PLATEAU by MLIT

Overview the “Project PLATEAU” :The Initiative of Digital Twin in Japan

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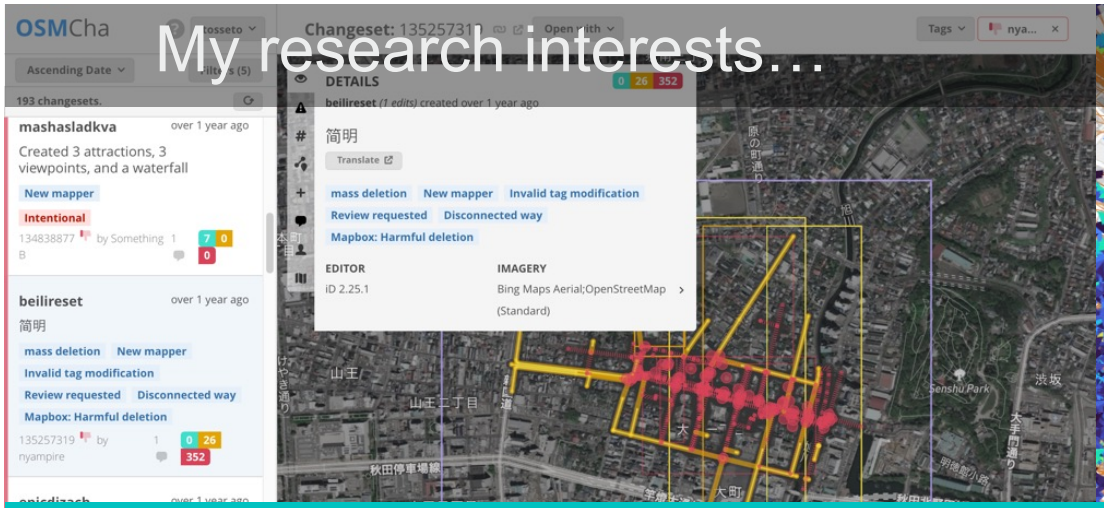
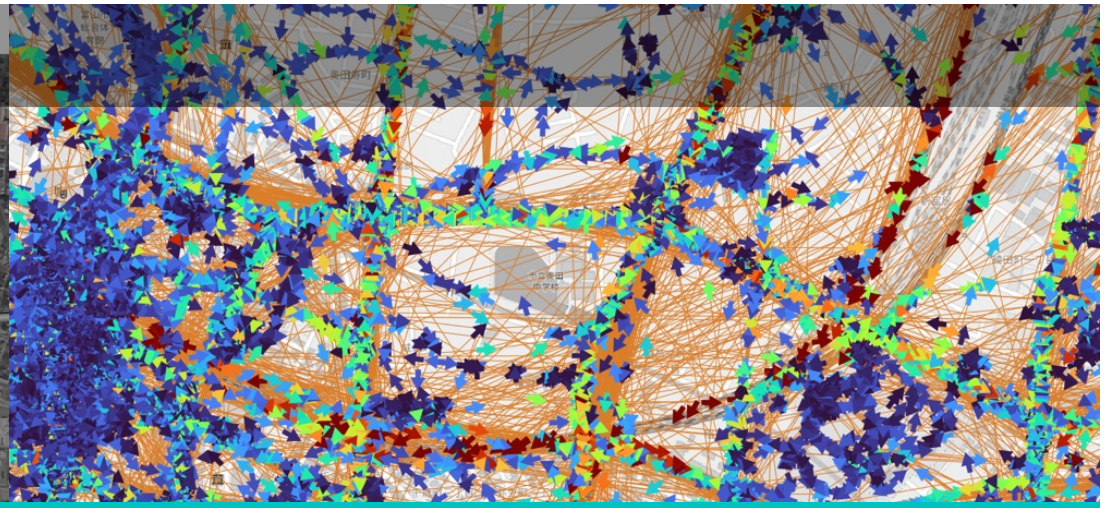
Project PLATEAU Advisory Board

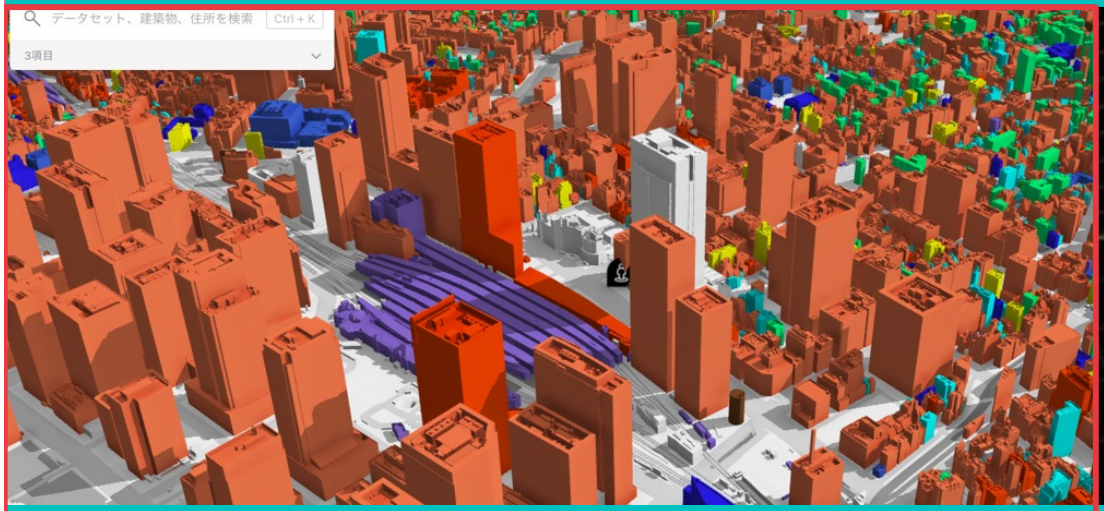
My research interests…



Evaluating Sustainability of Open SDI Using Multiple VGI Data Sources (OSM, Overture, Mapillary)



Geographical Analysis of Human Mobility During the COVID-19 Pandemic in Japan Using Mobile Data



Assessments of Smart City Data Commons Policies through project PLATEAU Data and Use Cases

Visualization of 3D Point Cloud Data and Standardization of Big Data in Archaeology

What is PLATEAU? Since 2020

PLATEAU is a project by MLIT*
that focuses on developing, utilizing, and sharing
"3D city models," The Urban Digital Twin Data.

Project Mission:

We create a new value in a society

and solve local issues through the digital twin.

MLIT: Ministry of Land, Infrastructure, Transport and Tourism in Japan

国土交通省

What is project PLATEAU?

PLATEAU is a **project led by MLIT (Ministry of Land, Infrastructure, Transport and Tourism, Japan)** that focuses on developing, utilizing, and sharing 3D city models for urban planning since 2020.

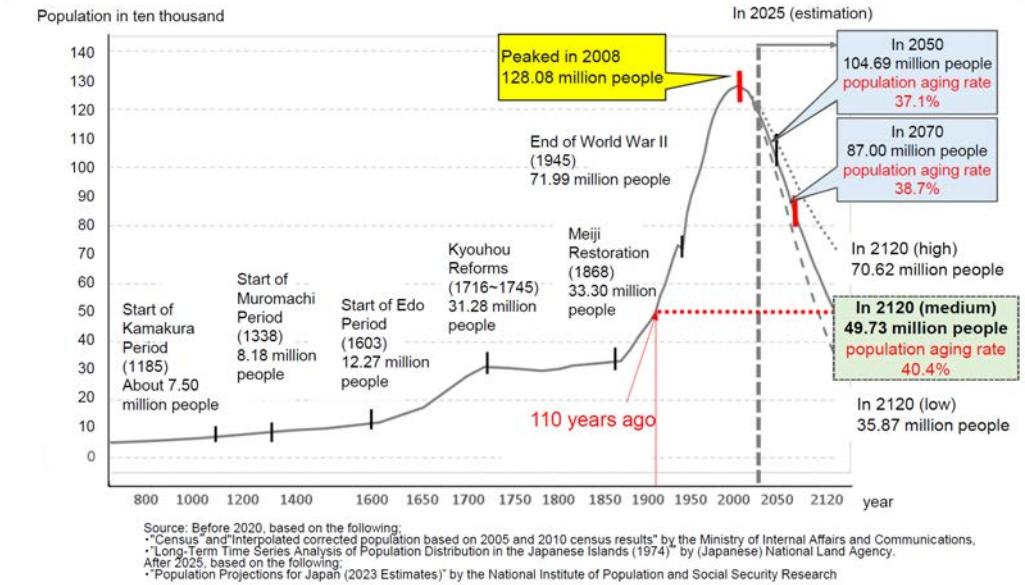
1. **Openness: multi-licensed under CC BY 4.0 and ODbL**
   - PLATEAU provides various resources, including 3D city models and tools and materials for creating and utilizing them.
   - By aligning with the OSM license (ODbL), the data import process is currently underway with the community's approval.
2. **Collaboration**
   - Various entities, including government agencies, local governments, private companies, universities and research institutions, and local communities, are collaborating to create new value from 3D city models.

- **Sustainability**
  - PLATEAU's goal is to create an ecosystem for the development, utilization, and sharing of 3D city models to enhance urban resilience.

What Japan is facing with…

Long-term trends in Japan's population

Japan's population peaked in 2008, and is likely to **return to the level of about 110 years ago over the next 100 years**. In addition, **the ageing rate** is expected to **remain at around 40%**.



