

Presented at the FIG Working Week 2025,
6-10 April 2025 in Brisbane, Australia

GIS and the Geospatial Ecosystem:

Creating the World You Want to See

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Our World Is Evolving Rapidly

Driven by Many Innovations



Geospatial Ecosystem

Enabling a level of exploration and problem-solving we could only once imagine

Geospatial

geo·spa·tial

jē-ō-'spā-shəl

adjective

Consisting of, derived from, or relating to data that is directly linked to specific geographic locations



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G S I

I D A R

A digital globe with glowing network lines and city lights. The globe is composed of a mesh of blue and white lines, with bright orange and yellow lights representing city lights or data points. The background is a dark, starry space with a subtle purple and blue gradient.

*“CHANGE IS THE ONLY
CONSTANT IN LIFE.”*

Heraclitus

Surveying

UAV – 1849 Balloons

early to mid-1900s RC craft

GIS – 1854 Dr. Ben Snow

Ancient Times -1960

1878 – FIG Founded

1910 – ISPRS Founded

Pos/Meas – Optical & Mechanical

Surveying

GIS – Roger Tomlinson

1960 - 1970

1960s – Computers Advance

Pos/Meas – GPS in Infancy



Surveying

Pos/EO – 1972 1st Landsat Satellite Launched

1970 - 1980

Pos/Meas – 1978 1st GPS satellite launched

Computing 1970s – continued advancement



Surveying

GIS – 1981 First GIS user conference

Pos/Meas – 1983 GPS Available; Scrambled

1980 - 1990

1985 – First in-car (digital) navigation emerges

Computing – 1989 World Wide Web



Surveying – Instrumentation is evolving

Computing – 1990s Workstations and data storage; websites for public use

1990 - 2000

Pos/Meas – 1998 First terrestrial Lidar

1999 – First GIS day



Surveying

UAV – FAA debate UAV use

Pos/Meas – 2000 U.S. government stops scrambling GPS

GIS – 2001 One million GIS users

2004 – Web 2.0

2000 - 2010

2005 – Google Maps emerges

2006 – Cloud computing – AWS released

2007 – iPhone introduced

2009 – Uber founded



Disruption

dis·rup·tion

dis'rəpSH(ə)n/

noun

noun: **disruption**; plural noun: **disruptions**

radical change to an existing industry or market due to innovation



Surveying

GIS – 2018 AI & GIS come together = GeoAI

Pos/Meas – 2010s Other GNSS systems maturing

2020s – Communication and IT infrastructure mature

2010 - 2020

UAV – 2016 FAA Part 107

GIS – 2020 GIS supports Covid-19 response

Pos/Meas – 2010s Machine control emerging



Surveying

GIS – Big data and big data analytics

Pos/Meas – Widespread spatial data collection; IoT

2020 - NOW

UAV – 2020s Accelerated adoption

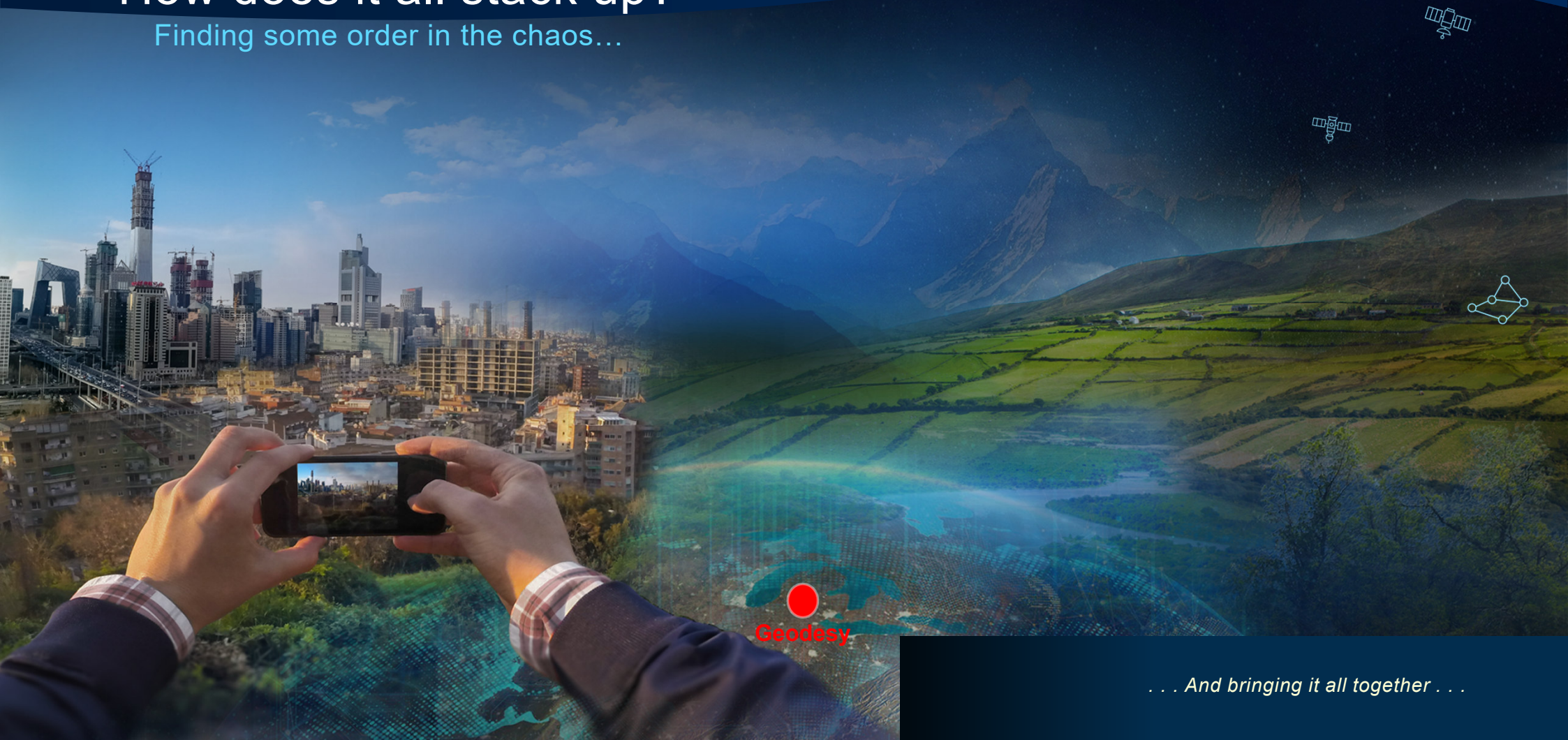
2020s – Generative AI emerges

Pos/Meas – 2020s Spatial reference system modernization



How does it all stack up?

