

Refining legal Land Administration-related aspects in LADM

Eftychia Kalogianni, TUDelft, MSc, PhD (c)

Abdullah Kara, TUDelft, MSc, PhD

Anthony Beck, Ordnance Survey, PhD

Jesper Paasch, Aalborg University & University of Gävle, Prof

Jaap Zevenbergen, Twente University, Prof

Efi Dimopoulou, NTUA, Prof

Dimitrios Kitsakis, NTUA, PhD

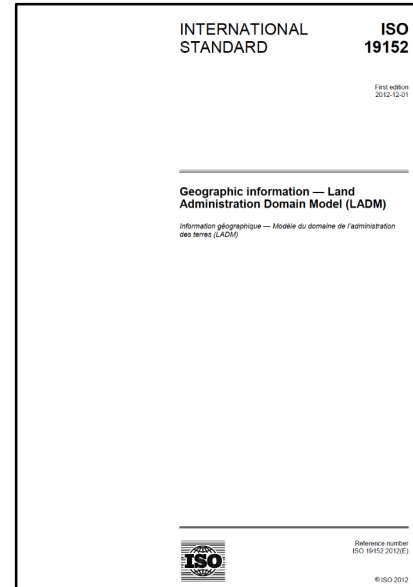
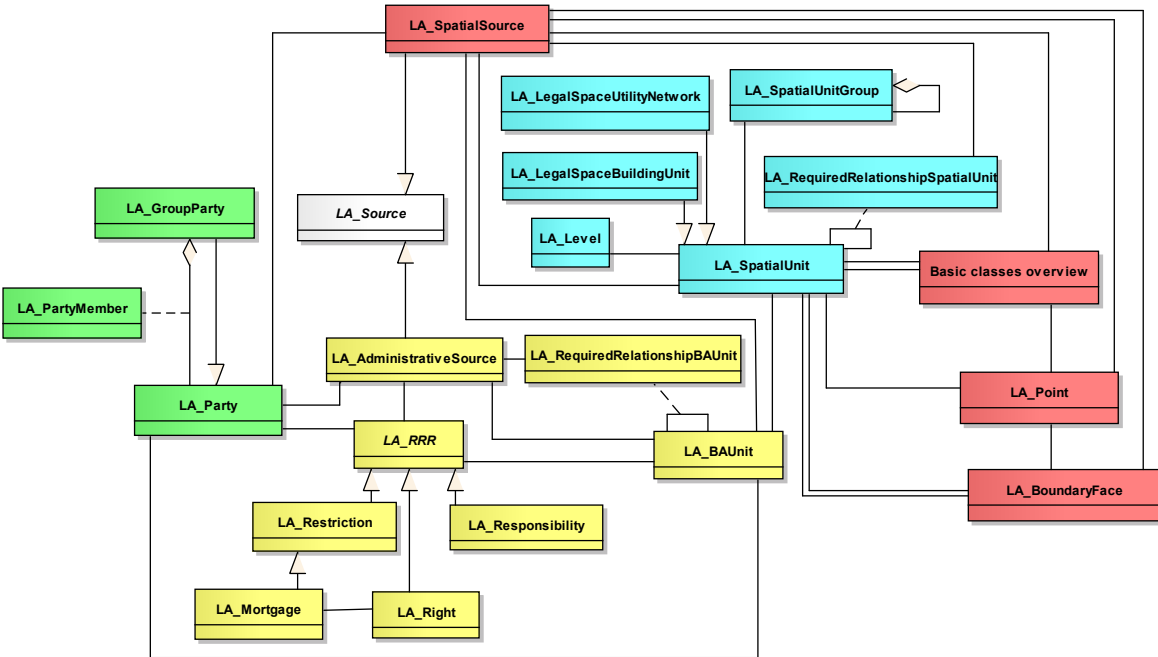
Christiaan Lemmen, Twente University, Prof & Kadaster

Peter Van Oosterom, TUDelft, Prof

Overview

- I. Introduction
- II. LADM legal aspects: related developments
- III. LADM I & LADM II: ongoing revision
- IV. Refinement of LADM I Legal Profiles: aspects to consider
- V. Conclusions & Future Work

