Design a Geodatabase

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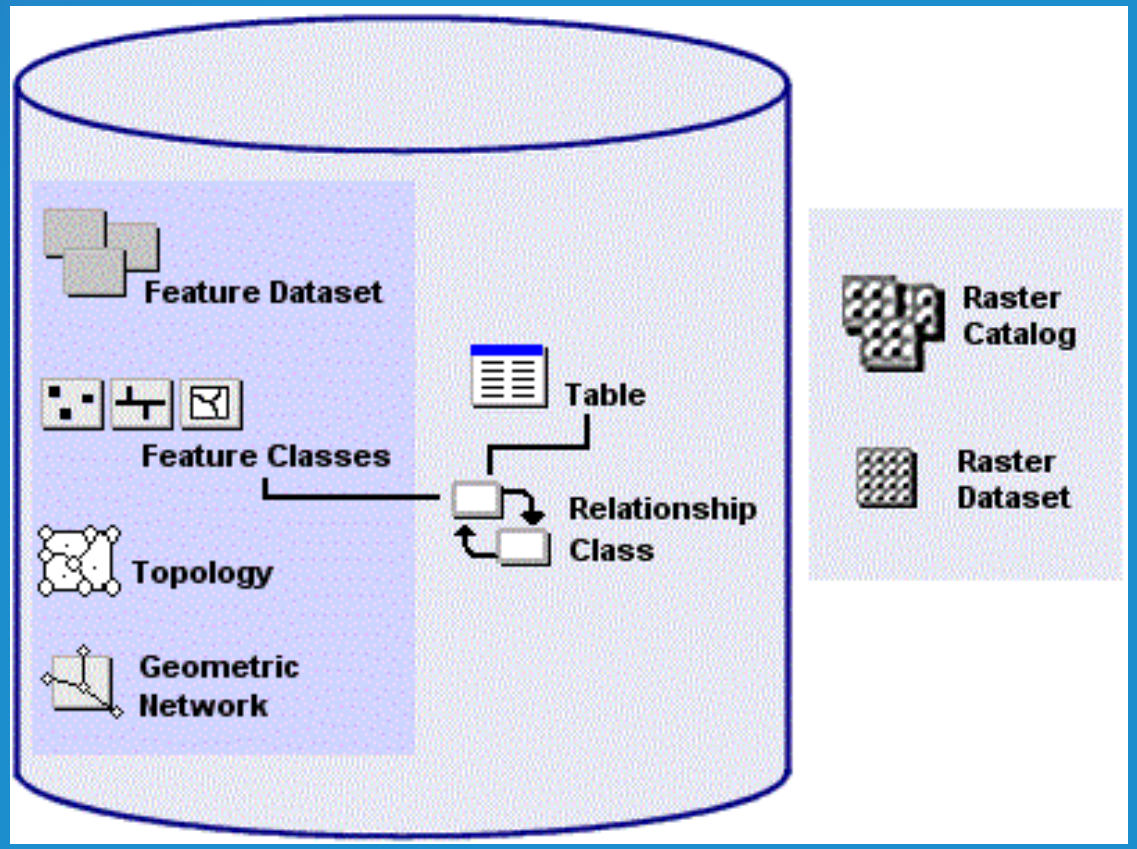
Presentation Overview

Geodatabase Design Process

- Data requirements gathering
  - Understanding your Organization
  - How to gather requirements
- Geodatabase design
  - Leverage existing models
  - Design tools
  - Testing and refining
  - Documentation

