Analysis of Studies on the Land Administration Domain Model in Turkey

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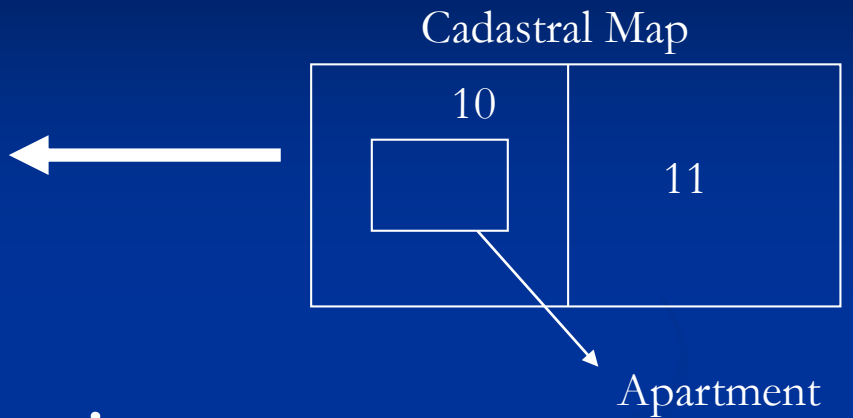
Overview

- Current Land Title and Cadastral Systems in Turkey
- Brief review of ISO 19152 Land Administration Domain Model (LADM) and its temporal aspects
- LADM Applications in Country Profile
- Studies on the LADM in Turkey
- Conclusion

Current Land Title And Cadastral Systems (Turkey)

Cadastral Data :

Land Title Data : Parcel or apartment, owners, ownership rights information's.



