Application of Controlled Vocabularies to Foundational Spatial Information

Ashlee Poeppmann and Michael Elliott-Smith (Australia)

Key words: Cadastre; Capacity building; Digital cadastre; e-Governance; Geoinformation/GI; Land management; Legislation; Positioning; Real estate development; Reference systems; Spatial planning; Standards

SUMMARY

The modernisation of foundational spatial information, such as roads and addressing datasets, is critical for delivering accurate, reliable geospatial information systems. This paper examines the application of controlled vocabularies as tools to standardise and enhance the Queensland Addressing and Location Information (QALI) database.

The objective has been to adopt semantic web-based data models for foundational spatial information datasets, with an initial focus on addressing. These data models rely on access to machine-readable controlled vocabularies, pre-defined lists of concepts including road types (e.g. road, drive, street, lane) and address geocode types (e.g. parcel centroid, building centroid). This approach will extend to related datasets that form key components of addresses, such as roads and geographic names.

The implementation of controlled vocabularies has led to the creation of an authoritatively maintained code repository, openly available under the authority of the Intergovernmental Committee on Surveying and Mapping (ICSM). Each vocabulary entry is assigned a persistent unique identifier (e.g. https://linked.data.gov.au/def/road-types), recognised by the Australian Linked Data Working Group. Unlike static code lists embedded in standards documents, these repositories are dynamic, allowing public suggestions for updates, which are reviewed and implemented by authorised users. This approach ensures an auditable change history and fosters national collaboration by providing machine- and human-readable access to the controlled vocabularies via APIs.

The adoption of a linked open data approach promotes the reuse and extension of existing controlled vocabularies, avoiding duplication of content. This method ensures that updates are

Application of Controlled Vocabularies to Foundational Spatial Information (13248)
Ashlee Poeppmann and Michael Elliott-Smith (Australia)

FIG Working Week 2025
Collaboration, Innovation and Resilience: Championing a Digital Generation
Brisbane, Australia, 6–10 April 2025

efficiently managed by enabling third parties to reuse or directly link to primary data. Changes made to the vocabulary are automatically reflected in all referencing systems.

The adoption of controlled vocabularies and linked open data disrupts traditional approaches to foundational spatial data management. This approach reduces the need for extract-transform-load (ETL) processes and duplicative methods of copying reference data, enabling more direct integration with authoritative sources. This shift streamlines workflows, improves data accuracy, and fosters real-time collaboration, marking a significant advancement in the modernisation of spatial data infrastructures. Controlled vocabularies pave the way for more efficient and collaborative geospatial systems.

Application of Controlled Vocabularies to Foundational Spatial Information (13248)
Ashlee Poeppmann and Michael Elliott-Smith (Australia)

FIG Working Week 2025
Collaboration, Innovation and Resilience: Championing a Digital Generation
Brisbane, Australia, 6–10 April 2025