UT1867 - Can You Hear me Now! AUD talking to GIS

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Safe Harbor

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Class summary

In this lecture session, we present the first and foremost workflow in utilities is to enable the designers with as-built information from mapping and/or GIS systems. This session will give opportunity to understand what you are facing in trying to move data to/from GIS to your design environment. This will try to enlighten the audience with capabilities of AUD 2014 and its data exchange framework for integrating with external as-built data. The complete round-trip workflow enables track and merge back information without loss of data fidelity in the translation process.

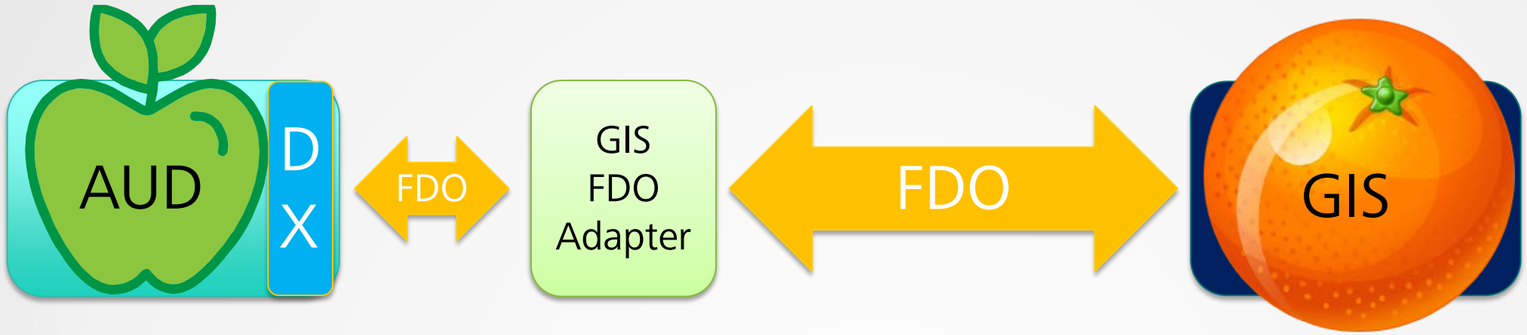
Key learning objectives

At the end of this class, you will be able to:

- Use the new data exchange feature in AutoCAD Utility Design
- Exchange information between AutoCAD Utility Design and GIS systems
- Explain how AutoCAD Utility Design can be integrated with other systems to extend workflow outside of AutoCAD Utility Design
- Explain how Esri® and Smallworld™ GIS data can be exchanged without data loss

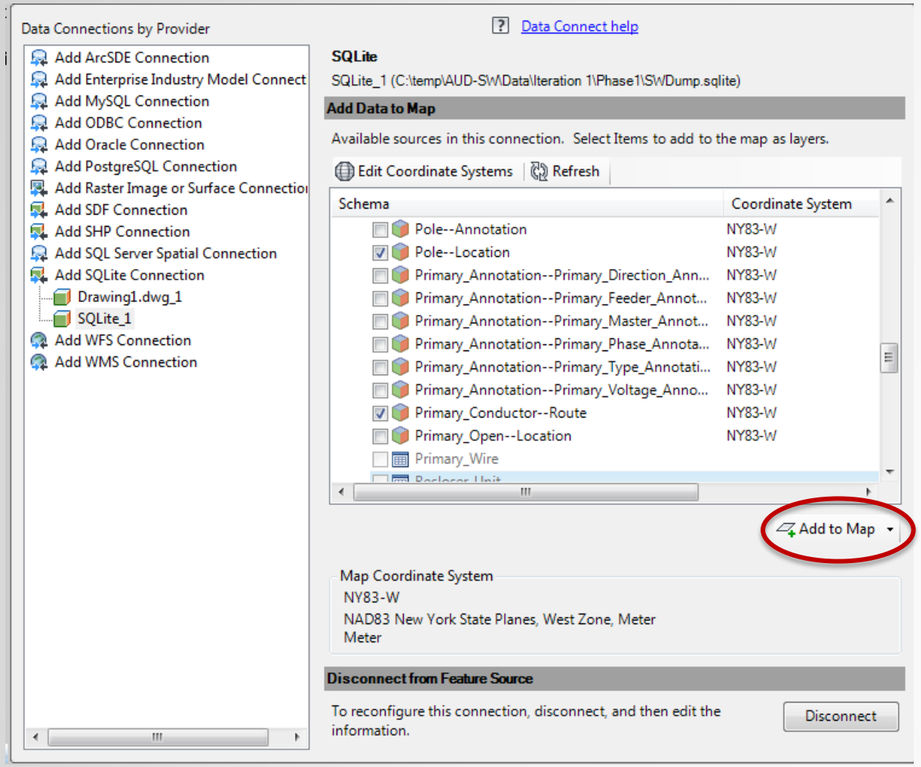
New Component in AUD

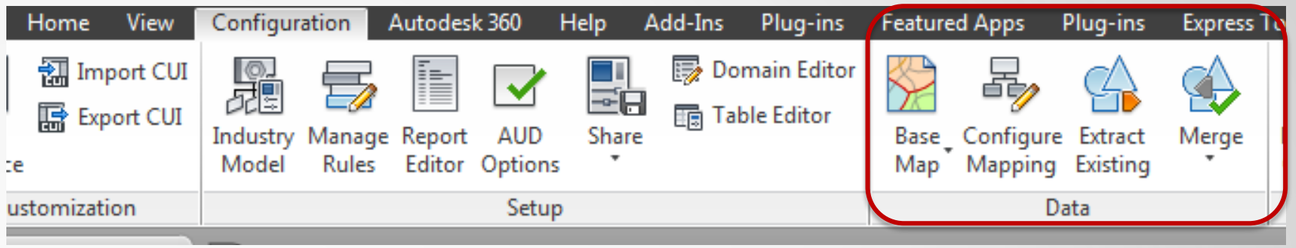
What is Data Exchange(DX) in AUD?