Fundamentals of Geodatabase Design

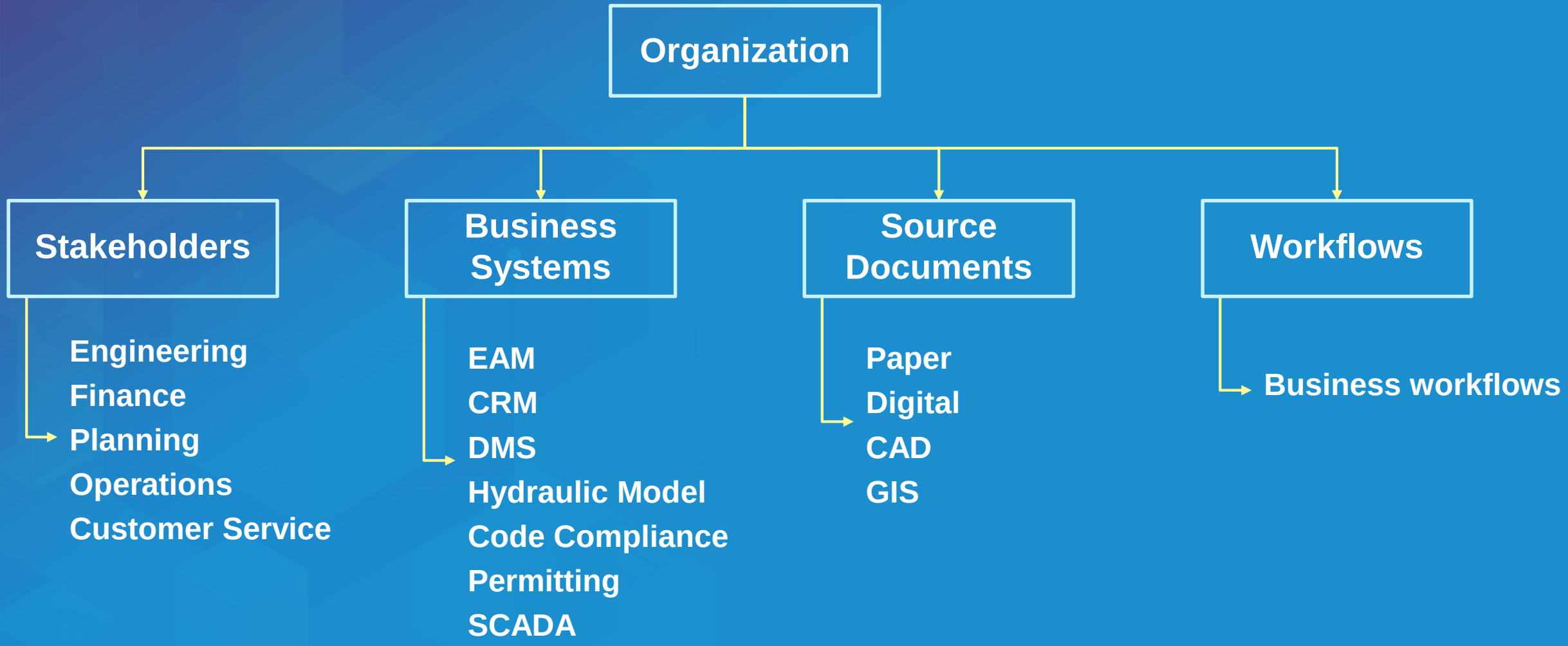
- Organizing geographic features
  - Line
  - Point
  - Polygon
  - Raster
- 3 flavors
  - Personal, File and Enterprise
- Feature datasets
- Feature classes
  - Attributes, domains
- Topologies, Networks
- Tables
- Relationship classes



Geodatabase Design Approaches

- Address specific need
  - Single user or a small group
  - No integration with other groups or business systems
- Enterprise-wide
  - Larger group or groups
  - Integration with other groups or business systems