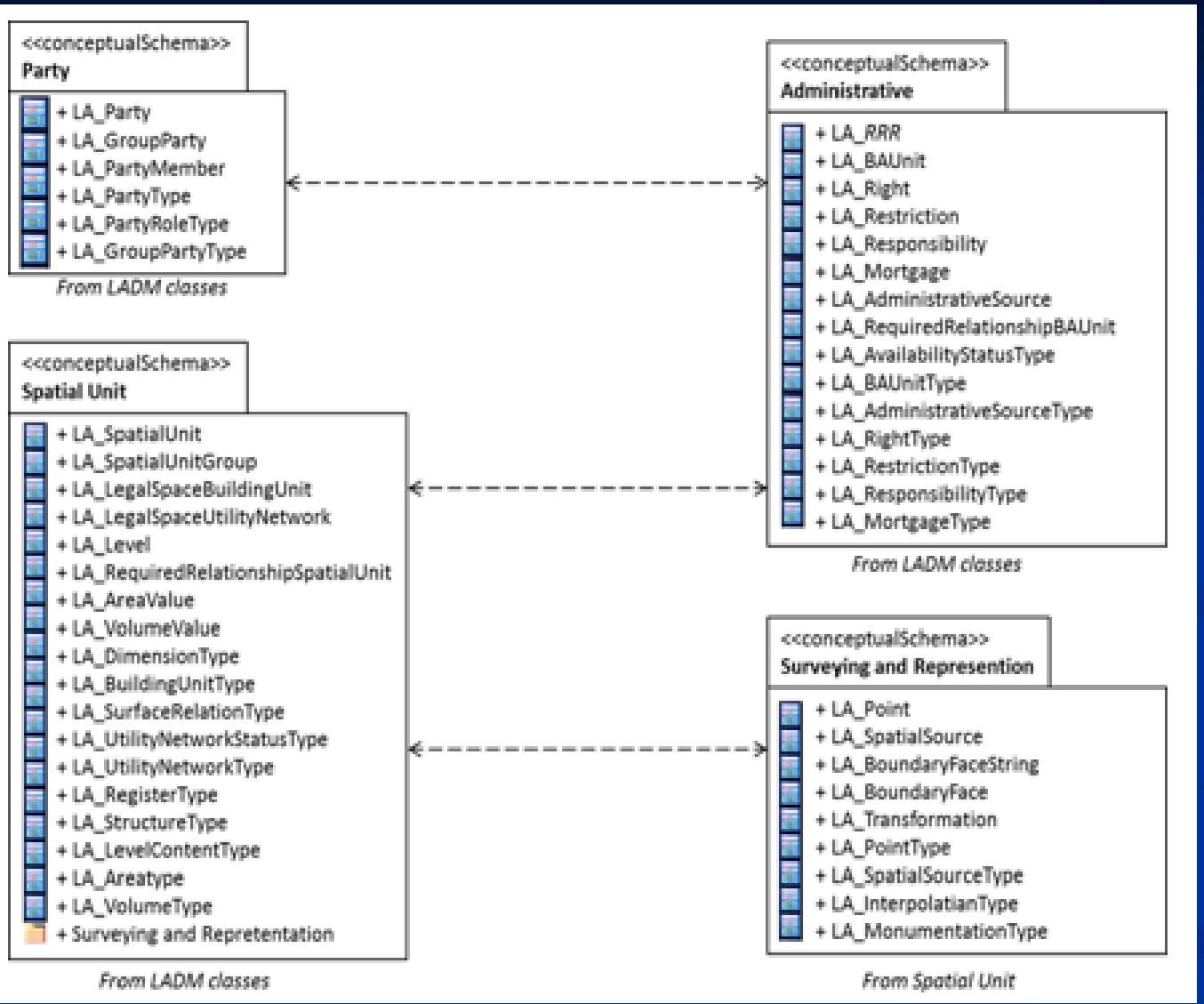
Land Title Registers

Main Registers	Auxiliary Registers
Land title register	Owners registers
Real estate(condominium) register	Representatives register
Transactions register	Corrections register
Legal documents	Public owned lands register

Brief Review of ISO, LADM

- LADM is identified to be the International Standard Organisation of ISO 19152 under technical committee TC/211 for Geographic Information/Geomatics (Lemmen et al., 2010; Paasch et al.,2013; Tjia and Coetzee, 2013; Van Oosterom, 2015). LADM was designed as a standard for all land registration and transactions within the country and countries or local and localities (Babalola et al., 2015). The LADM serves at least two important goals:
- (1) to provide an extensible basis for efficient and effective cadastral system development based on a model-driven architecture (MDA) in order to avoid reinventing and re-implementing the same functionality over and over again, and (2) to enable involved parties, both within one country and between different countries, to communicate based on a shared ontology implied by the model (Van Oosterom et al., 2009).

Brief Review of ISO, LADM



The LADM provides an abstract, conceptual schema with three basic packages and two subpackages. Parties (such as, people and organisations), administrative rights, responsibilities and restrictions (such as property rights) and spatial units (such as parcels, buildings, and networks), with the latter having one subpackage that surveying and spatial representation

Figure 1: The LADM overview of (sub) packages (with their respective classes) (ISO, 2012).