INTRODUCTION | MOTIVATION



LADM Country profiles developed

Bénin	Japan	Republic of Korea
Brazil	Kenya	Saudi Arabia
Cape Verde	Malaysia	Scotland
China	Mongolia	Serbia
Colombia	Montenegro	Singapore
Croatia	Morocco	South Africa
Cyprus	Mozambique	South Korea
Czech Republic	Nigeria	The Netherlands
Greece	Poland	Trinidad and Tobago
Honduras	Portugal	Turkey
Hungary	Queensland, Australia	Victoria, Australia
Indonesia	Republic of Srpska	Vietnam
Israel	Russian Federation	...

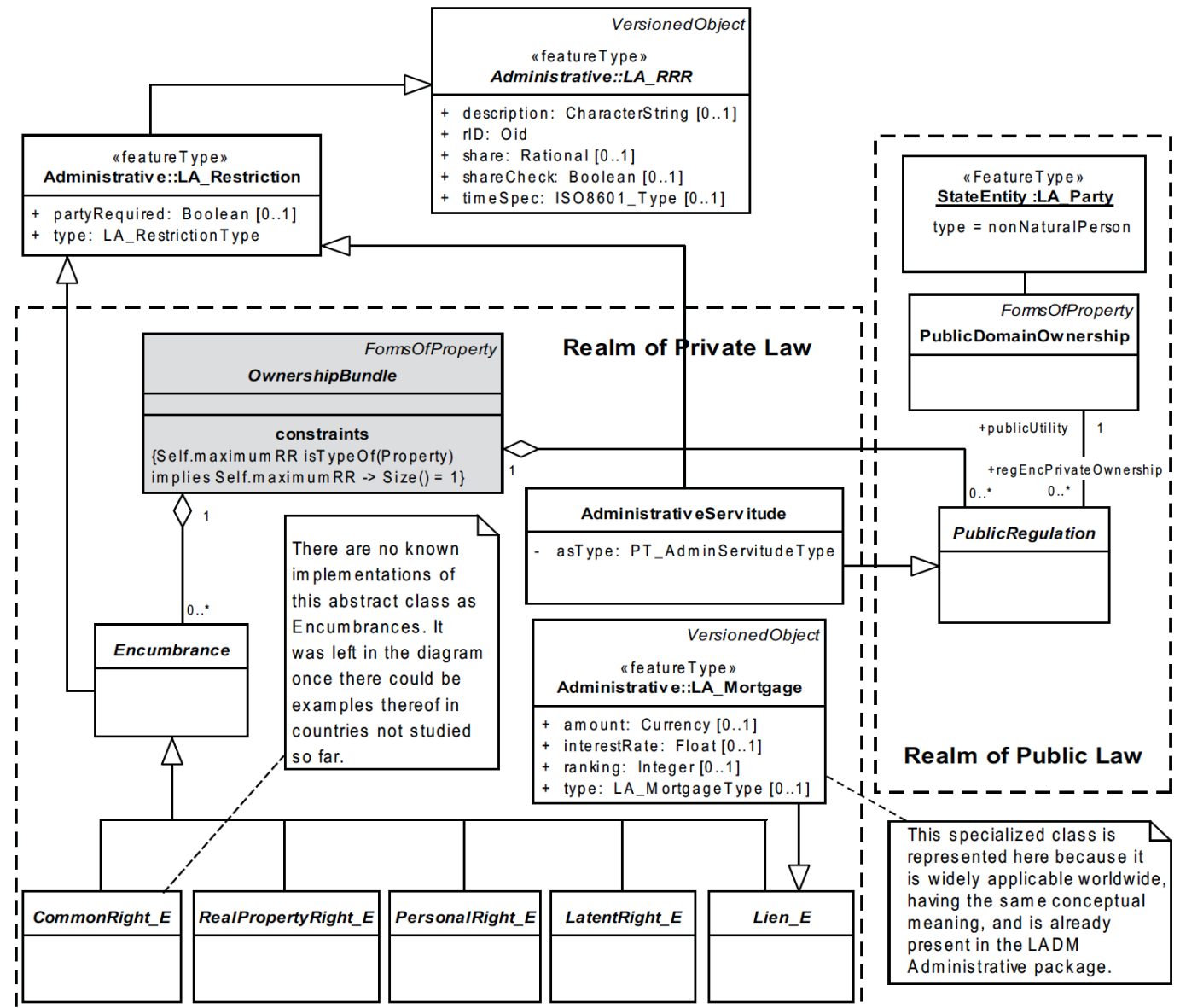
- informal and customary tenures?
- formal, informal and customary land systems?
- hierarchy in RRRs?
- ...

