

From Land Data to Land Intelligence: How a National Land Platform Enhances Transparency, Multi-Stakeholder Governance and Sustainable Territorial Development

Audrey ALAJOUANINE & Cyril DUGARD, France

Key words: Open data, Institutions, Land's information, Land Governance, Land register

1. SUMMARY

Land governance increasingly relies on the availability of reliable, transparent and interoperable land-related data. While many countries have invested in the digitisation of cadastral and planning information, land data often remains fragmented across institutions, limiting its effective use for public decision-making and sustainable development.

This paper explores the transition from land data to land intelligence, defined as the ability to transform heterogeneous land-related datasets into actionable, evidence-based information supporting both public policies and private decision-making. It highlights the role of national land platforms as key enablers of this transformation, not only through technical data integration but also through governance frameworks, institutional coordination and trust-building mechanisms.

Using the French national land platform Géofoncier as a case study, the paper presents how multi-source spatial and land data—such as cadastral information, urban planning regulations and risk data—can be integrated into a coherent and reliable reference system. The platform's governance model, involving public institutions and regulated professions, ensures data quality, transparency and long-term sustainability.

The paper further illustrates how land intelligence supports concrete use cases for public authorities and private stakeholders, including spatial planning, land-use regulation, project feasibility assessment and land sobriety strategies. Finally, it discusses lessons learned and conditions for international transferability, emphasizing that effective land intelligence depends as much on governance and institutional alignment as on technology itself.

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2. INTRODUCTION

Land governance is a cornerstone of sustainable development. Secure land rights, transparent land information and effective spatial planning are essential for economic development, social stability and environmental protection. However, in many countries, land-related data remains fragmented across institutions, limiting its usability for public decision-making and private initiatives.

Digital transformation has enabled the production of large volume of spatial and land data, but the challenge has shifted from data availability to data usability.

In this current context, considering population growth and environmental challenges, all stakeholders involved in the land governance require to get access to complete, reliable land information and tools to support land sobriety strategies.

This paper explores how a national land platform can transform dispersed datasets into land intelligence, supporting transparency, governance and sustainable territorial development. The French national land portal, Géofoncier, is presented as a case study illustrating this transition.

3. INSTITUTIONAL CONTEXT AND GOVERNANCE FRAMEWORK IN FRANCE

France's land administration system is characterised by a strong institutional framework involving public authorities, professionals and regulated professions. Land-related data is produced by multiple actors, including land register, urban planning institutions, communities and the surveyors as well.

Within this ecosystem, governance and data reliability are critical. The French Order of Surveyors (Ordre des Géomètres-Experts) plays a central role in ensuring data quality, professional standards and legal consistency. The national land platform Géofoncier operates within this institutional framework, ensuring alignment between public data, surveyors interventions sources and professional practices.

This governance model provides legitimacy, legal reliability and long-term sustainability, which are key conditions for transforming land data into trusted land intelligence.

4. GÉOFONCIER AS A NATIONAL LAND PLATFORM : GOVERNANCE, TRUST AND INSTITUTIONAL POSITIONING

Géofoncier operates as a national land platform designed to provide a reliable and shared reference framework for land-related information in France. Its positioning is not that of a

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Cape Town, South Africa, 24–29 May 2026

commercial tool but rather that of a digital infrastructure embedded within the national land governance ecosystem.

A key factor underpinning the platform's effectiveness is its governance model. Géofoncier is developed and operated within a professional and institutional framework that ensures neutrality, legal consistency and long-term sustainability. The platform acts as an intermediary between public data producers and end-users, translating institutional datasets into usable and understandable land information while preserving their legal meaning.

Trust is a central issue in land information systems. Land-related decisions often involve significant legal, financial and social implications. As a result, users require not only access to data, but confidence in its origin, reliability and interpretation. Géofoncier addresses this challenge by ensuring data traceability, documentation of sources and alignment with professional standards defined by institutions and surveyors.

The platform also distinguishes between governance and usage. While data governance is centrally coordinated to ensure consistency and quality, access and use cases are diversified according to stakeholder needs. Public authorities, professionals and private actors access the same reference data but through interfaces and services adapted to their respective roles. This approach reinforces transparency while preventing fragmentation of interpretations.

By positioning itself as a trusted national infrastructure, Géofoncier is a unique entry point of land's information and contributes to strengthening collaboration between institutions and professions. It supports a shared understanding of land constraints and opportunities, which is a prerequisite for effective land governance and evidence-based territorial policies.

1. INTEGRATING MULTI-SOURCE GEOSPATIAL AND LAND DATA: CHALLENGES AND ADDED VALUE

The integration of multi-source land and geospatial data is one of the core challenges addressed by national land platforms. In the French context, land-related information is produced by multiple institutions, each operating under specific legal mandates, technical standards and update cycles. These datasets include land register information, which is the starting point, urban planning regulations, environmental, natural technological risks data, and building permits.