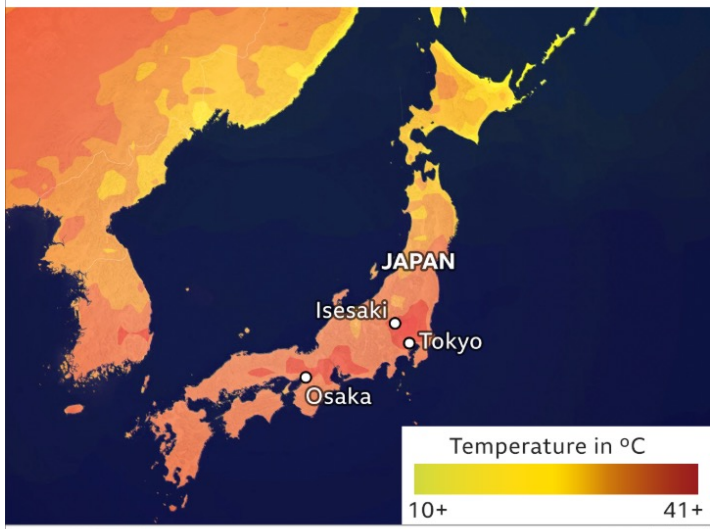
Source: Before 2020, based on the following;
・"Census" and"Interpolated corrected population based on 2005 and 2010 census results" by the Ministry of Internal Affairs and Communications,
・"Long-Term Time Series Analysis of Population Distribution in the Japanese Islands (1974)" by (Japanese) National Land Agency.
After 2025, based on the following;
・"Population Projections for Japan (2023 Estimates)" by the National Institute of Population and Social Security Research

Increasing heavy rainfalls

The frequency of short duration heavy rainfall (over 50mm/hour) has increased by about 1.4 times in 30 years.

Japan is dealing with an intense heatwave

Maximum daily temperature forecast for 29 June



Source: BBC Weather

PLATEAU Empowers Urban Resilience

Expanding the coverage of data

Creating best practices for use cases

Fostering open and social innovation

Digital Transformation for Urban Planning

Optimal and Sustainable City

Analyze various urban issues such as disaster prevention, environment, and transportation in cyberspace in an integrated manner and fed back to physical space.

"Human-centered" City

Visualize current and future patterns of the town concretely for participatory urban planning that incorporates the wisdom and thoughts of diverse entities.

Agile City

Precisely reproduce and predict (simulate) urban activity conditions.

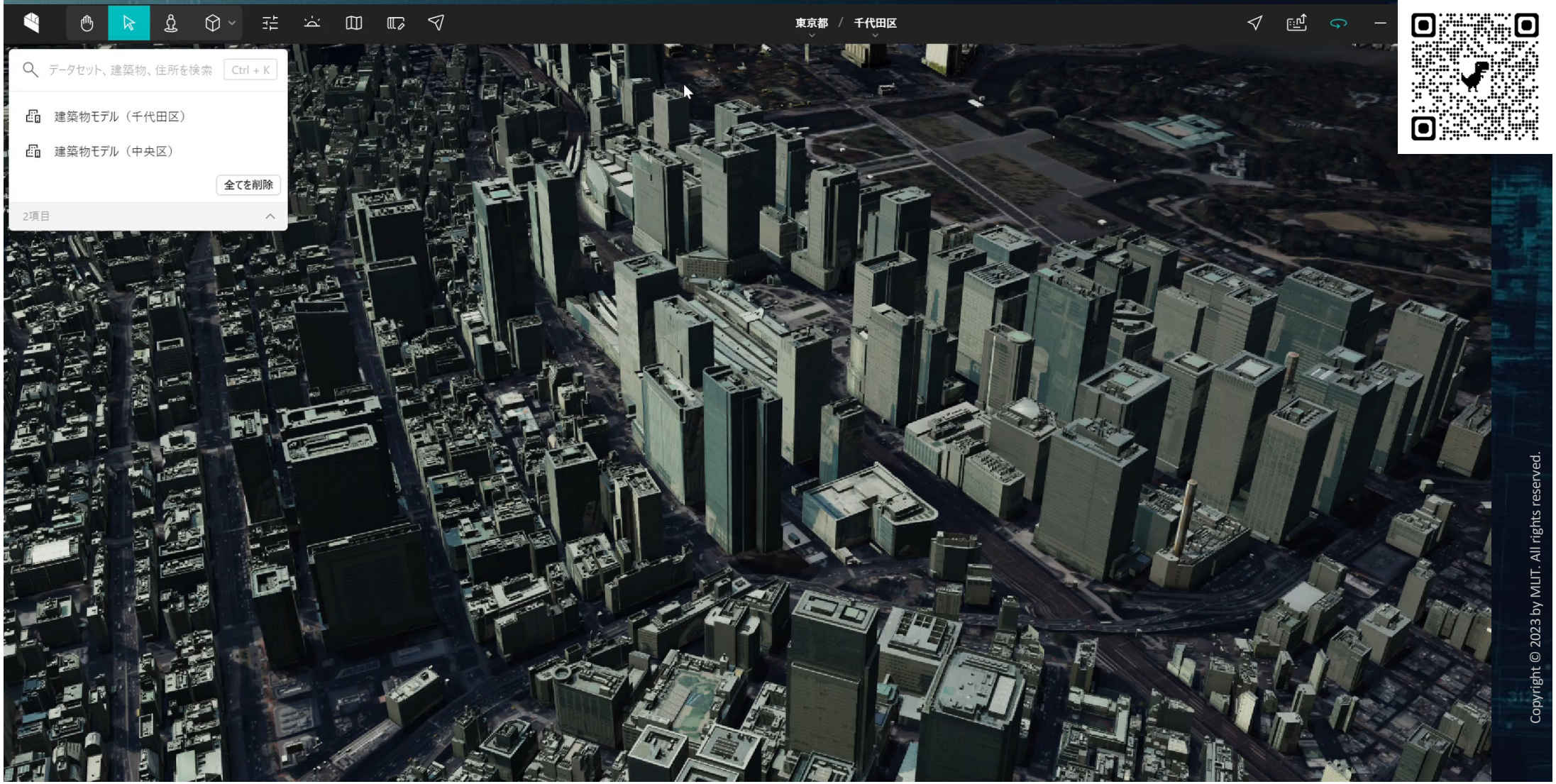
The latest technology is also utilized to realize agile and nimble urban development.

PLATEAU Project Partners | over 200 local governments and 100 companies are joined

https://www.mlit.go.jp/plateau/about/

PLATEAU VIEW

PLATEAU VIEW 5.0　https://plateauview.mlit.go.jp/

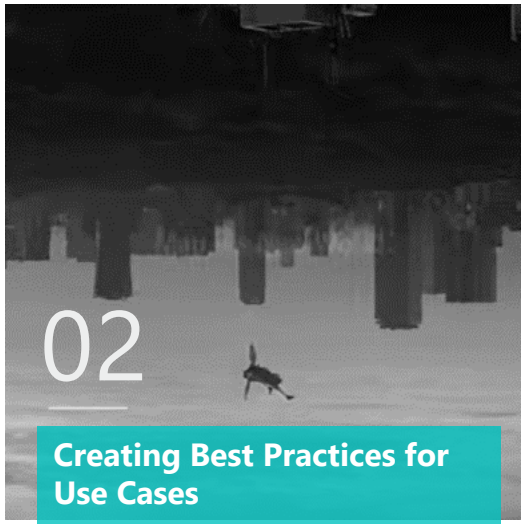


Project PLATEAU's Scope

Project PLATEAU is a collaborative initiative led by MLIT, aiming to implement urban digital twins.
The project involves partnerships with local governments, private companies, and tech communities.

Expanding the coverage of data

To promote data development and updating of 3D city models,
we establish standard data models and develop autonomous data development process.



Creating Best Practices for Use Cases

To solve social issues and create new value, We develop solutions that utilize 3D City Models.

Fostering Open Innovation

To Forster open innovation, we provide 3D city models as open data and enable communities to leverage them.

Facilitating Social Implementation

To facilitate Social Implementation for Urban Digital Twin, We provide support for local government to take the initiative in data development and use case creation for 3D city models.

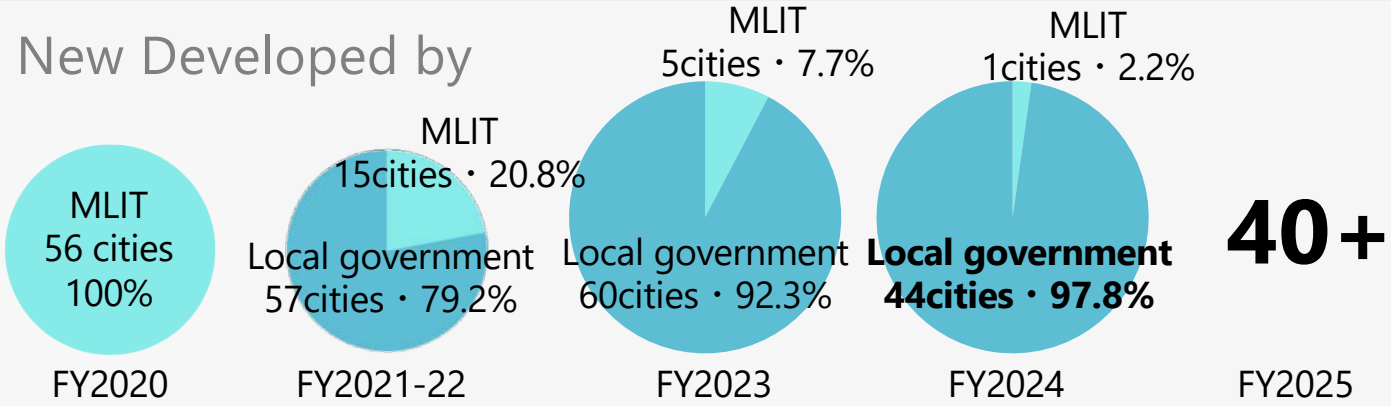
FY2020 - FY2025 Project PLATEAU | Achievement (tentative: updated March 2026)

304 / 1741 Cities
23,800km² / 378,000km²
Total area

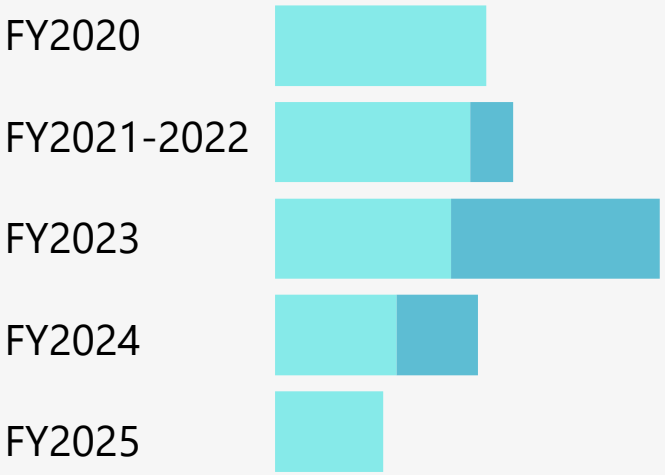
27.6 million* LOD1
Number of buildings

about 52.0%
Population coverage rate

New Developed by



New development/Update



New	56cities
New	72cities・82%
Update	16cities・18%
New	65cities・46%
Update	77cities・54%
New	45cities・60%
Update	30cities・40%
New	40+ cities
Update	

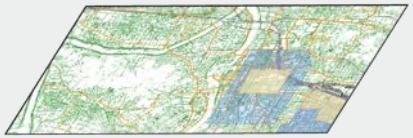
Expanding the coverage of data

Establishment of high-quality and scalable data development

accuracy-controlled within a horizontal deviation of 1.75 m and a height deviation of 0.66 m.

