AUTODESK UNIVERSITY 2013

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

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Description The first and foremost workflow in utilities is to enable the designers to access as-built information from mapping and/or GIS systems. This roundtable session covers the capabilities of Autodesk Utility Design 2014 software and its data exchange framework for integrating with external as-built data. The complete round-trip workflow enables users to track and merge back information without loss of data fidelity in the translation process.

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
- 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.

About the Speaker

Ram is a solutions architect for 20+ years with extensive consulting experience in geographic information systems (GIS) and related technologies; He has delivered successful projects in the utility industry and has the experience of the whole project life cycle. He is experienced in delivering projects for the telecom, utility, banking and airline industries. He has a strong database and enterprise GIS integration technology background, and has extensive background in integrating enterprise systems using open standards and middleware technology. He is currently responsible for providing solutions to integrate Autodesk® products into the utility customer's workflow.

Co-Speaker

A member of the Autodesk Geospatial/Utilities Technical Specialist team for over 8 years he has worked with a wide variety of customers in implementing geospatial/utility solutions that include desktop and web mapping utilizing Autodesk solutions. He is an expert in a variety of databases including database design and implementations (notably Oracle) with Autodesk geospatial/utility products including evangelizing the newly introduced DX (Data Exchange) framework now available in AutoCAD Map 3D and AutoCAD Utility Design.

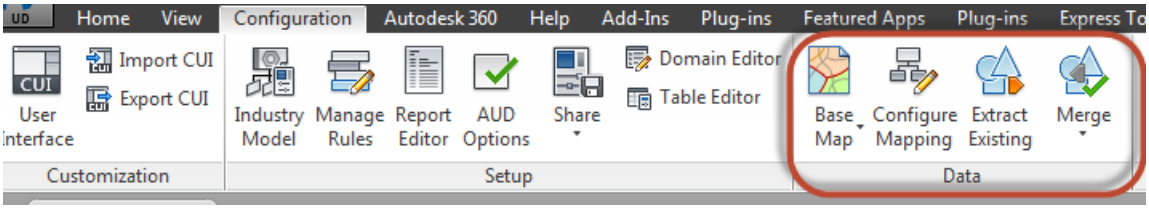
Rick (AKA “Easy Button” or EB by his team) is also outstanding at developing innovative solutions to a wide variety of industries including mapping, and utilities and has a unique skill of dissecting the business issues/problems facing customers today and implementing the appropriate solution(s).

Use the new data exchange feature in AutoCAD Utility Design

What is Data Exchange (DX)?

Data exchange is a new component introduced in AUD 2014 which allows users to map and exchange data from external FDO (Feature data source) sources.

It is available in the “Configuration” tab on the ribbons.



What are its capabilities?

- Allow mapping of GIS features to AUD features (reverse map too)
- Import GIS data to AUD
- Keep track of the foreign keys and GIS Ids
- Keep track of changes performed on GIS features and new AUD features
- Merge back to Source selectively using a UI

What it cannot do today?

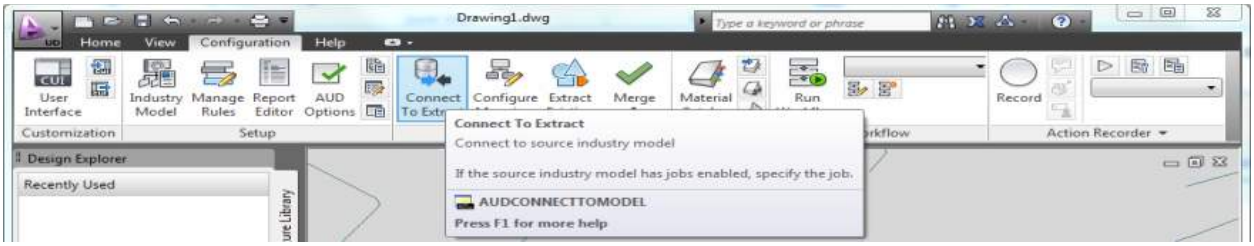
- Complex mappings
- Attribute tables without geometry
- Non-FDO data sources
- Multiple source schemas

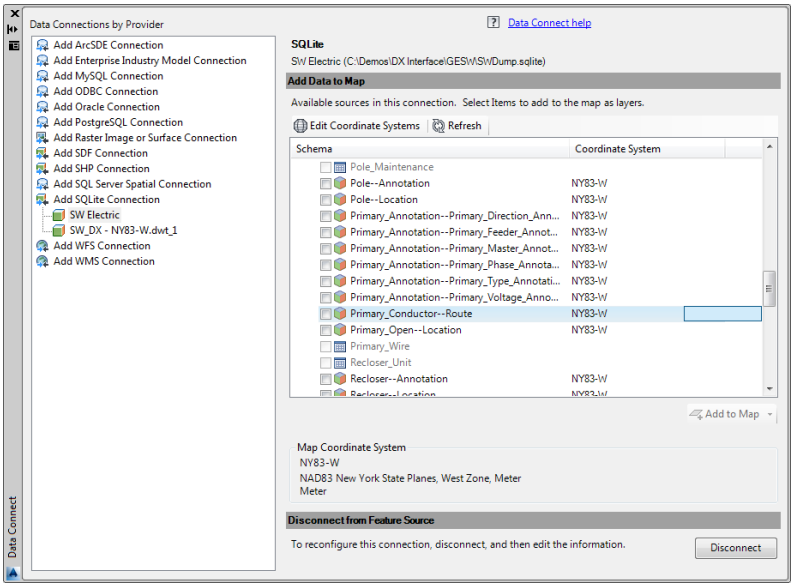
What is the process involved?