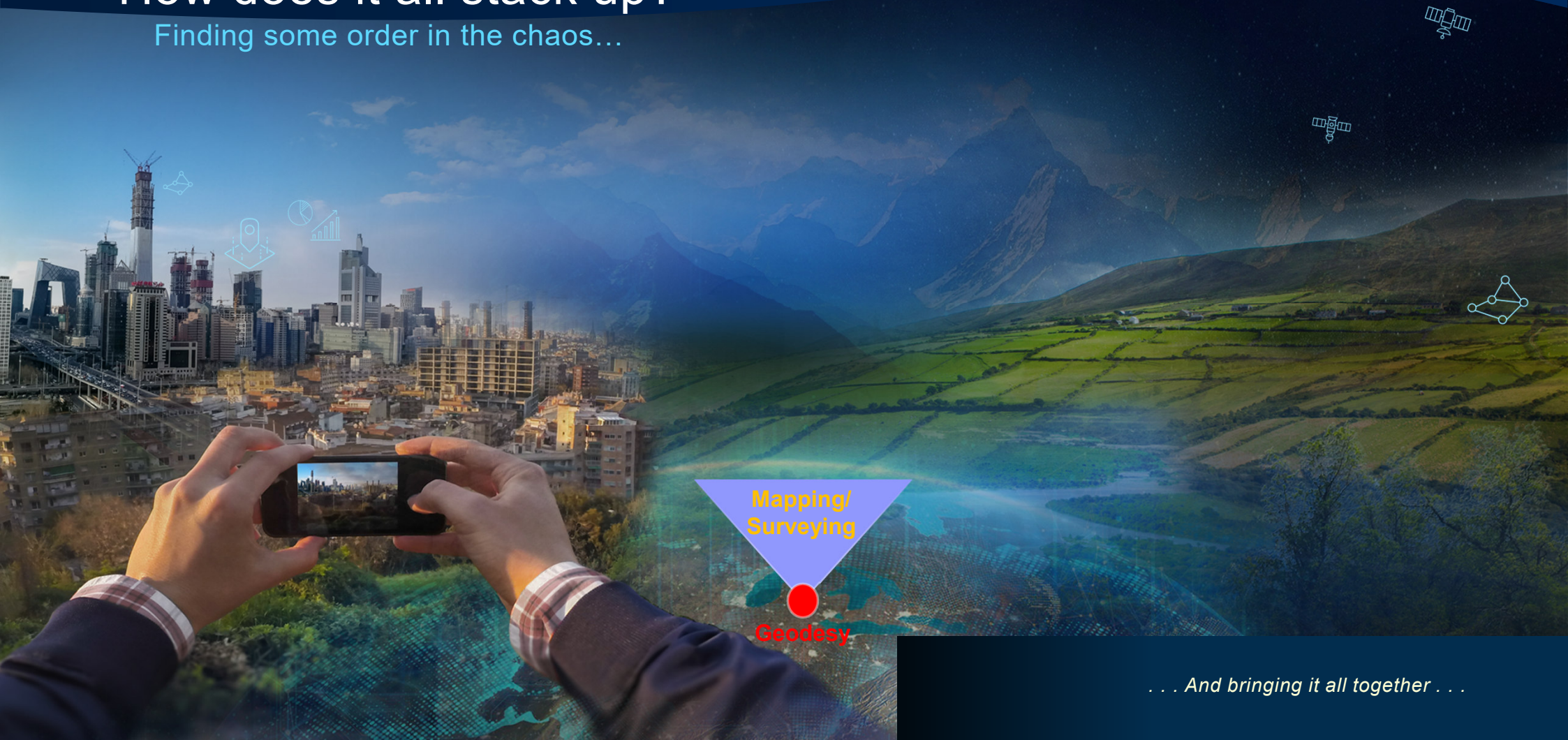
Finding some order in the chaos...



. . . And bringing it all together . . .

How does it all stack up?

