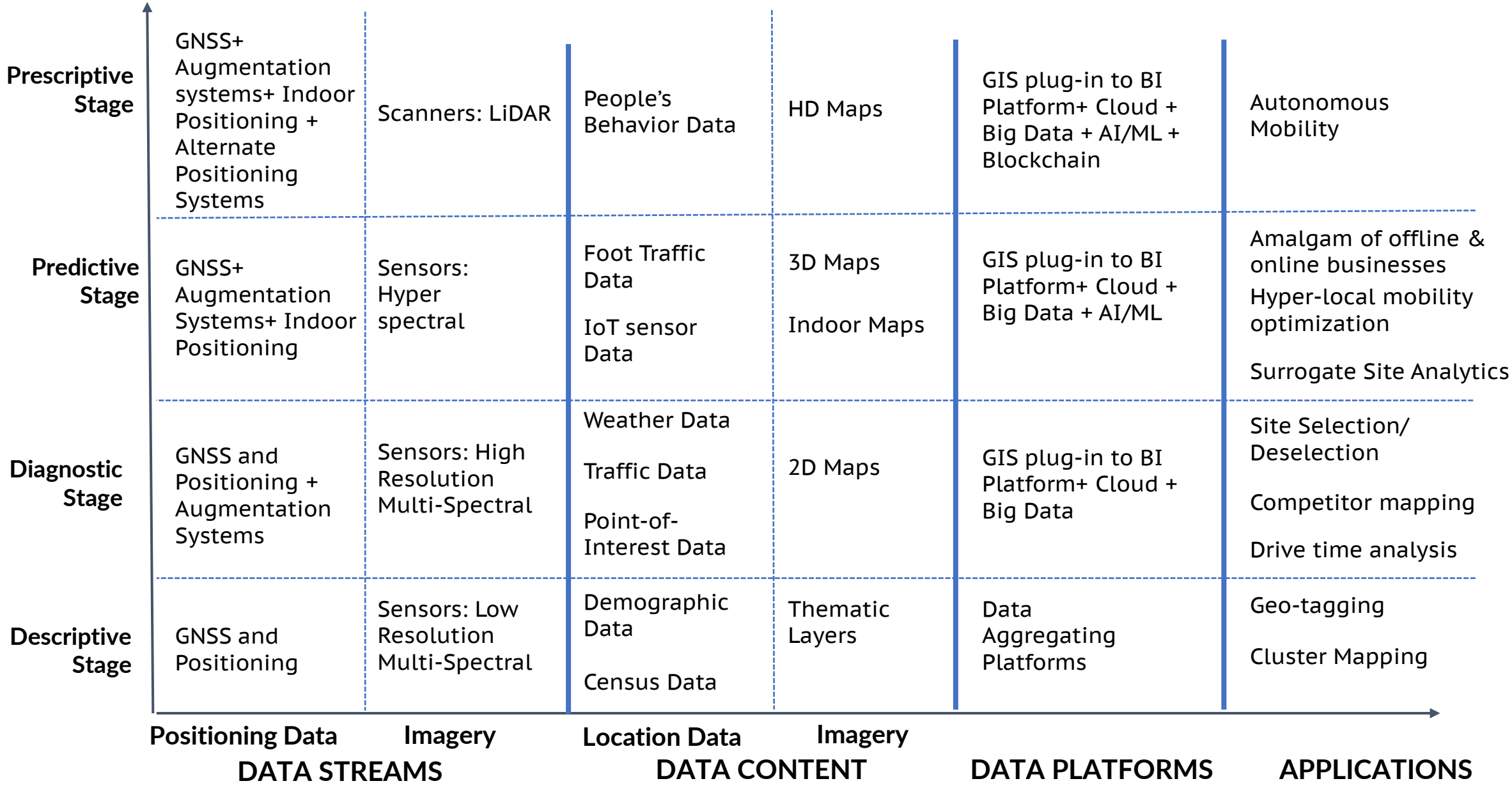
“…Integration of geospatial technologies for advanced IT workflows and applications”

Geospatial Technologies Integration for Business Intelligence Workflows



Source: Geospatial Industry Advancing Sustainable Development Goals; a report prepared on behalf of UNGGIM PSN by Geospatial World