LADM Edition I

specific parts are further modelled and included in the informative Annexes

Annex F – Legal Profiles

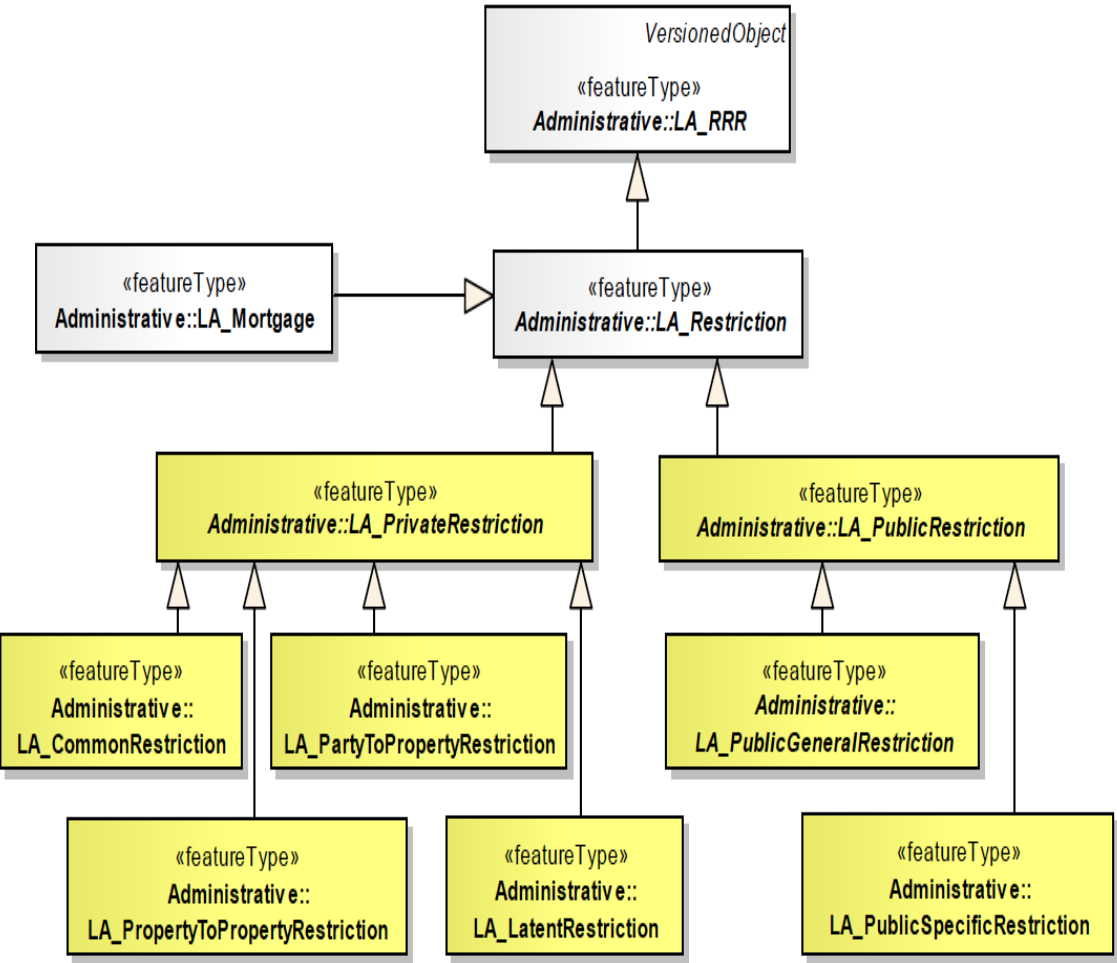
- legal profile for Rights
- legal profile for Restrictions
- legal profile for Responsibilities