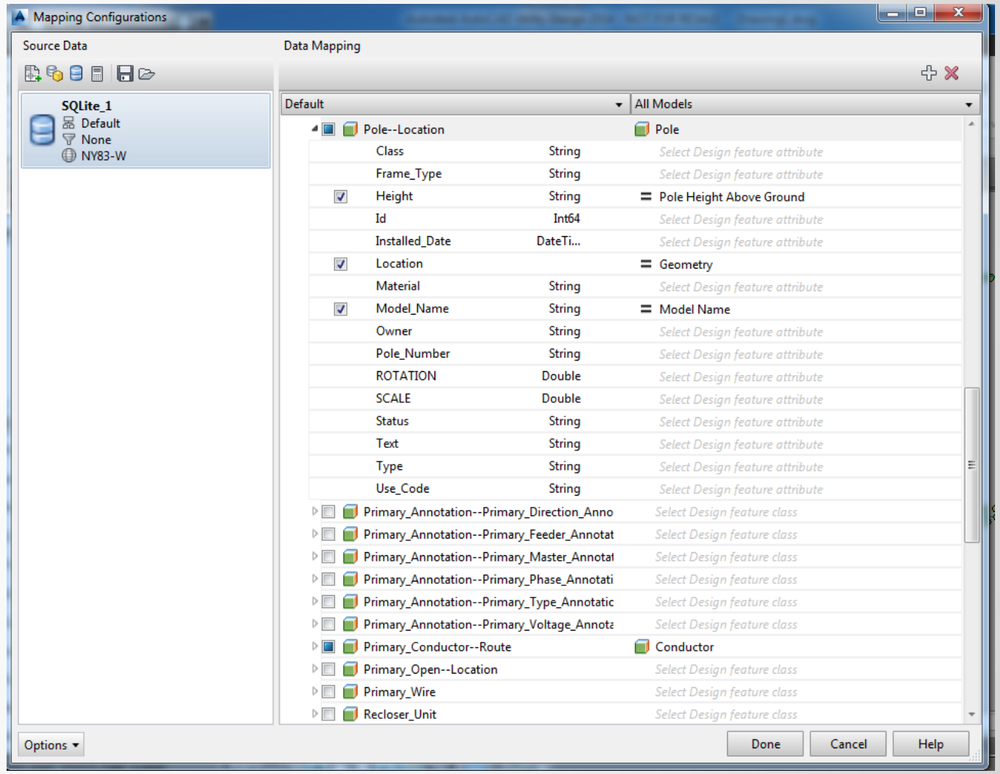


- Data Exchange (DX) component is built-in to AUD 2014+
- GIS FDO Adaptors are available as plug-in components
- Feature Data Objects (FDO) Technology is fundamentally baked into all Infrastructure products.
- GIS to AUD schema mapping is done using DX mapping UI inside AUD
- Built-in data exchange capability is for moving data from GIS schema to AUD (vice-versa), but minimal model transformation capabilities are available out of the box
- Traditional effort to exchange data between systems involve,
  - Analyzing & Mapping schemas
  - Modifying source schema to fit target
  - Applying transformation rules in source and/or target
  - Audit Tracking changes and feedback to users

