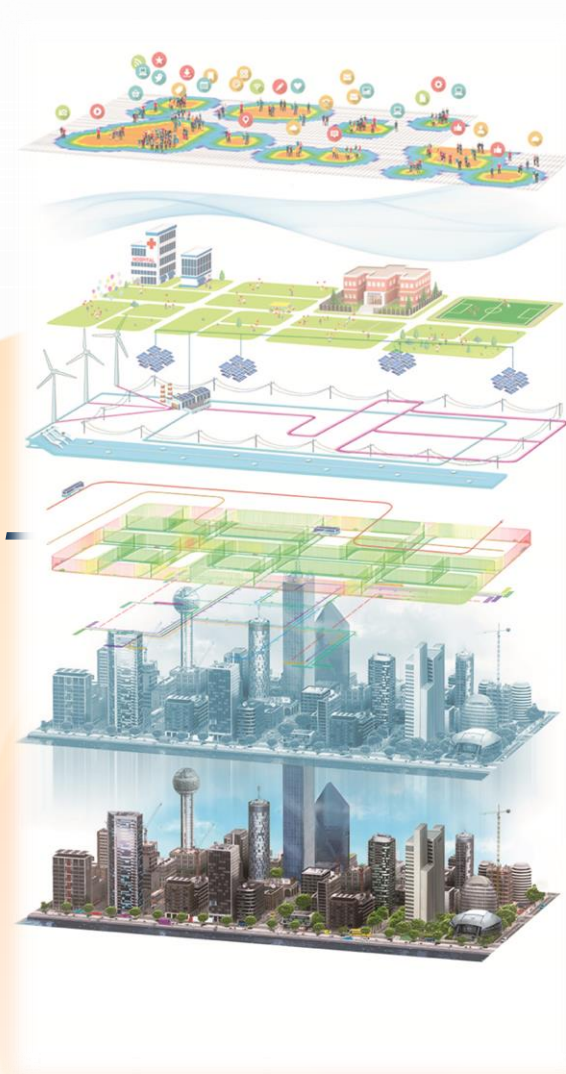# Land Intelligence – a Vision to Empower National Economy:

Emerging Opportunities with Digital Twin-based Cadastre for Smart Cities

Advancing Land Administration Systems with Innovation

Professor Abbas Rajabifard

Director, Centre for Spatial Data Infrastructures and Land Administration (CSDILA)
Associate Dean, Sustainability, Faculty of Engineering and IT
Discipline Leader, Geomatics, Department of Infrastructure Engineering
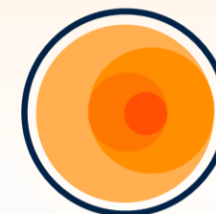
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THE UNIVERSITY OF
MELBOURNE

Key Drivers

- Population Growth & Increasing *Complexity*;
- Land **Administration System** Modernization agenda;
- Emerging Markets, Global Trade, *Safety* and *Supply Chain*;

..climate change, digital disruption, economic downturn and burgeoning populations are all **Sustainability-related Challenges** *that we are positioned to make foundational and creative contributions towards.*

Access to Land for Climate Action

- IoT, GeoAI, AR, LLM, making sense of smart data, smart utilities, 3D, 4D,*..nD data*…
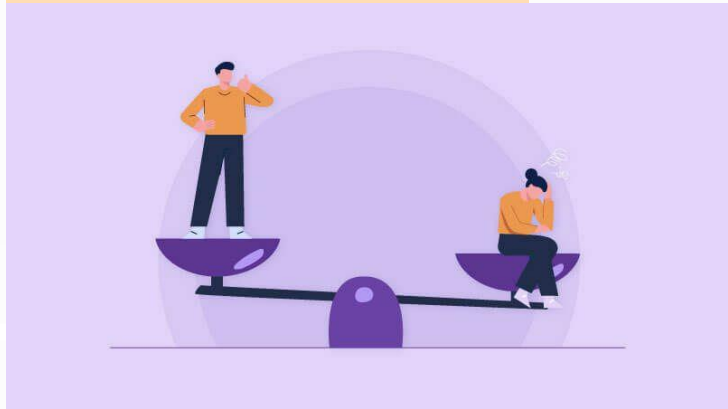
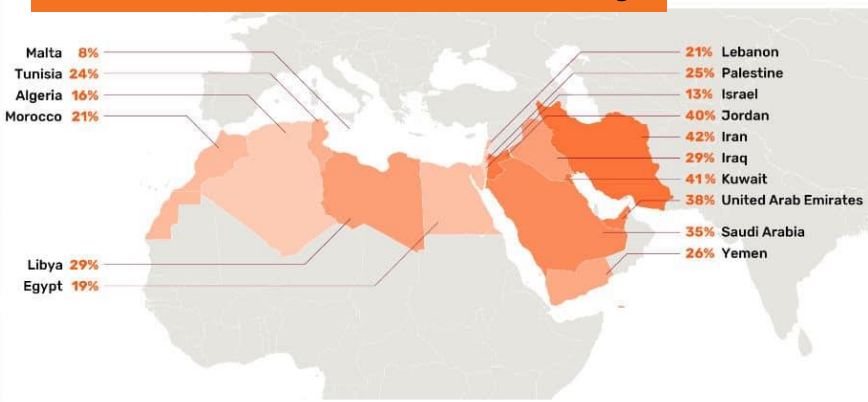# Global Challenges & Land Administration

Climate Change

Urbanization

Land Degradation

Gender Inequality

Land Tenure Insecurity

Malta 8%
Tunisia 24%
Algeria 16%
Morocco 21%
Libya 29%
Egypt 19%

21% Lebanon
25% Palestine
13% Israel
40% Jordan
42% Iran
29% Iraq
41% Kuwait
38% United Arab Emirates
35% Saudi Arabia
26% Yemen

Land Use Conflicts

Photo Source: www.paanluelwel.wordpress.com
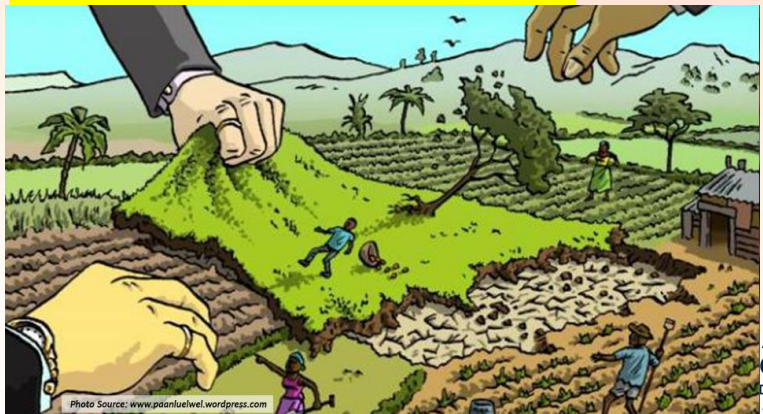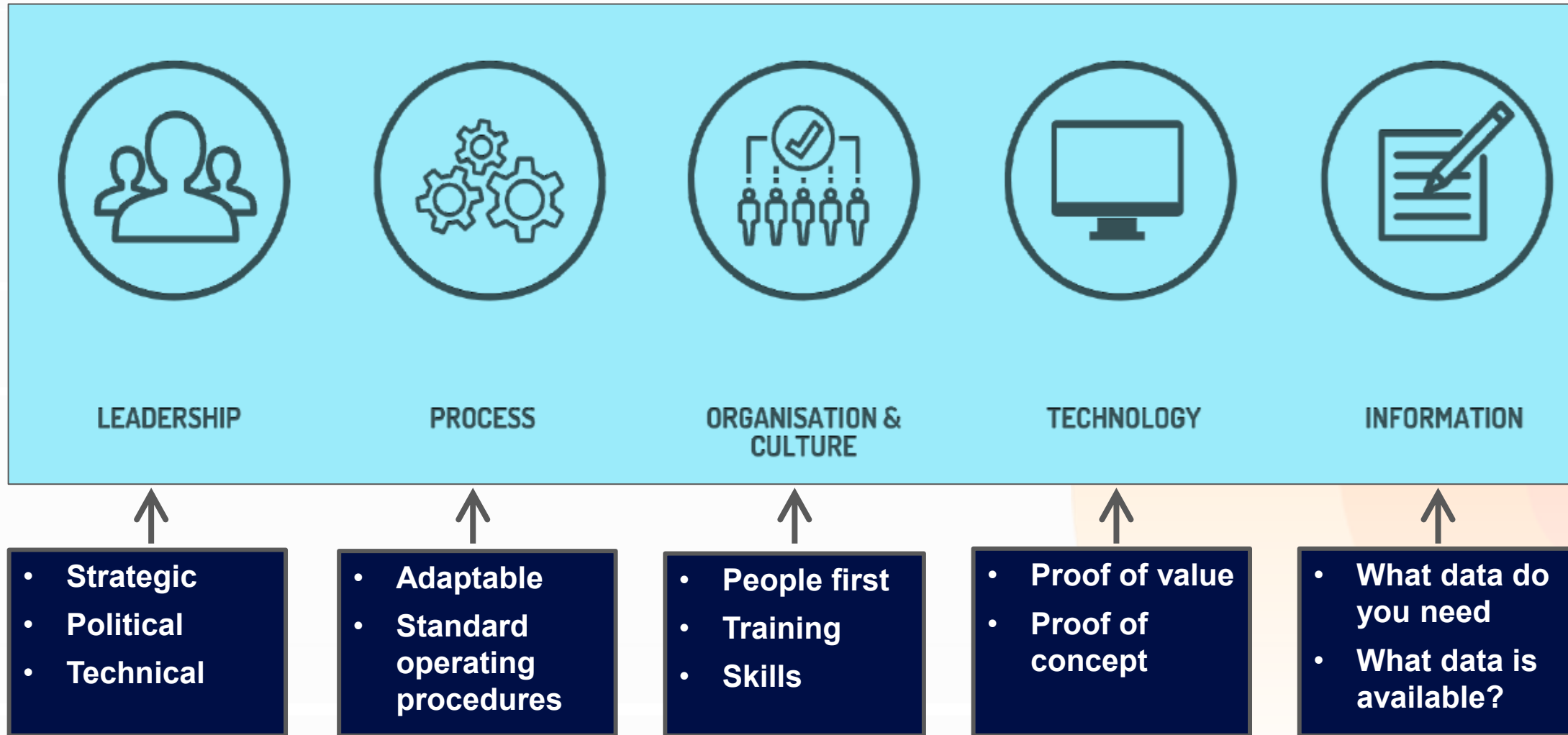
Our Shared Future

- ✓ **Land Information** and **Geospatial data** are **critical infrastructure.**

- ✓ **National resilience depends** on **land and geospatial trust**.

- ✓ We face a choice:

  - ✓ Collaborate now to elevate land intelligence.

  - ✓ Or allow poor-quality data to undermine national systems, resilience and disaster preparedness.
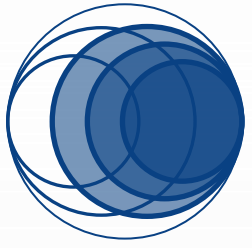
- ✓ The time to act is now.

The Role of Digitalization in Climate Resilience: Transforming Local Responses to Climate Change

Abbas Rajabifard
Director of Smart and Sustainable Development
Melbourne School of Engineering
The University of Melbourne

https://csdila.unimelb.edu.au

Making the strategic case for treating:
Land Information and Geospatial Data as critical National Infrastructure, essential to building Resilient, Sustainable, and Inclusive Communities in the face of climate risks, technological disruption, and economic uncertainty.

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Key Drivers for Digital Strategy

LEADERSHIP
- Strategic
- Political
- Technical

PROCESS
- Adaptable
- Standard operating procedures

ORGANISATION & CULTURE
- People first
- Training
- Skills

TECHNOLOGY
- Proof of value
- Proof of concept

INFORMATION
- What data do you need
- What data is available?

Tempo Institute, (2023).

Land Intelligence…

Access to Land for Efficient Planning, Climate Action and Infrastructure is critical.

Aim

In support of **National Vision and Mission**, **the Land Intelligence** will aim to support and ensure organisations have **access to trusted, accurate, usable and fit-for-purpose land data and geospatial information** so they can **sustainably** manage human-kind relationship to land and climate resilience **in the face of existing and emerging environmental, economic and societal challenges.**

The **Land Intelligence** will **drive the advances in governance, policy, capacity building, innovation, and end-to-end land administration modernisation and geospatial processes** to achieve improved climate resilience and sustainable land management across scales in line with **UN-IGIF** and **SDGs**.