Data Requirements Gathering



Data Requirements Gathering

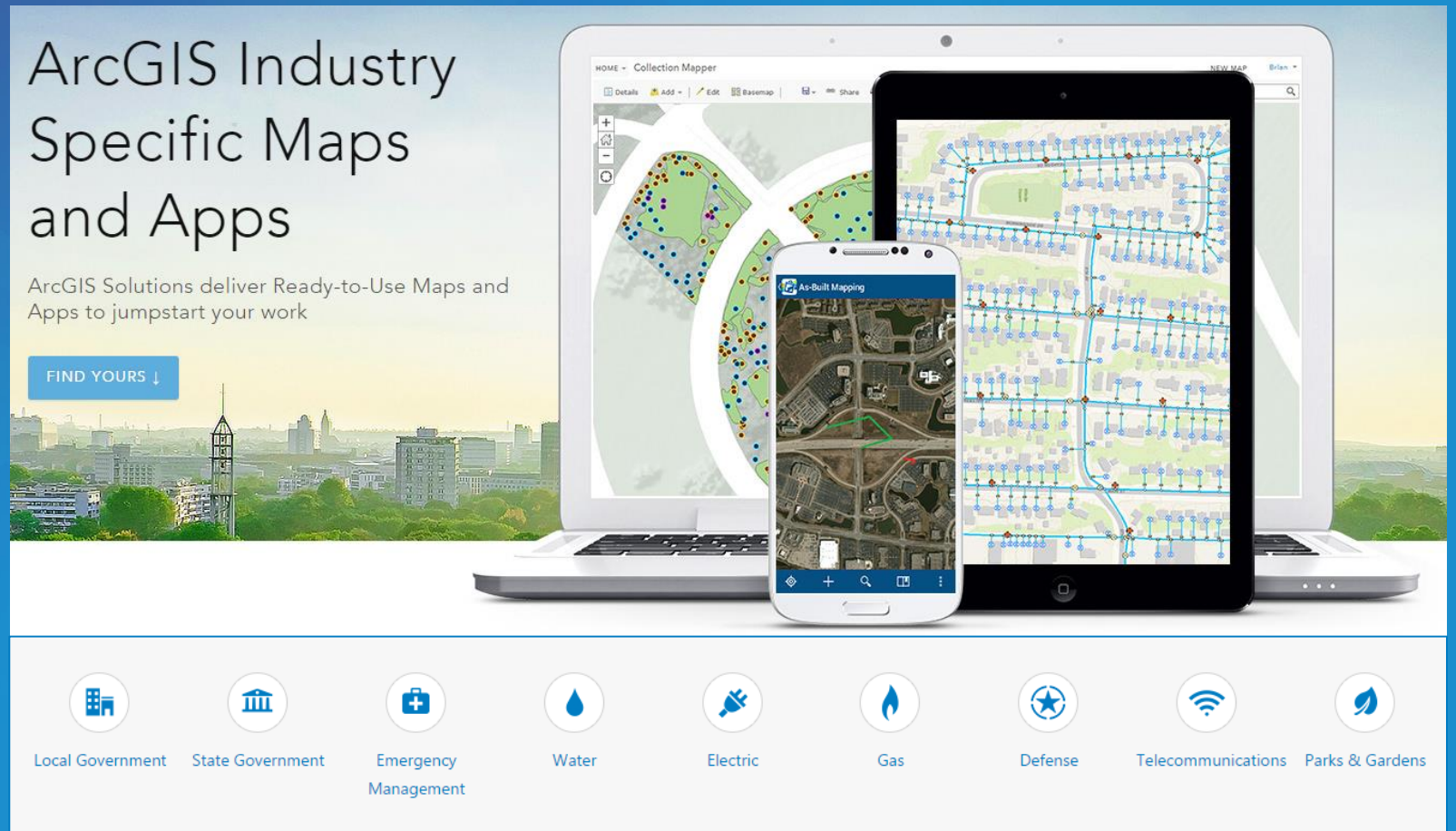
- How?
  - Interviews
  - Workshops
  - Survey

Definition of GIS Needs

1. What are the objectives of the GIS?
2. What is the reason for developing or expanding the GIS?
3. What do you expect accomplish with the GIS?
4. How will the GIS make your work easier?
5. Which departments and divisions want to acquire GIS or add to their GIS capabilities?
6. What does each department and division expect to gain from the use of GIS?
7. Will different departments develop and maintain different parts of the GIS?
8. What are the most important features or functions of a GIS?
9. Who will use the GIS?
   - What is their function?
   - How many users will use the GIS now and in the future?
   - How many locations?
11. Data source
12. Data format
13. Method or procedure for accessing the data
14. Data access restrictions and security requirements

Design Process

- **Leverage existing models**
  - **ArcGIS Solutions http://solutions.arcgis.com/**



- Address
- AdministrativeArea
- AssessmentInformation
- CadastralReference
- CapitalPlanning
- CitizenService
- Demography
- ElectionAdministration
- Elevation
- EmergencyOperations
- ExecutiveReporting
- FacilitiesStreets
- FireServiceOperations
- InfrastructureOperations
- LandUseOperations
- LandUsePlanning
- LawEnforcementOperations
- ParcelEditing
- ParcelPublishing
- PublicSafetyPlanning
- ReferenceData
- SewerStormwater
- Stormwater
- Telemetry
- WaterDistribution