Urban Planning Base Ma (1:1,500~2,500)

2D map data of buildings, roads, blocks, etc.

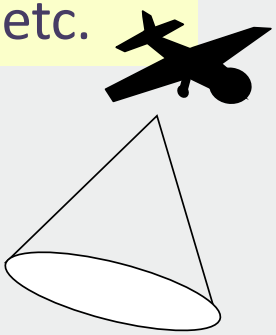


Geometry (shape)

×

Aerial survey results

3D data of building heights, shapes, **texture** etc.



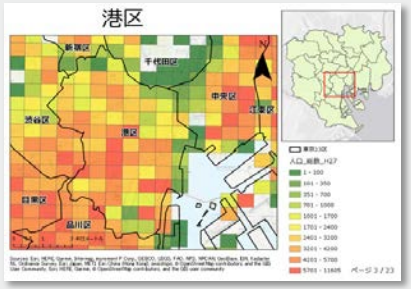
Buildings, Roads, Bridges, Trees, etc.

3D City Models

Semantics(attribute)

Urban Planning Basic Survey data

Current status of each buildings and land, etc.



Development of Standard Data Product Specification +ADE for 3D city models in Japan

Standardization of 3D city model data products in Japan

- The Standard Data Product Specification for 3D City Model was developed in March 2021 as Japan's first standard data model for 3D city model, which was updated by **version 5.1 in March 2026**.
- The development of this standard document has resulted in the unification of the specifications, standards, and quality of 3D city models in Japan.
- As a result, software development will be more efficient, knowledge will be shared, and data will be linked more easily.

1,380 pages !

Compatible with international standards

- The PLATEAU standard data specification is based on **CityGML 2.0**, an open format developed by an international standards organization OGC.
- The PLATEAU standard is a localized standard unique to Japan that adds attribute information and detailed LOD definitions.

HTML version also available

- HTML version was released in 2022 to improve usability

https://www.mlit.go.jp/plateaudocument/

PLATEAU Standard

Modules of the PLATEAU standard (version 3.0)

建築物モデル-Building

LOD0 LOD1 LOD2 LOD3 LOD4

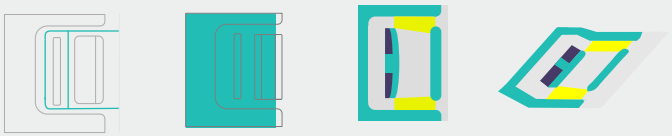
交通（道路）モデル-Transportation(Road)

LOD0 LOD1 LOD2 LOD3

交通（徒歩道）モデル-Transportation(Track)

LOD0 LOD1 LOD2 LOD3

交通（広場）モデル-Transportation(Square)



LOD0 LOD1 LOD2 LOD3

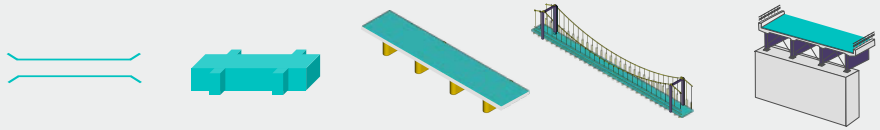
交通（鉄道）モデル-Transportation(Railway)

LOD0 LOD1 LOD2 LOD3

交通（航路）モデル-Transportation(Waterway)

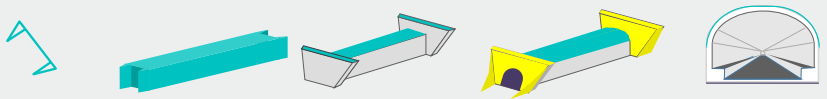
LOD0 LOD1 LOD2

橋梁モデル-Bridge



LOD0 LOD1 LOD2 LOD3 LOD4

トンネルモデル-Tunnel

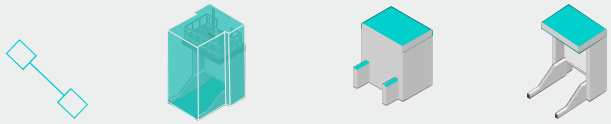


LOD0 LOD1 LOD2 LOD3 LOD4

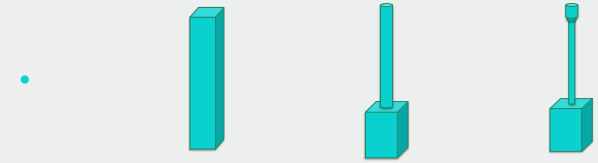
PLATEAU Standard

Modules of the PLATEAU standard (version 3.0)

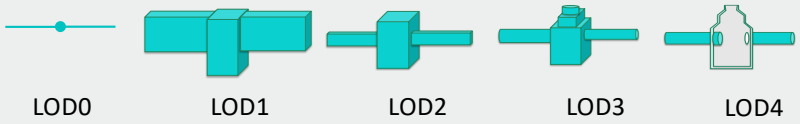
その他の構造物モデル-OtherConstruction



都市設備モデル-CityFurniture



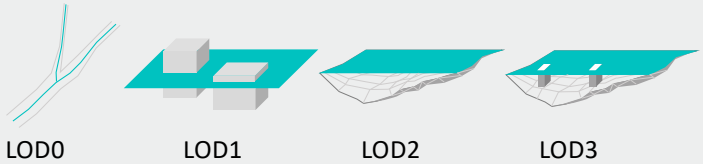
地下埋設物モデル-UtilityNetwork



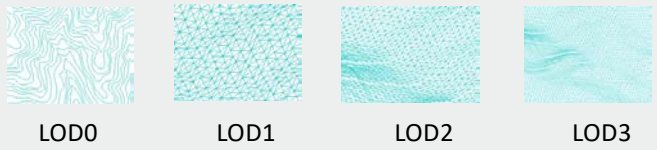
地下街モデル-UndergroundBuilding

植生モデル-Vegetation

水部モデル-WaterBody



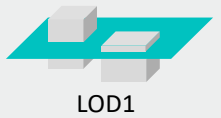
地形モデル- Relief



LandUse

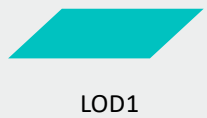
UrbanPlanning Area

Disaster Risk area(flood)



Disaster Risk area(landslide)

OtherArea

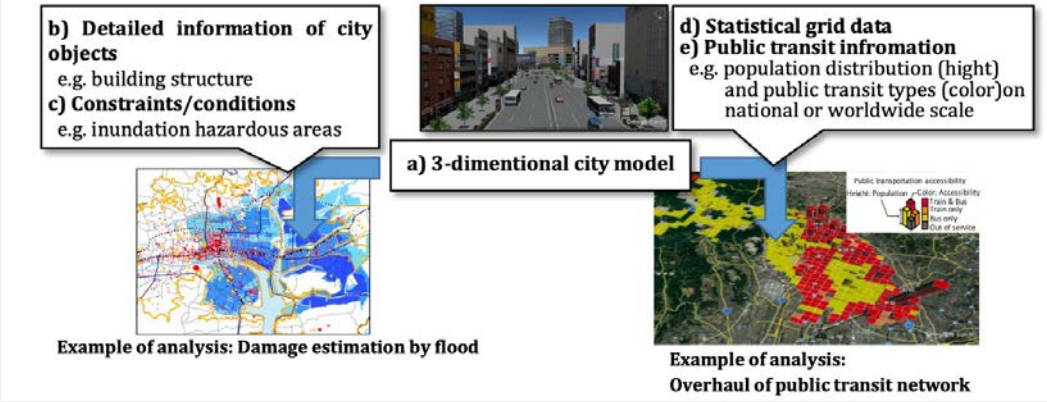


Urban Planning ADE (i-UR)

381 pages !

- Main components
  - **Urban Object module**
    - Extends physical objects (e.g., buildings, roads, vegetation)
    - Adds detailed attributes (e.g., structure type, usage, regulations) [mlit.go.jp]
  - **Urban Function module**
    - Represents **non-physical / regulatory concepts**
    - e.g., zoning, planning areas, hazard zones
- Data scope
  - Covers a wide range of urban elements:
  - Buildings, transportation, water bodies, land use, city furniture
- Key contribution
  - Enables representation of planning regulations and policy information in 3D
  - Supports analysis, simulation, and consensus-building in urban planning

a) 3-dimentional city objects and city model
b) Detailed information of city objects for analysis
c) Constraints/conditions (e.g. regulation) related to urban revitalization
d) Statistical grid data for global analysis and visualization
e) Public transit information to consider urban function accumulation in regional planning



https://www.chisou.go.jp/tiiki/toshisaisei/itoshisaisei/iur/index.html

The i-Urban renovation and planning Data Encoding Specification

Part 1: Urban Object Data Encoding Specification
This document targets on b) Detailed information of city objects for analysis and define them as properties of CityGML object.

Part 2: Urban Function Data Encoding Specification
This document targets on c) Constraints/conditions related to urban renovation and define constraints and conditions as subclasses of the root class in CityGML.