DX - Steps

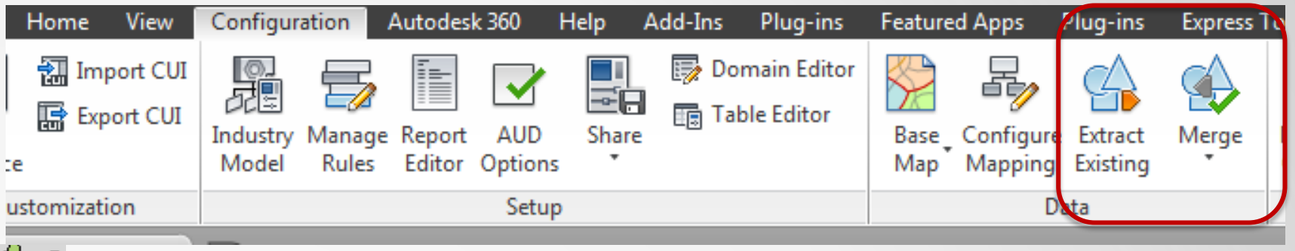


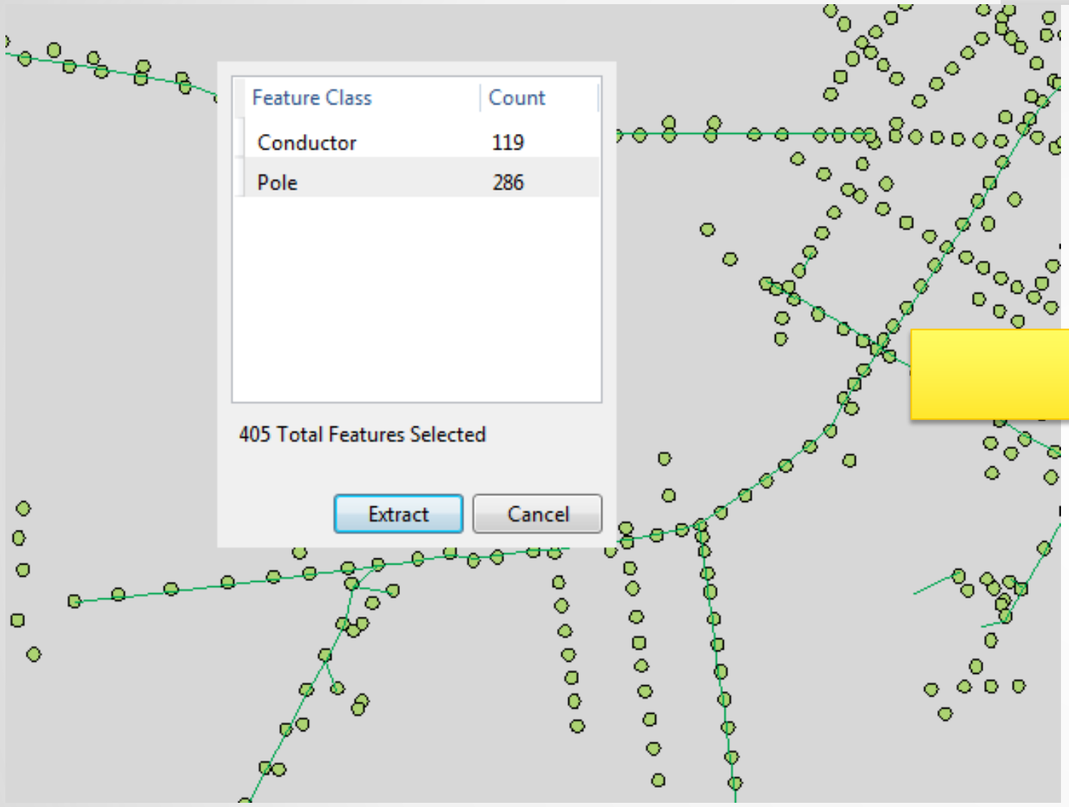




- Open Design Drawing
- Connect to GIS using FDO
- Map GIS features to AUD features (including attributes)

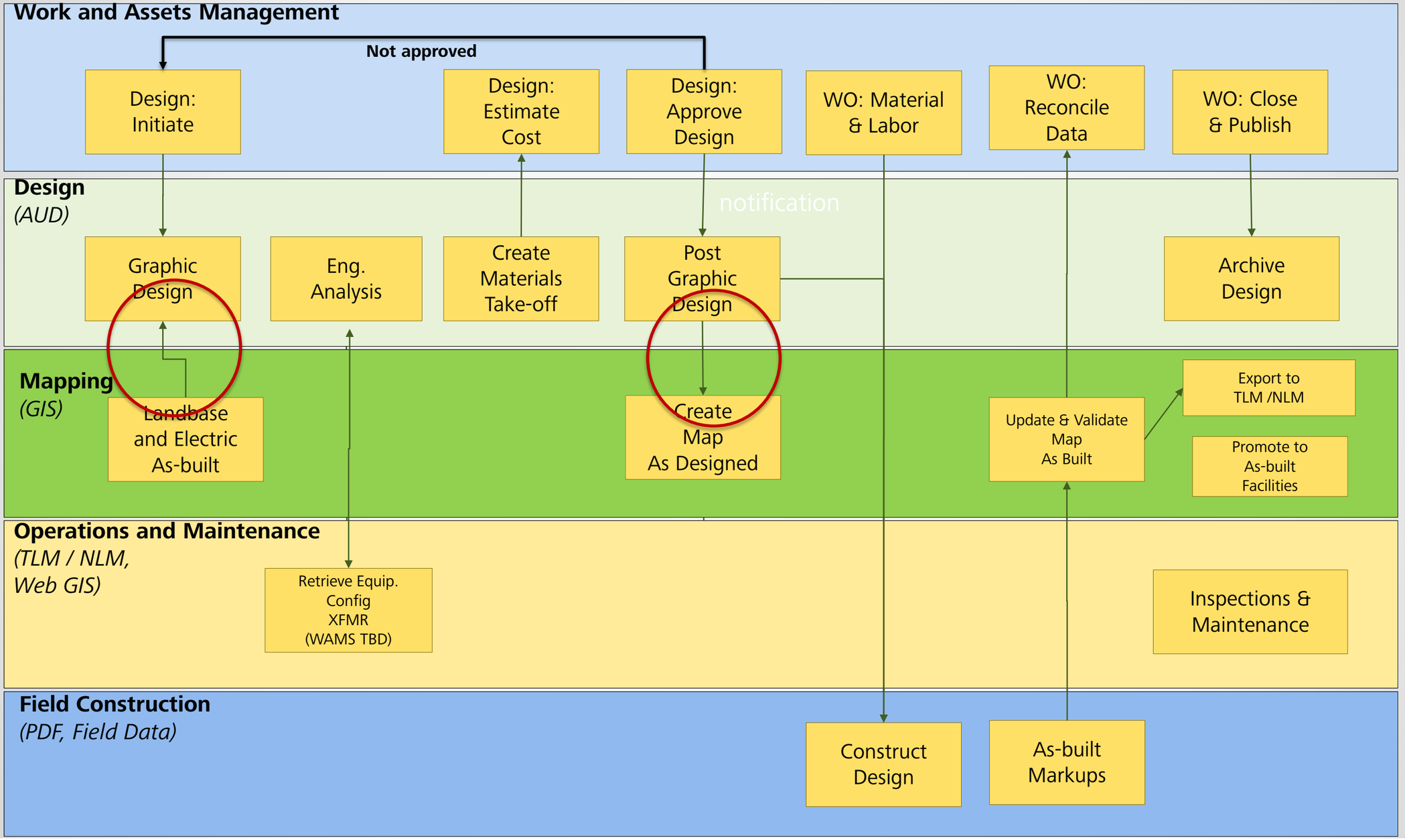
DX - Steps





- Extract a specific area of interest
- Do Design
- Merge back

Integrated Workflow



DX Introduction Demo ….