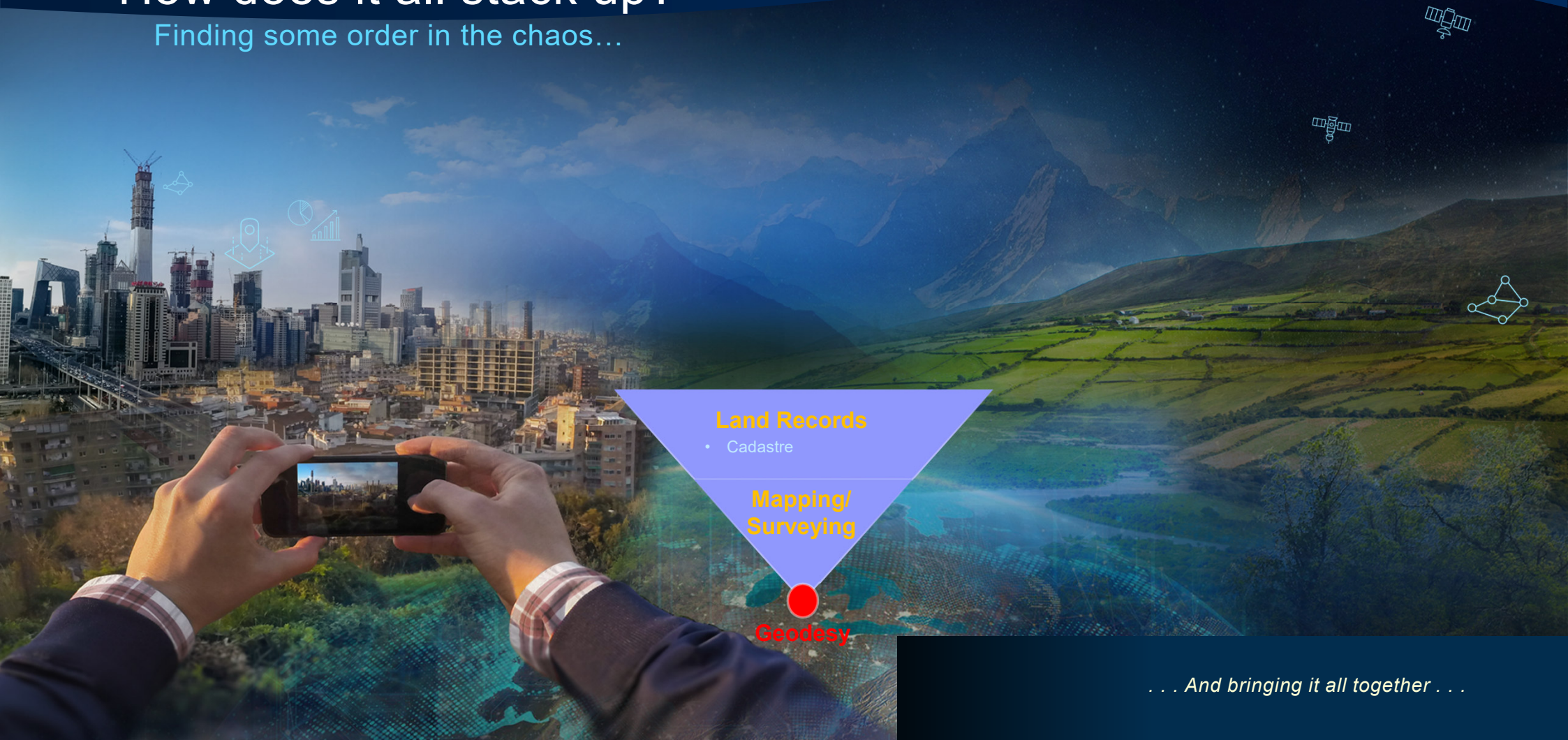
Finding some order in the chaos...



... And bringing it all together ...

How does it all stack up?

Finding some order in the chaos...



. . . And bringing it all together . . .

How does it all stack up?

Finding some order in the chaos...