Design Process

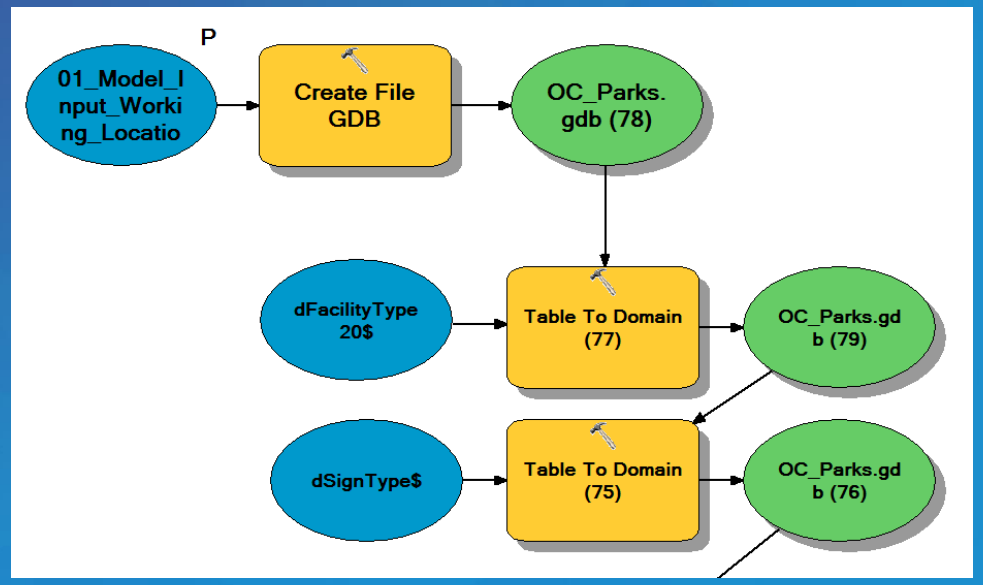
- Leverage existing models
  - Esri data models http://support.esri.com/technical-article/000011644
    - Agriculture
    - Carbon Footprint
    - Forest Service
    - Groundwater
    - Health
    - Irrigation

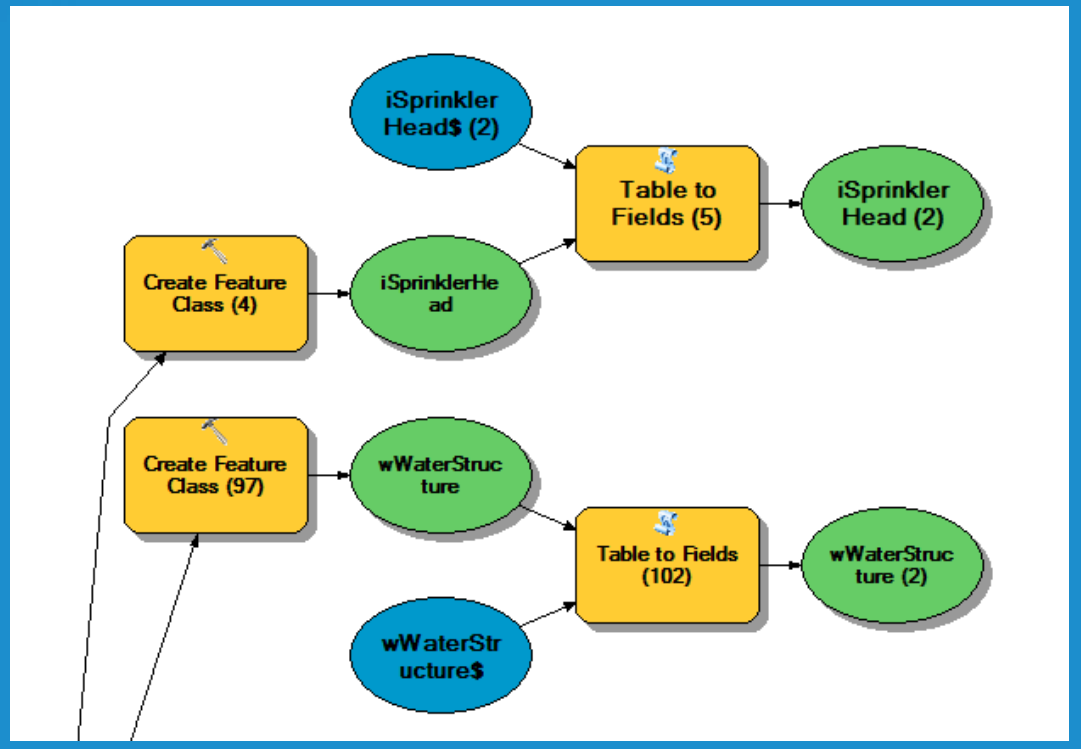
Design Process

- Extend existing models
  - Review and modify models
    - Feature classes
    - Fields
    - Domains