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“…for adequately addressing and achieving the Sustainable Development Goals (SDGs)”

1 NO POVERTY

- GIS-based poverty map

Remote Sensing, GIS and Spatial Analytics, mobile phone

2 ZERO HUNGER

- Geospatial data for agriculture yield estimation
- Smart Agriculture

Remote Sensing, GIS and Spatial Analytics, and UAVs/Drones

3 GOOD HEALTH AND WELL-BEING

- Geospatial analysis for examining healthcare system
- Location of hospitals
- Disease pattern and distribution

Remote Sensing, GIS and Spatial Analytics, and IoT

4 QUALITY EDUCATION

- GIS based maps on online education

GIS and Spatial Analytics

5 GENDER EQUALITY

- GIS based gender mapping on access to financial institutions
- Gender equality and women empowerment through ICT

GIS and Spatial Analytics, and ICT

6 CLEAN WATER AND SANITATION

- Spatial location of water resource and distribution of water pollution
- Locations of points and non-points pollution source

Remote Sensing, GIS and Spatial Analytics, Sensors, and GNSS and Positioning

7 AFFORDABLE AND CLEAN ENERGY

- GIS based mapping for location of energy resources
- Use of drones for oil & gas pipeline monitoring
- Use of remote sensing in finding out optimum location for renewable energy

GIS, UAVs, Satellite

8 DECENT WORK AND ECONOMIC GROWTH

- Change in LULC Maps
- GIS based maps for mapping parking and other facilities for specially abled

Remote Sensing, and GIS and Spatial Analytics

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

- Earth observation for sustainable infrastructure development

Remote Sensing, GIS and Spatial Analytics, IoT, and AI/ML

10 REDUCED INEQUALITIES

- Night time lights data to map regional inequality
- Detecting spatial pattern of inequality from remote sensing

GIS and Spatial Analytics, and IoT

11 SUSTAINABLE CITIES AND COMMUNITIES

- Global mapping of LULC changes
- Smart City development

Remote Sensing, GIS and Spatial Analytics, UAVs/Drones, LiDAR, IoT, and AI/ML

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

- Determining air pollution through remote sensing across different industries

Remote Sensing, GIS and Spatial Analytics

13 CLIMATE ACTION

- Detection on a large-scale impact of climate (CFCs, hazards) on human lives

Remote Sensing, GIS and Spatial Analytics, AI/ML, and IoT

14 LIFE BELOW WATER

- Detection of ocean pollution (oil spills)
- Identification of potential fishing zones, ocean temperature

Remote Sensing, and GIS and Spatial Analytics

15 LIFE ON LAND

- Quantifying forest cover
- Deforestation and forest degradation
- Forest biomass

Remote Sensing, GIS and Spatial Analytics, and AI/ML

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

- GIS based temporal maps on homicide rate
- GIS based regional maps on completeness of birth registration

GIS and Spatial Analytics, IoT Sensors, and AI/ML

17 PARTNERSHIPS FOR THE GOALS

- Mapping government revenue as a share of GDP
- Mapping share of the population using internet

GIS and Spatial Analytics, and AI/ML

“...and enabling and enhancing technology innovation and advanced application”

