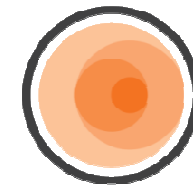




Bridging the Gap between LADM and Cadastres



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CSDILA
THE CENTRE FOR SPATIAL
DATA INFRASTRUCTURES
& LAND ADMINISTRATION

stewart

Secure land. Empower citizens. Assure the future.

Introduction



- Implementation guidelines for LADM – A six pillar approach
- A case study driven methodology
 - Victoria
 - Belize
- Design and develop a LADM Geodatabase
- Disclaimer

Pillar 1- Objectives and motivation



- International compliance
 - Global Cadastre (McDougal et al 2013)
- Cross jurisdictional data exchange
 - PSMA Australia
- Upgrading or new versions for existing systems
 - Stewart

Pillar 2- Existing institutions



- It is not about data, it is about implementation implications
- Case study Victoria, lesson from ePlan implementation
 - Vicmap property update
 - Software vendors and solution providers for ePlan
 - Cadastral surveyors, data literacy
 - Local governments
 - State governments
 - National bodies such as PSMA Australia
- Case study ESRI Geodatabase
 - Use LADM as a reference and make sure to be compliant but let the business needs drive and put it to the test

Pillar 3 – Semantic Compliance



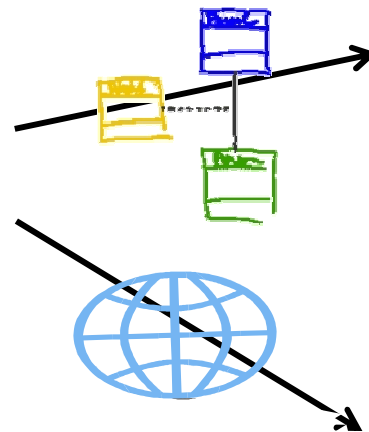
- Existing land administration processes
- Other relevant domains e.g. land development, land use planning
- Example:
 - **Restriction (Encumbrance):** A **restriction** is a formal or informal requirement to refrain from doing something (modified from ISO 19152: 2012 (LADM)). In Victoria, formal restriction examples include building envelopes, rules of an Owners Corporation, mortgages, easements and covenants. These are known as encumbrances when they are recorded on title.
 - **Responsibility (Obligation):** A **responsibility** is a formal or informal requirement to do something (modified from ISO 19152: 2012 (LADM)). In Victoria, responsibilities are known as obligations and examples include Section 173 agreements under *Planning and Environment Act 1987*, municipal rates and land taxes.

Pillar 4 – Structural Compliance



- Existing cadastral or land administration databases
- Interoperability with other relevant datasets
- Examples
 - ePlan, spatial approach, legal independence and interoperability

Parcel 1	Parcel 2	Parcel 3
Easement 1		



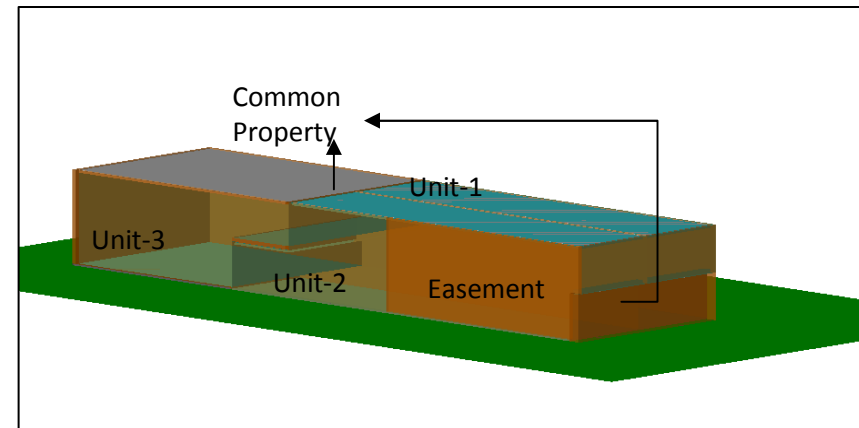
	Parcel 1	Parcel 2	Parcel 3
Rights	Ownership	Ownership	Ownership
Restrictions	Easement 1	Easement 1	Easement 1
Party	Owner 1, LGA 1	Owner 2, LGA 1	Owner 3, LGA1

	Parcel 1	Parcel 2	Parcel 3	Easement 1
Interest	Ownership	Ownership	Ownership	Easement
Beneficiary	Owner 1	Owner 2	Owner 3	LGA 1