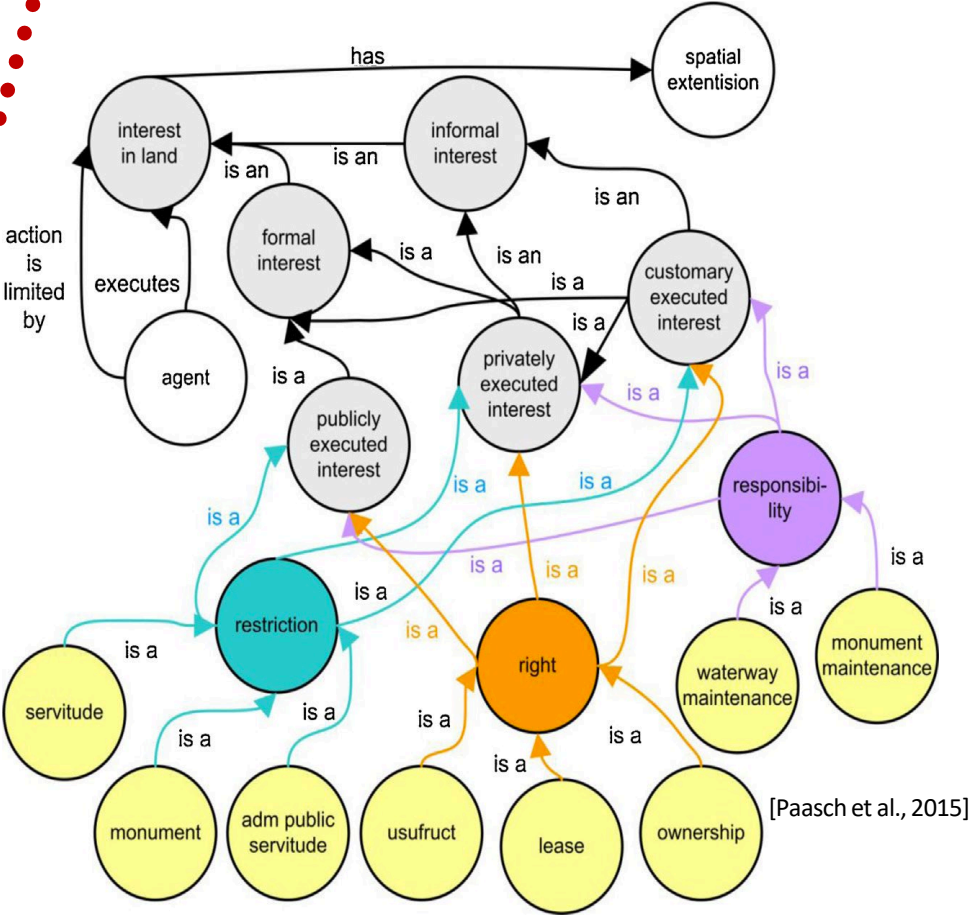
[Fig. F2, ISO 19152, 2012]

Specialisation of the LADM LA_Restriction legal profile

Extended profile for privately and publicly imposed restrictions



[Paasch et al., 2013]



[Paasch et al., 2015]

Specialisation of LADM code lists, using Legal Cadastral Domain Model & Social Tenure Domain Model

RRRs representation on a more detailed level, including informal RRRs

PUBLIC LAW

*slide from Kitsakis et al., 2021



PLRs can be registered according to :

- Integrated in cadastral systems.
- Maintained by an individual responsible authority.
- Development as “themed” cadastres, dedicated to specific PLRs
- Development of a special registry for PLRs (PLR cadastre).