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Interconnected Future for All
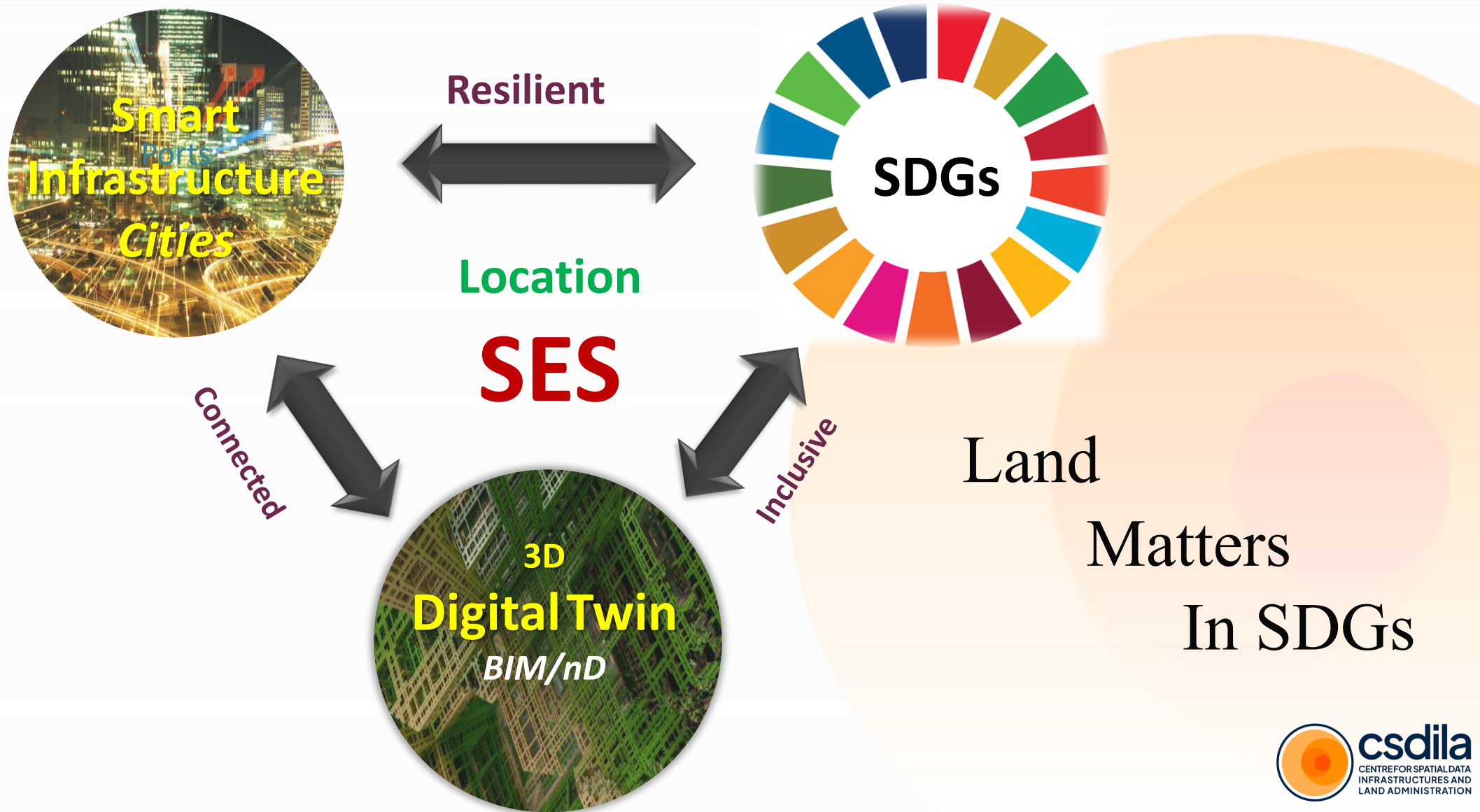
Cities are Complex and Dynamic

- Cities are our safety valves, the engine rooms of our economies;

- Advances in ICT are driving significant social changes;

- Enhancing the way people interact, move around and connect in cities requires leadership, and new skills;

- Technology can help address the impacts of climate change, and foster urban resilience, sustainability, and delivery of data infrastructures;

- ICT, data analytics and digitalization can advance sustainable urban development.

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Land Administration Systems are the basis for recording the complex range of **Rights, Restrictions, and Responsibilities** (*RRRs*) related to **People, Policies, and Places.**

People

Policy

RRRs

Place

Land Administration Systems

- **Land Use**
- **Land Tenure**
- **Land Valuation**
- **Land Development**

The Opportunity:
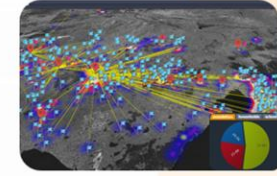# Land and Geospatial Data as a <u>Transformative Asset</u>

Adoption and Integration with Emerging Technologies:

GeoAI

Cloud & Edge Computing

Real-time Analytics & Decision Making

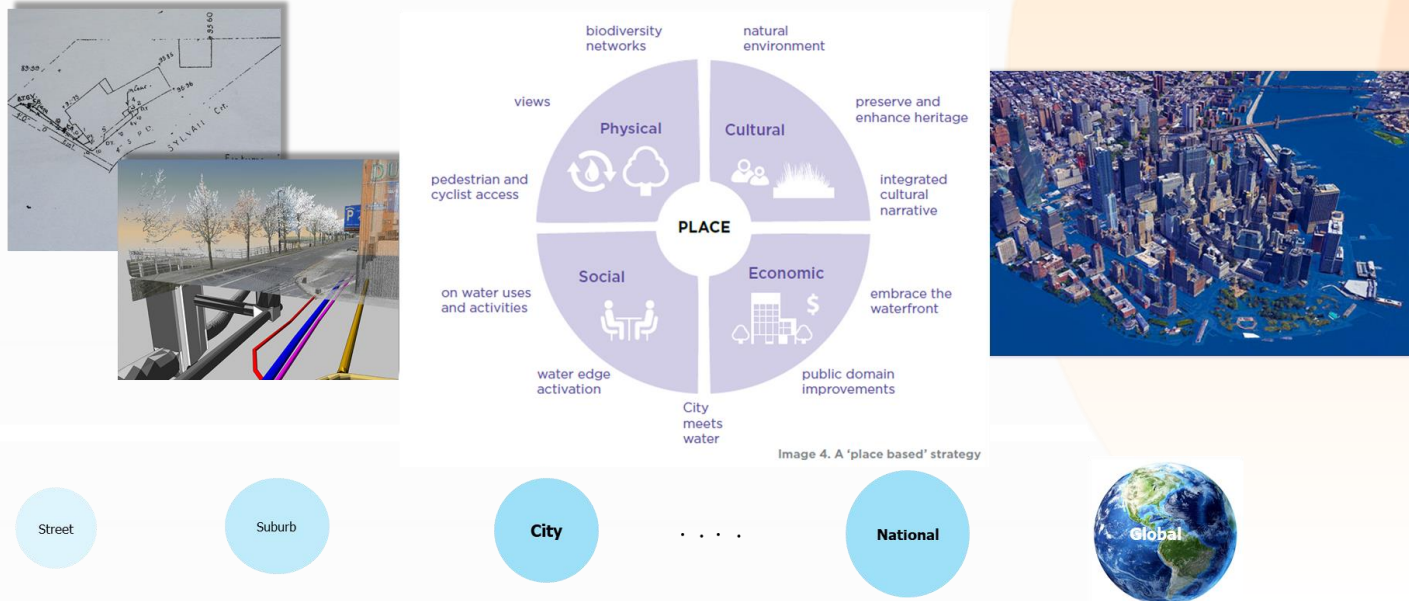Advanced visualization with VR, AR and MR

✓ **Handled properly, land and geospatial data can:**

  ✓ Unlock coverage for uninsurable homes via improved flood risk data.

  ✓ Enable site selection and design for climate-smart, circular construction.

  ✓ Build smarter, adaptive cities and infrastructure.

  ✓ Catalyze industries in AI, sensing, data fusion, and analytics.

Land Information is not just critical — *it is Transformative*.

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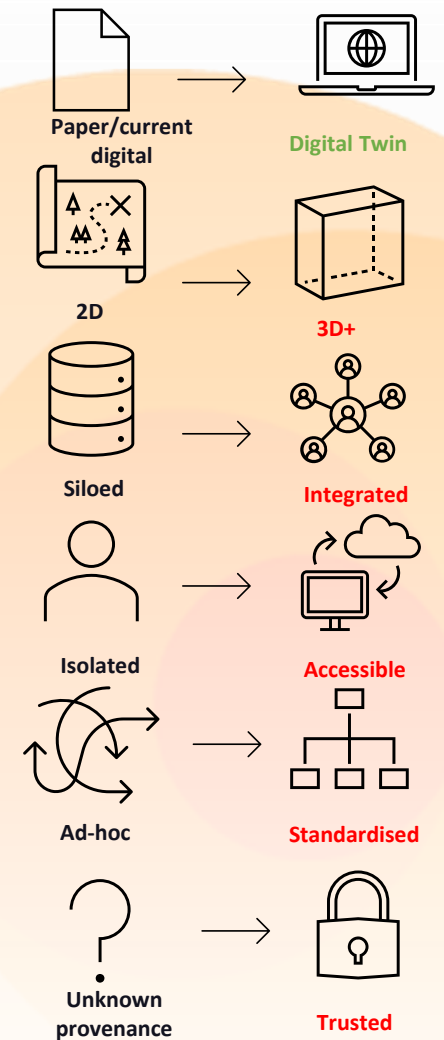CENTRE FOR SPATIAL DATA INFRASTRUCTURES AND LAND ADMINISTRATION

Understanding Barriers

✓ One reason for the limitations in addressing the interdisciplinary challenge of sustainability is the **lack of an ecosystem of open, harmonised and interoperable information models and datasets across land, built environment and natural environments**.

✓ We don't need to just build the technology anymore – much of it is already here.

✓ We need to develop capacity and apply our knowledge to enable trust, fairness, quality, and market growth in geospatial innovations

To achieve sustainability, we need to remove **barriers to integrating and analysing land data from multiple disciplines** and enable access to data that can directly inform decisions. This can reduce costs, increase productivity and help plan climate change mitigation and adaptation.

biodiversity networks

natural environment

views

Physical

Cultural

preserve and enhance heritage

pedestrian and cyclist access

integrated cultural narrative

PLACE

Social

Economic

embrace the waterfront

on water uses and activities

water edge activation

public domain improvements

City meets water

Image 4. A 'place based' strategy

Street   Suburb   **City**   . . . .   **National**   Global

Complexity

- ✓ We've come a long way:
  - ✓ Cloud accessible, open distributed systems are readily available
  - ✓ Standards are facilitating integration and interoperable solutions in many domains
  - ✓ Coupled with Machine Learning (ML) and AI provide there is real potential to address some of the grand sustainability challenged

- ✓ But now, **lack of:**
  - ✓ Regulation - mandating sustainable outcomes
  - ✓ Skills – to work with diverse stakeholders to implement trusted complex solutions
  - ✓ Quality Assurance - geospatial expertise ensuring AI and GEOAI produce quality spatial outputs
  - ✓ Trust & Social License – <u>starting</u> with communities to ensure technology enables rather that alienates

- ✓ Means **we still have a complex challenge.**

Paper/current digital

Digital Twin

2D

3D+

Siloed

Integrated

Isolated

Accessible

Ad-hoc

Standardised

Unknown provenance

Trusted

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Emerging Trends in land and Geospatial Innovation

Integration of AI/ML in location/geospatial analysis (GeoAI)

Next Generation Land & Geospatial Intelligence *Solutions Through **Collaboration** and **Leadership***