Pillar 5- Feedback and improvements

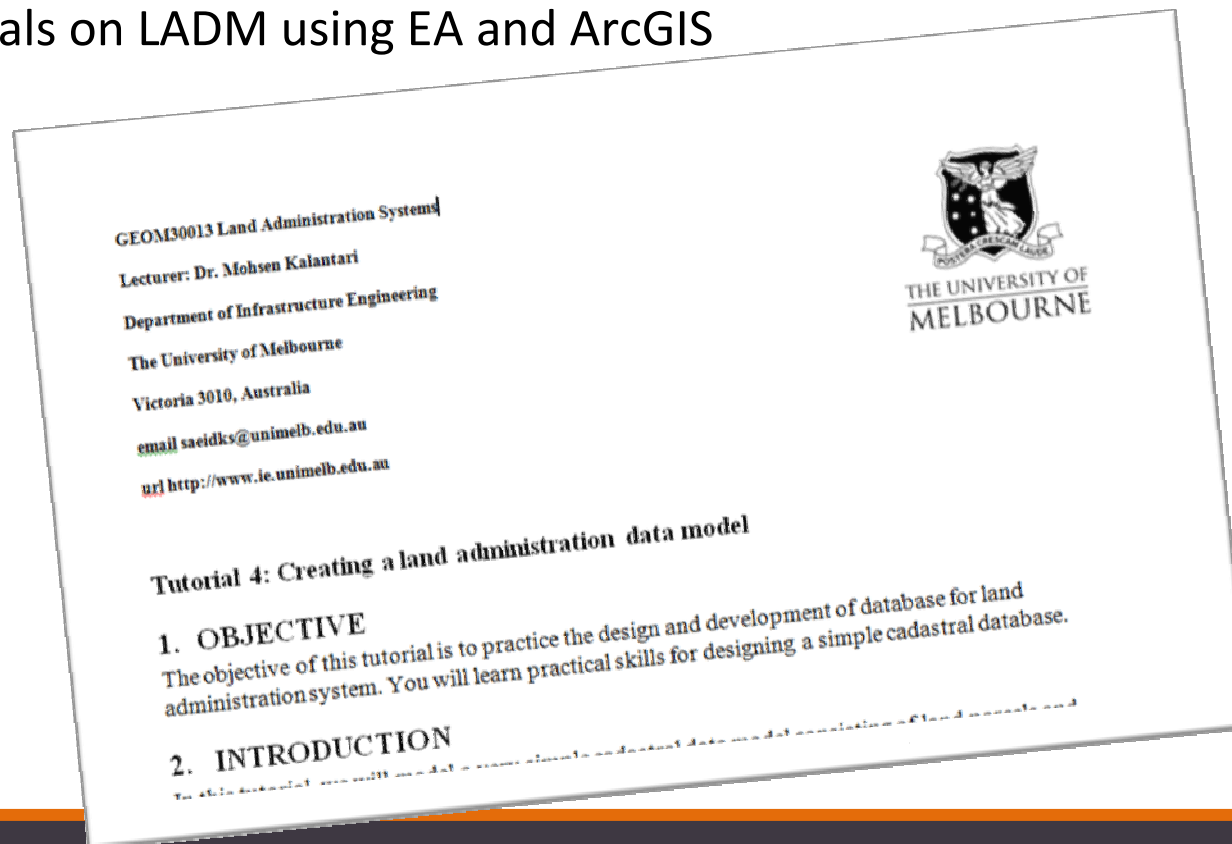


- Examples
 - Towards 3D-Cadastre and business case for it
 - Consideration of BIM for 3D-Cadastres
 - Integrated legal and physical views of the world (Advanced principles of cadastral data modelling , Aien et. al. 2013)
 - Cadastral Template 2.0 to include LADM
- A FIG LADM working group to formalise
- Improvement to LADM to be introduced on a regular basis