....Collaboration and Partnership with Other Communities

Vehicle Navigation

General Aviation

Financial Transactions

Utilities

Precision Agriculture

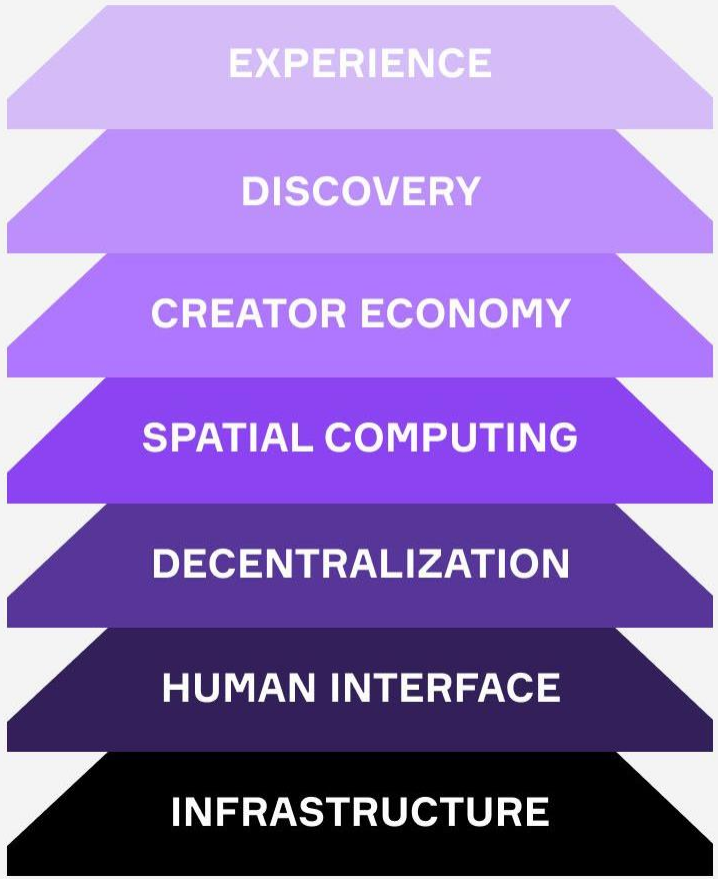
Surveying

Construction

Autonomous and Robotics

...And much more

Geospatial Key for Building the Metaverse



Games, Social, Esports, Theater, Shopping

Ad Netwoarks, Social Curation, Ratings, Stores, Agents

Design Tools, Asset Markets, Workflow, Commerce

3D Engines, VR/AR/XR, Multitasking UI, Geospatial Mapping

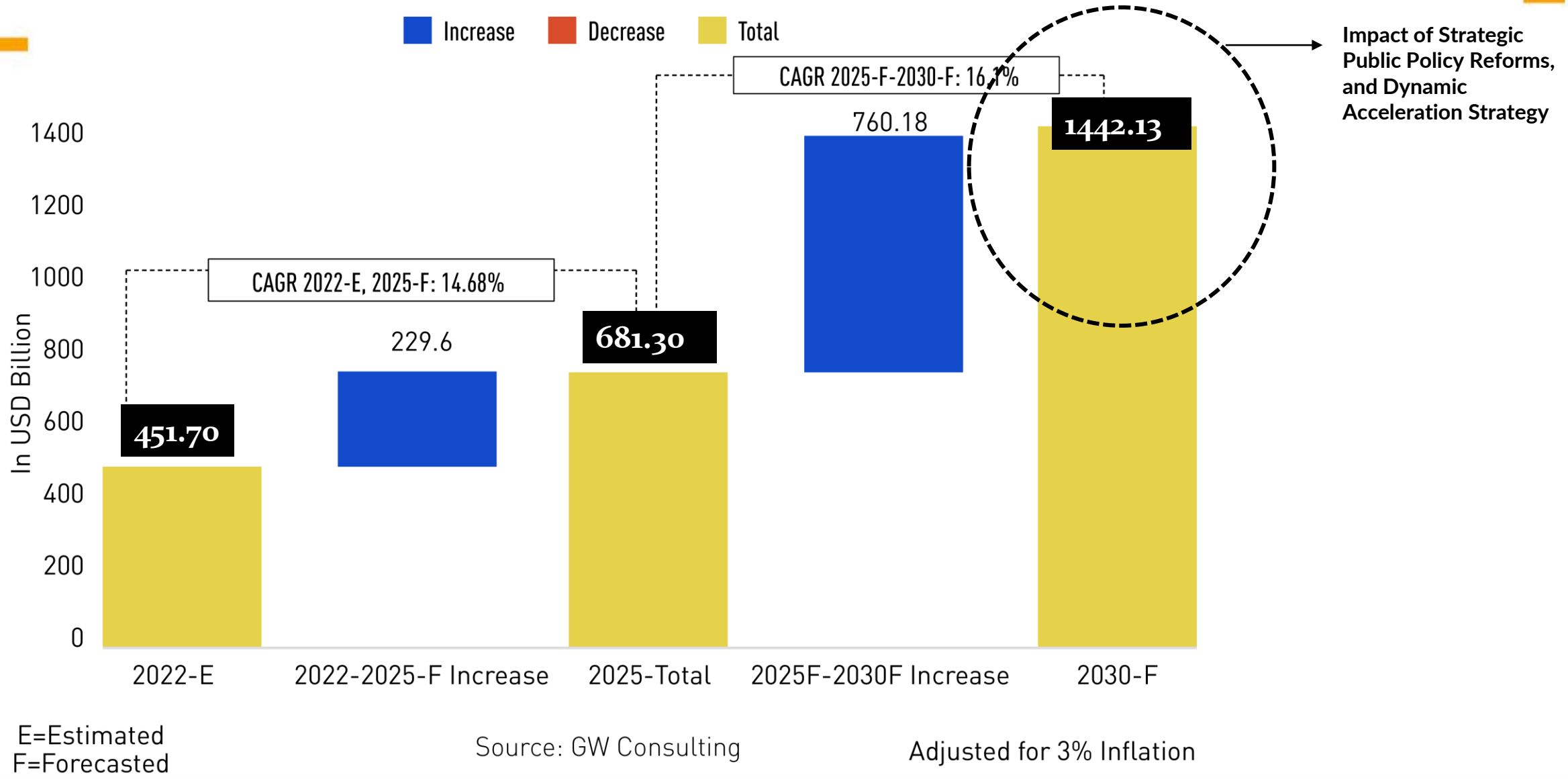
Edge Computing, AI Agents, Microservices, Bclockchain