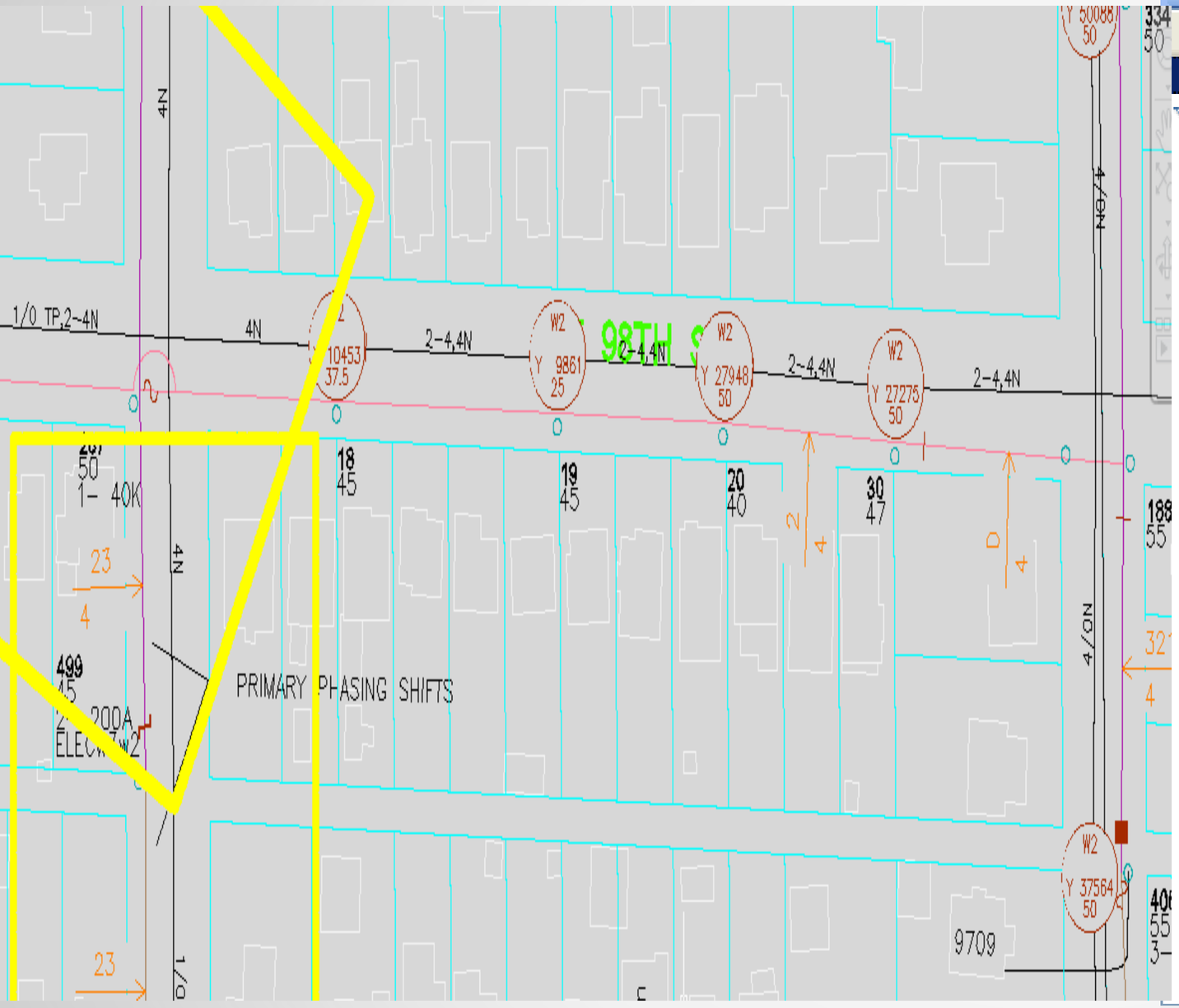
Source GIS Schema Variations and Options

Data Fidelity Matrix

GIS Schema Compatibility	Level 1	Level 2	Level 3
Native recognized (Map IM)	95%*		
Closely Matched	80%	95%*	
Incompatible & Foreign	50%	80%	95%*

- * - Some source GIS features may still be a gap (e.g.: Hypernodes, Annotation)
- Need a Assessment Pilot effort to determine where your GIS schema fits