Brief Review of ISO, LADM and TGIS

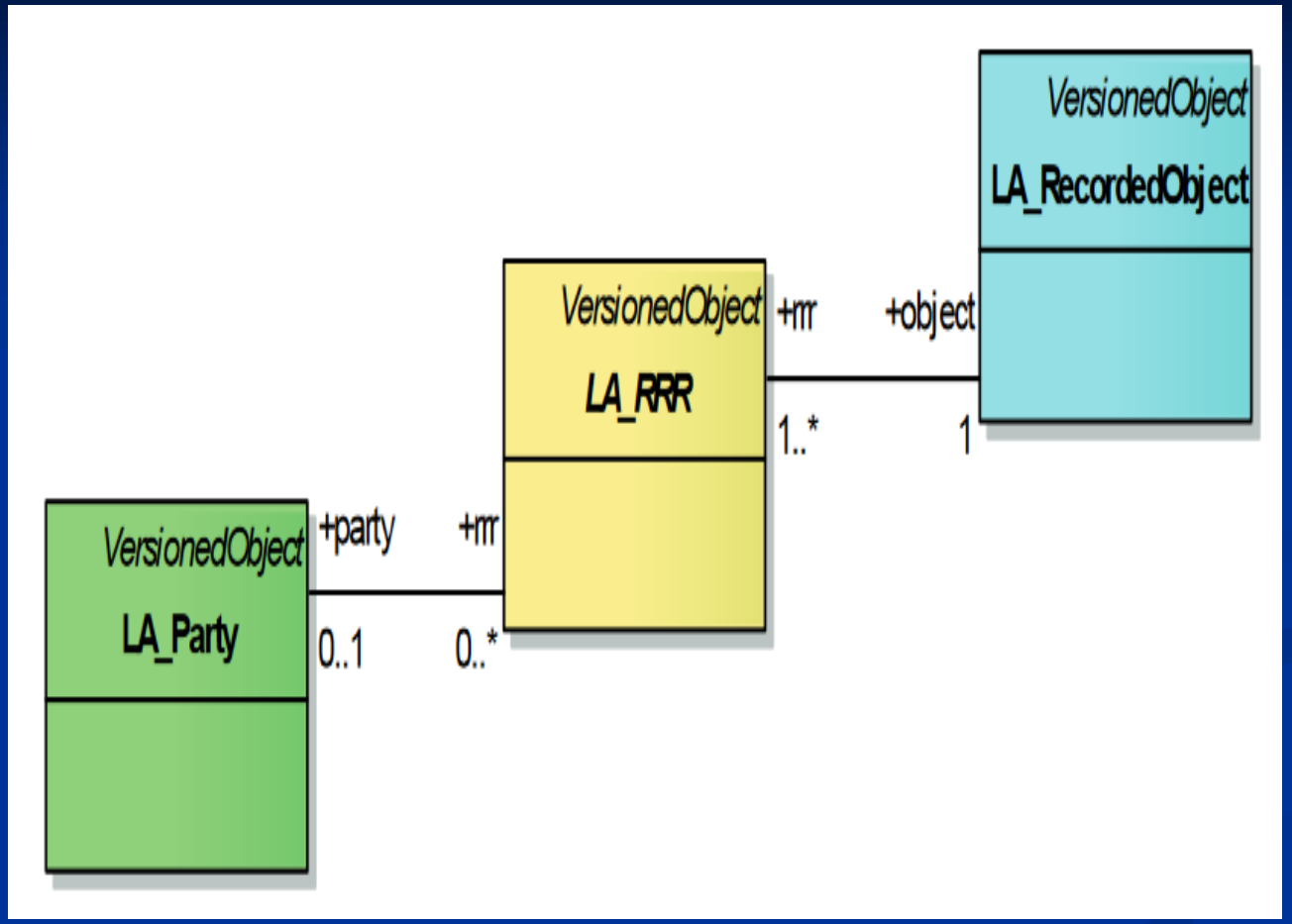


Figure 2: Core classes with temporal aspects of LADM

Brief Review of ISO, LADM and TGIS

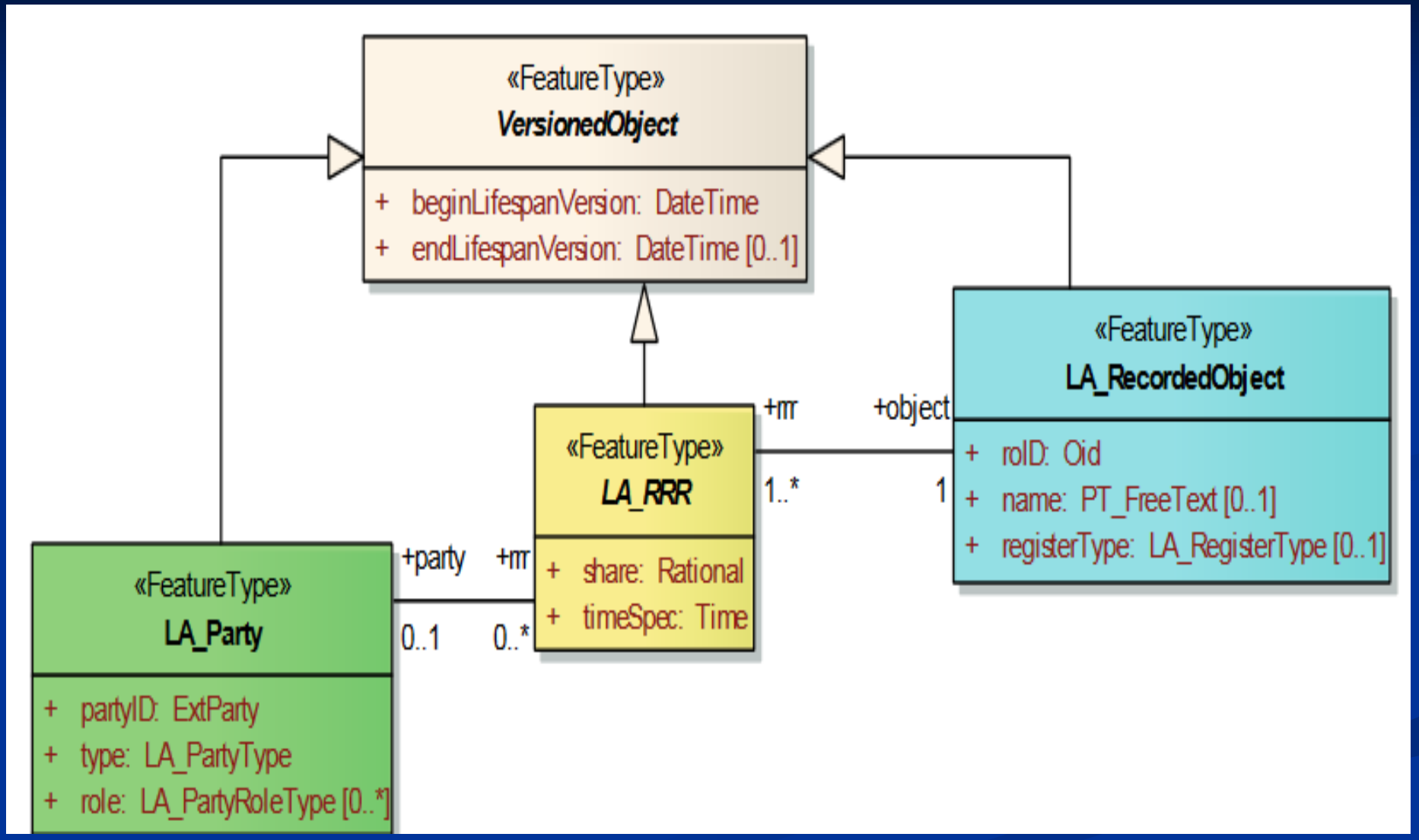


Figure 3: Class version objects for Spatio-Temporal data

Model Design Based on ISO 19152 LADM

In this study, conformity of LADM for modeling easement rights in terms of temporal cadastre situations in Turkey was evaluated. For testing the designed model, the easements registered in the land registry were examined. The main types of recorded easements can be listed as follows (the Turkish terms are added in italic, in brackets).