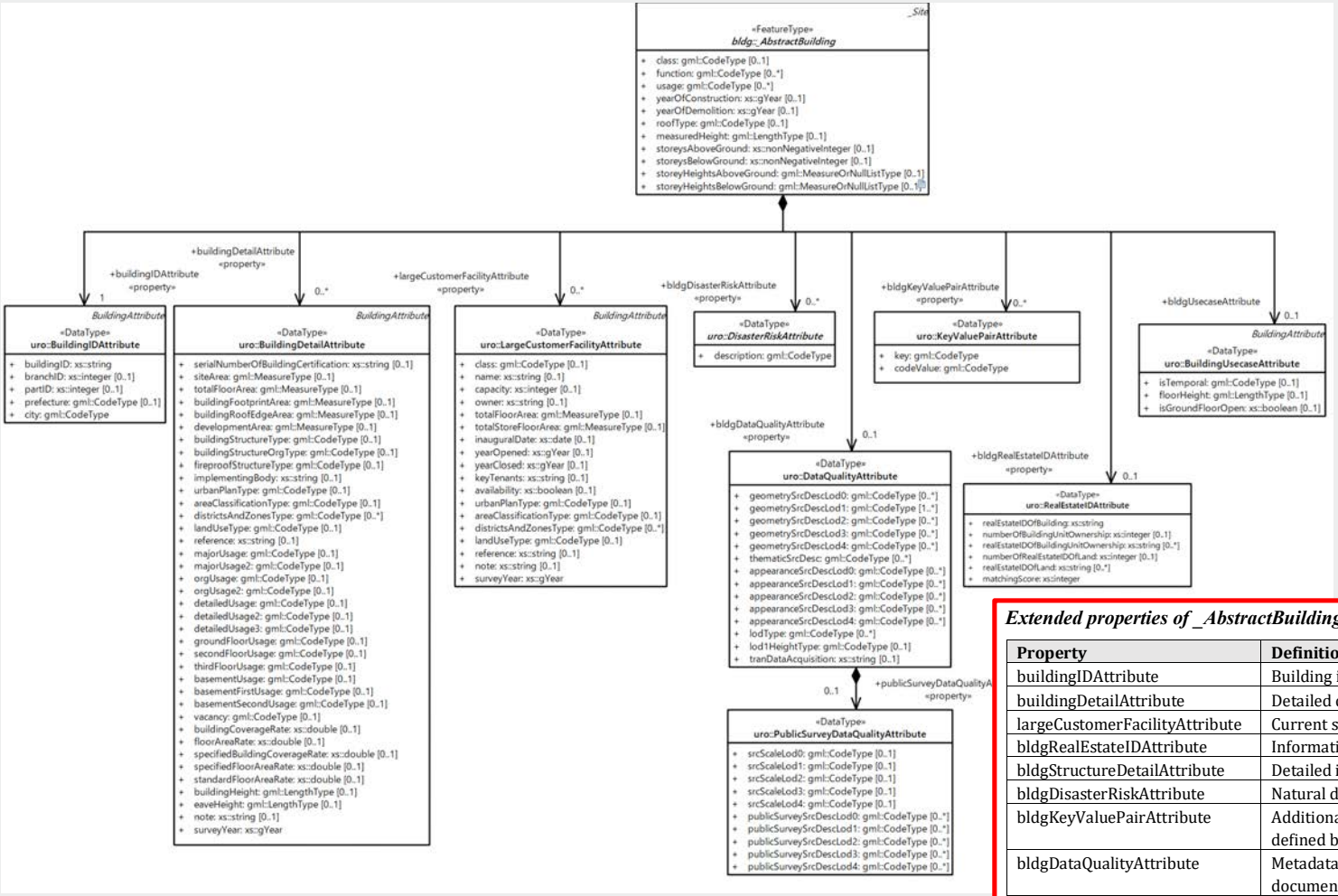
Part 3: Statistical Grid Data Encoding Specification
This document targets on d) Statistical grid data for demand and supply analysis and define a statistical grid as subclasses of the root class in CityGML.

Part 4: Extended LOD Data Encoding Specification for Global City Model
This document targets on e) Global city model for global analysis and visualization. To promote “compact cities”, global analysis and visualization are necessary for role sharing among cities, and global city model which is easy to handle is also required.

Feature		LOD0	LOD1	LOD2	LOD3	LOD4
Building		v1	v1	v1	v1	v1
Land Use			v1			
Transportation	Road	v3	v1	v2	v2	
	Track	v3	v3	v3	v3	
	Square	v3	v3	v3	v3	
	Railway	v3	v3	v3	v3	
	Waterway[2]	v3	v3	v3		
Urban Planning[1]			v1, v2			
Disaster Risk[1]			v1, v2			
City Furniture			v2	v2	v2	
Vegetation			v2	v2	v2	
Water Body		v3	v3	v3	v3	
Relief Feature			v1	v2	v2	
Bridge		v3	v3	v3	v3	v3
Tunnel		v3	v3	v3	v3	v3
Other Construction[2]		v3	v3	v3	v3	
Underground Building[1]			v3	v3	v3	v3
Utility Network[1]		v3	v3	v3	v3	
Zone[1]			v3			
Generic City Object		v1	v2	v2	v2	v3

1 Features defined in Urban Planning ADE
2 Features defined in Urban Planning ADE while ensuring consistency with CityGML 3.0

Building properties for urban planning

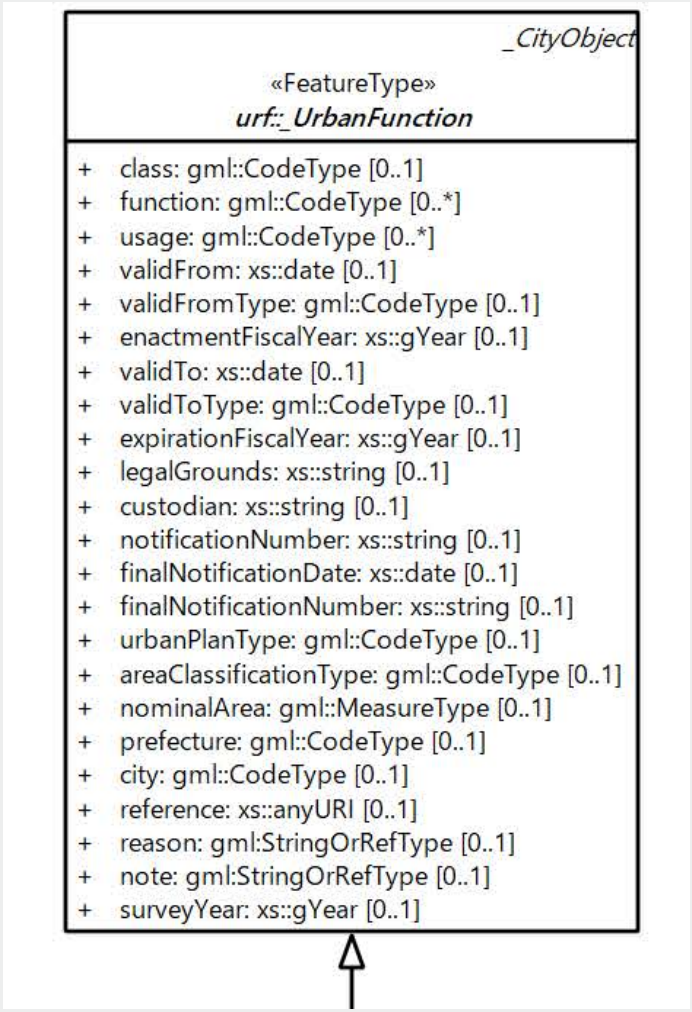


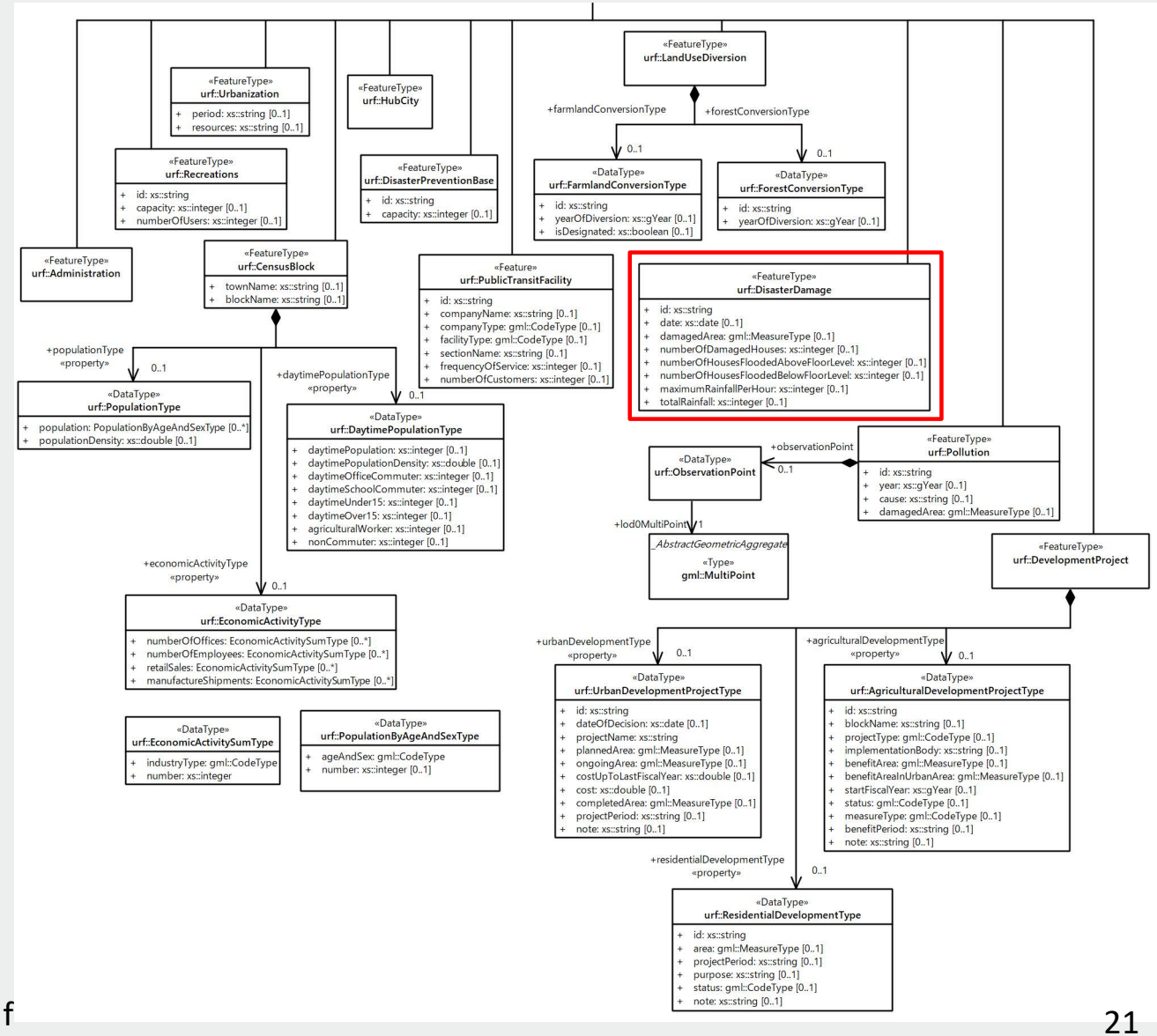
Extended properties of _AbstractBuilding