Land Administration

- Urban Planning
- Valuation & Taxation

Land Records

- Cadastre

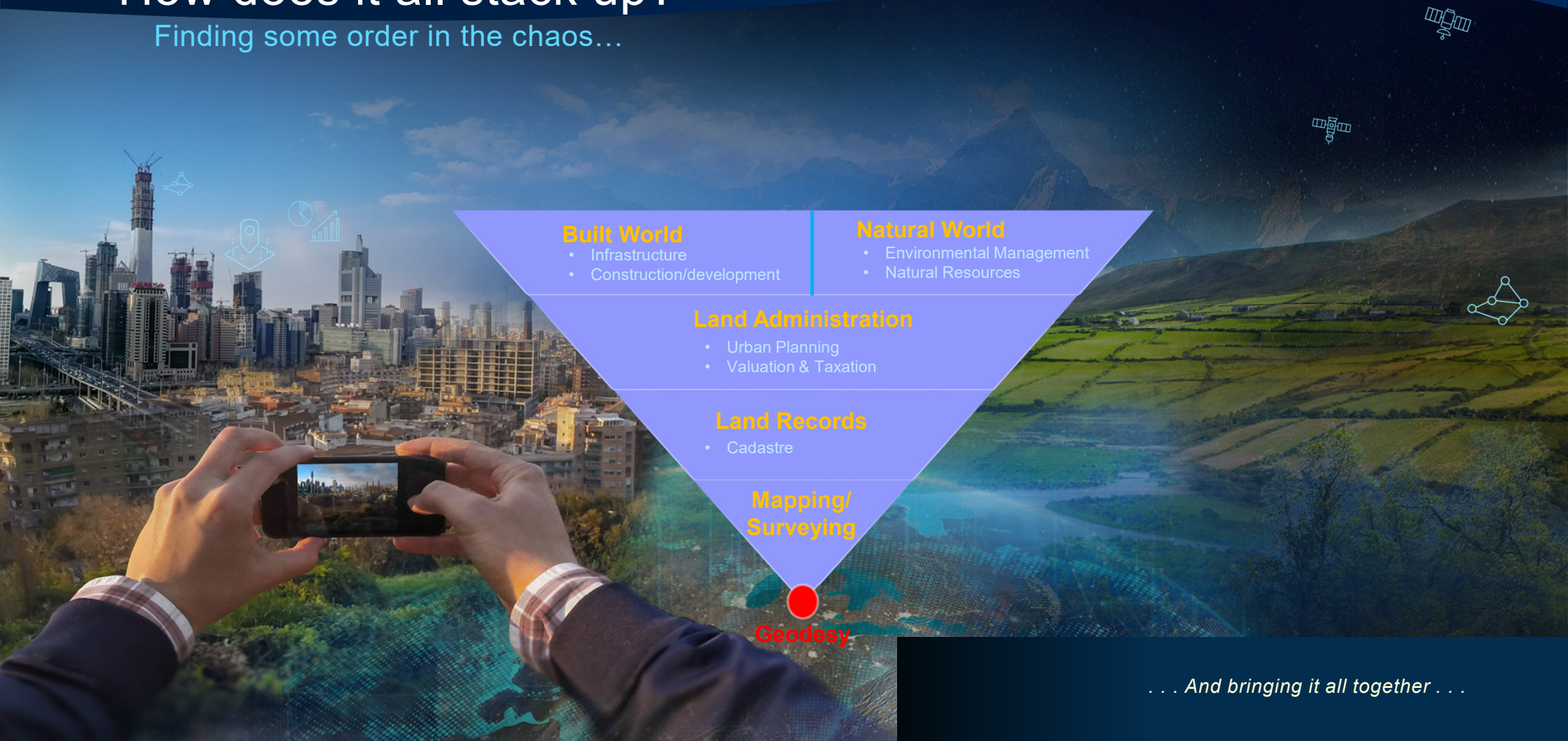
Mapping/ Surveying

Geodesy

... And bringing it all together ...