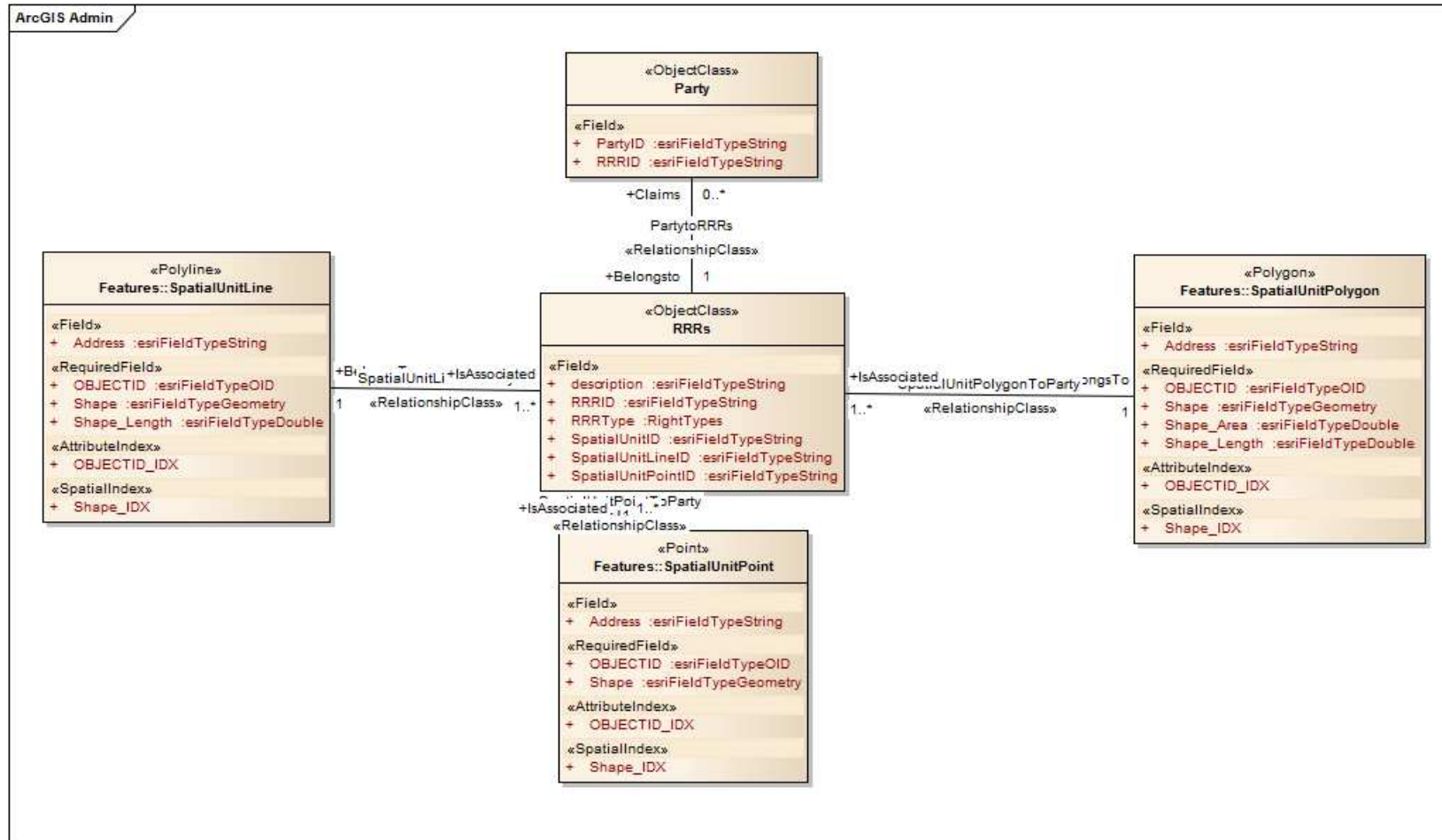


Pillar 6- Capacity building

- Land administration curriculums in universities and educational institutions to include LADM
- Examples
 - University of Melbourne, Land Administration systems GEOM30013
 - Tutorials on LADM using EA and ArcGIS



LADM Geodatabase



Belize Case Study



- Stewart has integrated land registration/cadastre software package – landfolio®; currently version 2.5
- Belize project began in 2006 with the initial IADB funded work modernizing the offices of Land Registry and Surveys and Mapping of the Ministry of Natural Resources and Environment
- Landfolio is in the process of re-design (version 3.0) and will include LADM and Esri's parcel fabric
- Selected Belize as test case for new landfolio LADM compliance

Belize Case Study – cont'd



- Belize has 64 categories of land ownership
 - Declared land: registered in a Torrens system
 - Undeclared land: titled in a deed book and volume system
 - Government or private ownership
 - Absolute or provisional rights
 - Leasehold
 - Timeshare, condominium
- Belize has 170+ user environment across multiple departments (Physical Planning, Valuation, National Estates, Inland Revenue + original registry and cadastre) in 6 district offices + 1 national office