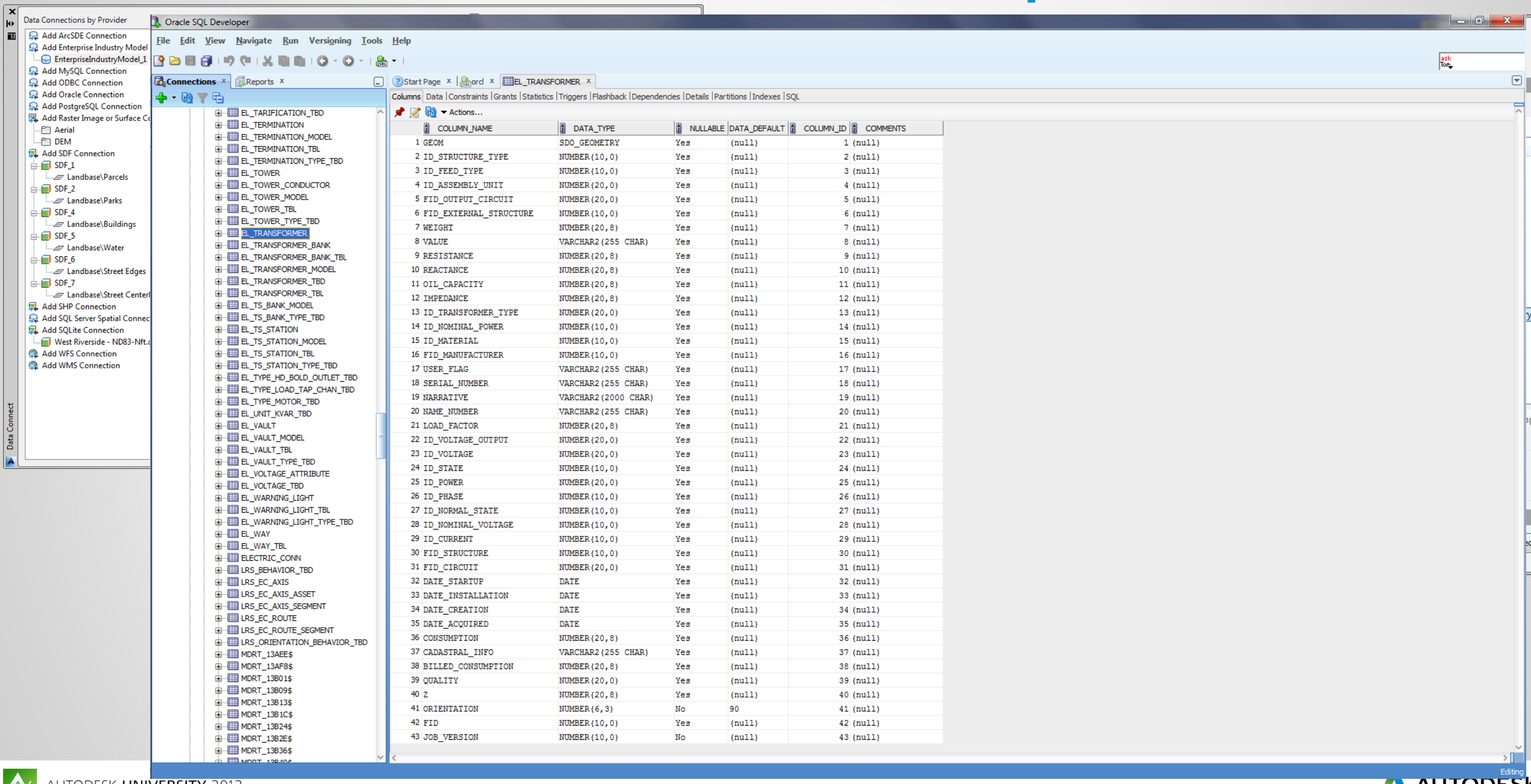
GIS Model – Variation 1 - ESRI ®



Edit Coordinate Systems | Refresh

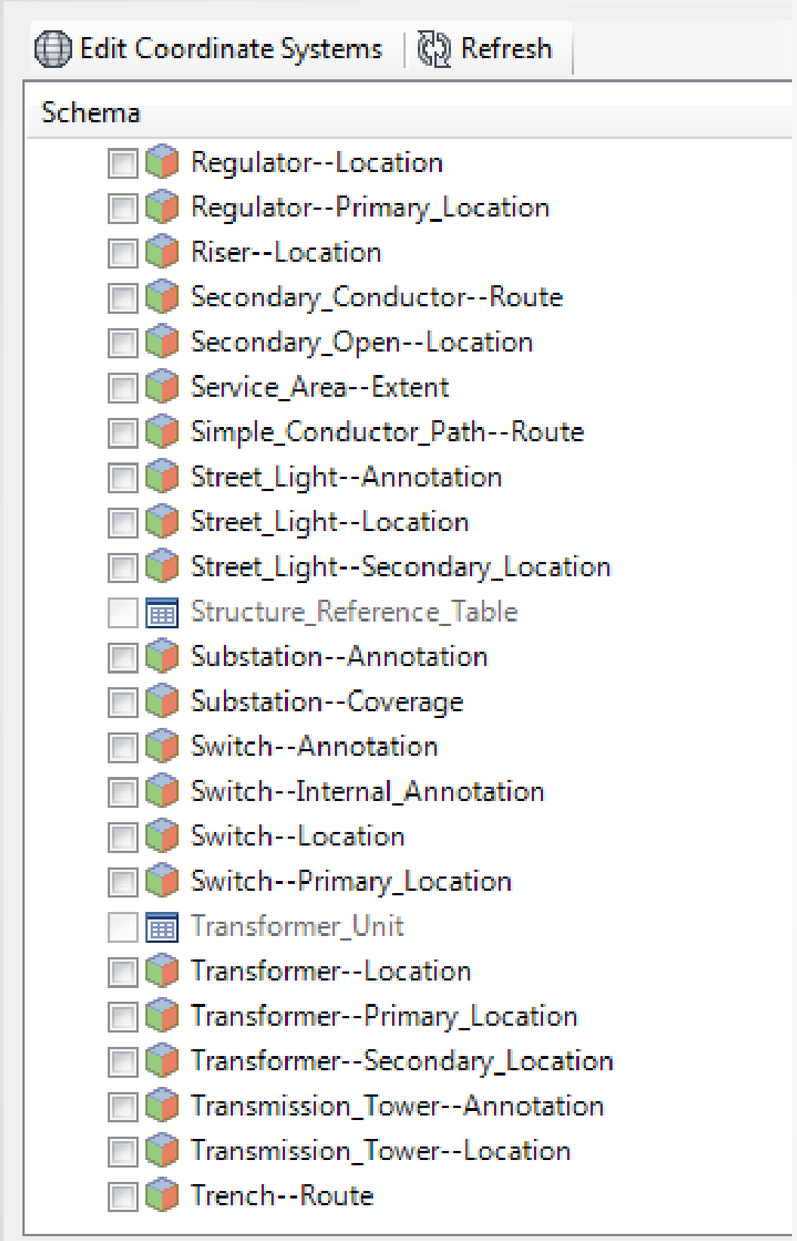
Schema	Coordinate System
Default	
ElectricDataset	
WhiteSpan	HARN/WO.WA-NF
CapacitorTie	HARN/WO.WA-NF
MiscLineGraphics	HARN/WO.WA-NF
ANOMALY_POINT	HARN/WO.WA-NF
Riser	HARN/WO.WA-NF
SupportStructure	HARN/WO.WA-NF
SurfaceStructure	HARN/WO.WA-NF
ElectricStation	HARN/WO.WA-NF
SwitchingCabinet	HARN/WO.WA-NF
AnchorGuy	HARN/WO.WA-NF
FeatureLabelPoint	HARN/WO.WA-NF
ElectricInsetFrameSource	HARN/WO.WA-NF
UGTransmissionLine	HARN/WO.WA-NF
MiscPointGraphics	HARN/WO.WA-NF
PhaseFlag	HARN/WO.WA-NF
AbandonedElectricLineSe...	HARN/WO.WA-NF
UGHazards	HARN/WO.WA-NF
Neutral	HARN/WO.WA-NF
ServicePoint	HARN/WO.WA-NF
ANOMALY_LINE	HARN/WO.WA-NF
PriUGElectricLineSegment	HARN/WO.WA-NF
SecUGElectricLineSegment	HARN/WO.WA-NF
PriOHElectricLineSegment	HARN/WO.WA-NF