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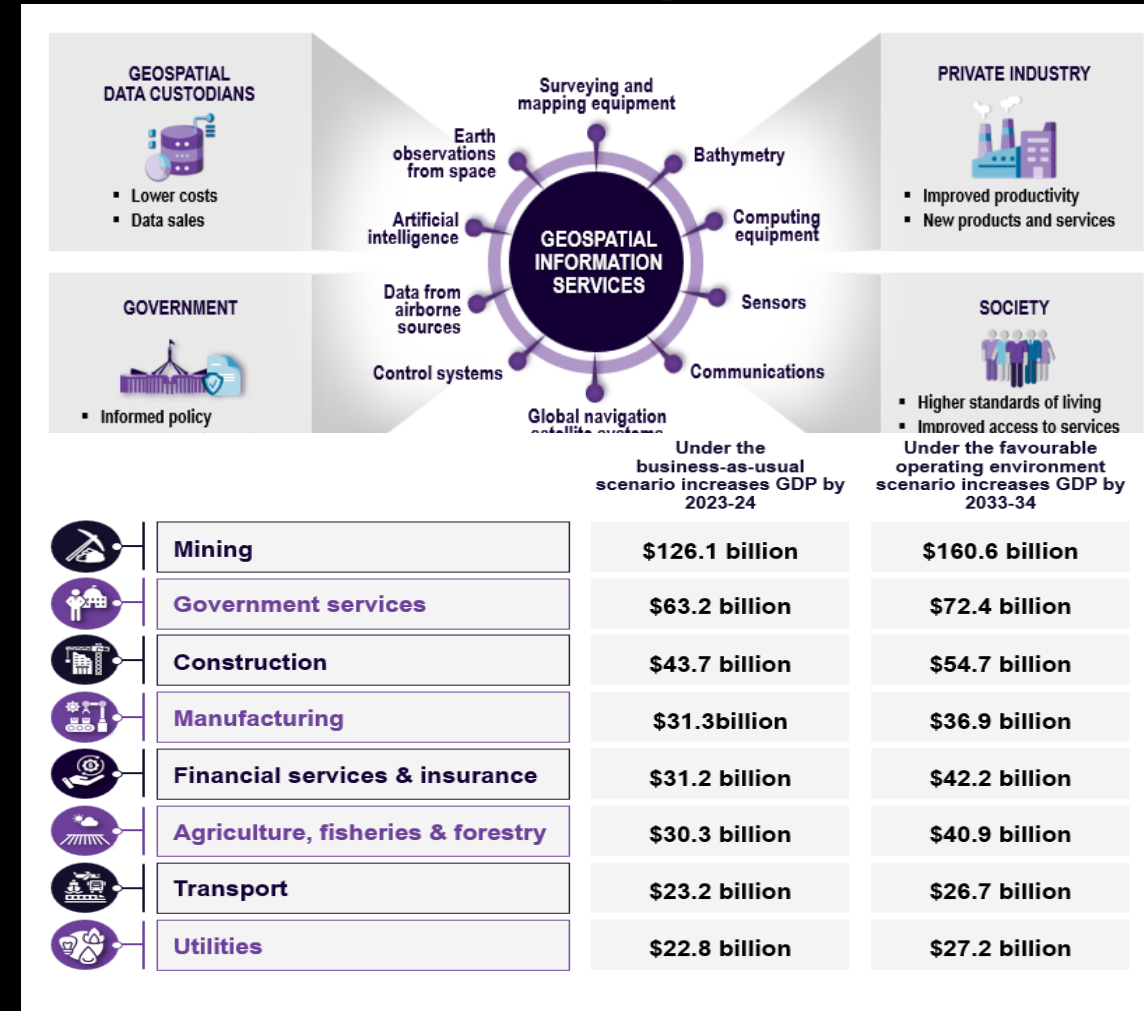CENTRE FOR SPATIAL DATA
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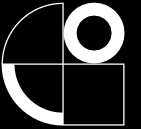
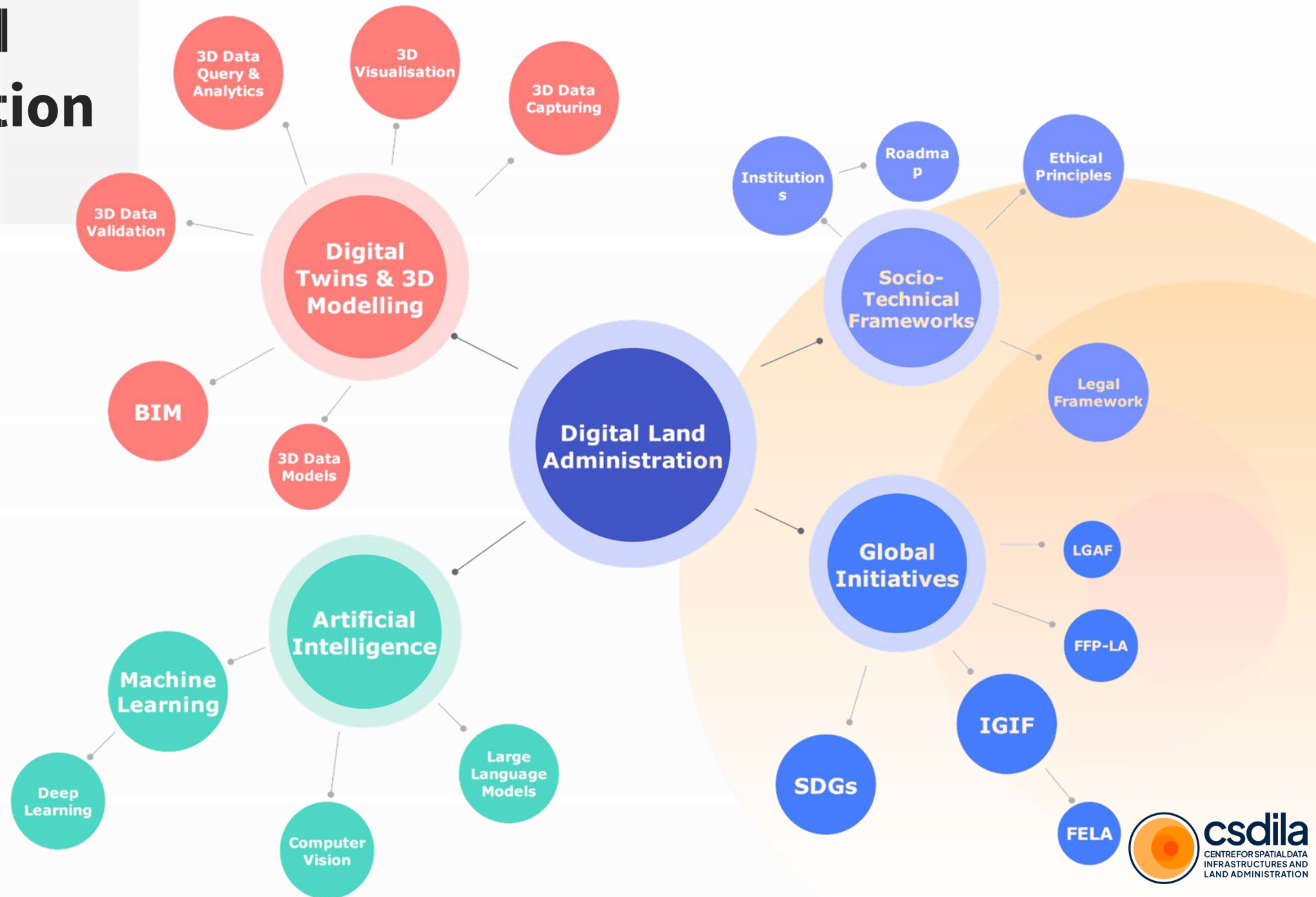# Land and Geospatial capability powers Australia... and has the potential to add a further $689B in economic impact!

- **Critical to the economy** - cuts across government, industry, society
- **Enables strategic policy** — climate, housing, services, security
- **Powers industry** — mining, construction, finance, agri, transport
- **Presently adds $38.6B to the Australian economy**
- Will add a further $689B in economic output if a 'favorable operating environment' is created...

Government fully utilizing its sovereign Geospatial via Geospatial asset will help fuel productivity

$689B

	Under the business-as-usual scenario increases GDP by 2023-24	Under the favourable operating environment scenario increases GDP by 2033-34
Mining	$126.1 billion	$160.6 billion
Government services	$63.2 billion	$72.4 billion
Construction	$43.7 billion	$54.7 billion
Manufacturing	$31.3billion	$36.9 billion
Financial services & insurance	$31.2 billion	$42.2 billion
Agriculture, fisheries & forestry	$30.3 billion	$40.9 billion
Transport	$23.2 billion	$26.7 billion
Utilities	$22.8 billion	$27.2 billion

Geospatial Council of Australia/ACIL ALLEN 2024 modelling over next 10 years

Digital Land Administration Systems

Digital Twins & 3D Modelling
- 3D Data Query & Analytics
- 3D Visualisation
- 3D Data Capturing
- 3D Data Validation
- BIM
- 3D Data Models

Digital Land Administration

Socio-Technical Frameworks
- Institutions
- Roadmap
- Ethical Principles
- Legal Framework

Global Initiatives
- LGAF
- FFP-LA
- IGIF
- SDGs
- FELA

Artificial Intelligence
- Machine Learning
- Deep Learning
- Computer Vision
- Large Language Models

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Land Administration Maturity Levels

Level 1 – 2D Digital Land Administration

Level 2 – 3D Parcel Fabric

Level 3 – 3D Digital Land Administration

Level 4 – Digital Twin & Land Administration
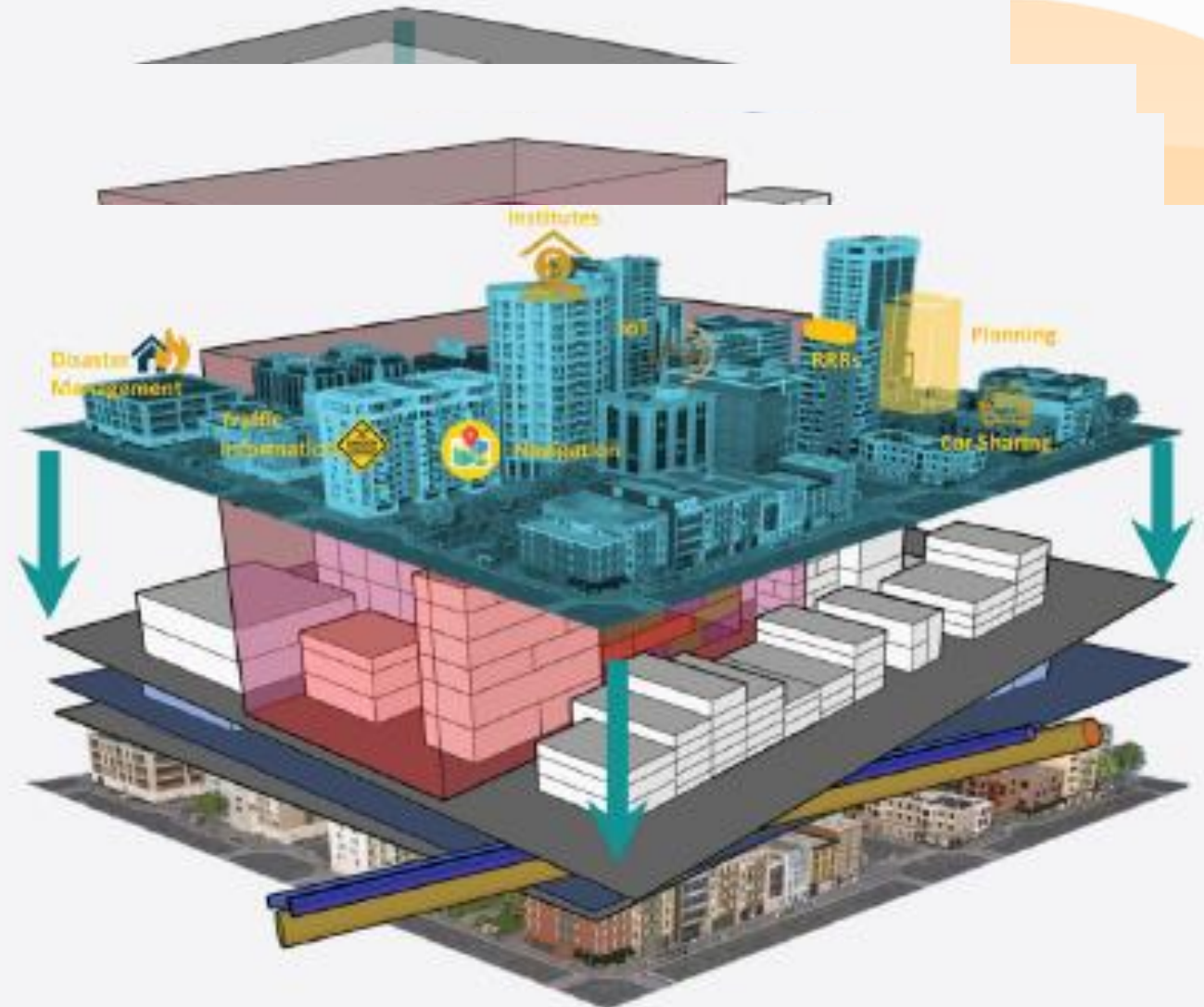
Digital Cadastre Modernization Framework

- Current format of cadastral plans lodged with Government
- Map base status & accuracy
- Digital cadastral plan protocol
- Strategic plan for Digital Cadastre Modernisation
- Smart cadastre services

Capture & Back capture

Validation & *Adjustment*

- Required map base accuracy in metro & rural areas
- Adjustment technique
- Adjustment software application

Automation

Integration

- Digital plan lodgement platform
- Automatic adjustment specifications
- Automatic data integration specifications
- Cadastral systems interactions

- Fundamental datasets superimposed over the map base
- Datasets specifications

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3D Land Administration-Research & Development