Property	Definition
buildingIDAttribute	Building identification information.
buildingDetailAttribute	Detailed descriptions of the building, such as its structure and total floor area.
largeCustomerFacilityAttribute	Current status of the building, especially if it is a large customer facility.
bldgRealEstateIDAttribute	Information for linking to real estate registration data.
bldgStructureDetailAttribute	Detailed information on the building's structure.
bldgDisasterRiskAttribute	Natural disaster risk based on the building's location.
bldgKeyValuePairAttribute	Additional code attributes for describing properties not covered by other attributes defined by i-UR and CityGML.
bldgDataQualityAttribute	Metadata information about data creation, including positional accuracy and source documents.
bldgUsecaseAttribute	Use-case specific attributes.

https://www.geospatial.jp/iur/shiyouan3_2.pdf

Subclasses of urf::_UrbanFunction





https://www.geospatial.jp/iur/shiyouan3_2.pdf

PLATEAU View: Flood estimation area and each buildings forecast (color is rank)

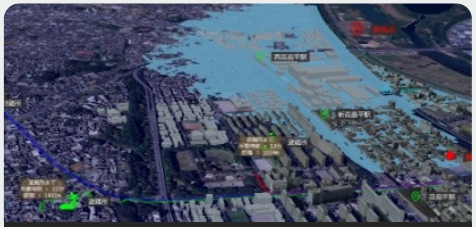
PLATEAU by MLIT

Creating Best Practices for Use Cases

Creating digital twin-based solutions in diverse public and private sectors

Urban Planning

Use in planning and simulation for urban planning, development and area management, consensus building, and in apps for the community.



Disaster Management

Use in disaster prevention planning and simulation, risk visualisation, evacuation route apps, disaster prevention workshops.

Revitalisation/Tourism

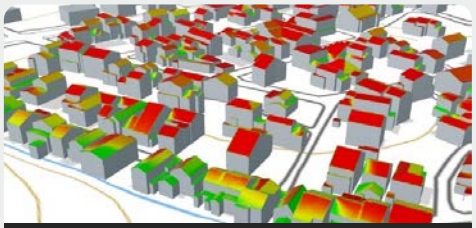
Used for creating metaverse spaces, XR tourism contents, tourism guide apps, advertising effectiveness simulations.

Mobility/Robots

Use for autonomous vehicles and drones for maps, OS and optimum route searches.

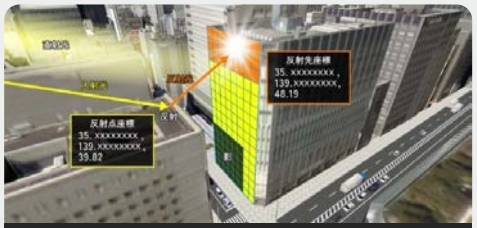
Public participation

Use for apps, XR tools, dashboards to support public participation in urban development and local activities



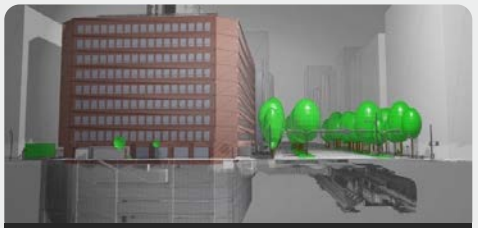
Environment/Energy

Use for simulation of solar power generation, heat islands, ventilation, and area energy management.



Infrastructure

Use for apps for buildings and park facilities management, ageing simulation and management through IoT data.



Digital twin tech

Development of technologies for segmentation and modelling of sensing data such as point clouds and integration with BIM.

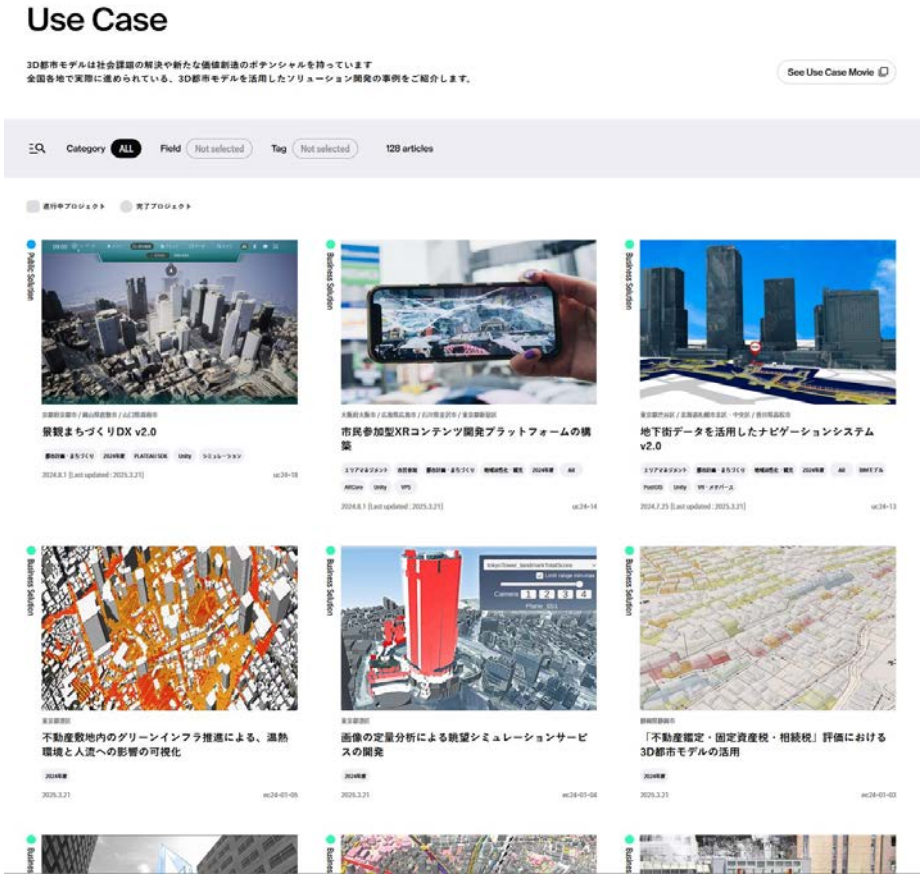
PLATEAU by MLIT

Creating Best Practices for Use Cases

A total of **148 use cases** are developed between 2020 and 2025.

- All use cases developed on PLATEAU are available on the website.
- Additionally, the technical insights gained during the process of use case development are published as technical reports.
- These materials are available to municipalities and others interested in similar use cases and applications.
- Sharing not only successful experiences but also failures as knowledge allows us to accelerate the social implementation of technology.

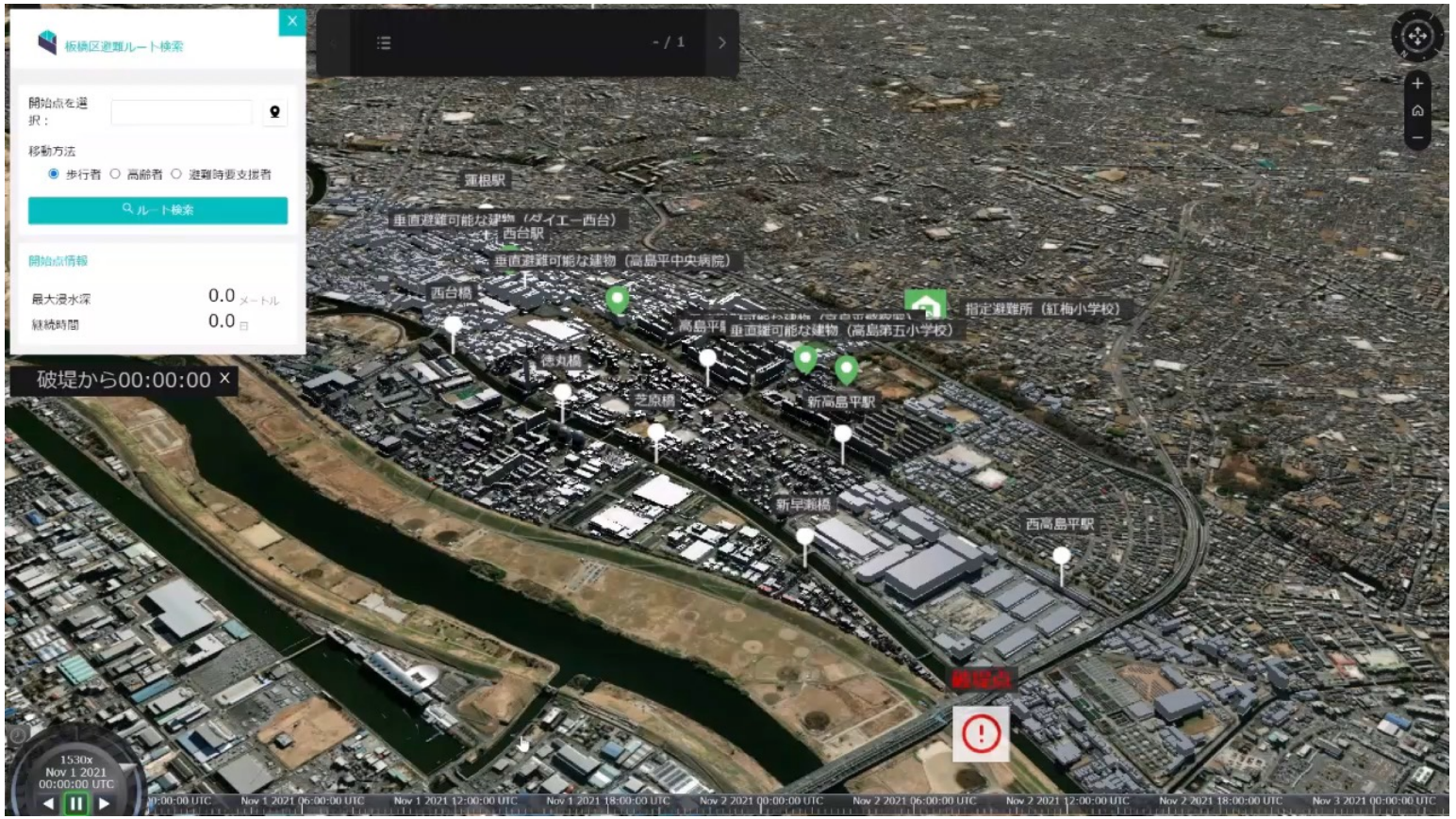
https://www.mlit.go.jp/plateau/use-case/