Mobile, Smartglasses, Wearables, Haptic, Gestures, Voice, Neural

5G, WiFi 6, 6G, Cloud, 7nm to 1.4nm, MEMS, GPUs, Materials

Source: Building the Metaverse – Job Radoff

...towards the **NEXT BIG** opportunity



E=Estimated
F=Forecasted

Source: GW Consulting

Adjusted for 3% Inflation

“Geospatial data has moved from the realms of maps to knowledge – wherein citizens and customers require data and solutions which are more current, accurate, with on-demand accessibility and in application ready formats.

For countries to avail the next BIG OPPORTUNITY the role of dynamic and knowledge-based infrastructure is now more than critical”

Trends in Geospatial Infrastructure

Data

Knowledge

1st Generation

Data/Product Based

Linkages of existing and future database

Data producers (NMA) - focusing on data production, database creation and centralization

2nd Generation

Process Based

Creation of an Infrastructure to facilitate the management of info assets

Driven by data sharing and re-using data collected by wide range of agencies for a diversity of purpose

Changing geospatial landscape

- New geospatial data sources and services
- Technological advances
- (Digital Twin)
- More automation, analytics, and intelligence
- Changing user expectations
- Transforming Organizations vision and mission

Future Generation

Knowledge Based

Real-time generation and integration of data

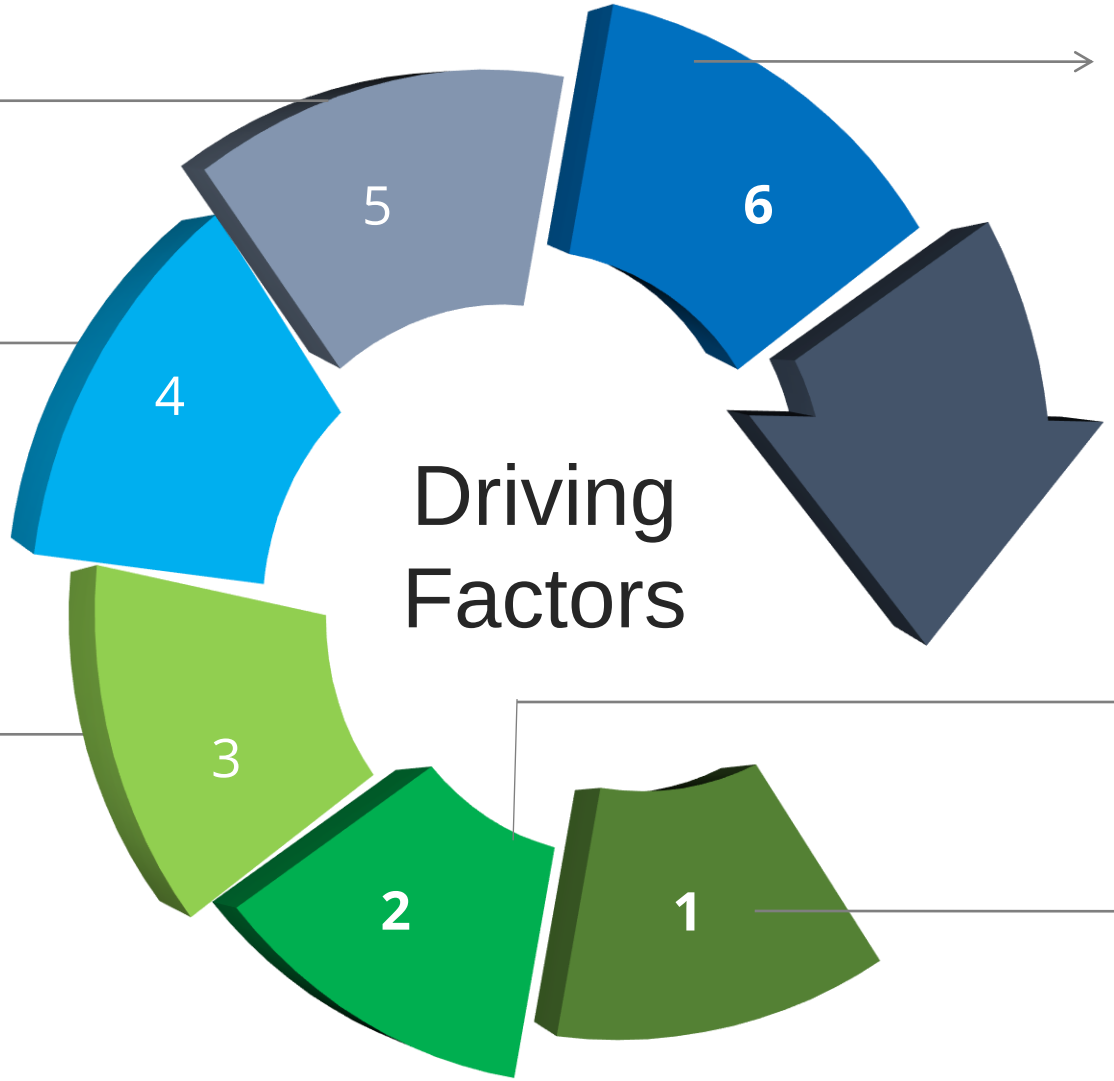
Integration of data from private (geospatial and other digital/data economy generated data), citizen and academia

Profound impact of Technology (Moving towards 4th Industrial Revolution and Way Forward