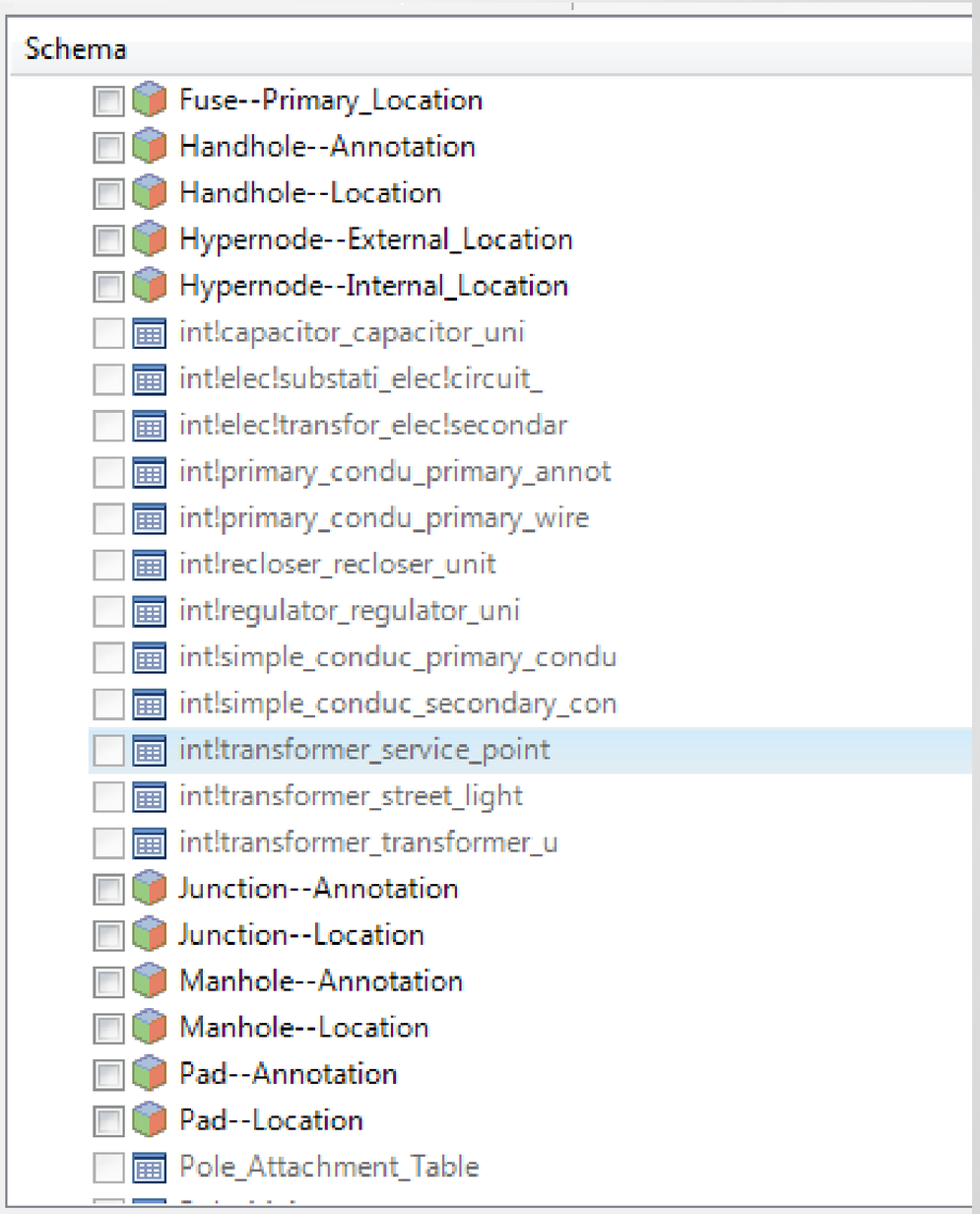
GIS Model - Variation 2 – AutoCAD Map 3D®