ISO 19152:2012

Geographic information — Land Administration Domain Model (LADM)

LIFE CYCLE

NOW

PUBLISHED
ISO 19152:2012

A standard is reviewed every 5 years
Stage: **90.92** (To be revised) ~

WILL BE REPLACED BY

UNDER DEVELOPMENT
ISO/AWI 19152-1
Part 1: Fundamentals

UNDER DEVELOPMENT/ SUBMITTED
ISO/ WI 19152-2
Part 2: Land Registration

UNDER DEVELOPMENT/NOT YET
ISO/ WI 19152-3..6
SUBMITTED

NOW

UNDER DEVELOPMENT
ISO/AWI 19152-1

Stage: 20.00 ~

00 10 20 Preparatory ^ 30 40 50 60 90 95

20.00 2020-10-02

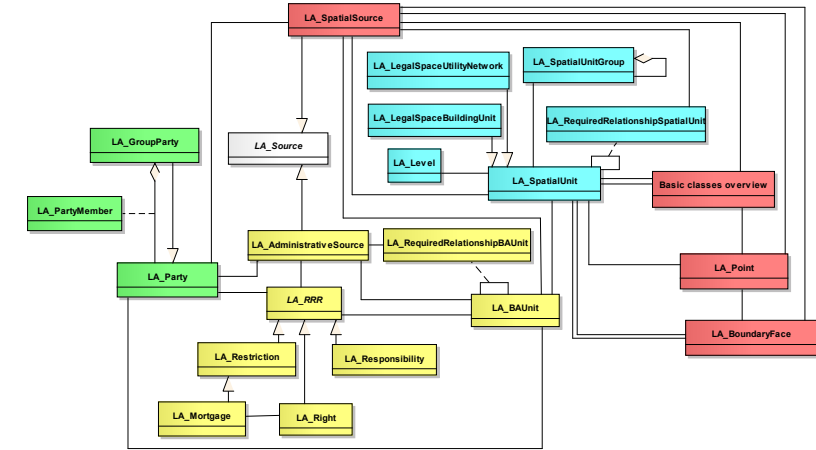
New project registered in
TC/SC work programme