Role

National Government — **Private Sector**

Need for adapting a new concept



Changing Nature of Map (2D-3D to Digital Twins)

Technology Disruption (In data collection and processing)

Political (including geo-political), Social, and Legal Disruptions (New Directives, World Challenges)

Democratization of geospatial data use by society and government bodies

Transition towards sophisticated analysis and applications

Effective need for integration of geospatial data across all parts of public administration and proactive partnership with others in government.

Source: Geospatial World Analysis; Eurogeographics document

The “Evolving” Role of National Geospatial Agencies

Leadership

To champion the use of geospatial data effectively and proactively for national priorities of the country

Facilitation

Embrace new sources of data, provide ”fit for purpose” datasets based on FAIR principles for all users

Strengthen Geospatial Infrastructure

- Data Infrastructure
- Resilient Positioning Infrastructure
- Geospatial Knowledge Platforms and Services (Cloud and AI-driven)
- Establish Geospatial Standards and Interoperability Frameworks

Build, Facilitate and Support Enabling Geospatial Regulatory Frameworks

Enable Inter-and Intra Government Collaborations for Enabling Use of Data for Larger Public Good

Enable and Encourage Public-Private Partnership

- Geospatial Knowledge Co-Creation
- Citizens Partnership

…Towards making use of technology more efficient and more effective

Source: Geospatial Industry Advancing Sustainable Development Goals, Geospatial World Analysis; Eurogeographics document