Belize Case Study – cont'd

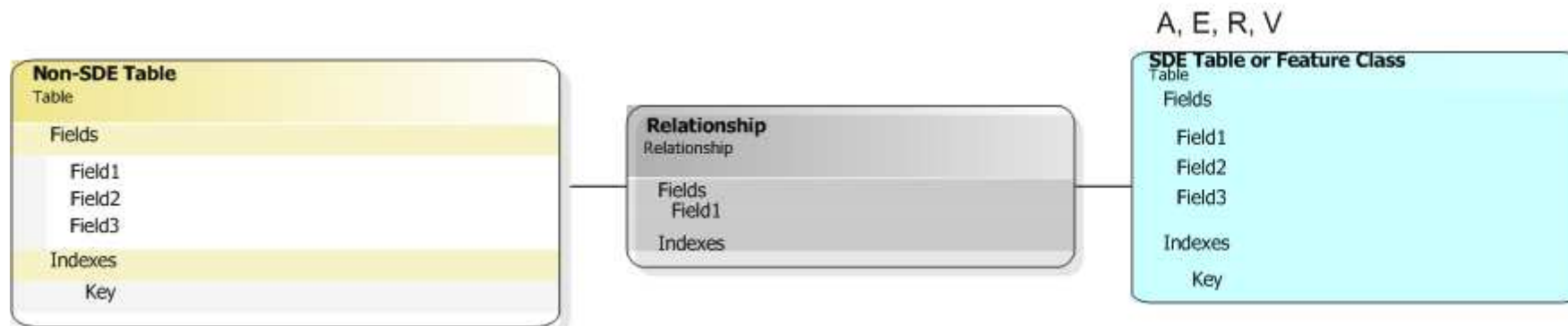


- The previous system explicitly models:
 - Proprietorship
 - Taxation
 - Mortgage and easement restrictions
- The previous system implicitly models:
 - Other types of RRRs (for example, Power of Attorney, charge, etc.)
- Since both data models share the Torrens capabilities, the new system retains the implicit RRRs from the entries, however, the data conversion process includes a manual review of each “land register” to find RRRs that are implied in the entries and explicitly create the appropriate objects in the LADM model.

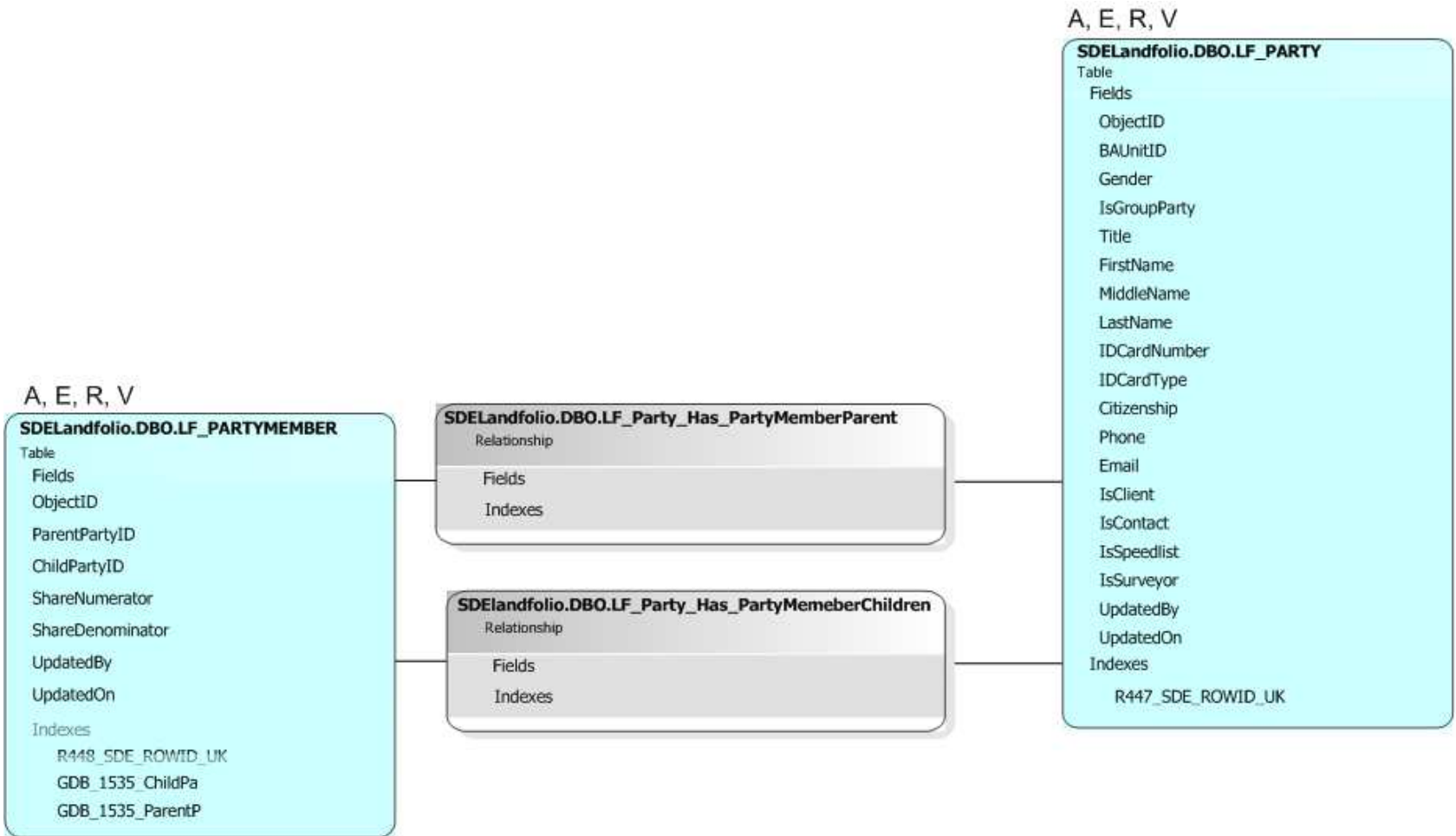
Key

A = Archive Enabled
E = Edit Tracking Enabled
(CreatedBy, CreatedOn, UpdatedBy, UpdatedOn fields)
R = Registered
V = Versioned
Att = Attachments Enabled