- Right of superficies *(üst hakkı)*
- Right of usufruct *(yararlanma hakkı)*
- Right of passage *(geçit hakkı)*
- Right of water *(kaynak hakkı)*
- Right of residence *(oturma hakkı)*

Model Design Based on ISO 19152 LADM

Turkish model original class name	Name in the Turkey's profile	Corresponding LADM class	Corresponding LADM subclass
TK_İrtifakHakları	TR_Easement	LA_Right	-
TK_Kısıtlılıklar	TR_Restrictions	TR_Restrictions	-
TK_Sorumluklar	TR_Responsibilities	TR_Responsibilities	-
TK_ÜstHakkı	TR_RightOfSuperficies	LA_Right	LA_EasementRightType
TK_YararlanmaHakkı	TR_RightOfUsufruct	LA_Right	LA_EasementRightType
TK_GeçitHakkı	TR_RightOfPassage	LA_Right	LA_EasementRightType
TK_KaynakHakkı	TR_RightOfWater	LA_Right	LA_EasementRightType
TK_OturmaHakkı	TR_RightOfResidence	LA_Right	LA_EasementRightType
TK_ResmiBelgeler	TR_AdministrativeSourceType	LA_Source	TR_AdministrativeSourceType
TK_HakkınİlgiliOlduğuTaşınmazTipi	TR_TypeOfRealPropertyRelatedToRights	LA_Right	LA_EasementRightType
TK_İrtifakHakkınınSüresi	TR_DurationOfEasement	LA_Right	LA_EasementRightType
TK_İrtifakHakkınınBedeli	TR_CostOfEasement	LA_Right	LA_EasementRightType

Table 1: The main classes of Turkish temporal cadastral data model classes of Turkey's country profile and related ISO 19152 LADM classes.