20.20
Working draft (WD) study
initiated

20.60
Close of comment period

20.99
WD approved for registration
as CD

LADM Edition II
Legal Profiles



LADM Edition II Multipart

PART 1 – Land Administration Fundamentals

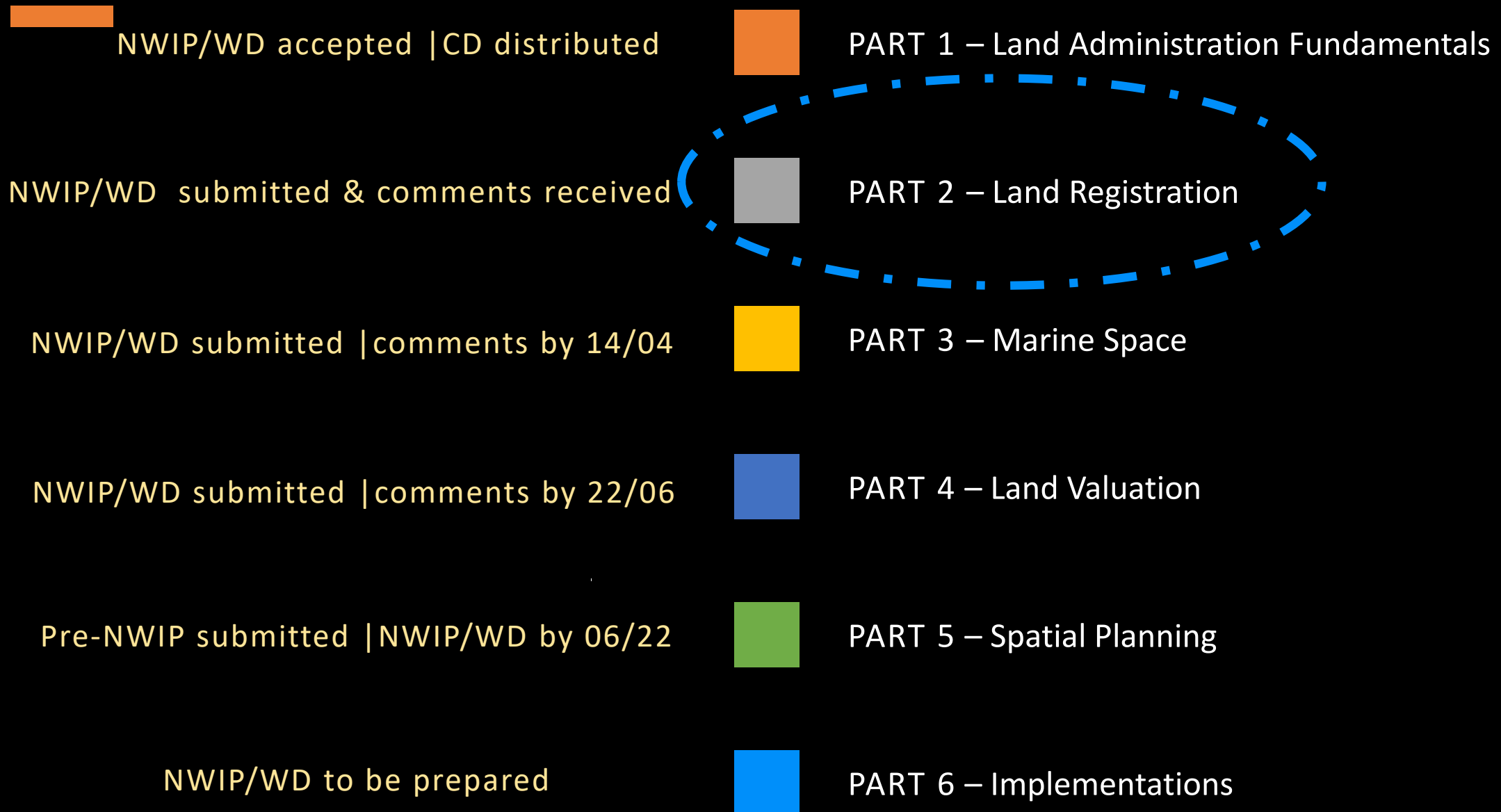
PART 2 – Land Registration

PART 3 – Marine Space

PART 4 – Land Valuation

PART 5 – Spatial Planning

PART 6 – Implementations



REFINEMENT OF LADM I LEGAL PROFILES: ASPECTS TO CONSIDER

MODELLING

- the new model should be **backwards compatible** with Edition I
- avoid complexity | keep the model simple
- apart from the refinement of the classes, the increasement of the **semantic capabilities** of the model via code list values shall be explored
- awarding new classes with a shadow class at both the legal & the spatial side to be identified.

ORGANISATIONAL

- the refined legal model should be helpful **both within** and **across** jurisdictions
- the model should be **aligned with other novel governmental information systems**.

REFINEMENT OF LADM I LEGAL PROFILES: ASPECTS TO CONSIDER

I. Rights registration in various systems

Title as being framed by three key elements:

Originally Land Registers registered **DEEDS**: the legal facts of a transaction → the purpose of a deed is not to describe a full party-right-land relationship; instead, a deed describes a transactional change to a party-right-land state.

1. the party (the *who*) that benefits from
2. the ownership right (the *what*) over and
3. a plot of land (the *where*).

DEEDS

TITLES represent the consequences of the legal facts represented in deeds. Title by registration means that the consequences of the change articulated in the deed are registered rather than the deed itself (although the deed can also be archived as part of the application process).

Title is demonstrated by examining the sequence of prior deeds back to a 'good root of title'.

TITLES

REFINEMENT OF LADM I LEGAL PROFILES: ASPECTS TO CONSIDER

I. Rights registration in various systems

high quality deed systems need to generate an 'unambiguous identification of the subject unit of land' to support a "uniform system for identification of properties"

The registration process represents how the Registrar implements the relationship between *state change* (e.g. deeds and applications) and *state* (e.g. products, such as derived searches and Titles).

→ that this is a requirement for any modelling of Deeds Registers using LADM.

That said, from a conceptual perspective it is of course possible for a Deed Register to be LADM based but can also not be LADM compliant.



Not that clearly supported in LADM Edition I

Title by registration and the recording of Deeds **are not competitive systems**, rather they reflect different positions on the representation of property right-land relationships.