Blue = table registered with ArcSDE
Yellow = table is not registered with ArcSDE
Purple = an ArcSDE relation between two other tables



Party



Source



A, E, R, V, Att

SDELandfolio.DBO.LF_FolioItem	
Table	
Fields	
ObjectID	
FolioID	
FolioItemTypeID	
StatedBaseAmount	
ApprovedBaseAmount	
FiledDate	
CompleteDate	
PostedDate	
IsBackDated	
IsRejected	
IsSuspended	
IsPosted	
Description	
ClientDocument	
FolioItemNumber	
ProgramType	
ProcessingOrder	
IsPrimary	
UpdatedBy	
UpdatedOn	
Indexes	
PK_Folio	

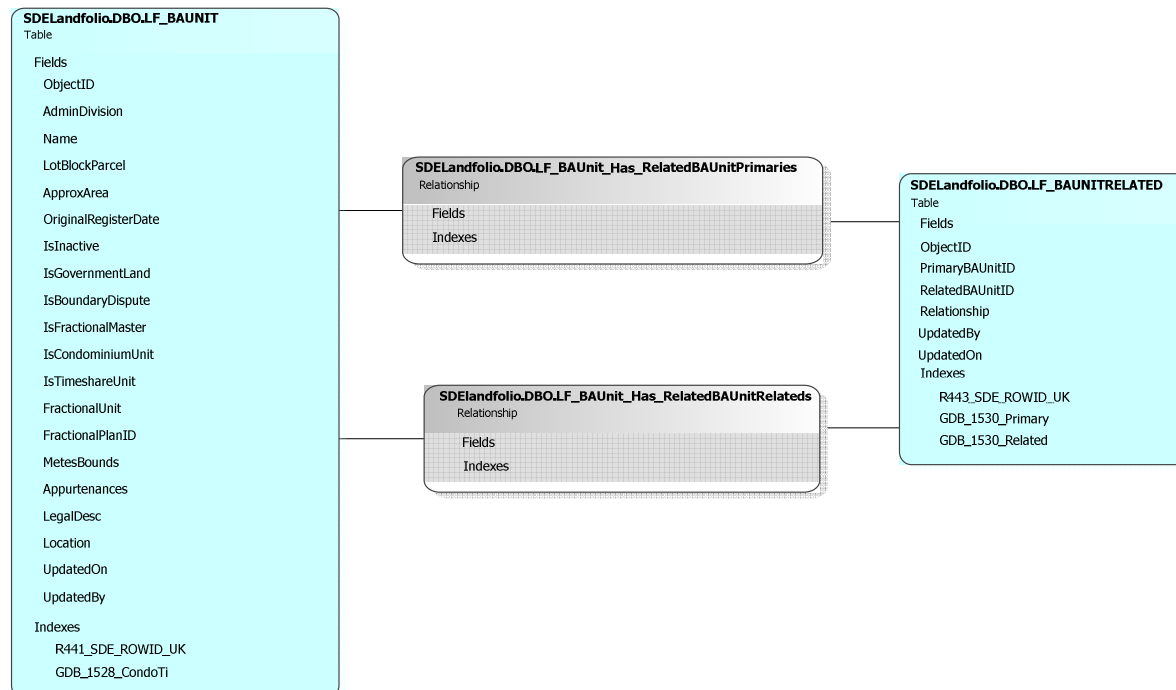
SDELandfolio.DBO.LF_FolioItem_Has_BAUnitEntries	
Relationship	
Fields	
Indexes	