From Real World to Digital World

Maximizing Return on Our Investments

Digital Economy

Digital World/ Digital Twin

$1/3 Return Ratio

IoT/Linked Data

3D Digital Cadastre

3D Parcel Fabric

2D Spatially Accurate Parcel Fabric

2D Cadastre

Real World

Connected Platform

From 2D to 3D Floor Plan

- Line to Polygon
- Geometry clean up
- Geo-reference

- Merge floor plan layers
- Export and publish results via WFS

DWG Data Preparation → **Attributes Enrichment** → **Whole Building Floor Plan Aggregation** → **Register data in DT for Visualisation & Query**
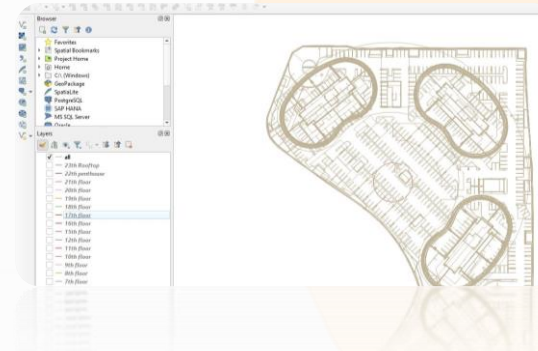
- Floor number
- Floor-to-ground height
- Floor-to-ceiling height

- Upload data into DT
- Create styles
- Query floor plan features

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BIM: Enabler for 3D Land Administration

- IFC version
- Data integrity
- Geo-reference
- Global XYZ Elevation
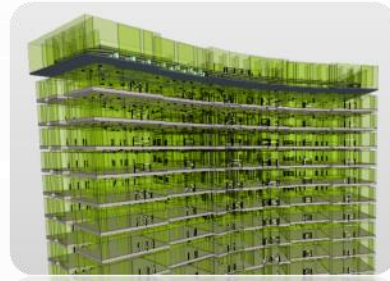
- Split building by floors
- Convert 3D cadastre geometries into 3DTiles
- Export 3D cadastre attributes into JSON
- Location adjustment

- Register 3D Cadastre in DT
- Create 3D rendering styles
- Query and visualise cadastre data interactively
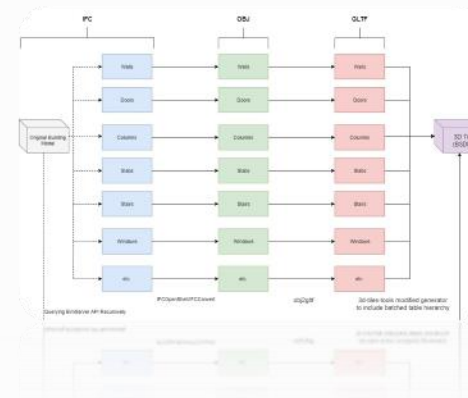
IFC Verification → **Cadastral Boundary Creation** → **IFC to 3DTiles Conversion** → **Cadastral Data Enrichment** → **3D Cadastre Visualisation & Query**

- Identify Lots and Common Properties
- Create ifcSpace for cadastral boundaries
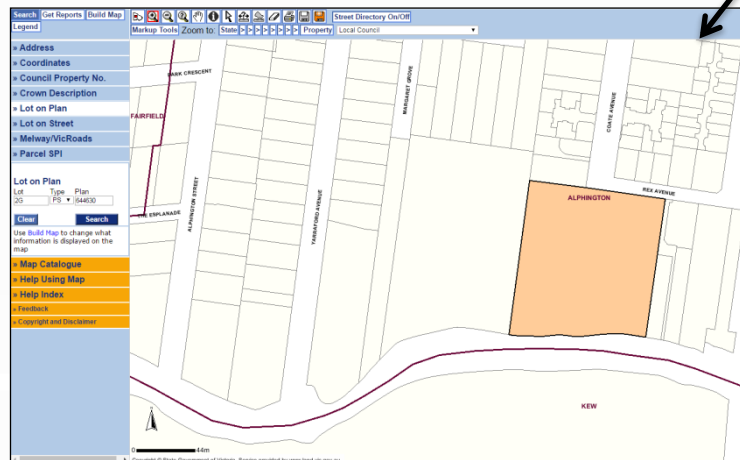- Export data as IFC2X3

- Sync JSON data into Cadastre Info DB
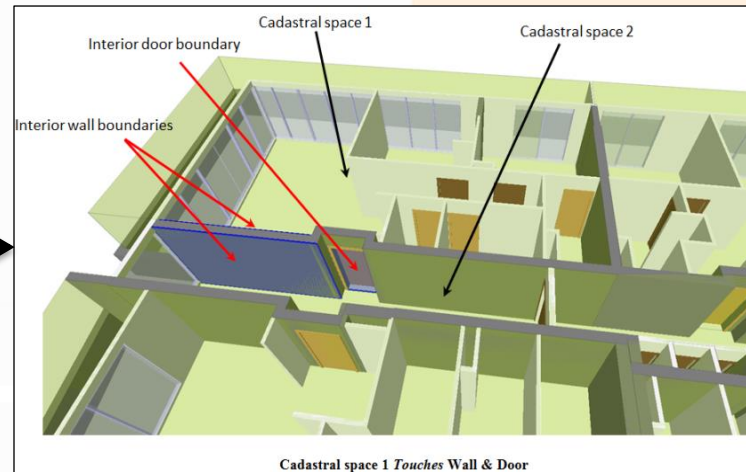- Enrich cadastre information for Lots and common Properties

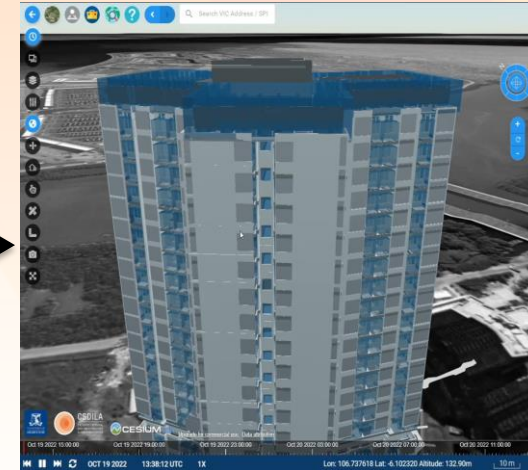# 3D MapBase and DT for Smart Urban Land and Property System

Subdivision Plan

3D Digital Subdivision Model

Validate Model

Euler-Poincaré Formula

$$V - E + F - (L - F) = 2(S - G)$$
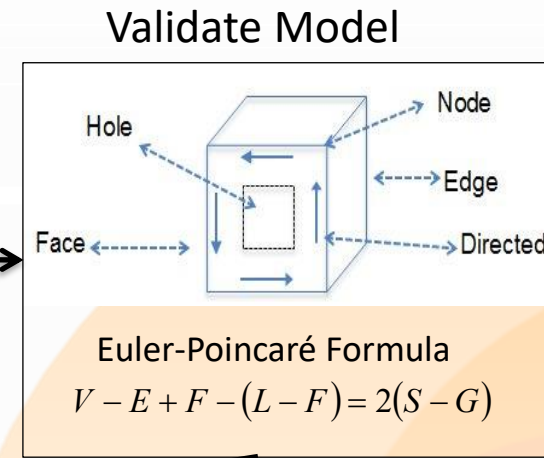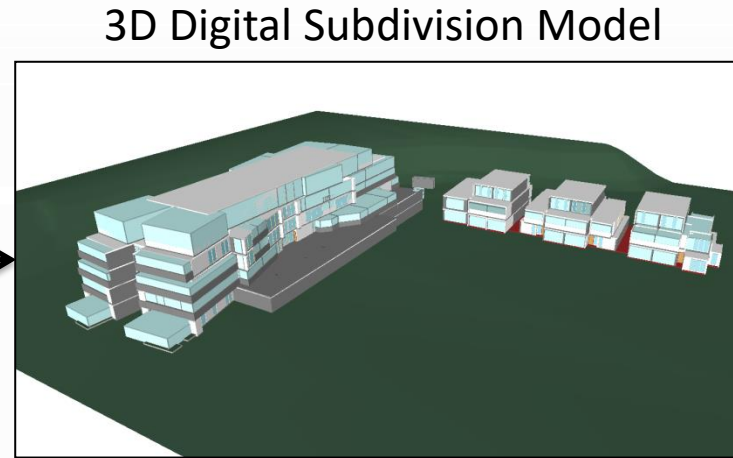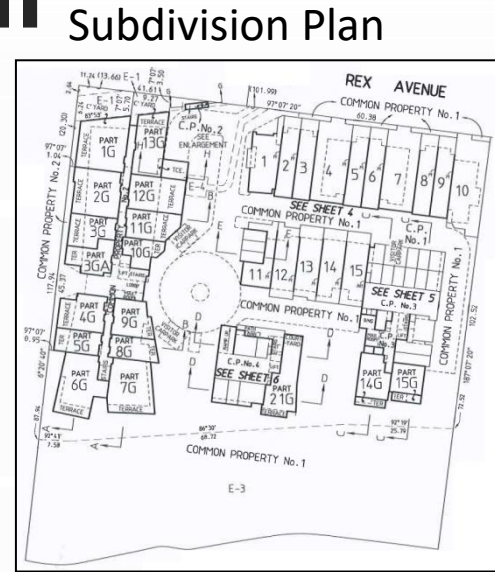
Integrate 3D Model into Map Base

3D Spatial Operations on MapBase

MapBase to Digital Twin

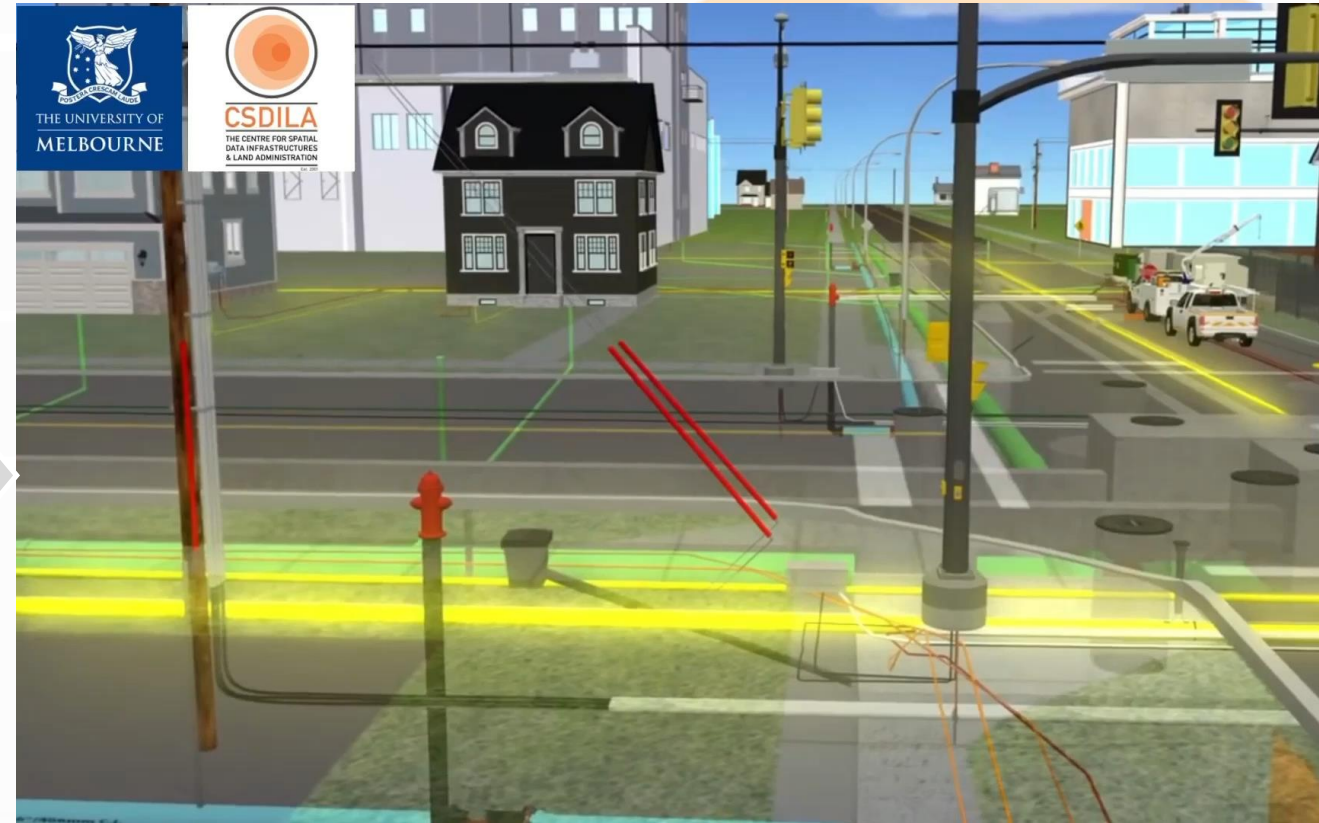# 3D Cadastre and Urban Underground Modelling and Visualization