Design Tools

- Geoprocessing Models





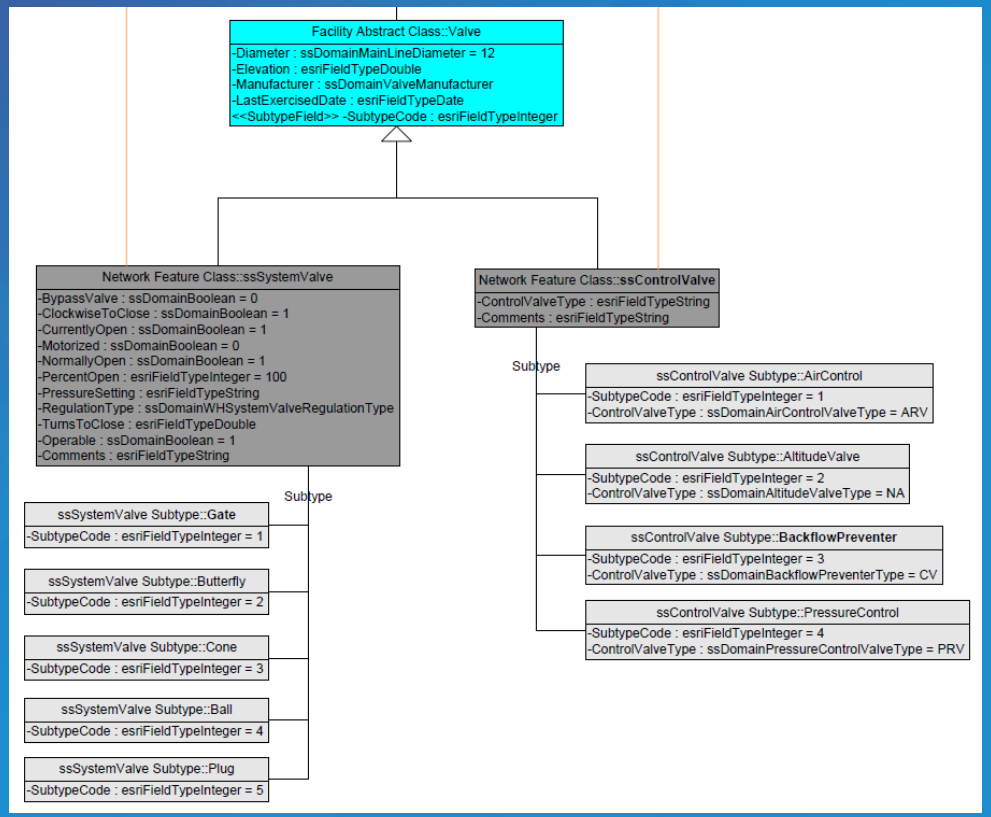
Design Tools

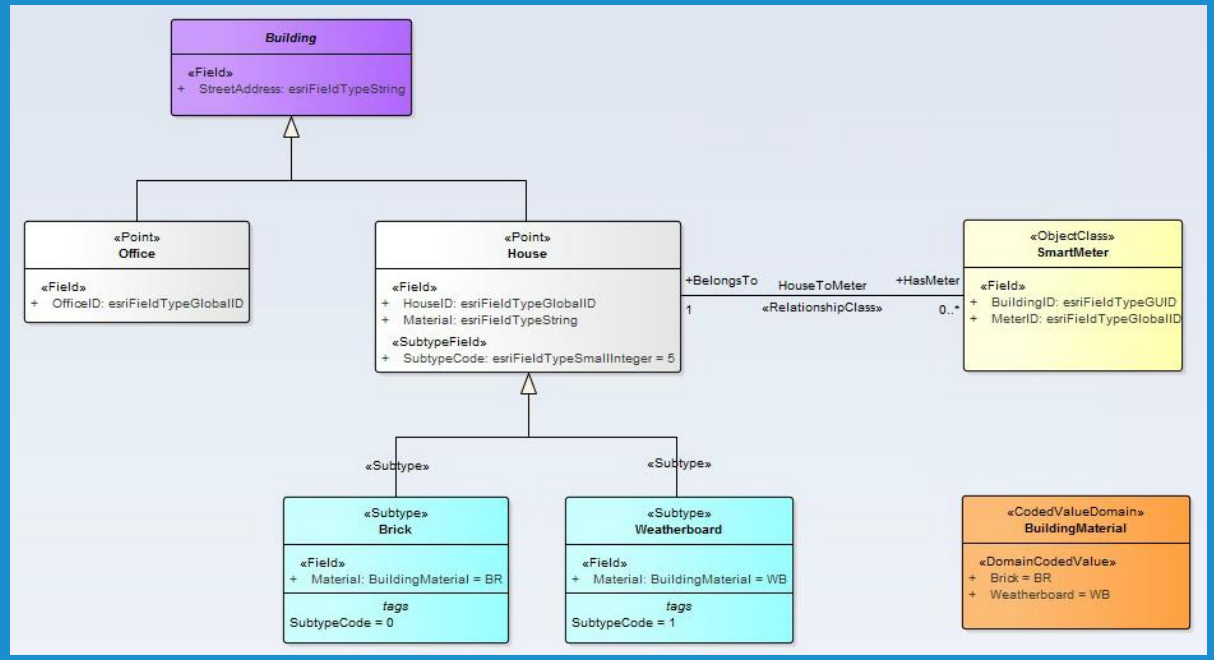
- **Geodatabase X-Ray**

	A	B	C	D	E	F	G	H	I	J	K	L
1	**FeatureClassName**	FireStations										
2	**DatasetType**	FeatureClass										
3	**Description**	REQUIRED: A brief narrative summary of the data set.										
4	**FeatureDataset**	Landbase										
5	**Tags**	REQUIRED: Common-use word or phrase used to describe the subject of the data set.										
6	**ShapeType**	Point										
7	**FeatureType**	Simple										
8	**AliasName**	FireStations										
9	**HasM**	false										
10	**HasZ**	false										
11	**SubtypeFieldName**	null										
12	**DefaultSubtype**	null										
13	**DSID**	10										
14												
15	**Fields**											
16	**FieldName**	**Type**	**Length**	**Description**	**AliasName**	**DomainName**	**DefaultValue**	**IsNullable**	**Precision**	**Scale**	**Required**	**DomainFixed**
17	Status	String	1	Status	Status	null	null	true	0	0	null	null
18	Score	SmallInteger	2	Score	Score	null	null	true	0	0	null	null
19	Side	String	1	Side	Side	null	null	true	0	0	null	null