Disaster management

Point

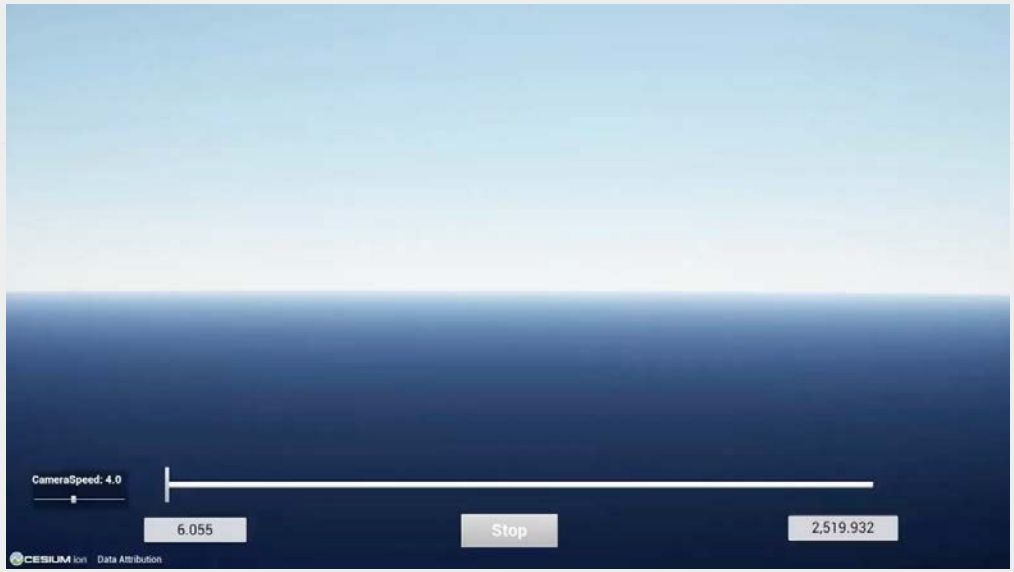
- Overlays and AR can help to understand flood changes and evacuation routes.

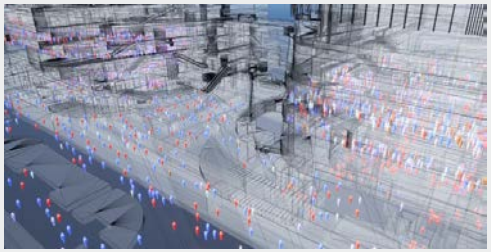


FY2022 Project PLATEAU

Advanced Disaster Management in Area Design

Developed large-scale Crowd simulation using a 3D urban model to achieve DX in area design with a focus on disaster management.





- By integrating BIM, CAD, and 3D city models of the Shinagawa Station North District, we create an integrated indoor-outdoor model to facilitate large-scale guidance and evacuation simulations involving 10,000 people. This environment visualizes 3D representations of potential risks during disasters and the necessary evacuation plans to solve them.
- Leveraging these outcomes, we provide support for planning and consensus-building regarding evacuation in preparation for updating the Urban Regeneration Safety Assurance Plan (a disaster management plan in collaboration with the public and private sectors) for the area.

Agency: JR-EAST, KDDI CORPORATION, Tokyu Land Corporation, Nikken Sekkei Co., Ltd.

Location: Minato Ward, Tokyo

https://www.mlit.go.jp/plateau/use-case/uc22-030/

PLATEAU SDK for Unity / Unreal Engine

- PLATEAU SDK is an open-source software developed by MLIT as a toolkit for using PLATEAU's 3D city models within Unity and Unreal Engine 5.
- By utilizing the PLATEAU SDK, you can easily import the 3D city model data from PLATEAU into your game engine projects and develop real-world applications and city simulations.
- The official version, ver1.0.0, was released on February 28, 2023, and garnered significant attention through various media outlets and social media platforms.

Tools for All

PLATEAU SDK tool kit for Unity

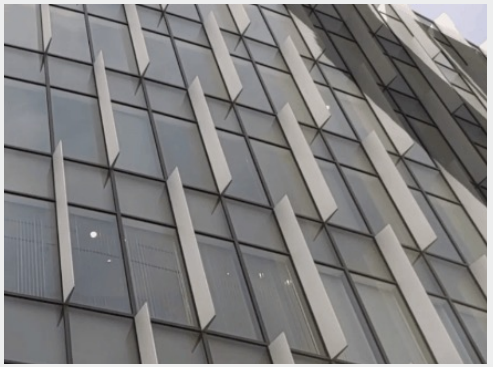
- A toolkit collection to support application development on Unity using the "3D city model" data provided by PLATEAU.
- Based on PLATEAU use cases, various types of applications using PLATEAU can be implemented with the required functionalities provided in four toolkits.

Render Toolkit

An environment system is provided that can change conditions such as location, time, and weather conditions.

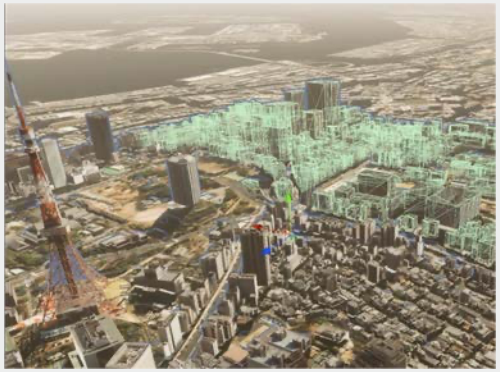
Sandbox Toolkit

3D models of people, vehicles, and urban objects are provided as assets. Using a dedicated placement tool, automated movement settings can be configured.



AR Toolkit

Features are provided for utilizing 3D city models as occlusion objects in AR applications. Alignment functions using AR markers and Google's Geospatial API are also available.



Maps Toolkit

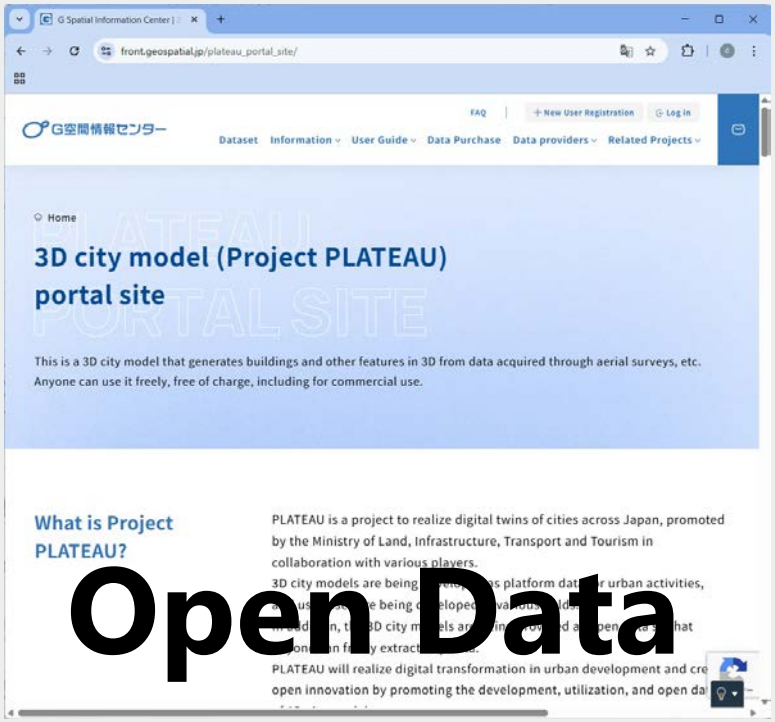
A toolkit for spatial analysis, visualization, integration with architectural information, and the development of map applications using PLATEAU's 3D city models.

https://github.com/Project-PLATEAU/PLATEAU-SDK-Toolkits-for-Unity

PLATEAU Achievements

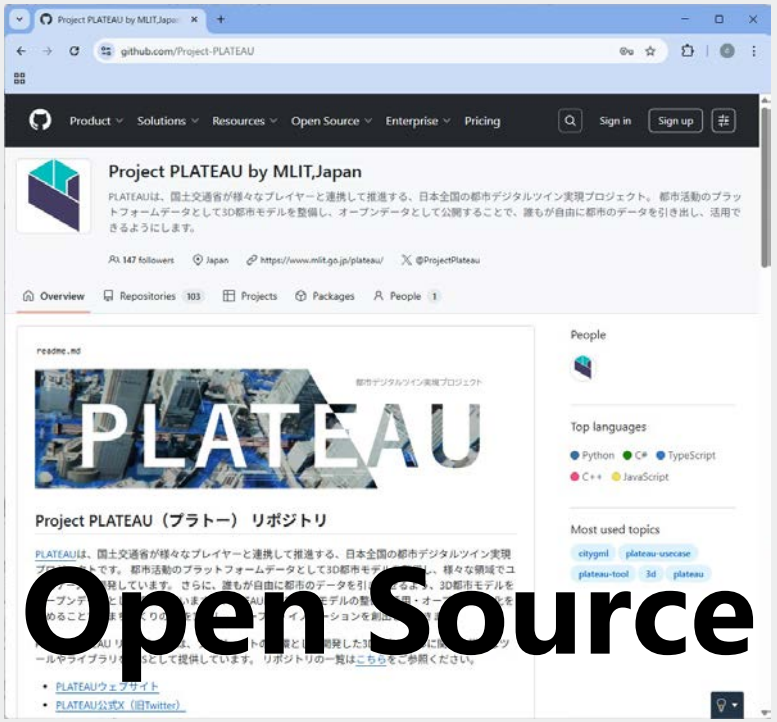
Fostering Open Innovation

- PLATEAU not only shares the **3D city model as open data by CKAN** but also provides a variety of tools and other assets to utilize the 3D city model to foster open innovation.
- By adopting open licenses such as **CC BY 4.0**, we enable secondary use, modification, and commercial utilization, thereby promoting open innovation in various fields.