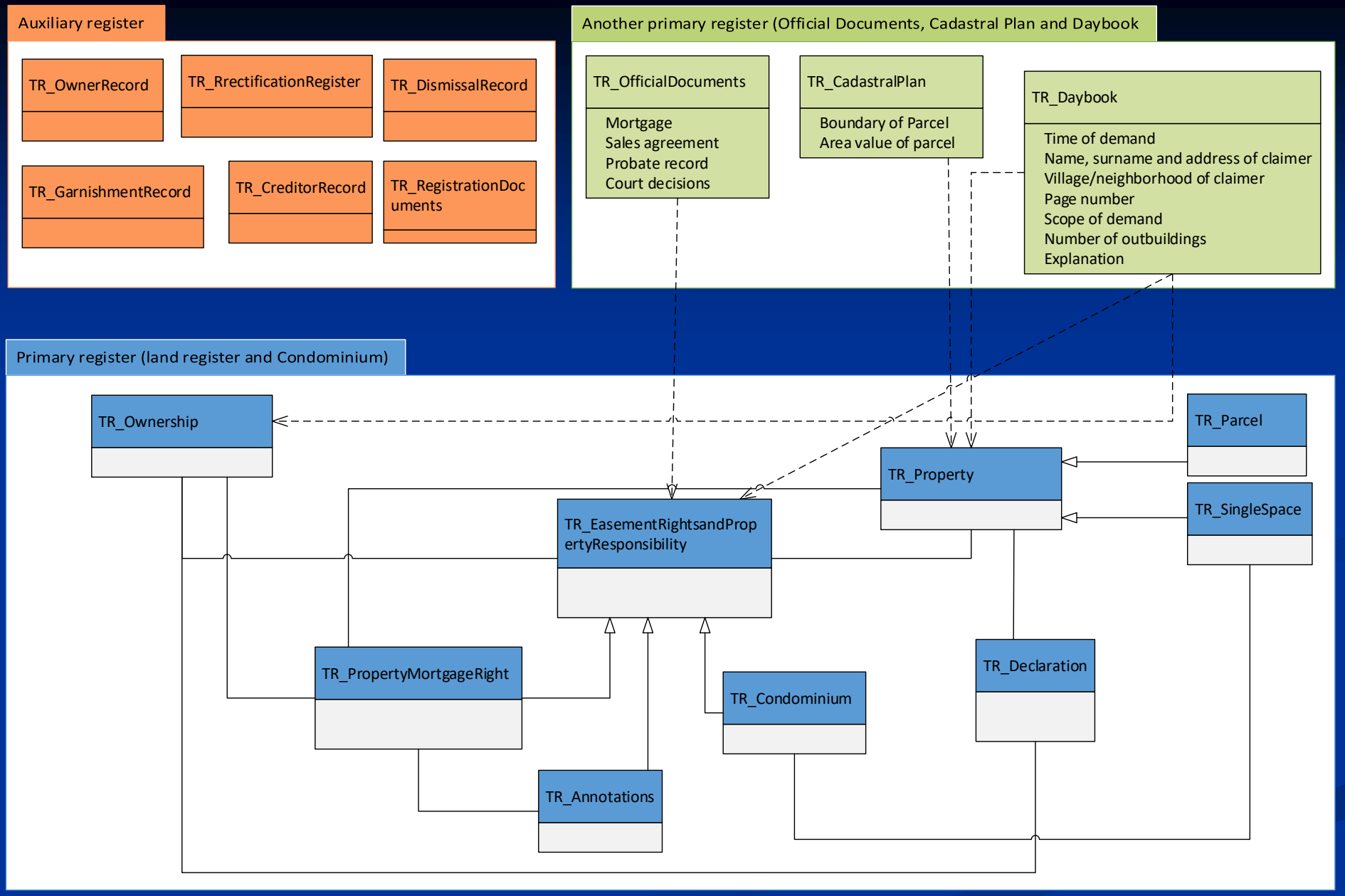


Figure 4. Land registry procedures in Turkey