20	X	Double	8	X	X	null	null	true	0	0	null	null
21	Y	Double	8	Y	Y	null	null	true	0	0	null	null
22	Stan_addr	String	79	Stan_addr	Stan_addr	null	null	true	0	0	null	null
23	Ref_ID	Integer	4	Ref_ID	Ref_ID	null	null	true	0	0	null	null
24	Pct_along	Double	8	Pct_along	Pct_along	null	null	true	0	0	null	null
25	ARC_Street	String	60	ARC_Street	Street or Intersection	null	null	true	0	0	null	null
26	ARC_City	String	30	ARC_City	City	null	null	true	0	0	null	null
27	ARC_State	String	4	ARC_State	State Abbreviation	null	null	true	0	0	null	null
28	ARC_Zip	String	20	ARC_Zip	Zip	null	null	true	0	0	null	null
29	Station_Id	Integer	4	Station_Id	Station_Id	null	null	true	0	0	null	null
30	Address	String	50	Address	Address	null	null	true	0	0	null	null
31	City	String	50	City	City	null	null	true	0	0	null	null
32	State	String	2	State	State	null	null	true	0	0	null	null

Design Tools

- **Unified Modeling Language (UML)**



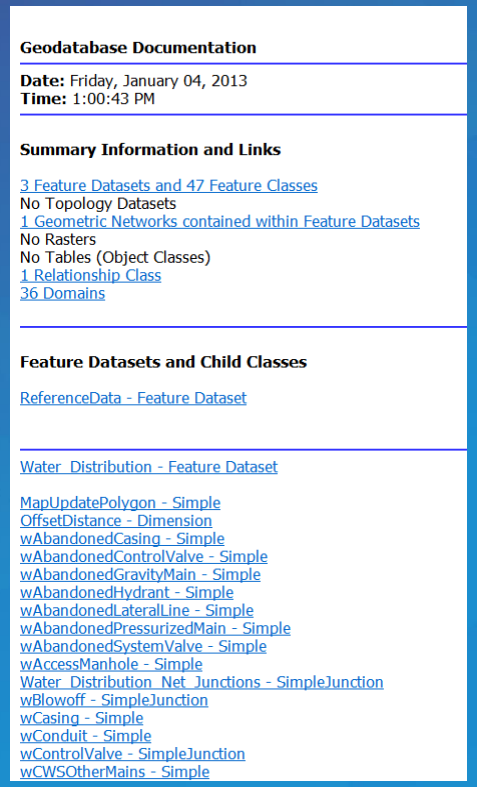


Design Process

- **Testing and Refining**
  - **Perform a pilot data conversion or migration**
  - **Configure applications**
  - **Test functionality and performance**
  - **Refine**