Open Data

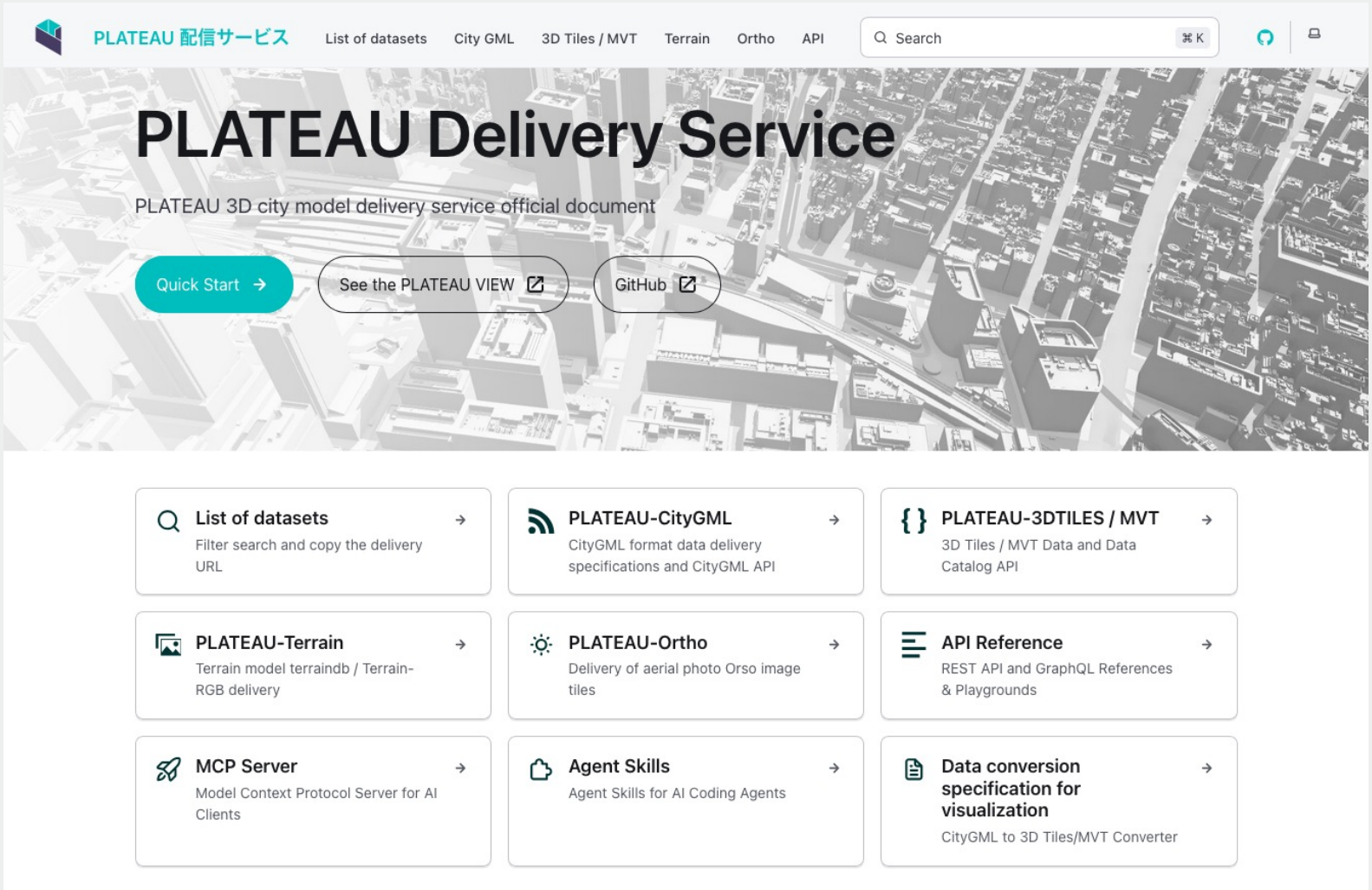
https://www.geospatial.jp/ckan/dataset/plateau



Open Source

https://github.com/Project-PLATEAU

Searching PLATEAU Data with GenAI (experimental services)



https://docs.plateauview.mlit.go.jp

Fostering Open Innovation

Community building, enhancing digital capabilities for local governments, information dissemination, and developing support tools for developers.

Community Building

Encourage the formation of communities of engineers, citizens, and companies participating in PLATEAU through activities like app contests, hackathons, pitch events, hands-on workshops, and acceleration programs.

Enhancing Digital Capabilities

Strengthen digital capabilities in the public and private sectors to promote data utilization and support digital transformation by developing training programs for digital talent.

Creating Movement

Through information dissemination and media content creation, promote the usefulness of PLATEAU in various fields and stimulate a movement to encourage participation.

PLATEAU's Initiatives

Fostering Open Innovation : PLATEAU Next

PLATEAU Next, unique opportunities where you can experiment with new ideas and share the knowledge gained.

- Provide a platform to practice the "Creative Learning Spiral".
- Offer collaboration on 3D city models.
- Participant with diverse technical backgrounds, skill levels, specialties, and social positions.
- Promote cooperation and innovation.
- Facilitate the development of new talent.

↓

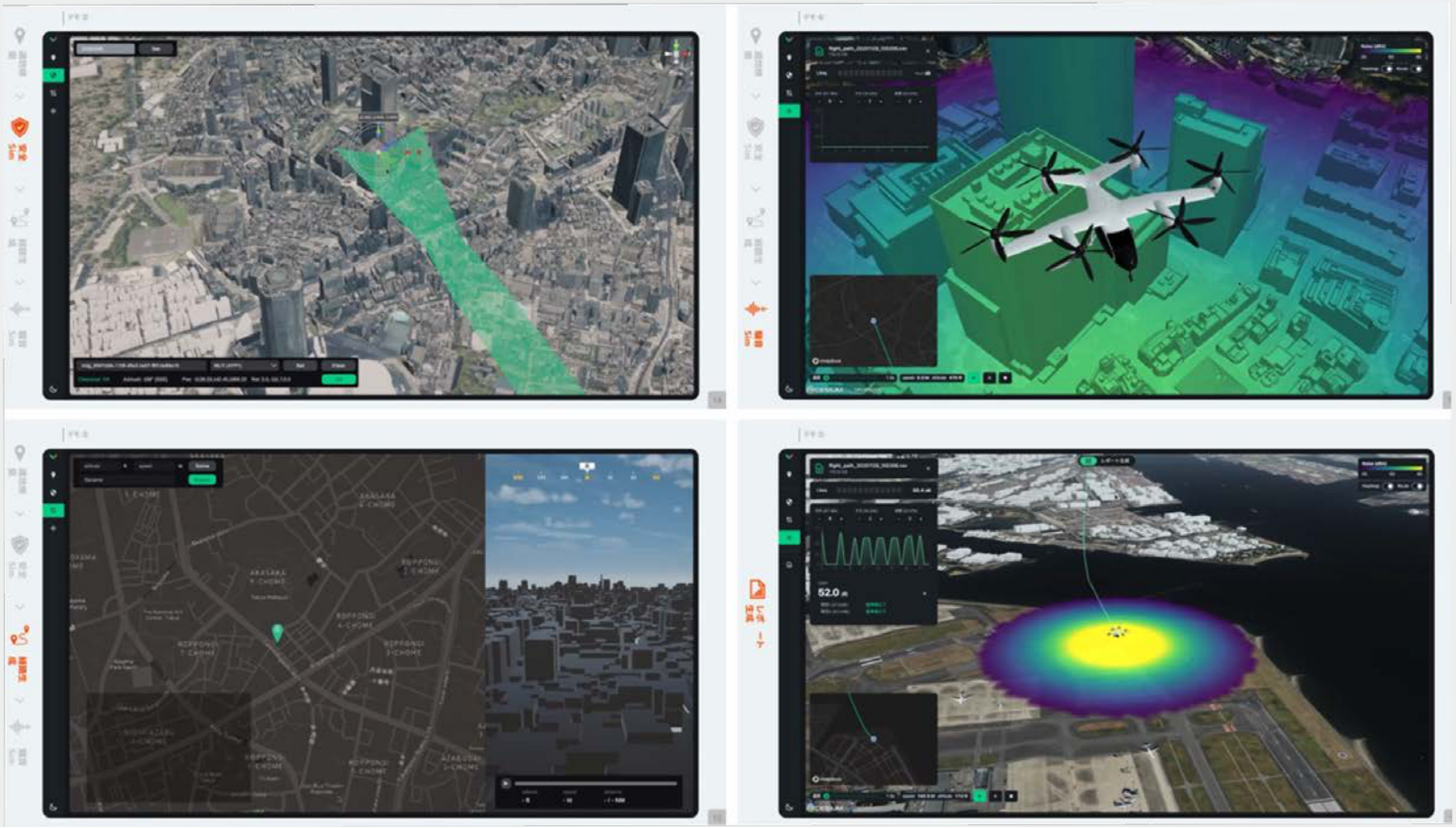
PLATEAU Award (Competition)

(in Japanese)

Lightning Talk, Hands-on and Hackathon events

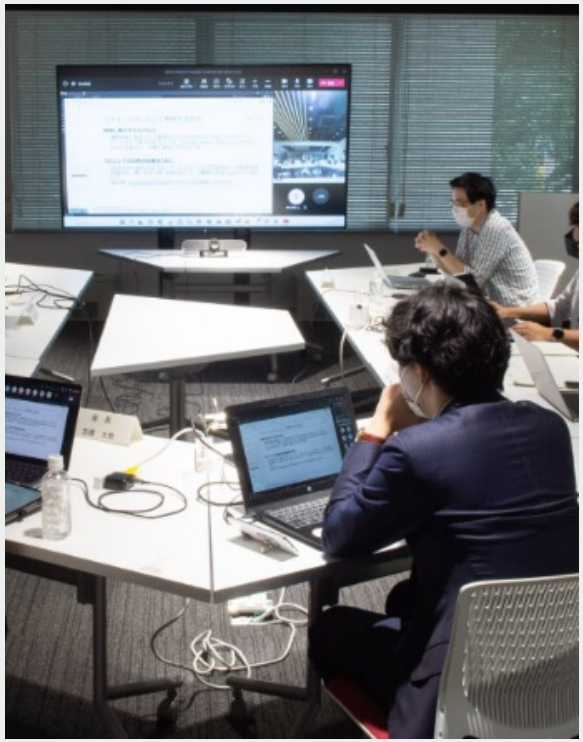
WINNER: 「VP Studio」https://speakerdeck.com/kokusaidigital/no-dot-1-vp-studio

- VP Studio is a web app that supports planning and expanding vertiports for eVTOL (“flying cars”) by integrating processes such as site selection (rooftops/land), safety assessment, route design, and noise simulation—previously handled by separate specialized tools.
- It leverages generative AI to enable intuitive evaluation and automated analysis (e.g., obstacle-avoiding routes, flight-based noise aggregation) and produces integrated reports, helping stakeholders share insights and accelerate real-world deployment in collaboration with local governments.