BIM-based Data Model for 3D Land Administration
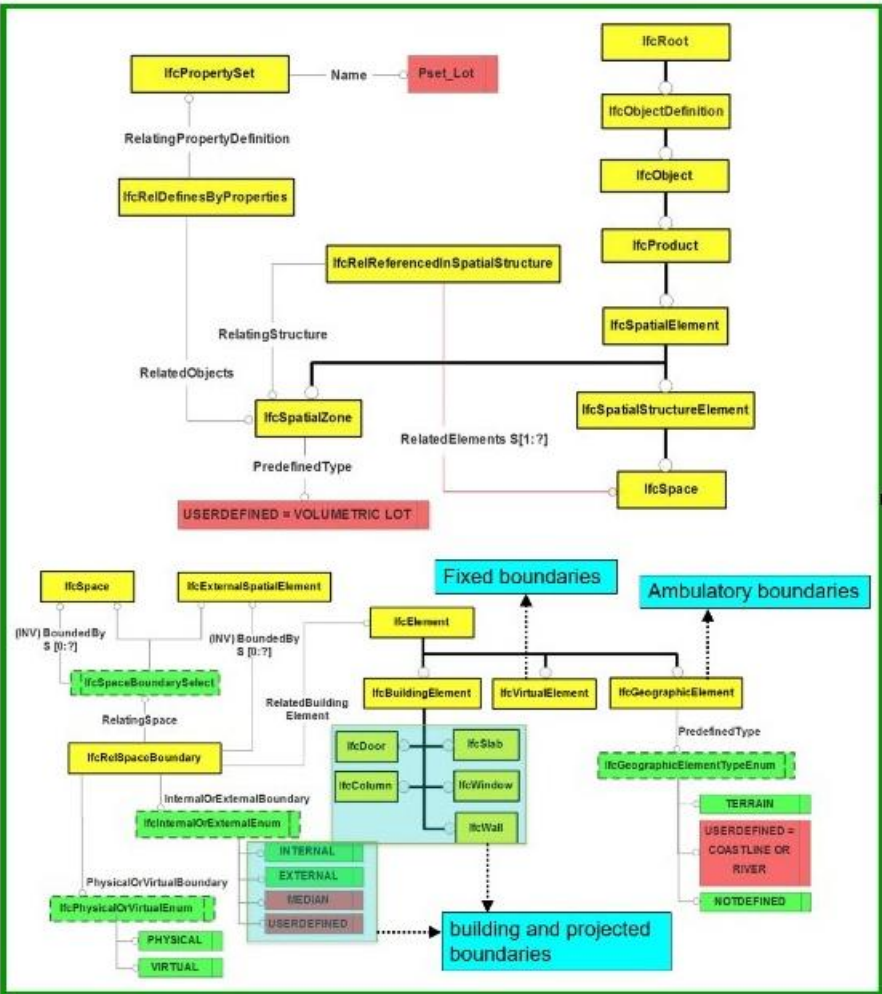
New 3D Data Model for Underground Land Information

Current 2D Subsurface Land Administration | New 3D Underground Data Model | Future 3D Subsurface Land Administration
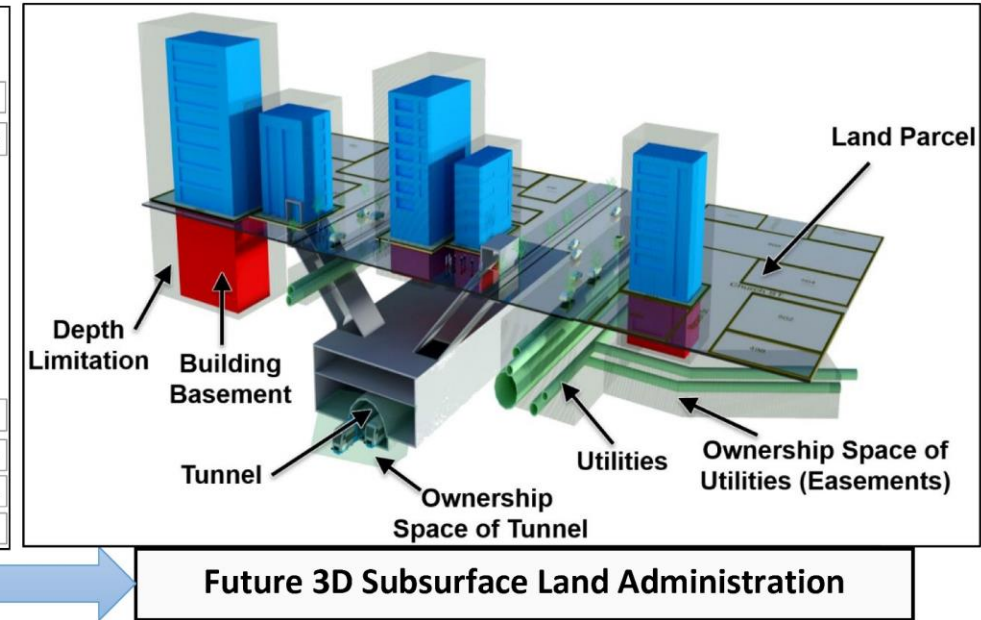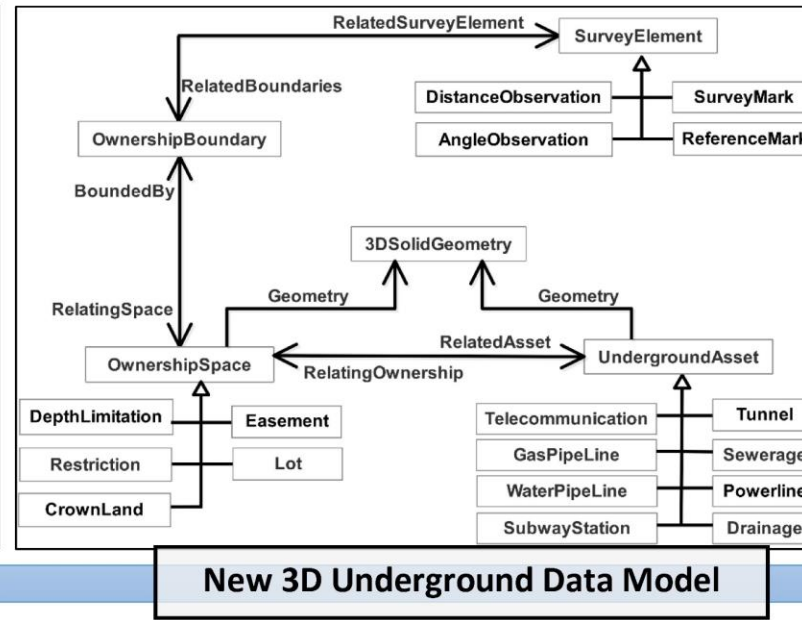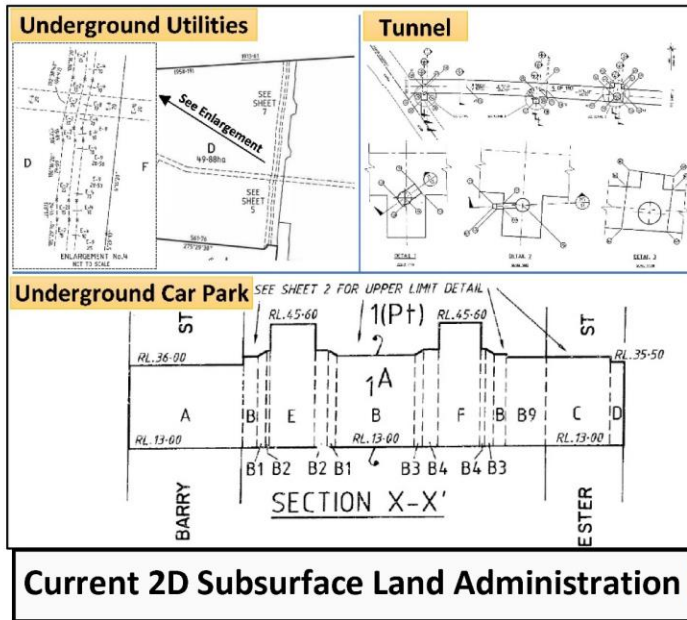
We are developing a **new 3D data modelling approach** to managing **subterranean ownership** RRRs by **referencing** these RRRs to the **physical reality** of the **underground** environment

3D Land Administration and BIM in Infrastructure Projects

Major (Linear) Infrastructure Projects

Land Administration and GeoAI

AI for Land Administration

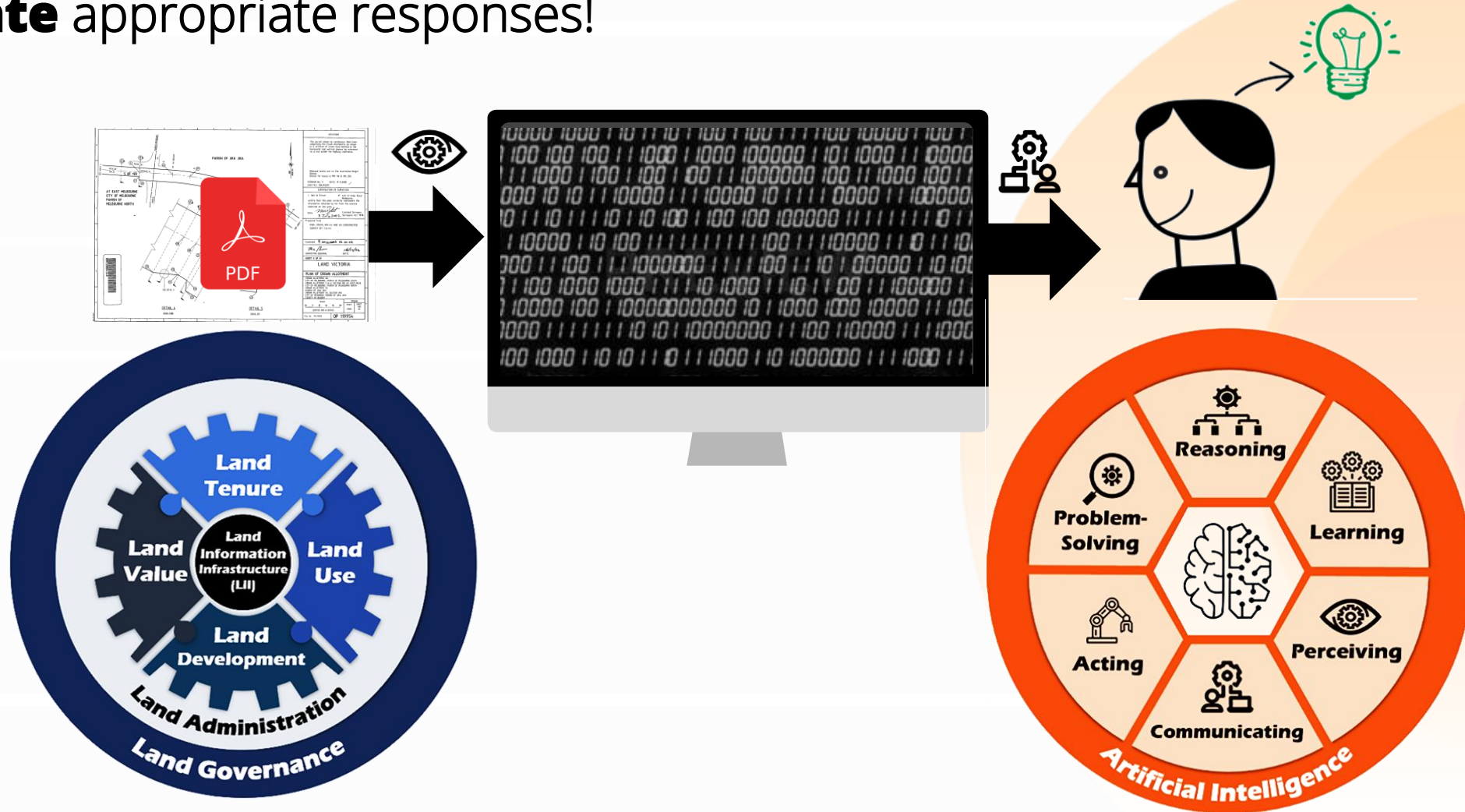Enabling **machines** to mimic **cognition aspects** of **human-intelligence** **(i.e., Vision and Language)** to **understand** land and property data and **generate** appropriate responses!

AI for Land Administration Challenges

Complexity of Land Rights

- Land ownership includes formal and informal rights and overlapping ownership. AI helps clarify and reconcile these using NLP.