Design Process

- **Documentation**



Geodatabase Documentation

Date: Friday, January 04, 2013
Time: 1:00:43 PM

Summary Information and Links

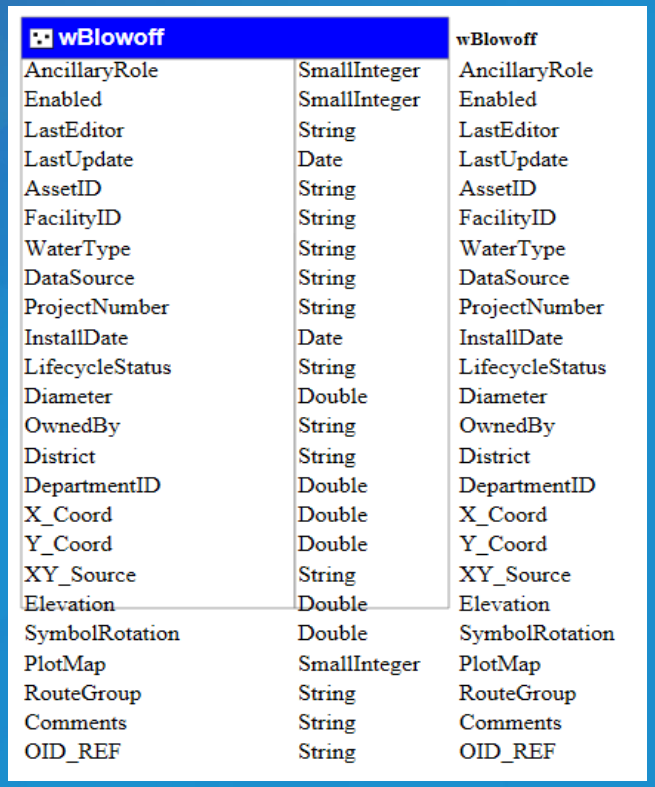
3 Feature Datasets and 47 Feature Classes
No Topology Datasets
1 Geometric Networks contained within Feature Datasets
No Rasters
No Tables (Object Classes)
1 Relationship Class
36 Domains

Feature Datasets and Child Classes

ReferenceData - Feature Dataset

Water_Distribution - Feature Dataset

MapUpdatePolygon - Simple
OffsetDistance - Dimension
wAbandonedCasing - Simple
wAbandonedControlValve - Simple
wAbandonedGravityMain - Simple
wAbandonedHydrant - Simple
wAbandonedLateralLine - Simple
wAbandonedPressurizedMain - Simple
wAbandonedSystemValve - Simple
wAccessManhole - Simple
Water_Distribution_Net_Junctions - SimpleJunction
wBlowoff - SimpleJunction
wCasing - Simple
wConduit - Simple
wControlValve - SimpleJunction
wCWSOtherMains - Simple



wBlowoff		wBlowoff
AncillaryRole	SmallInteger	AncillaryRole
Enabled	SmallInteger	Enabled
LastEditor	String	LastEditor
LastUpdate	Date	LastUpdate
AssetID	String	AssetID
FacilityID	String	FacilityID
WaterType	String	WaterType
DataSource	String	DataSource
ProjectNumber	String	ProjectNumber
InstallDate	Date	InstallDate
LifecycleStatus	String	LifecycleStatus
Diameter	Double	Diameter
OwnedBy	String	OwnedBy
District	String	District
DepartmentID	Double	DepartmentID
X_Coord	Double	X_Coord
Y_Coord	Double	Y_Coord
XY_Source	String	XY_Source
Elevation	Double	Elevation
SymbolRotation	Double	SymbolRotation
PlotMap	SmallInteger	PlotMap
RouteGroup	String	RouteGroup
Comments	String	Comments
OID_REF	String	OID_REF

Design Process

- **Key Takeaways**
  - **Think through the goals and output information products**
  - **Collaborate**
  - **Consider existing designs**

Requirements > Design > Database > Information Products/Applications