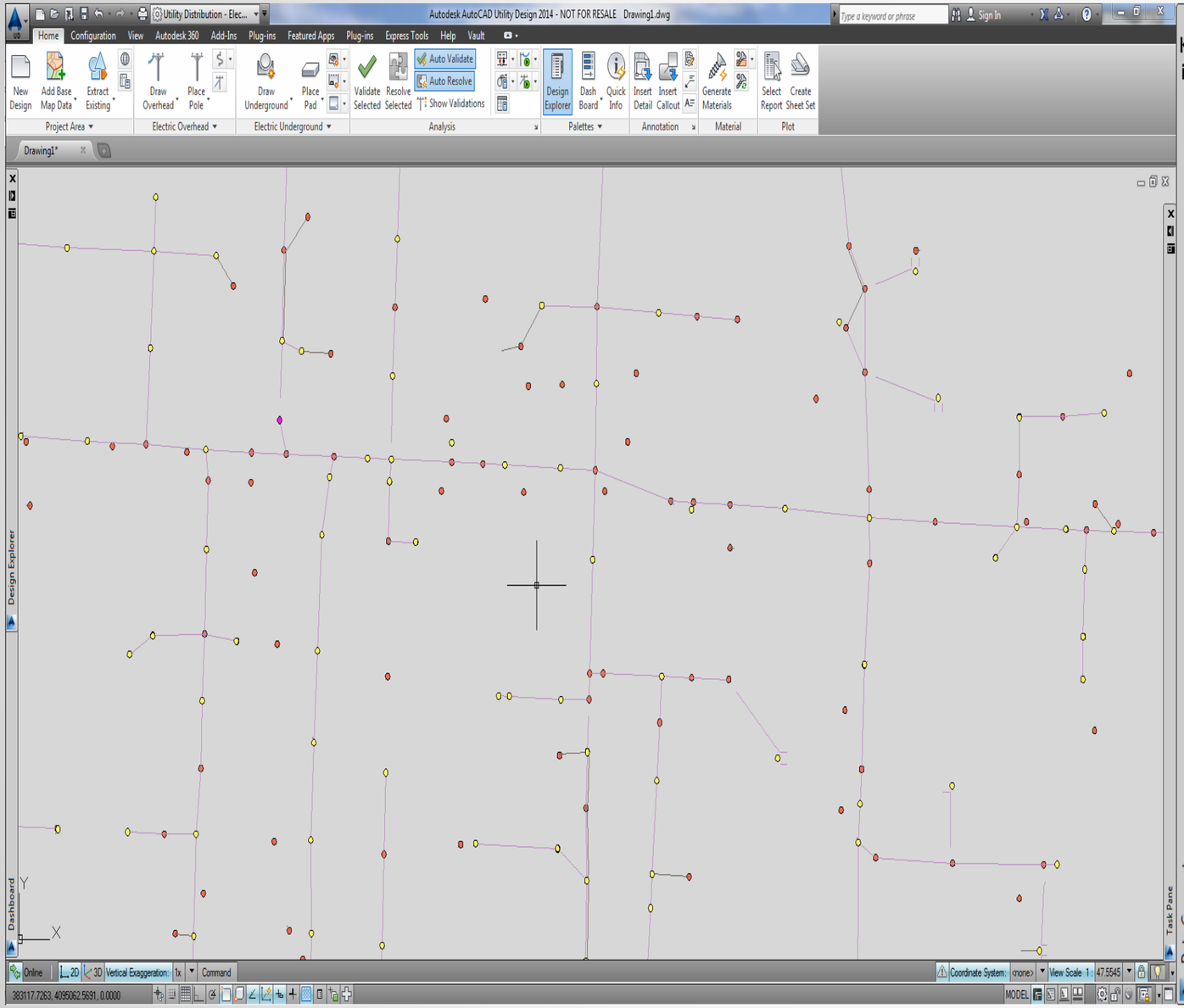
	COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1	GEOM	SDO_GEOMETRY	Yes	(null)	1	(null)
2	ID_STRUCTURE_TYPE	NUMBER(10,0)	Yes	(null)	2	(null)
3	ID_FEED_TYPE	NUMBER(10,0)	Yes	(null)	3	(null)
4	ID_ASSEMBLY_UNIT	NUMBER(20,0)	Yes	(null)	4	(null)
5	FID_OUTPUT_CIRCUIT	NUMBER(20,0)	Yes	(null)	5	(null)
6	FID_EXTERNAL_STRUCTURE	NUMBER(10,0)	Yes	(null)	6	(null)
7	WEIGHT	NUMBER(20,8)	Yes	(null)	7	(null)
8	VALUE	VARCHAR2(255 CHAR)	Yes	(null)	8	(null)
9	RESISTANCE	NUMBER(20,8)	Yes	(null)	9	(null)
10	REACTANCE	NUMBER(20,8)	Yes	(null)	10	(null)
11	OIL_CAPACITY	NUMBER(20,8)	Yes	(null)	11	(null)
12	IMPEDANCE	NUMBER(20,8)	Yes	(null)	12	(null)
13	ID_TRANSFORMER_TYPE	NUMBER(20,0)	Yes	(null)	13	(null)
14	ID_NOMINAL_POWER	NUMBER(10,0)	Yes	(null)	14	(null)
15	ID_MATERIAL	NUMBER(10,0)	Yes	(null)	15	(null)
16	FID_MANUFACTURER	NUMBER(10,0)	Yes	(null)	16	(null)
17	USER_FLAG	VARCHAR2(255 CHAR)	Yes	(null)	17	(null)
18	SERIAL_NUMBER	VARCHAR2(255 CHAR)	Yes	(null)	18	(null)
19	NARRATIVE	VARCHAR2(2000 CHAR)	Yes	(null)	19	(null)
20	NAME_NUMBER	VARCHAR2(255 CHAR)	Yes	(null)	20	(null)
21	LOAD_FACTOR	NUMBER(20,8)	Yes	(null)	21	(null)
22	ID_VOLTAGE_OUTPUT	NUMBER(20,0)	Yes	(null)	22	(null)
23	ID_VOLTAGE	NUMBER(20,0)	Yes	(null)	23	(null)
24	ID_STATE	NUMBER(10,0)	Yes	(null)	24	(null)
25	ID_POWER	NUMBER(20,0)	Yes	(null)	25	(null)
26	ID_PHASE	NUMBER(10,0)	Yes	(null)	26	(null)
27	ID_NORMAL_STATE	NUMBER(10,0)	Yes	(null)	27	(null)
28	ID_NOMINAL_VOLTAGE	NUMBER(10,0)	Yes	(null)	28	(null)
29	ID_CURRENT	NUMBER(10,0)	Yes	(null)	29	(null)
30	FID_STRUCTURE	NUMBER(10,0)	Yes	(null)	30	(null)
31	FID_CIRCUIT	NUMBER(20,0)	Yes	(null)	31	(null)
32	DATE_STARTUP	DATE	Yes	(null)	32	(null)
33	DATE_INSTALLATION	DATE	Yes	(null)	33	(null)
34	DATE_CREATION	DATE	Yes	(null)	34	(null)
35	DATE_ACQUIRED	DATE	Yes	(null)	35	(null)
36	CONSUMPTION	NUMBER(20,8)	Yes	(null)	36	(null)
37	CADASTRAL_INFO	VARCHAR2(255 CHAR)	Yes	(null)	37	(null)
38	BILLED_CONSUMPTION	NUMBER(20,8)	Yes	(null)	38	(null)
39	QUALITY	NUMBER(20,0)	Yes	(null)	39	(null)
40	Z	NUMBER(20,8)	Yes	(null)	40	(null)
41	ORIENTATION	NUMBER(6,3)	No	90	41	(null)
42	FID	NUMBER(10,0)	Yes	(null)	42	(null)
43	JOB_VERSION	NUMBER(10,0)	No	(null)	43	(null)