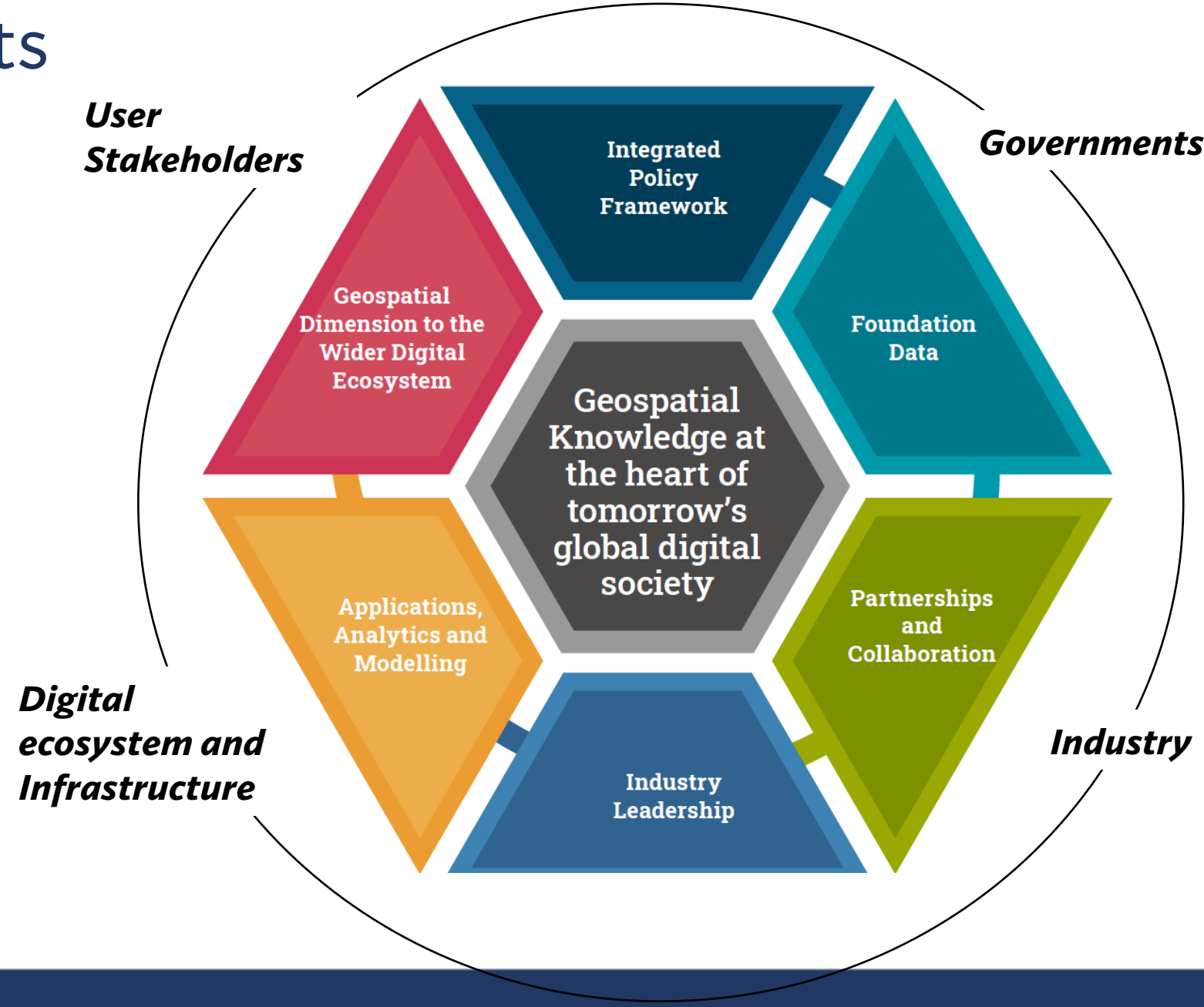
Geospatial Knowledge Infrastructure provides a blueprint to integrate digital economies, societies and citizens with geospatial approaches, data and technologies and in so doing deliver the location-based knowledge, services and automation expected in the 4IR age.