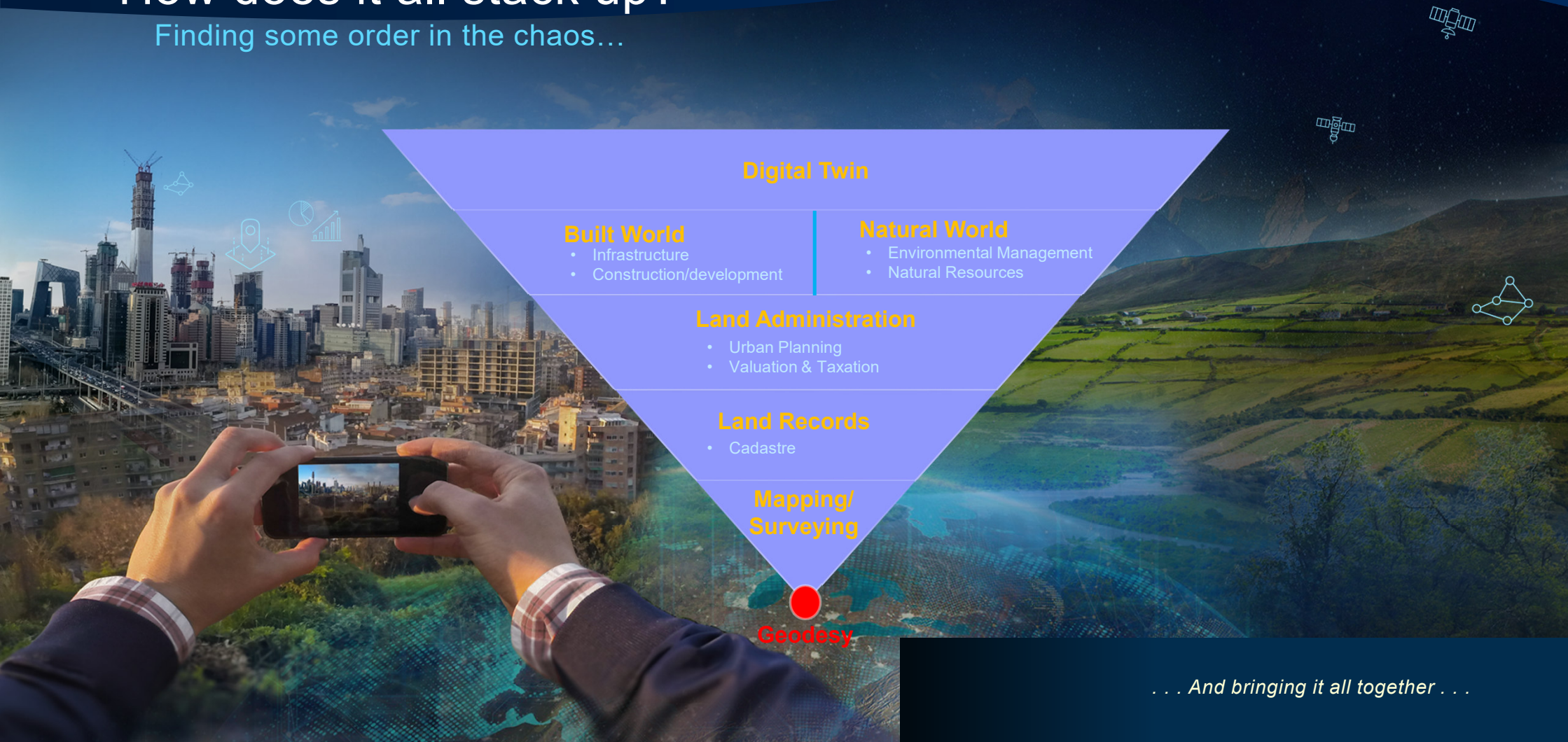
How does it all stack up?

Finding some order