Facilitating Social Implementation

Financial and technical support is provided to local governments, along with assistance in matching the needs and resources of the public and private sectors, to promote the expansion of data coverage for 3D city models and the social implementation of use cases.



Financial Support

Assist local governments in developing, utilizing, and transforming 3D city models into open data by leveraging the PLATEAU subsidy program.
A subsidy program for (private) **businesses** will also be launched in FY2025.

Technical Support

Provide materials to support the project formation and approval processes within local governments and conduct technical training in collaboration with the surveying industry to expand the pool of companies eligible for contracts.

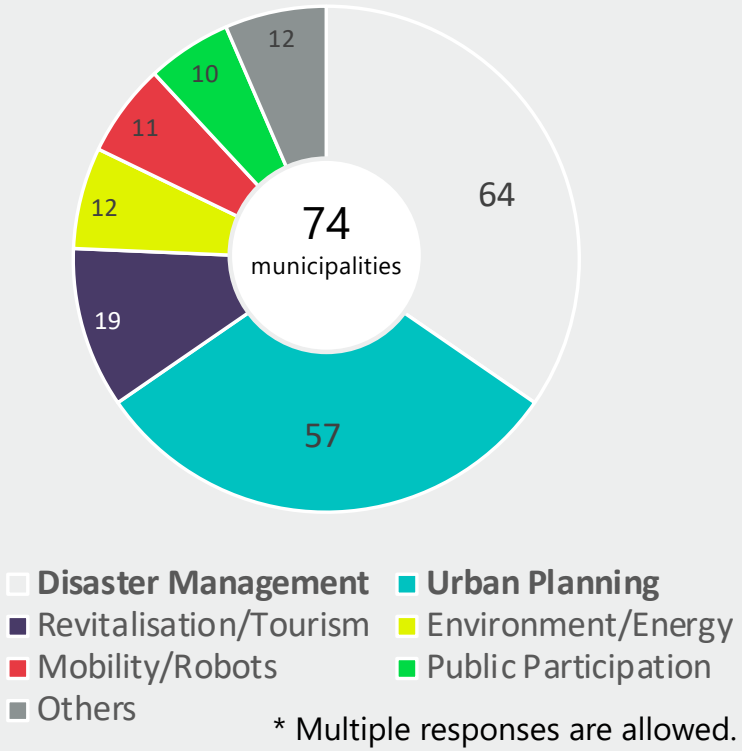
Support for Matching Needs and Resources

Facilitate connections between municipalities seeking solutions to regional issues with 3D city models and companies offering such solutions, promoting project development.

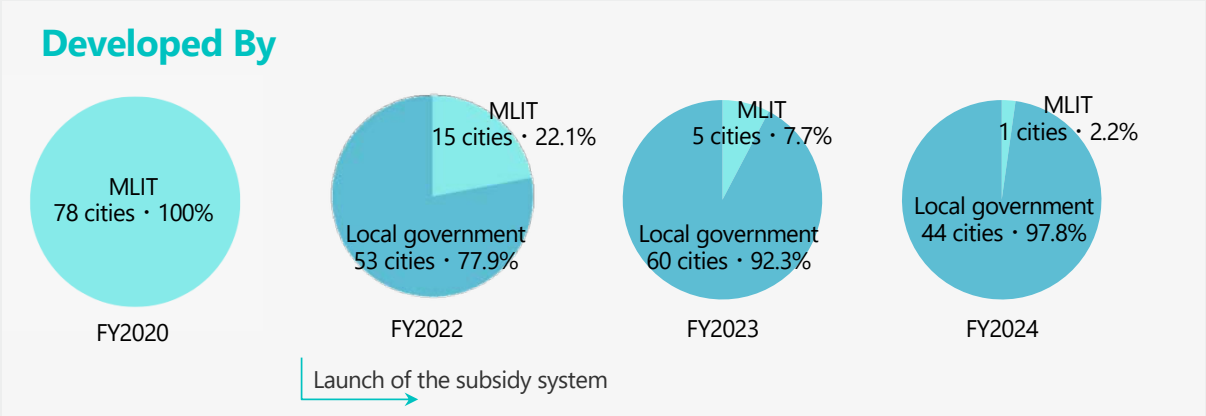
PLATEAU Achievements

Facilitating Social Implementation

74 municipalities developed use cases and 3D city models under the subsidy program from FY 2022 to FY 2024.



* Multiple responses are allowed.



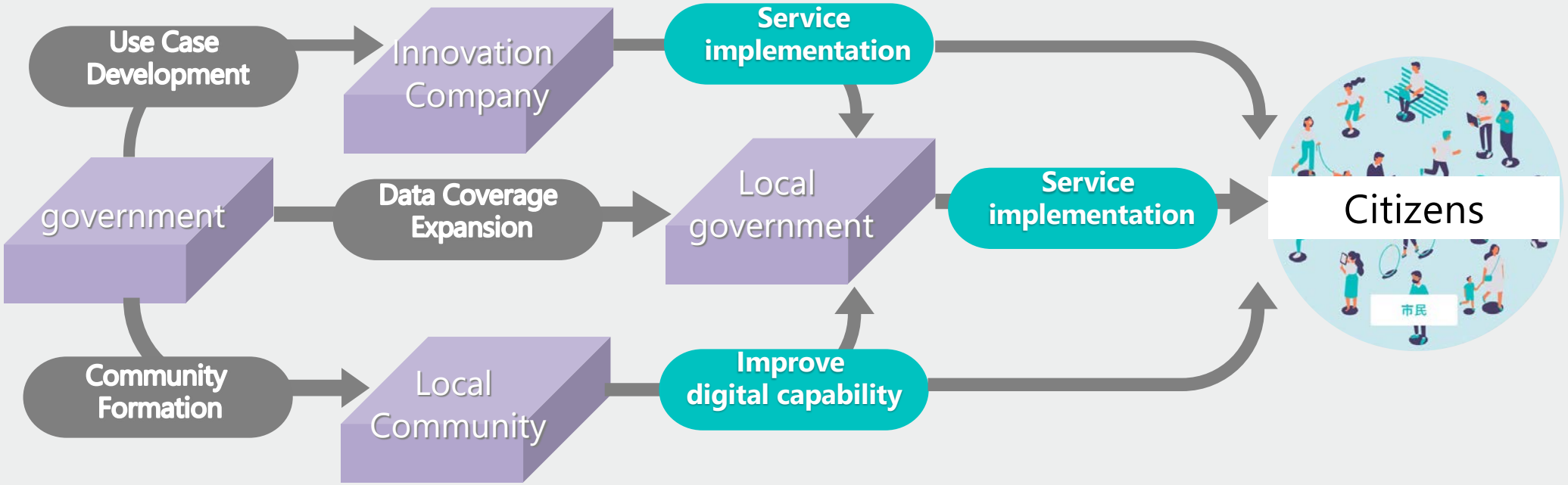
FY2024 Technical Support Results
(Training for Public and Private Sectors)

Number of Events	Number of Participants	Number of Prefectures
18	900	13

Project Goal: Ecosystem

PLATEAU's goal is to create an ecosystem for the development, utilization, and open availability of 3D city models for more urban resilience.

- PLATEAU aims to build an 'ecosystem' in which the maintenance, utilization and open data conversion of 3D city models develop autonomously through the cooperation of diverse actors



Governance and Policy Issues in project PLATEAU (in my opinion)

1. **High costs of development and continuous updating**
   Need for lighter, AI-supported models that reduce costs while remaining policy-relevant

2. **Mismatch between policy needs and required data quality**
   Many use cases can function with simplified, fit-for-purpose models
   The semantic model contains **many attribute values specific to urban planning** in Japan (iUR-ADE), but not all are used.

3. **Weak integration into routine administrative workflows**
   Especially limited optimization in current Japanese urban planning (“analog-style”) processes

4. **Limited incentives for sustained private-sector engagement**
   Data are open and free, but technical maturity in private-sector remains uneven

Potential next MSc thesis topic in Geomatic course!

Japan's PLATEAU: from CityGML to CityJSON

Japan's PLATEAU project is the world's most ambitious 3D city modelling effort, covering 300+ cities with over 170,000 CityGML files where buildings and other city objects are modelled. The project page gives a good overview, and the datasets in CityGML are openly available for download. One of the most notable aspects of PLATEAU is the variety and richness of its content: besides buildings, it includes transportation models, water bodies, land use, vegetation, natural-disaster-related information, and in some cases even LoD3 and LoD4 data with rich textures.

The datasets use CityGML (still v2) with a behemoth of an Application Domain Extension (ADE): the i-Urban Revitalization (i-UR) ADE (to support all aspects of urban planning). The full details of the i-UR ADE are here and there is a scientific summary there.

In practice, PLATEAU datasets have not been ported to CityGML 3.0 or to another format mostly because of the complexity of this ADE. Converting the geometries and basic attributes is straightforward with citygml-tools, but that ignores all the rich extra attributes and new city objects defined in the i-UR ADE. Through PLATEAU, this research will help reveal how some of the richest CityGML datasets can be converted into CityJSON together with appropriate ADE replacements in the form of CityJSON extension.

https://3d.bk.tudelft.nl/education/msctopics/#japans-plateau-from-citygml-to-cityjson

PLATEAU by MLIT

Dank u wel / Thank You !

PLATEAU WEB

PLATEAU View

PLATEAU GitHub

PLATEAU API/MCP tools (experimental)

Acknowledgement: The various materials in the slides are based on those provided by MLIT.