Defined

Geospatial Knowledge Infrastructure (GKI)

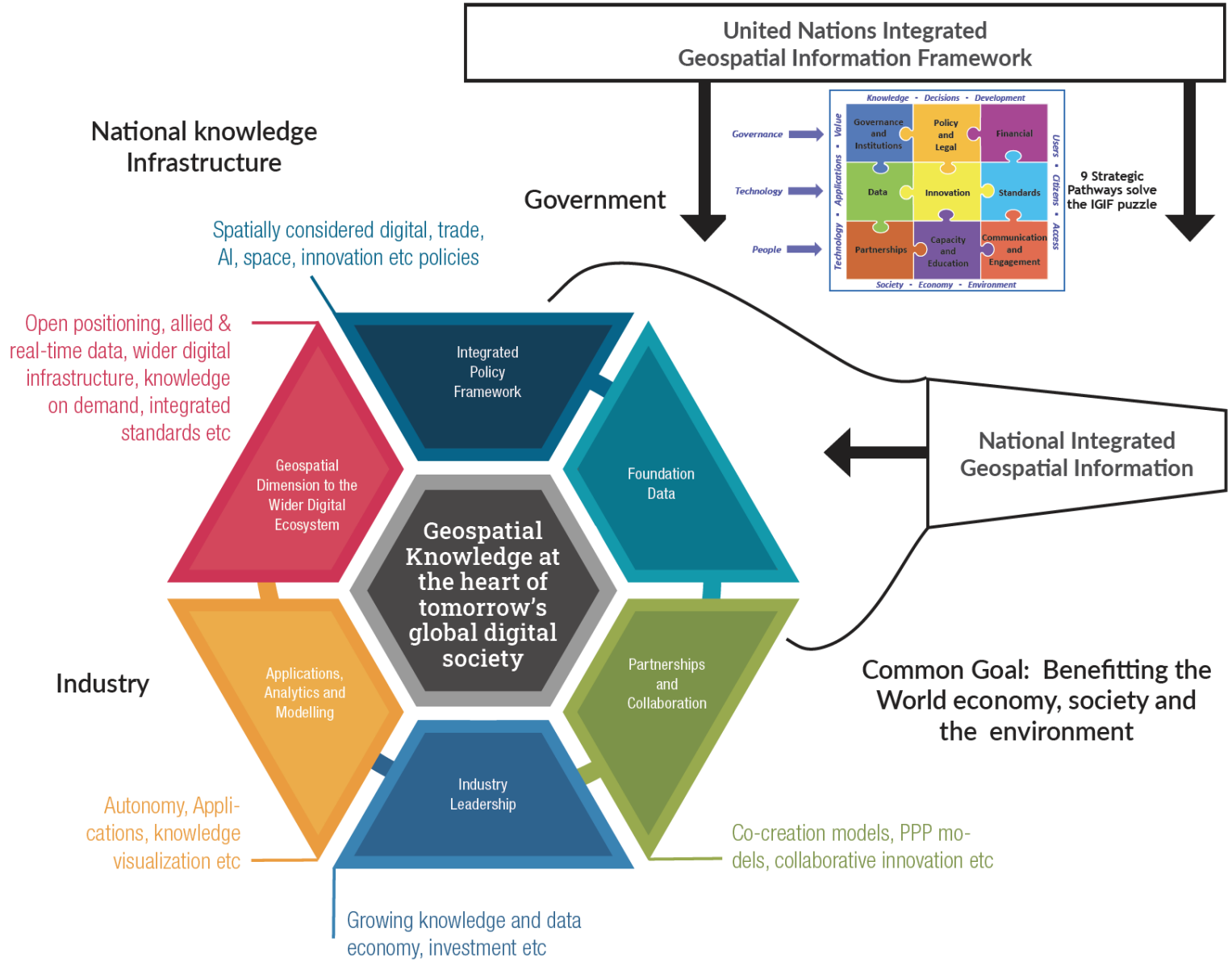
GKI – Key Elements

- GKI integrates a system of systems in which geospatial, complex though it is, is regarded as part of the wider digital ecosystem.
- The six elements contribute to improved national outcomes, both individually and collaboratively