SDELandfolio.DBO.LF_Folio_Has_BAUnitEntries	
Relationship	
Fields	
Indexes	

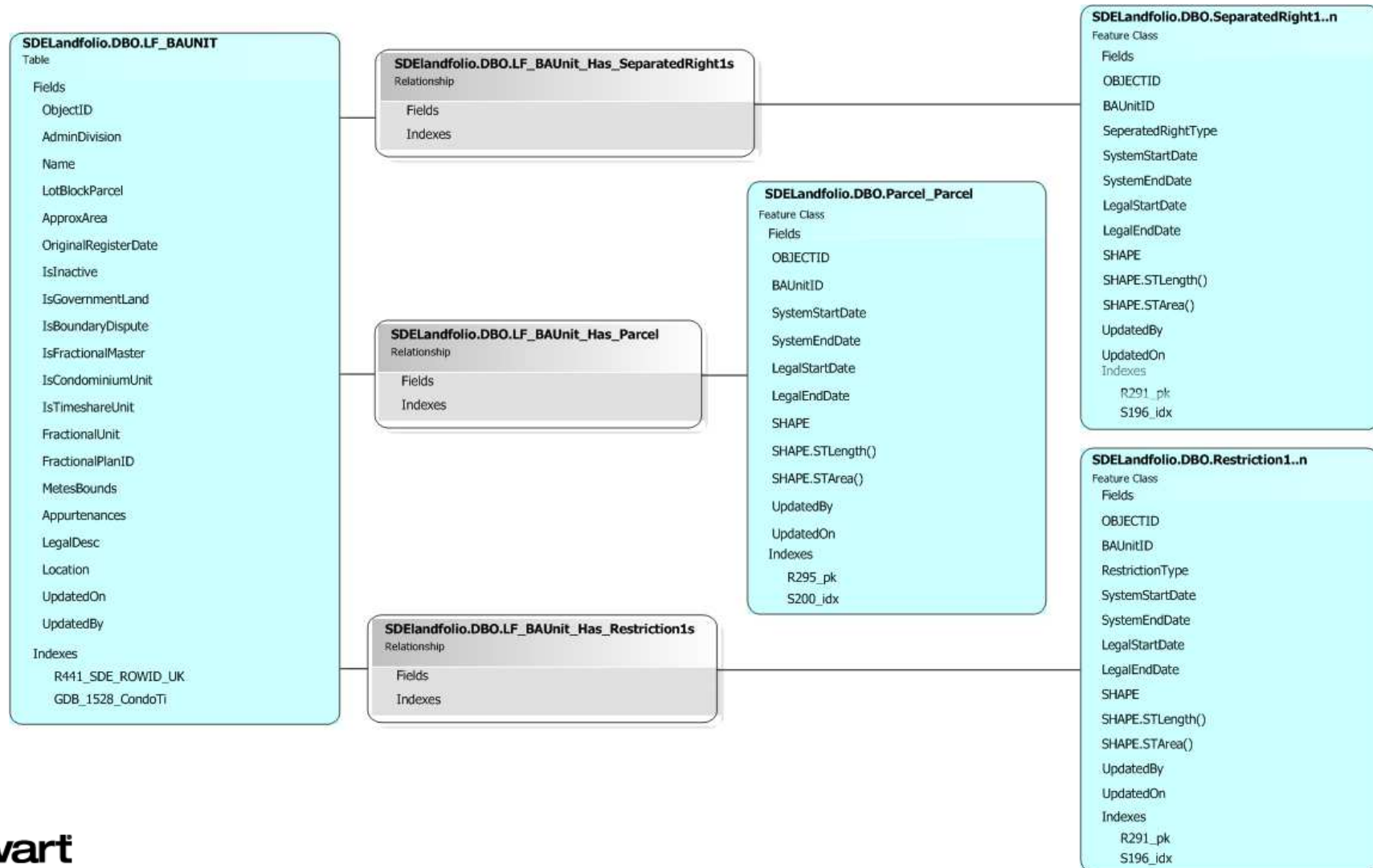
A, E, R, V

SDELandfolio.DBO.LF_BAUNITENTRY	
Table	
Fields	
ObjectID	
BAUnitID	
EntryCategory	
EntryFolioItemID	
EntryNumber	
EntryDate	
EntryUser	
EntryText	
TerminateFolioItemID	
TerminateUser	
TerminateText	
CreatedBy	
CreatedOn	
UpdatedBy	
UpdatedOn	
Indexes	
R442_SDE_ROWID_UK	
GDB_1529_BAUnitI	