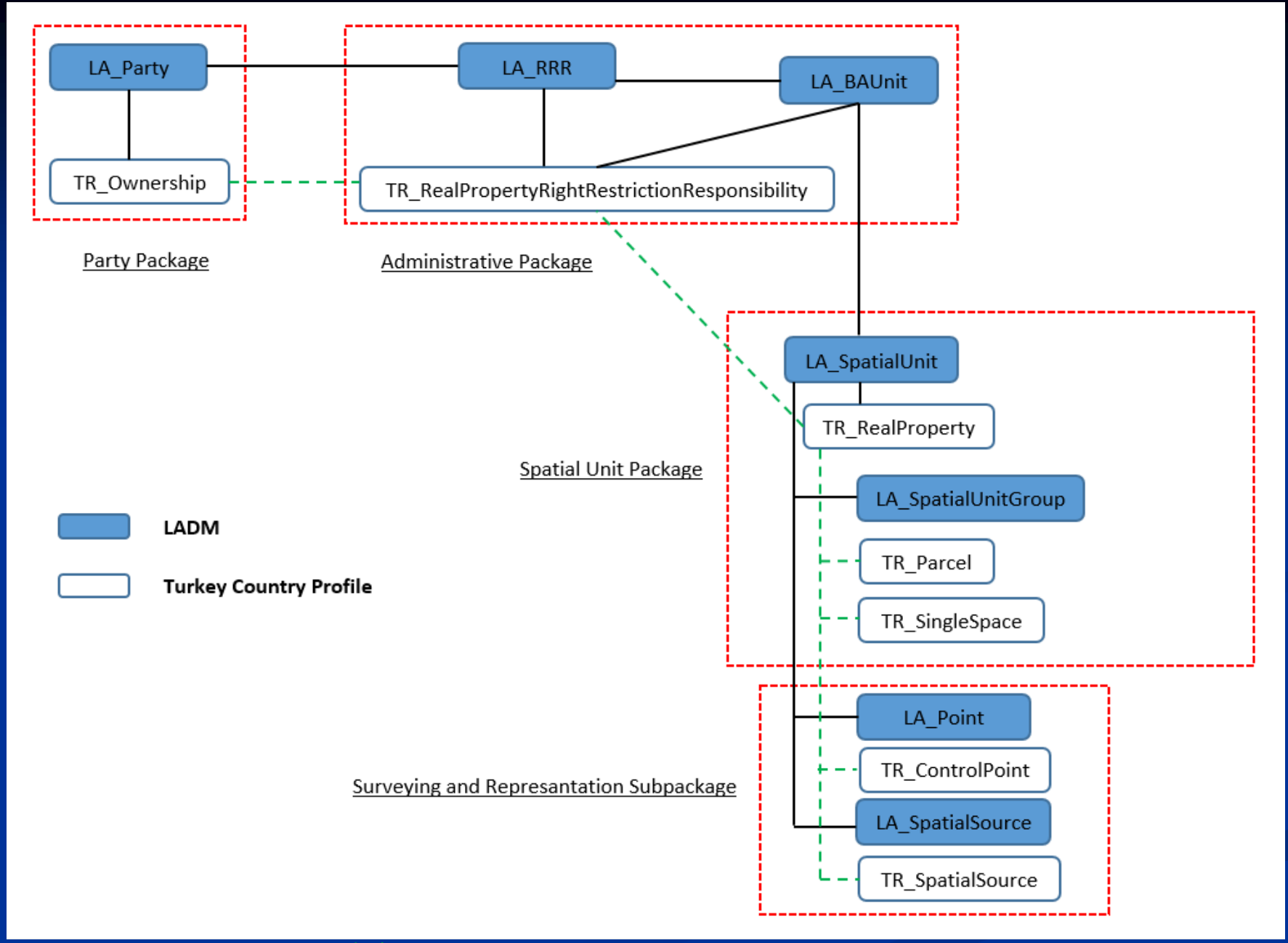
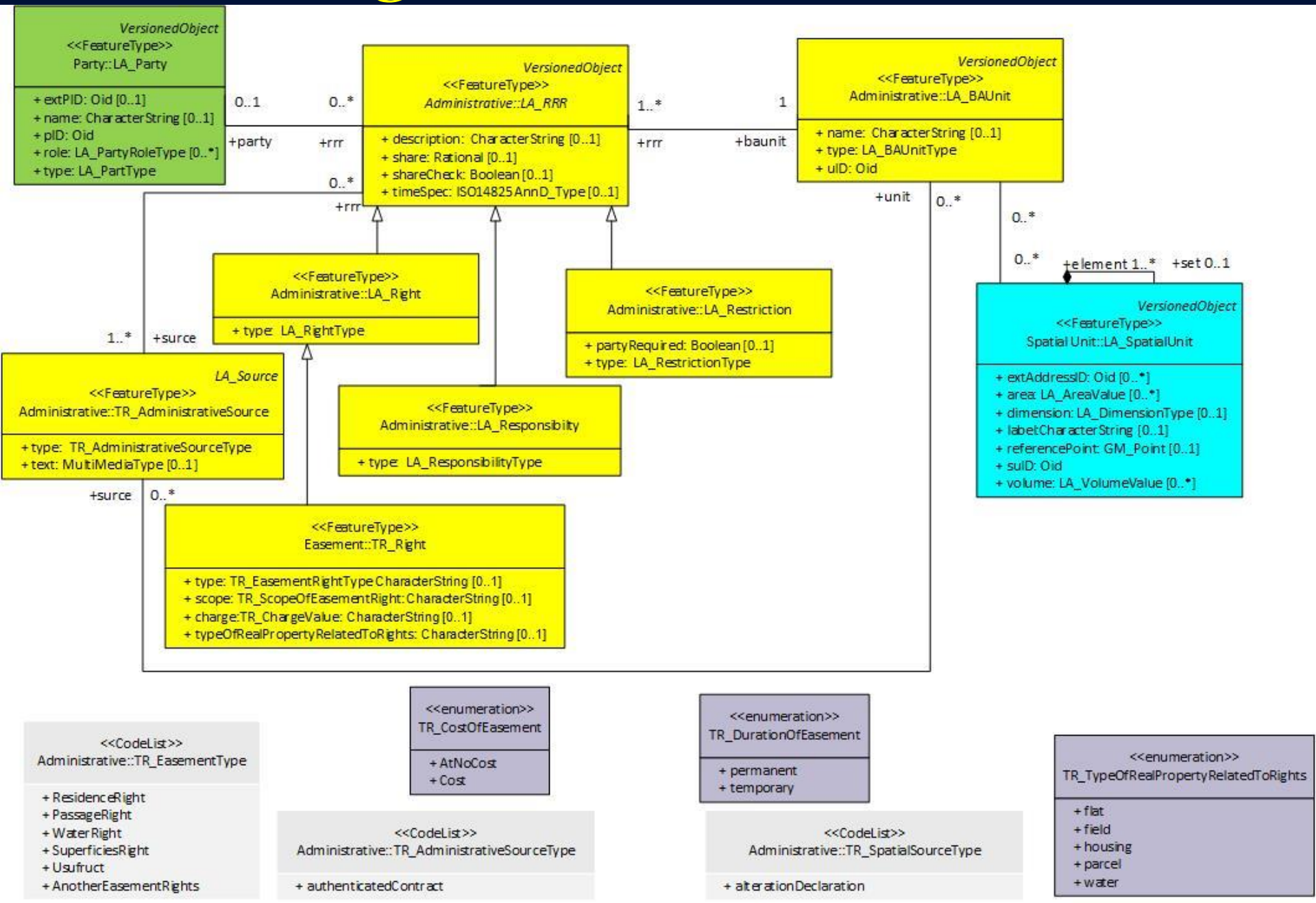