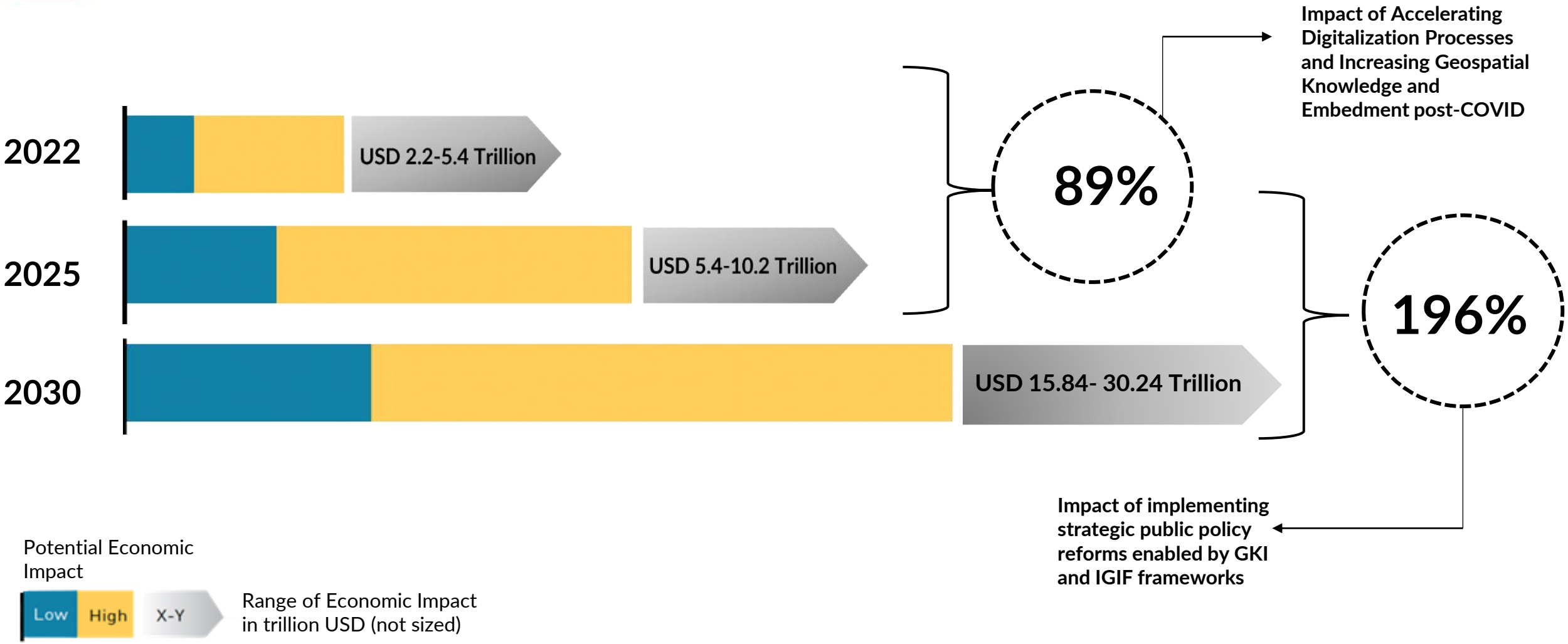
GKI and UN-IGIF

IGIF as a "framework" (not infrastructure) recognizes, complements and supports the implementation of NSDIs and other geospatial infrastructures such as the GKI. The IGIF supports national governments implementation of geospatial information management. This is one vital element of GKI, which is more broadly concerned with location as part of the wider digital, or knowledge, infrastructure across government and industry.)



“GKI is the hook into the wider digital infrastructure, and it aims to develop a knowledge-based geospatial infrastructure ecosystem which will be critical for a country's strategic readiness, and for its national development”

Direct Economic Impact of Geospatial Technologies on World Economy in 2022, 2025, and 2030



Knowledge Resources

Geospatial Knowledge Infrastructure –
...at the heart of tomorrow's society and economy

- **GKI Project**: https://www.geospatialworld.net/consulting/gki-campaign.html
- **GKI White Paper**: https://geospatialmedia.net/pdf/GKI-White-Paper.pdf
- **UN GGIM Future Trends**: https://ggim.un.org/meetings/GGIM-committee/10th-Session/documents/Future_Trends_Report_THIRD_EDITION_digital_accessible.pdf

Thank you!

Contact -

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