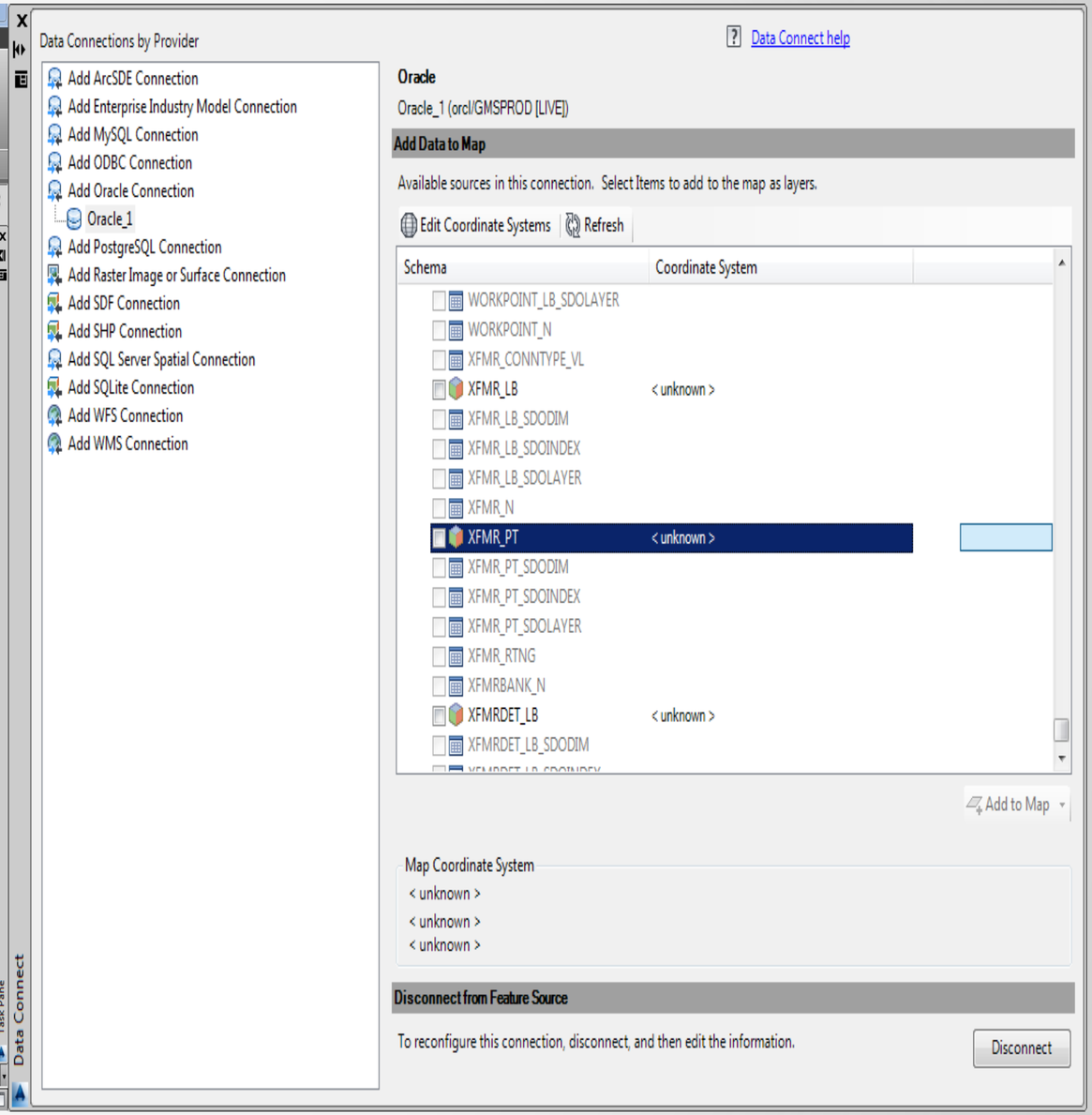
GIS Model – Variation 3 – GE Smallworld®





GIS Model – Variation 4 – Intergraph G/Tech®

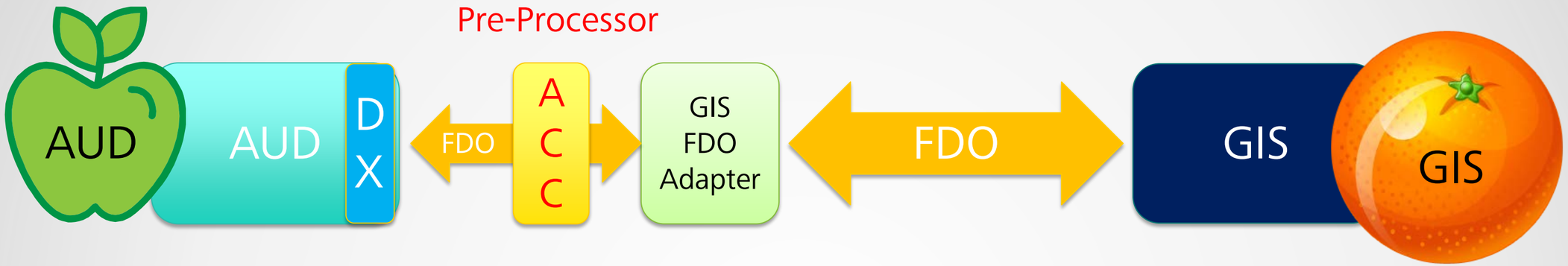




How can we transform?

- Creating a Staging schema to make it AUD friendly
- Leveraging staging as QA environment before posting to GIS on the way back
- Exposing only the relevant parts of the GIS schema

How can we transform?



- Pre-processor tool (AcClassify) which transforms models on the fly
- Makes it available to Data Exchange Framework in compatible format.
- Supports two-way transformation
- Flexible Mapping configuration separate from DX

DX Demo with AcClassify

Before you Pilot… what you need to do??

Analyze

- GIS Data Dictionary
  - Get details (Attributes/relationships)
  - Prioritize classes (Filter classes not needed in Design)
  - Decode - Domains & Label text
  - Join tables
- AUD Data Dictionary
  - Does all classes need to be round tripped?
  - Identify mandatory as-built data
  - Map Domains
  - New design data – do we have placeholders in GIS

Establish Process

- Review Current as-built extraction and design take-off process
- Ensure (or build) tools/capabilities to locate an asset/Area of Interest
  - Land base geo-coded streets
  - Asset search
  - Grids / District polygons
- Check in/out responsibilities
- Conflict management
- QA – GIS pre-posting
- Continuous improvement of design data fidelity in GIS
  - Improve more usage of as-built data by increasing value to designers
  - Preserve Eng. analysis data for future use

Leverage

- Existing integrations to enterprise systems
- Best use of purpose built tools
- Training

Thank You – Q & A