ISO Standards and the Australian Spatial Data Infrastructure

Andrew Jones
Australia
Until 1901, a grouping of British colonies rather than a single nation.

- Different defense forces
- Different railway gauges
- Border Posts
- Etc
Federation in 1901
- Areas of common interest referred to the Federal Government

Land Administration was retained by the States
- Eight jurisdictions responsible for land administration
Jurisdictional LIS

- Each jurisdiction has its own computer-based land administration system
  - Textual Component - Owner and Valuation
  - Spatial Component - Digital Cadastral
- Mostly only used within parent jurisdiction
- Major data models for each system component
National Projects

• Data sub-sets need to be bought together for national projects

• Problems
  – Different legislative frameworks
  – Different terminology
  – Different conventions
  – Different data models
National Cadastral Data Model

- Developed by ICSM during 1996/97.
- Published on ICSM’s Web Site.
- Provided a model for the transfer of parcel-based data.
- Is suitable for database implementation.
- Provided a dictionary for common terminology
Updating to ISO 19100

- Data Model in UML (ISO 19103)
- Uniform Geometry Description (ISO 19107)
- Uniform Date/Time Descriptions (ISO 19108)
- Consistency in Application Schema (ISO 19109)
- Feature Catalogue (ISO 19110)
- Metadata (ISO 19115)
- Encoding in XML (ISO 19118)
Data Model

- UML
- Conceptual Model
- Implementation Model for Databases
  - Include Association Classes
Feature Catalogue

- Seeking to comply with ISO 19110
- Developed as Access Data Base
  - Easy to distribute
  - Allows reports to be produced
  - Assists data management
- Can include other data themes
Encoding

• Following ISO 19118 as far as possible
• Encoding standard is not yet stable
• XML Schema and DTD are being developed in parallel with the data model and feature catalogue
• Trial implementation between two jurisdictions later this year
<complexType name="Parcel">
  <sequence>
    <element name="parcelToPlan" type="ref_Plan" minOccurs="0" maxOccurs="unbounded"/>
    <element name="parcelToTitle" type="ref_Title" minOccurs="0" maxOccurs="unbounded"/>
    <element name="parcelToProperty" type="ref_Property" minOccurs="0" maxOccurs="unbounded"/>
    <element name="parcelToStreetAddress" type="ref_StreetAddress" minOccurs="0" maxOccurs="unbounded"/>
    <element name="parcelToFeatureTypeCode" type="ref_FeatureType" minOccurs="0" maxOccurs="unbounded"/>
    <element name="parcelToAreaPoint" type="AreaPoint" minOccurs="0" maxOccurs="unbounded"/>
    <element name="parcelToCadastralPolygon" type="ref_CadastralPolygon" minOccurs="0" maxOccurs="unbounded"/>
  </sequence>
  <attributeGroup ref="IM_ObjectIdentity"/>
  <attribute name="datasetID" type="string"/>
  <attributeGroup ref="CommonTemporal"/>
  <attribute name="uniqueParcelIdentifier" type="string"/>
  <attribute name="legalArea" type="string"/>
  <attribute name="parcelFrontage" type="string"/>
</complexType>

<!ELEMENT uniqueParcelIdentifier %CharacterString;>
<!ELEMENT legalArea %CharacterString;>
<!ELEMENT parcelFrontage %CharacterString;>
<!ENTITY % ParcelAttributes '(uniqueParcelIdentifier, legalArea, parcelFrontage)'>

<!ELEMENT parcelToPlan %ref_Plan;*>
<!ELEMENT parcelToTitle %ref_Title;*>
<!ELEMENT parcelToProperty %ref_Property;*>
<!ELEMENT parcelToStreetAdress %ref_StreetAdress;*>
<!ELEMENT parcelToFeatureTypeCode %ref_FeatureType;>?
<!ELEMENT parcelToAreaPoint %ref_AreaPoint;*> 
<!ELEMENT parcelToCadastralPolygon %ref_CadastralPolygon;*> 
<!ENTITY % ParcelElements '(parcelToPlan, parcelToTitle, parcelToProperty, parcelToStreetAdress, parcelToFeatureTypeCode, parcelToAreaPoint, parcelToCadastralPolygon)'>
Spatial Data Infrastructure

- Institutional Framework
- Standards and Specifications
- Fundamental Datasets
- Clearinghouse
Harmonising With Other Themes

• Themes
  – Cadastre, Topography, Place Names, Street Address
  – Traditionally have had a ‘silo’ mentality to data.
  – Each data model has been developed individually

• All data sets have certain common characteristics
  – Persistent identifiers
  – Create and retire dates
  – Feature level metadata
  – Geometric primitives
Lessons

• Need for an integrated approach
  – Document decisions
  – Tackle data model, feature catalogue and encoding simultaneously if possible

• One size does not fit all
  – Application - data transfer?, data storage?
  – High-level conceptual model with specific implementation models
  – Issue when harmonising themes