Figure 5. Turkey's land administration profile and corresponding LADM classes (Alkan and Polat, 2017)

Model Design Based on ISO 19152 LADM

In this context, the connections between main classes of easements section of Turkish temporal cadastral data model were identified. The relationships between classes like LA_Party, LA_RRR, LA_BAunit, LA_SpatialUnit, TR_EasementRight, TR_AdminisrativeSource and TR_SpatialSource were presented in Figure 3.

Model Design Based on ISO 19152 LADM



Our Papers about LADM

- Polat ZA, Alkan M., Sürmeneli H., (2017). Determining strategies for the cadastre 2034 vision using an AHP-BasedSWOT analysis: A case study for the turkish cadastral and landadministration system. LAND USE POLICY.
- ALKAN MEHMET,POLAT ZEYNEL ABİDİN (2016). Design and development of LADM based infrastructure for Turkey. Survey Review.
- ALKAN MEHMET,POLAT ZEYNEL ABİDİN (2017). Design and Determine the Spatio-Temporal Cadastral Data Infrastructure for LADM. FIG Working Week
- Polat ZA, PhD Thesis;

EXTERNAL DATA MODEL DESIGN AND IMPLEMENTATION FOR LAND REGISTRATION AND CADASTRE TRANSACTIONS OF LAND ADMINISTRATION

Supervisor : Associate Prof.Dr. Mehmet ALKAN

Conclusions

- In this paper, the application of LADM was discussed with a focus on the academic and institutional studies in Turkey. The results of the study indicate that effective functioning of the information infrastructure LADM-based requires proper integration of data, proceeded by analysing the contents of existing data sets, indicating key registers and defining a linkage system between them.
- LADM presents the general conceptual schemas for land administration. And also, this model provides the basis for national and regional profiles and enables the combination of land management information from different sources in a coherent manner. For this reason, there are several countries that apply LADM to establish a country profile for their land administration system.

Conclusions

- The development of a conceptual schema could bring a common understanding within the domain of land administration for all the TLIS involved in the standardisation projects in Turkey, especially for TAKBIS and TUCBS. The study compared the basic entities in the TLIS data model concerned with land basic classes (e.g. parties, rights, restrictions and responsibilities, administrative, and spatial units) against the LADM basic classes. While there are corresponding TLIS entities for the relevant LADM basic classes, there are semantic differences between TLIS and LADM basic classes. For instance, the parties in the TLIS are modelled as owners. This limits the inclusion of other parties involved in the land administration process. Another difference is that the TLIS data model contains descriptive lineage data for the spatial units only, whereas the LADM prescribes timestamps for any change to an instance of most classes.

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