Clearly/efficiently supported in LADM Edition I

STATE CHANGE
REPRESENTATION

LADM

Land Registers have a requirement to articulate **state change** (the facts of change: Deeds) and **state** (the consequences of change: Titles)

REFINEMENT OF LADM I LEGAL PROFILES: ASPECTS TO CONSIDER

II. Detailed classification of Rights, Restrictions and Responsibilities (RRRs)

- ✓ RRRs implied by Private Law | Public Law
- ✓ Jurisdiction dependent → a set of ownership and non-ownership rights which are recognised by the state and are legally formalised
- ✓ Differences in the categorisation
- ✓ Depending on the 'view' the jurisdiction looks differences are presented between their definition, organisation & implications
- ✓ Various models designed to represent the rights and the relationships between them

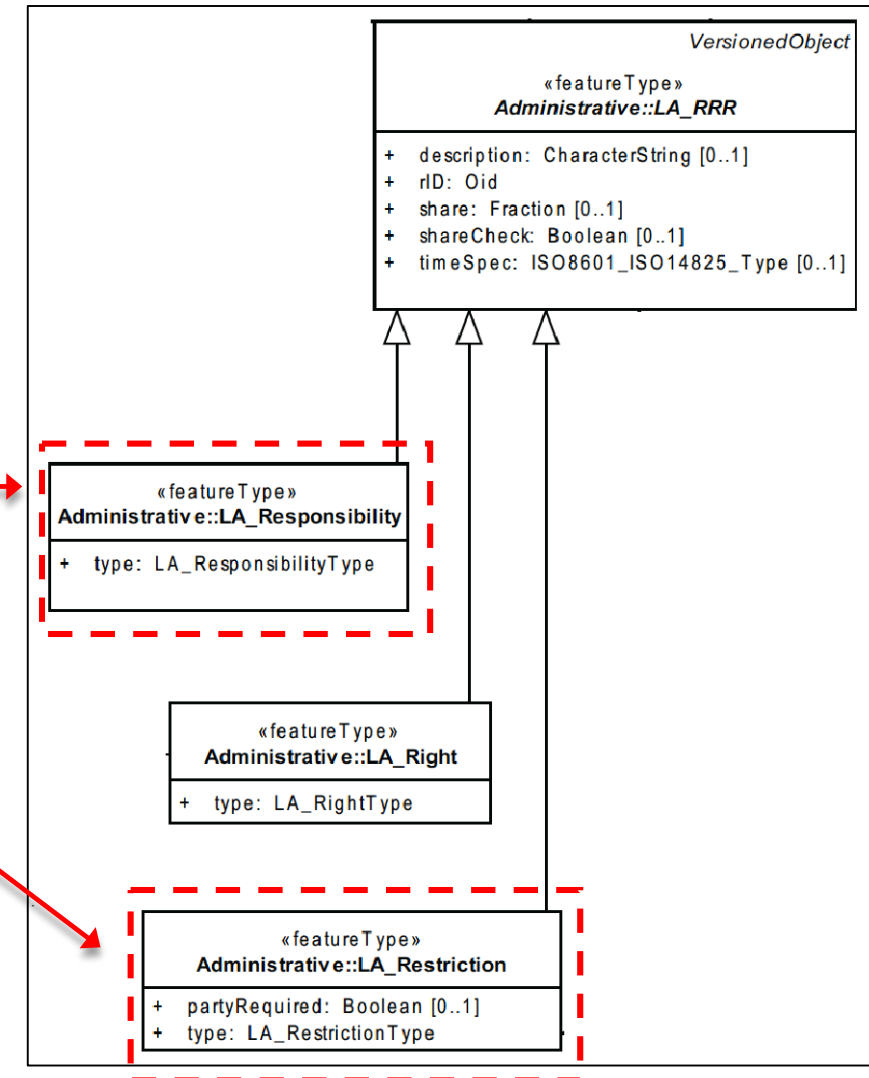
REFINEMENT OF LADM I LEGAL PROFILES: ASPECTS TO CONSIDER

III. Modelling restrictions as rights?

They are rights which encumber owned land

their implications are articulated through the *duality of the rights relationships* between the right holder and the landowner through land (as an owed duty).

Hence, when viewed from the perspective of the landowner **the encumbering rights held by third parties** are either a responsibility or a restriction.