Land Ownership Disputes and Fraud

- Disputes over land boundaries are common, especially where records are outdated. AI tools such as pattern recognition and anomaly detection can identify suspicious land transactions early.
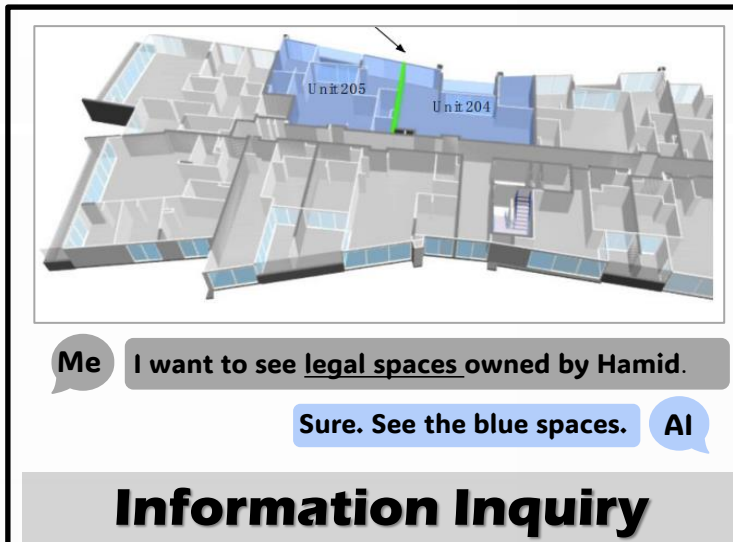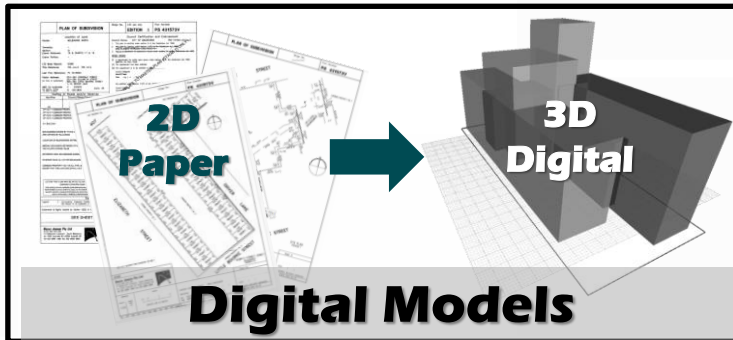
Unstructured and Incomplete Land Records

- Many ownership records are scanned, handwritten, or inconsistent. AI can extract, digitise, and standardise this data automatically.

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AI Opportunities for Land Administration Systems

Automation of Processes

- 2D Paper → 3D Digital — **Digital Models**
- **Information Inquiry**
  - Me: I want to see legal spaces owned by Hamid.
  - AI: Sure. See the blue spaces.

Insightful Data Analysis

- **Land Use Classification** — Identifying patterns, relations, trends. and influential factors
- **Urban Growth** — Making Predictions
- **Undefined ownership space** — Validation & Error Detection
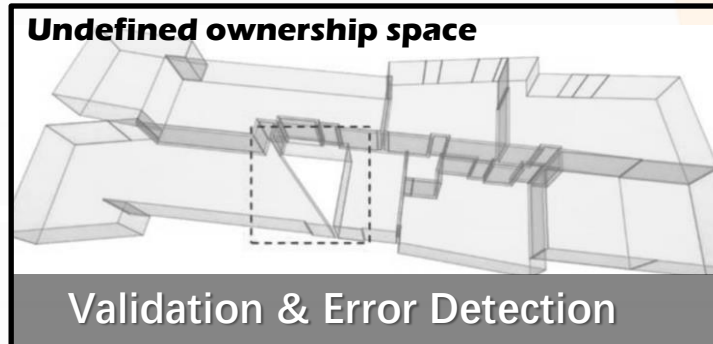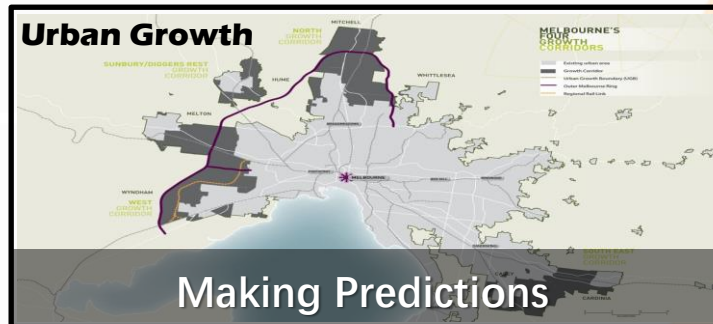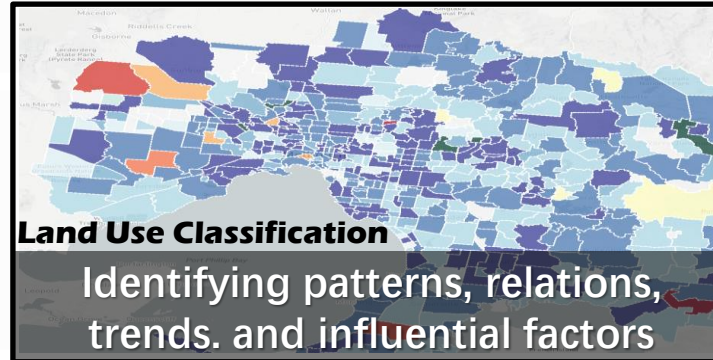
Decision Support and Recommendation

- **Dispute Resolution**

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Intelligent Land Administration Systems

Intelligent Land Administration Functions

- Automated land and property data recording (boundaries and RRRs)
- Automated error detection
- Automated cadastral data revision and enrichment
- Automated cadastral document analysis
- Online land dispute resolution
- Automated land reallocation within land consolidation and subdivision
- Influential factor analysis in specific practices like dispute intensity

- Automated land suitability evaluation
- Automated land allocation and distribution
- Automated land use planning document analysis
- Automated land use mapping and classification
- Identification of patterns and relationships in time-series land use change
- Predictive analysis for urban growth

- Automated land and property valuation
- Automated real estate document analysis
- Patterns and relationships identification in time-series for Market trend analysis
- Influential factor analysis
- Automated fraudulent activities detection

- Automated building and planning permit process
- Automated undocumented and illegal buildings detection
- Simulation of complex interactions between stakeholders
- Land development intensity prediction and influential factor analysis

Automation — Predictive Analysis

Intelligent Land Information Infrastructure
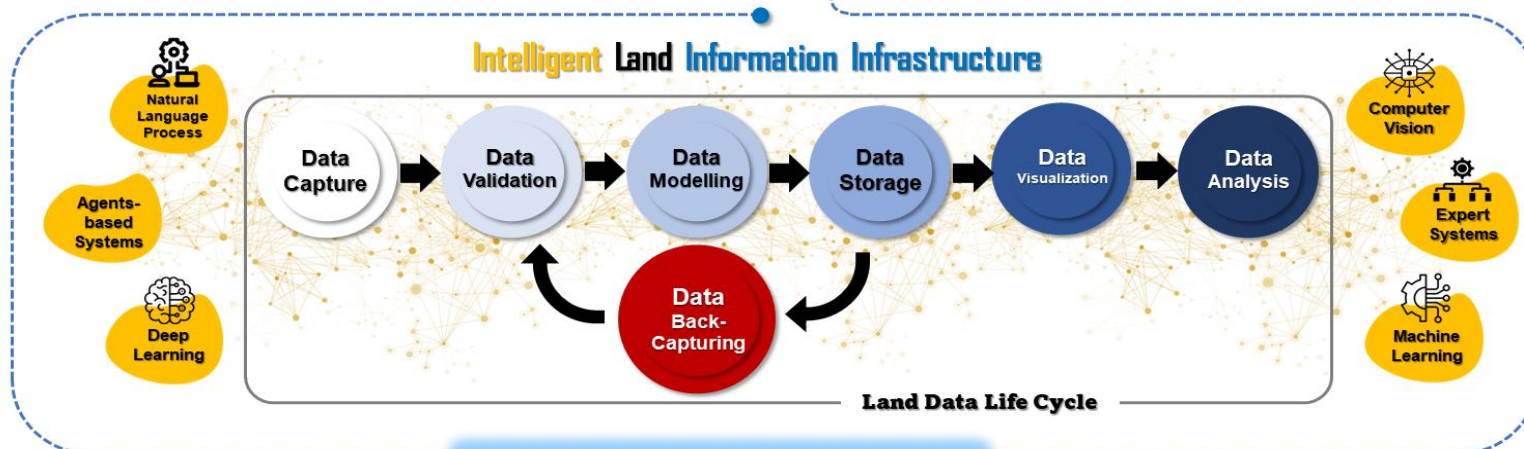
Data Capture
Data Validation
Data Modelling
Data Storage
Data Visualization
Data Query

Learning
- Supervised Learning
- Unsupervised Learning
- Semi-Supervised Learning
- Reinforcement Learning

Natural Language Processing
- Text Preprocessing
- Representation Learning
- Large Language Models

Reasoning
- Expert systems
- knowledge graphs
- Case-based Reasoning (CBR)
- Fuzzy logic
- Bayesian networks

Computer Vision
- Optical Character Recognition (OCR)
- YOLO (You Only Look Once)
- Vision Transformers (ViT)
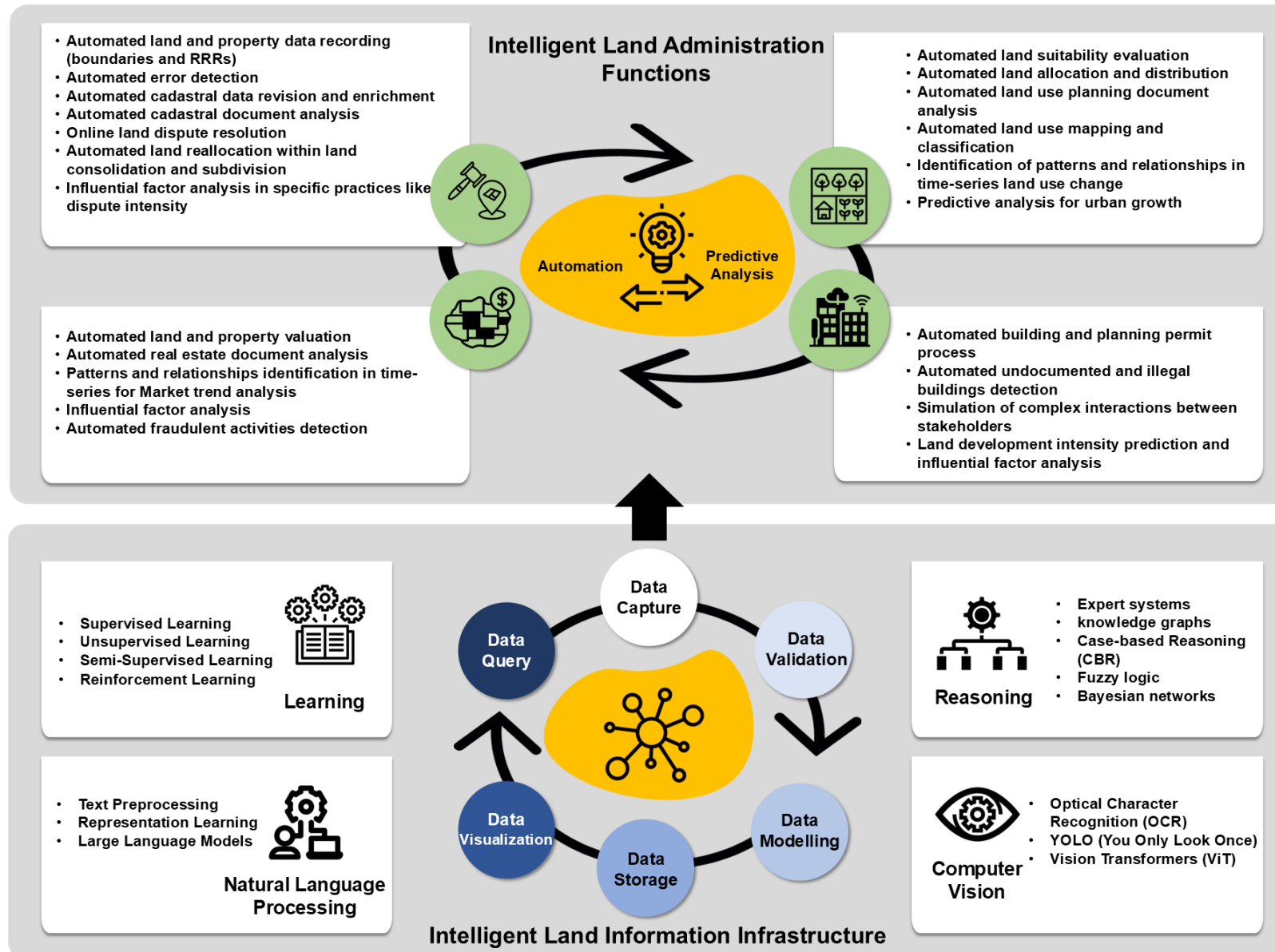
Large Language Models for Intelligent Land Administration

- ✓ **Automation** of labor-intensive tasks
- ✓ Enables automatic **interpretation** of survey plans and legal documents.
- ✓ Improves **querying** and **decision-making**
- ✓ Better stakeholder **communication** by making land information more **accessible to non-experts**, like citizens or policymakers (in natural language)
- ✓ Enables AI-assisted **dispute resolution** by analyzing both textual agreements and spatial layouts