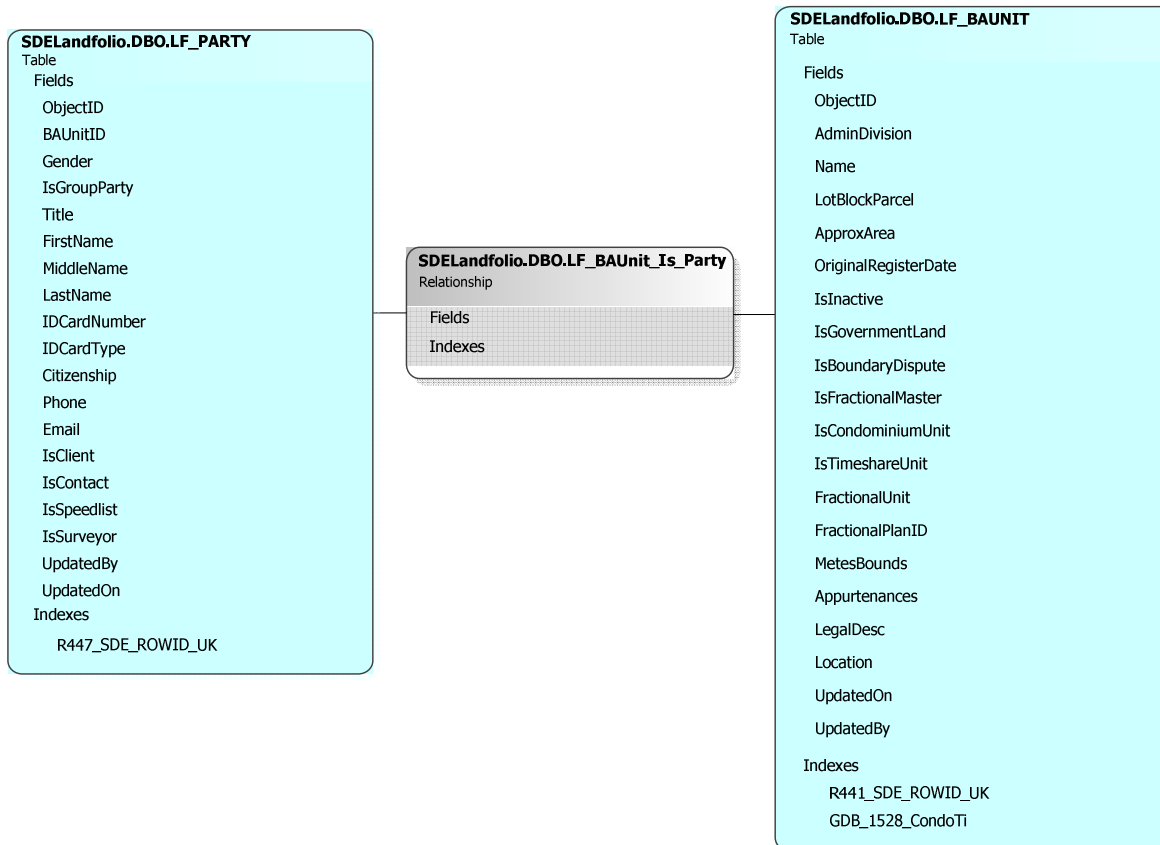
A, E, R, V, Att



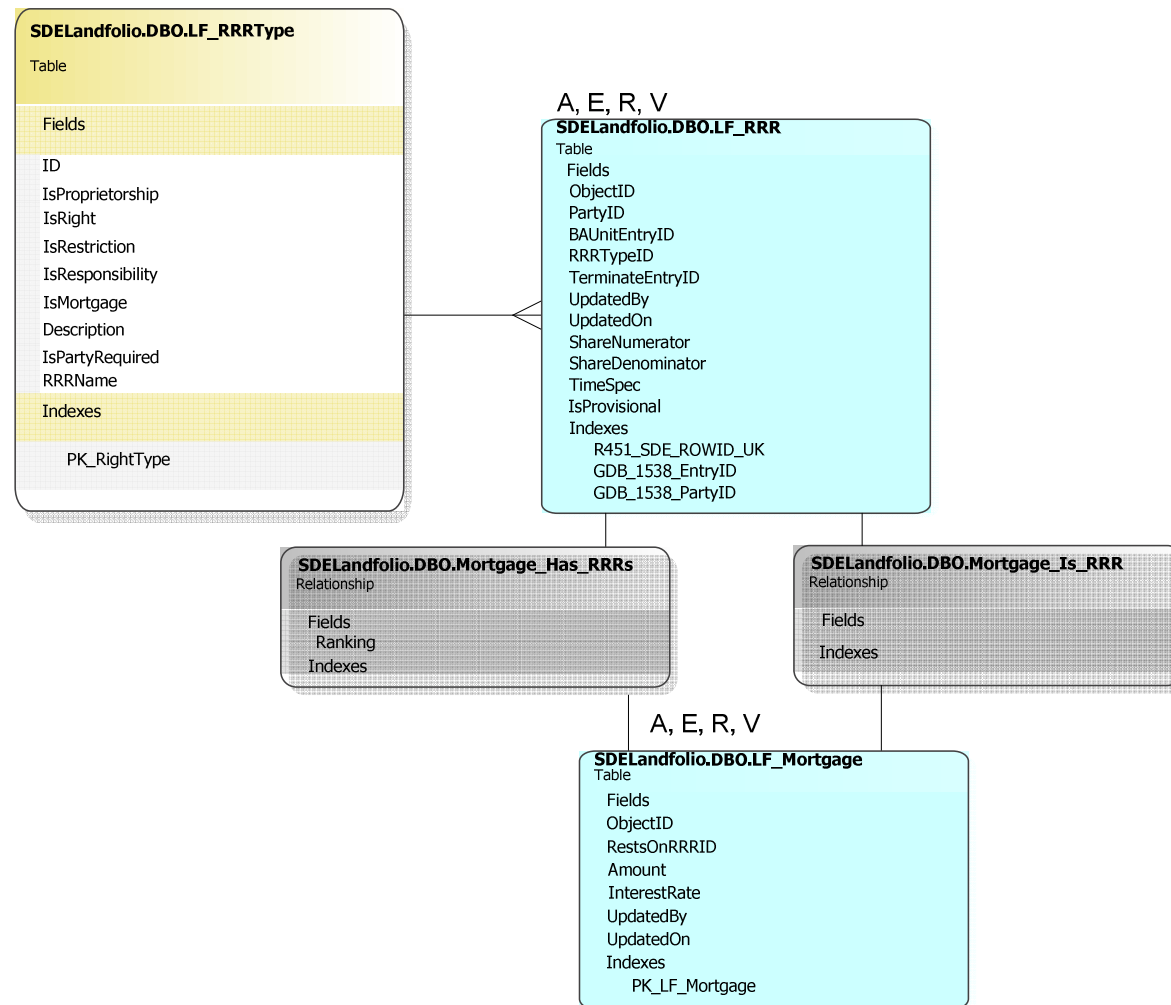
BAUnit - Spatial



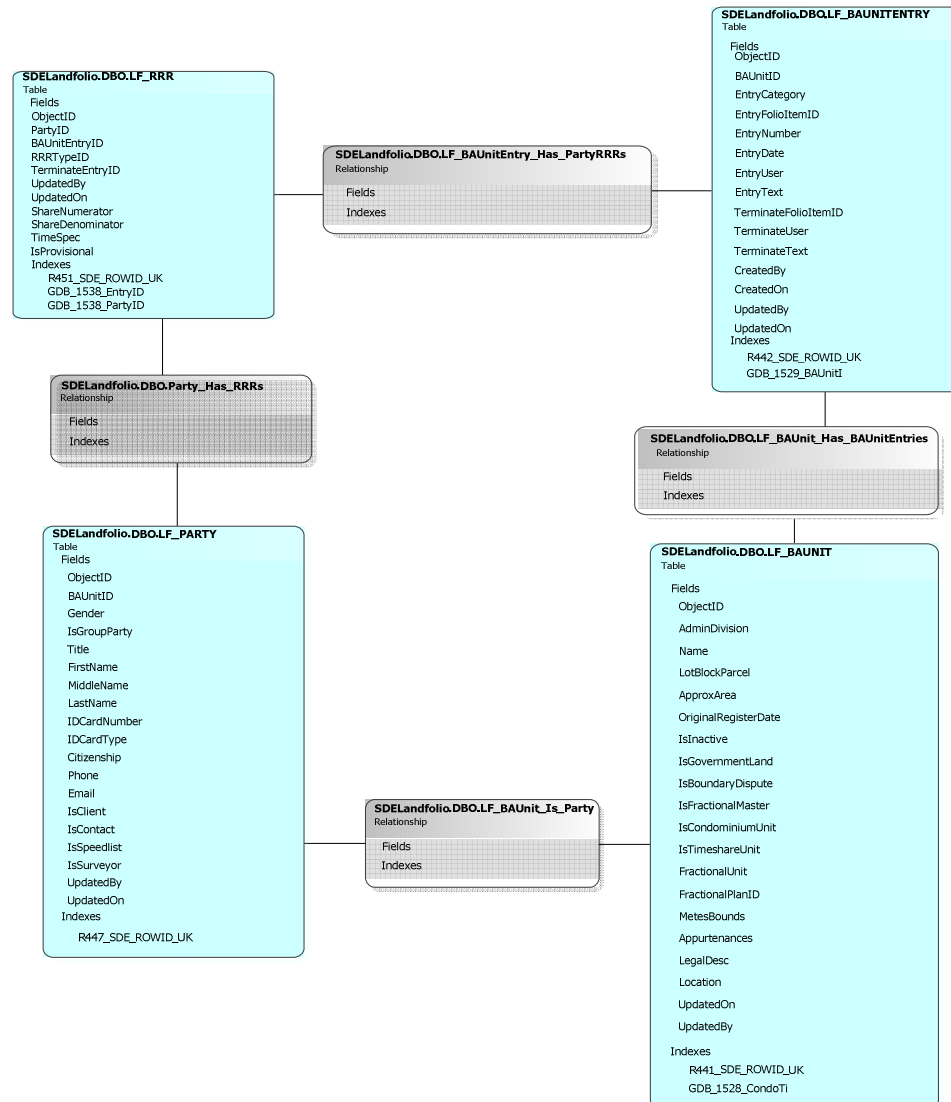
BAUnit Is Parcel



RRR



Source – BAUnit – Party – RRR



Belize – Next Steps



- Convert entire existing data set (200,000 parcels and associated attributes, documents) using a conversion program to enforce the rules of the relationships;
- Complete development of landfolio 3.0;
- Submit for LADM conformance testing;
- Roll-out to clients