in the chaos...



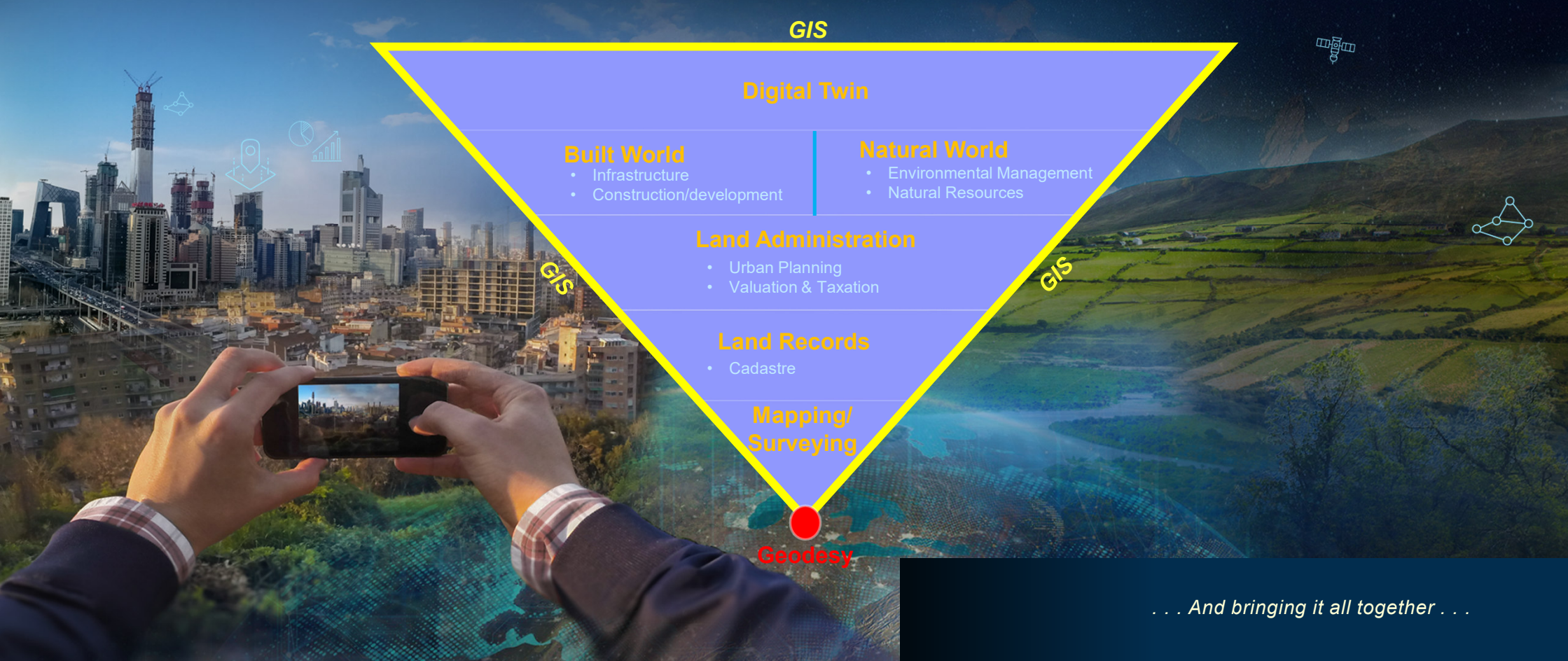
How does it all stack up?