LADM-based Knowledge Graph Retrieval-Augmented Generation (KG-RAG) for MLLMs
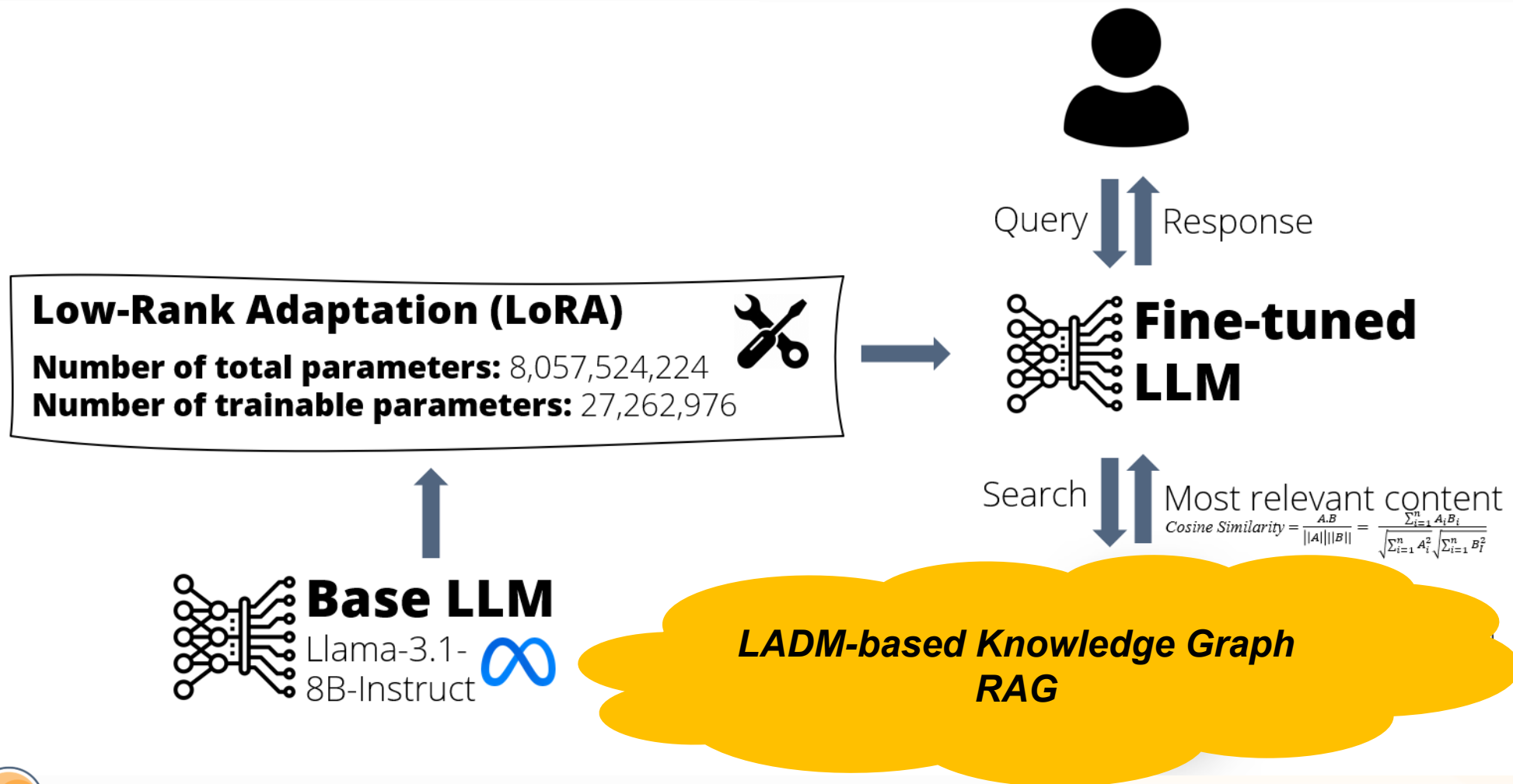
Challenges and Dependencies in Storing and Managing 3D Cadastral Data
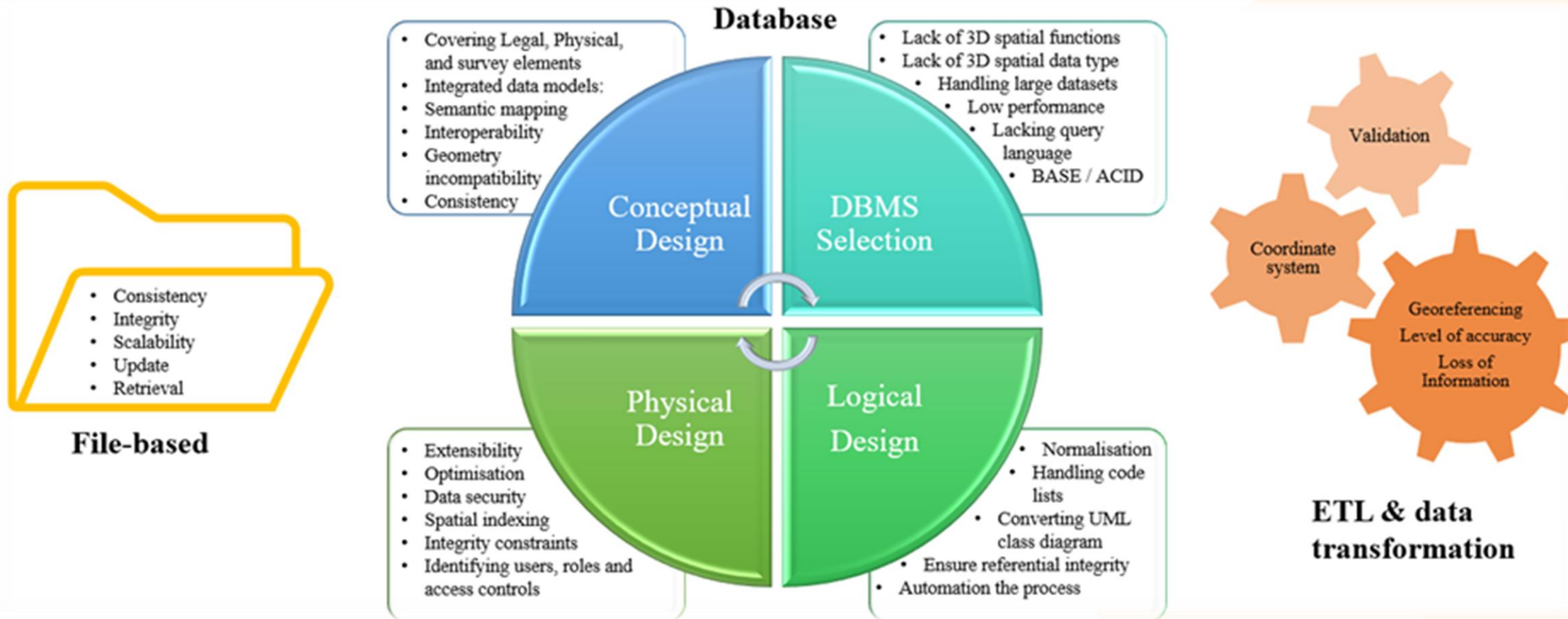
Approaches and Technologies in 3D Cadastral Databases
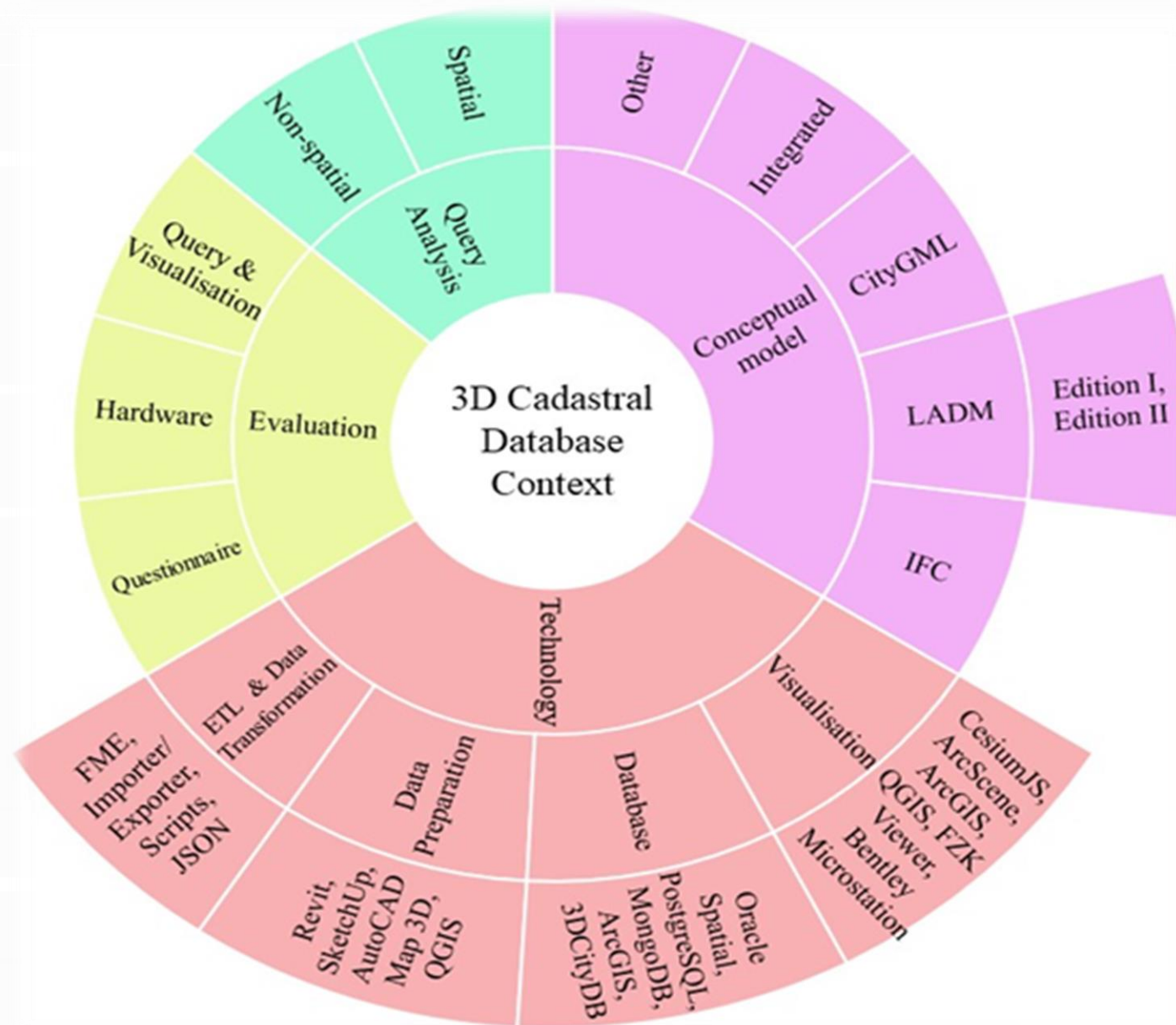
Geospatial Digital Twins for Smart City Planning

Geospatial Digital Twins for Smart City Planning

Digital proficiency for enhanced urban design, city & regional planning, sustainability-driven decision making & engagement

- Highly visual urban analytics

- 3D & 4D spatial & visual geospatial analysis & modelling

- Interactive urban digital twins

- Virtual reality (VR) & augmented reality (AR)

- Generative artificial intelligence (GenAI) technologies

Digital Urban

Required skills

- LEADERSHIP
- COMMUNICATIONS
- ARTICULATE CRITIQUE
- OUTCOME FOCUSSED
- PARTNERSHIPS
- TECH PROFCIENCY
- ETHICAL, TRUST

Digital Urban Planner

Urban applications

URBAN ANALYTICS
- RESILIENT & SUSTAINABLE
- INNOVATION
- URBAN DATA SCIENCE

SPATIAL & VISUAL
- GIS & MAPPING
- 3D/4D VR AR GEO/GEN-AI
- URBAN DIGITAL TWIN

PROCESS
- EFFICIENT REPORTING
- STREAMLINED ANLYSIS
- DATA DRIVEN DECISIONS

ENGAGE
- COLLABORATION
- INCLUSIVE FACILITATION
- PARTNERSHIPS

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Geospatial Digital Twins for Smart City Planning

There is a range of **strategic digital planning services** to advance **knowledge and innovation in geospatial land intelligence** and sustainable urban development:

LAND INTELLIGENCE	DATA ANALYSIS & PREDICTION	SPATIAL VISUALISATION	DIGITAL ADMINISTRATION	STAKEHOLDER ENGAGEMENT	DIGITAL & URBAN DESIGN STRATEGY	DEVELOPMENT APPROVALS	LEADERSHIP & CAPABILITY BUILDING
Strategic site evaluation	**Transforming data into insights**	**Interactive tools**	**Streamlining processes**	**People centric collaboration**	**Evidence based strategies**	**Streamlined evaluation**	**Professional development**
* Land use evaluation * Site analysis * Scenario testing * Accessibility * UN SDGs	* Social / demographic * Economic * Environment * Sustainable transport * Property * Community	* Mapping/ situational awareness * 3D modelling * visual AR/VR GeoAI/GenAI * Urban simulations	* Reporting * Templates * Systems * Smart software	* Government, industry & research * Inclusive engagement * Training & education * Facilitated workshops	* Digital frameworks * Master planning * Liveable, accessible, smart, sustainable communities	* Efficient, accurate & timely * Productivity * Data-informed	* Tailored tech training, team & individual * Risk mitigation * Ethical/trust * Career progression