PLRs IN LADM EDITION II

- Legal differences depending on jurisdiction
- Deriving from multiple authorities

- ✓ Classification
 - ✓ Organisation based on LADM Edition II
- 2 main criteria:
- Should PLRs be modelled at the legal part of the LADM or at the spatial part ?
 - Should subclasses to organise the various PLR categories, or a structure with semantically enriched code lists with hierarchical structure ?



Sector	Description
Mining areas	<ul style="list-style-type: none">▪ Health and safety provisions▪ Restrictions on activities related to the ownership of minerals/quarry material
Cultural Heritage	<ul style="list-style-type: none">▪ Restrictions to avoid harm of underground antiquities (e.g. in-situ preservation of antiquities; restrictions due to construction of infrastructures or other activities)▪ Restrictions in constructing new buildings, alteration, restoration and use▪ Restrictions in maritime activities within or in the vicinity of marine antiquities
Building Regulations and Spatial Planning	<ul style="list-style-type: none">▪ Construction Regulations/ Building restrictions (e.g. Restrictions on building height for landscape protection; Restrictions on materials, scale, colour, size, architectural style of constructions to match surrounding landscape, etc.)▪ Urban, zone and spatial planning provisions (e.g. land uses, zoning plans, Shoreline and coastal zones , forest zones etc.)
Civil Aviation	<ul style="list-style-type: none">▪ Non-military manned air vehicles (e.g. definition of special flights' rules such as non-flight zones; definition of general minimum flight height; definition of obstacle limitation surfaces, designating the airspace around an airport where restrictions apply to constructions' or physical objects' heights)▪ Unmanned Air Vehicles (e.g. Fly under permission above specific heights; Flight prohibition over infrastructures or correctional facilities; Definition of maximum flight height)
Environment protection	<ul style="list-style-type: none">▪ Natural protection zones (such as restrictions on forest protection; natural habitats; biodiversity and protected areas)▪ Soil (restrictions regarding soil contamination (deriving from soil geological or chemical characteristics); mitigation measures on contaminated soil)▪ Water (restrictions regarding the protection of surface and groundwater bodies)▪ Air (such as restrictions for the protection of public health from contaminants in the air; restrictions regarding radio waves propagation to ensure efficient communication and broadcasting as well as protect public health and the natural environment from extended exposure to electromagnetic

*slide from Kitsakis et al., 2018

REFINEMENT OF LADM I LEGAL PROFILES: ASPECTS TO CONSIDER

III. Legal refinement via semantically rich code lists

LADM Edition II



structured code lists

explicit proposal for the formalisation of code lists and their values

a **metamodel** for the semantic description of code list values using the Simple Knowledge Organisation System notation to represent LADM code lists & is extended to support **versioning**, **hierarchical relationships between concepts**, **textual definition with source reference** [Kara et al., 2022]

provision for **hierarchical code list values** (*parent-child relationships*), short code list values & longer descriptions of code list values, & **versioned code list values** in order to support possible changes.

Facilitator for the relation of the country profile code list values to the LADM code list values

CONCLUSIONS & DISCUSSION

Do we need a refinement on the legal part of LADM
Edition I?

--if yes, which one..?

CONCLUSIONS & DISCUSSION

- ✓ **indexing is critical:** to unambiguously identify the **party-right-land triples** which are to change is critical in deeds' register → LADM could be extended *to recognise the relationship between state and change elements* and *how these are articulated within a single deed*. Hence, while it is recognised **that party-right-land indexing is important**, **deed and title indexing is of equal importance**
- ✓ to add an extra attribute at the Administrative Package of the LADM to supporting the need to go back to the 'good root of title' in deed systems
- ✓ to include explicit links between deeds (chain of source documents), another attribute will be added to provide the **link between their IDs**.
- ✓ the use of an **extensible code list** is proposed via semantic technologies
- ✓ the increasing amount & importance of **PLRs** as tools for social change calls for attention.

Thank you!

Eftychia Kalogianni
Abdullah Kara
Anthony Beck
Jesper Paasch
Jaap Zevenbergen
Efi Dimopoulou
Dimitrios Kitsakis
Christiaan Lemmen
Peter Van Oosterom

https://wiki.tudelft.nl/pub/Research/ISO19152/LADM2022Workshop/LADM2022_paper_F2.pdf