Finding some order in the chaos...



How does it all stack up?

Finding some order in the chaos...



... And bringing it all together ...

A Closer Look at FIG Commissions

Comm 1 – Prof Stds

COMMISSION 3

COMMISSION 4

COMMISSION 10
COMMISSION 6

COMMISSION 8

COMMISSION 9

COMM 7

COMMISSION 5

Geodesy

Comm 2 – Education



GEOGRAPHY

The Science of Our World

Helps Organize **Everything** We Know

Seeing the World . . .
as an Interconnected Ecosystem



What

When

Where

The logo consists of the letters 'GIS' in a bold, white, sans-serif font. The letters are contained within a horizontal rectangular bar that has a light blue gradient, transitioning from a slightly darker blue on the left to a lighter blue on the right. The background of the entire slide is a deep blue with abstract, glowing network-like patterns of dots and lines in the upper corners, and large, soft, out-of-focus circular shapes in shades of blue and white.

Expands the Language of Geography

Making Everything We Know . . .
. . . Available to Everyone

Integrating Geographic Knowledge
into Everything We Do

Creating a Revolution in Understanding Everything

GIS

and The Geographic Approach

Provide the Framework . . .
. . . and Process

Integrating All the Factors . . .

Creating Understanding . . .

Finding Solutions . . .

. . . and Improving Collaboration



Data
Collection

Visualization &
Mapping

Analysis &
Modeling

Planning &
Geodesign

Decision-
Making

Action

MAPS

The Language of Geography

Communicating ... Content and Context

Providing Clarity ... and Valuable Insights

Making the Complexity
of Our World More Understandable



Maps

Reveal Patterns, Relationships and Systems

. . . Helping Us Think Differently





Our World is Evolving Rapidly

Driven by Accelerating Change

Transformation

trans·for·ma·tion

tran(t)sfər'māSH(ə)n/

noun

noun: **transformation**; plural noun: **transformations**

a thorough or dramatic change in form or appearance





Accelerating Change

Environment and Planet

Accelerating Change

Accelerating Change

Technology and Innovation


Accelerating Change

OUR WORK

Leveraging Technology
Embracing Innovation and Disruption

Ever
Changing





To Achieve a Sustainable and Resilient World

... We Must Leverage Technology and Innovation

Creating Geospatial Infrastructure ... GIS for the World

A Key Consideration is **Data Sustainability**

Collect Once, Use Many Times

Our Systems are Only as Robust and Reliable
As Our Best Information

... **Metadata** and good **Data Governance**

Key to Solving Problems and
Ensuring Long-Term Sustainability and Resilience

Our Future-

BUILDING THE NEXT GENERATION





GIS and the Geospatial Ecosystem:

Creating the World You Want to See

Linda Foster, PLS, GISP