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Gobal

SDGs
IGIF
NUA

National

National city indexes

State

State & regional plans and policies

City

SDG 11*

Precinct

Planning schemes

City plans, Green star communities

Neighbourhood indicators

Bottom-up Local projects influence policies above

Top-down Global policies influence local projects

Image adapted from www.povertyresearch 2020

- Developing adaptable **Digital Twin platform** empower researchers and policy makers to;
  - '**zoom-in**' to local issues in detail
  - '**zoom-out**' to contextualize more widely to better understand barriers and enablers

- **Digital Technology** and networking **to collect, model and analyse data** to support **sustainability** applying bottom-up and top-down strategies

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Urban Digital Twin Conceptual Framework

(Allan et al., 2025)
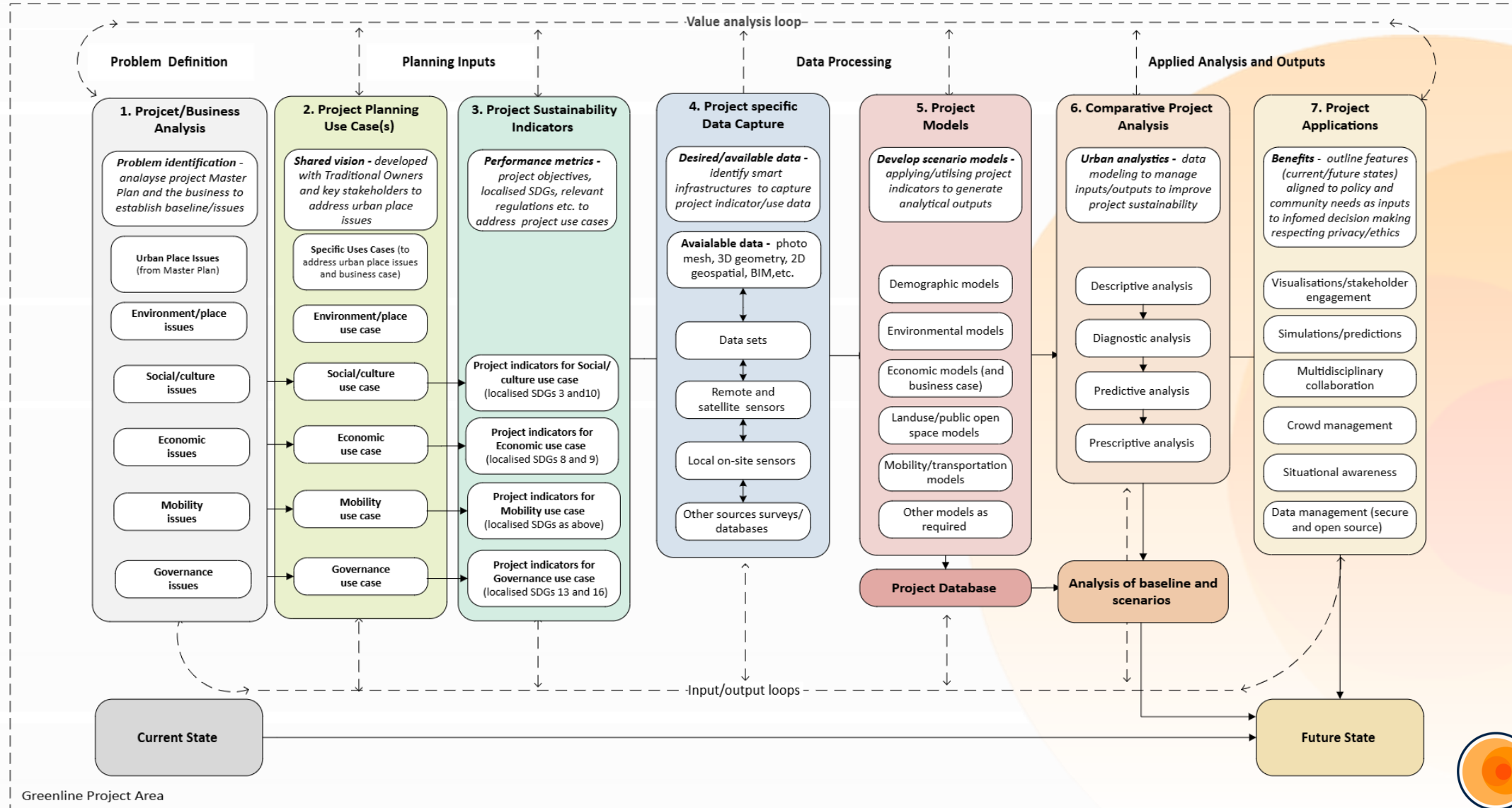
The Future of Land and Geospatial

Emerging Technologies, Evolving Data, Endless Possibilities

Exploring the next frontier in **land and geospatial** analytics, AI, and real-time insights.

Intelligent Urban and Land Systems

Transitioning from **static mapping** to **real-time**, intelligent geospatial systems that learn, predict, and adapt.

➤ **Key Focus Areas:**

- **GeoAI-Enhanced Digital Twins**: Dynamic simulations for land, transport, and infrastructure.
- **Sensor Fusion & Edge Analytics**: Cloud-independent real-time data from IoT, satellites, and crowdsourcing.
- **Agentic & Multimodal AI**: Systems capable of autonomous spatial reasoning and decision support.
- **Predictive Urban Governance**: Proactive AI-driven solutions for mobility, resilience, and climate adaptation.

➤ **Expected Impact:**

- Smarter, more sustainable cities and land systems.
- Faster responses to environmental and social risks.
- Data-driven planning supporting SDGs 11 & 13.

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Open, Collaborative, and Equitable Geospatial Ecosystems

Building inclusive, interoperable, and participatory land and geospatial infrastructures that empower all.

➢ **Key Focus Areas:**

- **Open Geospatial Data Platforms:** Cloud-native, interoperable, and API-driven ecosystems.
- **Semantic Integration & Knowledge Graphs:** Bridging statistical, environmental, and spatial datasets.
- **Citizen Participation:** Citizen-centric participatory GIS, NLP for civic input, and open data-driven governance.
- **Capacity Building & Partnerships:** Shared funding models, skills frameworks, and regional collaborations.

➢ **Expected Impact:**

- Reduced global geospatial divide.
- Stronger regional and international collaboration.
- More inclusive, transparent, and accountable spatial governance.
- Supports inclusive, participatory planning, aligned with SDG 17 and SDG 11.3.

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Responsible AI for Trusted and Ethical Governance

Building transparent, explainable, and Ethical AI systems that support geospatial decision-making at different scales.

➢ **Key Focus Areas:**

o **Explainable GeoAI:** Interpretable models for spatial reasoning and policy analysis.

o **Ethical & Inclusive Data Use:** Frameworks addressing bias, privacy, and fairness.

o **AI Governance Standards:** Embedding ethics and accountability into national geospatial infrastructures.

o **AI–Policy Integration:** Bridging technology innovation and geospatial policy.

➢ **Expected Impact:**

o Strengthened trust in AI-driven spatial governance.

o More equitable and transparent service delivery.

o Global benchmarks for responsible geospatial AI use aligned with SDG 16.

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WHO WE ARE ?

Centre for Spatial Data Infrastructures and Land Administration

A WORLD CLASS
RESEARCH
CENTRE

EMPOWERING SOCIETY WITH
LAND AND LOCATION
INTELLIGENCE

CSDILA

THE UNIVERSITY OF
MELBOURNE

POSTERA CRESCAM LAUDE

ABOUT OUR CENTRE

We deliver trusted geospatial technologies and solutions that empower communities, drive innovation, and create lasting impact.

Established in 2001, with the goal to lead **advancement in land administration and geospatial science knowledge and capability** that contributes to addressing global challenges through the power of geospatial data and location intelligence.

We provide hands-on training and capacity-building opportunities to practitioners and industry leaders that combine practical experiences with cutting-edge research in geospatial science and related disciplines.

A Leading Centre in *Research and Development in* Land Administration & SDI

50+
Researchers/Developers/RHD Students

OUR CORE CAPABILITIES

TRAINING
Empowering People and Training for the Future

Capacity Building and Training
We are constantly expanding our world-class training to build capacity and human capital from practitioners to executives across our focus areas

Our PhD students are an integral part of our Centre, driving cutting-edge research and contributing significantly to the advancement of our research agenda.

RESEARCH
New Knowledge and Innovation

Addressing critical challenges such as climate resilience, sustainable urbanisation, intelligent transport and equitable land governance with place-based, people focused geospatial intelligence

Research and Prototyping activities with industry partners to develop advanced geospatial technologies, digital prototypes, and data models to support real-world applications.

ENGAGEMENT & APPLICATION
Empowering Practice and Solutions for Global Impact

Policy and Roadmap Development to provide strategic advice to support governments and industries in implementing geospatial transformation and land modernisation

Working with industry partners to develop advanced geospatial technologies, digital solutions, and data models for application in the field.

OPERATIONS

Trusted and Inclusive Technology to ensure the reliability, accuracy, and robustness of geospatial systems, data models, and technologies to meet user and policy requirements with Quality Control, Assurance, and Auditing.

CAPACITY BUILDING EXPERTISE:
Delivering world-class training for practitioners and executives

STRATEGIC PARTNERSHIPS:
Collaborating with industry to solve challenges and enhance R & D

GLOBAL NETWORK:
Connecting academia and industry to form cross disciplinary teams

RESEARCH GRANTS:
Sustained funding from national and international sources

IN-HOUSE DEVELOPMENT TEAM:
Agile development team for proof-of-concepts and prototyping innovations

ENABLERS

MODERN LAND ADMINISTRATION SYSTEMS
Modernisation of Land Administration Systems and development of digital and intelligent cadastres in the contexts of smart cities, indigenous lands and land for climate actions

BUILDING INFORMATION MODELLING (BIM)
Developing multi-dimensional land and property rights, restrictions and responsibilities

BUILDING ENERGY & IOT
Analysis and solutions in building energy management, energy ownership and decarbonisation

URBAN ANALYTICS
Enhancing urban design and planning practice applying big data science, simulations and geodemographics

DISASTER MANAGEMENT AND CLIMATE RESILIENCE
Developing Spatial Information ecosystems for climate-resilient land management and decision support

REMOTE SENSING
Image and object recognition from remotely sensed data sources, from land tenure to vehicle and human movement, hierarchical modelling, mapping and optimal data utilisation

DIGITAL TWIN & AI TECHNOLOGIES
Developing leading-edge spatially enabled digital twin solutions and AI analytics to meet business and decision-making requirements

ECOLOGY & LANDSCAPES
Designed experiments and digital twin solutions for climate-resilient land and landscapes R & D capabilities include: Prototype Platforms, Tools and Applications; Modelling and Analytics Frameworks and Strategy and Policy Development, Consulting, Advisory Services and Training

CSDILA strategic areas of core capability are centred on proven and emerging knowledge and technology relating to land administration, geospatial and location intelligence

LAND ADMINISTRATION, GEOSPATIAL and LOCATION INTELLIGENCE

STRUCTURAL HEALTH MONITORING
Integrating real-time IoT data, geometric information, and physics-based data via FEM to provide comprehensive insights into the health & performance of critical infrastructure.

EXECUTIVE TRAINING & CAPACITY BUILDING
Strategic training to embed innovation and geospatial capability in practitioners and executives globally

SUSTAINABLE DEVELOPMENT GOALS (SDGs)
Supporting the development of data infrastructures that implement the SDGs

SDI & DIGITAL INFRASTRUCTURE ENGINEERING
Enhancing governance and digital engineering capabilities in our societies via Spatial Data Infrastructures (SDI)

VISALISATION & D-LAB
Cutting edge geospatial data collection, visualisation and analysis including lidar, drone, hologram, VR and AR

Land is a foundation of Economic, and Integrity of each country related to *Humankind to Land* relation

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Technological Arm of CSDILA

The D-Lab is a cutting-edge facility that provides advanced interactive visualization and data capture tools. It serves as a hub for research, development, and teaching across a broad range of disciplines, enabling innovation through the use of state-of-the-art technologies. Located within Melbourne Connect, the D-Lab facilitates the exploration and application of digital solutions to real-world challenges.

✓ Advanced Data Visualisation

✓ State-of-the-Art Data Capture

✓ Focus on Digital Twin Technology

✓ Interdisciplinary Application

D-Lab

Reimagining the digital world of tomorrow

Services

Data Capturing
The process of gathering raw data from various sources.

Data Visualisation
Representing data graphically to understand trends and patterns.

Data Analysis
Examining data to draw conclusions and make informed decisions.

THE FUTURE IS BRIGHTER

Thank You
We welcome new partnerships and collaborations.

CSDILA Contact Info

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