One of the primary difficulties lies in the heterogeneity of these datasets. Differences in geospatial references, scales, temporal validity and legal interpretation can lead to inconsistencies or misinterpretations when datasets are used independently. Moreover, land regulations are often context-dependent, requiring careful alignment between geospatial data and legal texts.

Géofoncier addresses these challenges through a structured integration approach. Data layers are spatially aligned, documented and contextualised to ensure coherence and readability. Particular attention is paid to the temporal dimension of land data, as regulatory information may evolve over time and directly affect land rights and development potential.

The added value of this integration does not stem solely from technical aggregation. It lies in the ability to present complex regulatory and spatial information in a coherent and intelligible

manner. Users can access a consolidated view of land constraints and opportunities, reducing uncertainty and facilitating informed decision-making.

This multi-source integration also supports interoperability between institutions and professional practices. By providing a shared reference framework, the platform reduces discrepancies in data interpretation and contributes to harmonised land management approaches across territories.

For instance, the surveyors works contribute to modernize and update the land register data.

5. USE CASES: FROM TRANSPARENCY TO EVIDENCE-BASED DECISION-MAKING

The transformation of integrated land data into land intelligence enables a wide range of operational use cases for both public and private stakeholders. Transparency is the first and most immediate benefit. By providing access to consolidated and reliable land information, the platform reduces information asymmetries and supports more balanced interactions between stakeholders.

For public authorities, land intelligence supports strategic and operational decision-making. Local and regional governments can better assess land constraints, monitor land consumption trends and design spatial planning policies aligned with sustainability objectives. The availability of integrated land data facilitates the implementation of land sobriety strategies, including densification and optimisation of existing urban areas.

Land intelligence also enhances coordination between planning, environmental protection and risk management policies. By visualising and cross-referencing regulatory constraints, public actors can anticipate potential conflicts and assess the cumulative impact of land-use decisions. Private stakeholders, including surveyors, notaries and real estate professionals, use land intelligence to secure projects, transactions and to accelerate analysis and decision making. Access to reliable and comprehensive land information allows them to assess feasibility at an early stage, identify regulatory constraints and reduce legal and technical risks. This shared reference framework also facilitates dialogue with public authorities by relying on commonly accepted data sources.

Having access to all land's information for a region, a city, a quarter or the historical of for all French territory, Geofoncier has become a reference.

The Geofoncier's portal allow to reinforce the collaboration between private / public partners and the French's surveyors.

On other side Geofoncier is also designed to serve the general public by providing open and free access to key land-related information. In line with the European INSPIRE Directive, the platform contributes to improving citizens' access to land information, enabling a better understanding of land constraints, planning regulations and environmental considerations.

By making authoritative land information accessible to non-expert users, the platform reduces information asymmetry and fosters transparency in land governance. This public access supports informed participation in land-use discussions and contributes to greater trust between citizens, public authorities and surveyors. In this sense, open access to land information is not

only a technical requirement but also a democratic and educational component of sustainable land governance.

More broadly, these use cases illustrate how land intelligence acts as an enabling layer between data and policy. Rather than prescribing decisions, it provides the analytical foundation required for informed, transparent and sustainable land governance.

6. CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOALS (SDG)

Land intelligence directly contributes to several Sustainable Development Goals. By enabling informed urban planning and land use decisions, it contributes to SDG 11 on sustainable cities. Rather than addressing SDGs directly, land intelligence acts as an enabling layer that strengthens the capacity of territories to design and implement sustainable policies.

7. LESSONS LEARNED AND INTERNATIONAL TRANSFERABILITY

The French experience highlights several key lessons. First, data governance is as important as technology. Institutional coordination, professional involvement and clear governance rules are critical success factors. Second, national platforms must balance open data principles with data reliability and legal responsibility.

While institutional contexts differ across countries, the principles underpinning land intelligence—interoperability, transparency and multi-stakeholder governance—are widely transferable. National professional bodies and public institutions can play a central role in developing similar platforms adapted to local contexts.

8. CONCLUSION AND OUTLOOK

The transition from land data to land intelligence represents a major step forward for land governance. National land platforms can act as catalysts for this transformation by providing trusted, integrated and actionable information.

Future developments may further enhance land intelligence through advanced analytics, real-time data integration and artificial intelligence. Beyond technological evolution, the key challenge remains governance: ensuring that land intelligence serves public interest, sustainability and inclusive territorial development.

CONTACTS

Audrey ALAJOUANINE

Topo Airtech

32 rue des Cosmonautes

31400 TOULOUSE

FRANCE

Tel. +33 6 30 47 33 18

Email: Audrey.alajouanine@geometre-expert.fr

Web site: <https://topoairtech.com/>

Cyril DUGARD

Geofoncier

42 rue Bernard Ortet

31500 TOULOUSE

FRANCE

Tel. +33 6 83 76 95 45

Email: Cyril.dugard@geofoncier.fr

Web site: <https://www.geofoncier.fr/>