- Create a FDO connection to source GIS (MAPCONNECT)
- Set proper source and target coordinate systems.
- Optionally, visualize it in AUD
- Bring up Mapping UI and select from the available FDO connections
- Map the features and attributes
- Save the mapping (either inside the dwg or outside as XML)
- Extract existing GIS data by selecting polygon boundary to extract into
- Verify and Start manipulating data in AUD
- Merge back once ready to post back to GIS using merge UI.

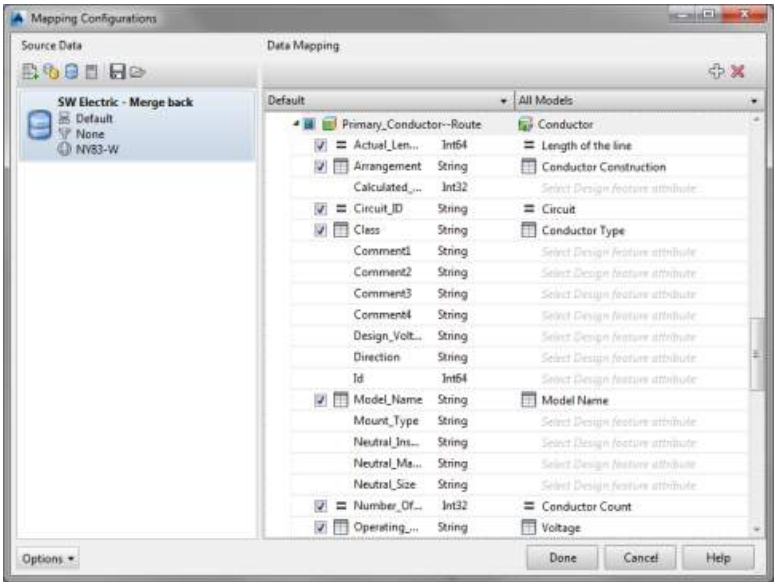
Below screenshots show the flow of steps needed in order to use DX tools to exchange data,

1. Connect to FDO data source.

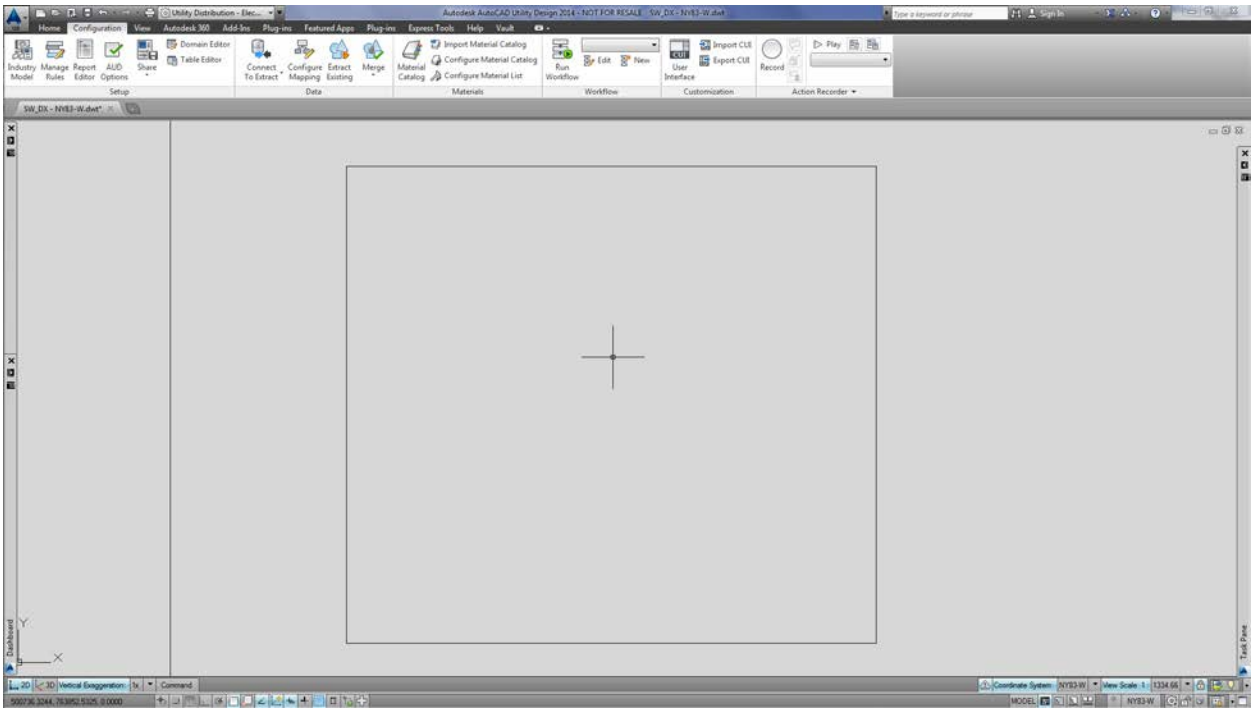




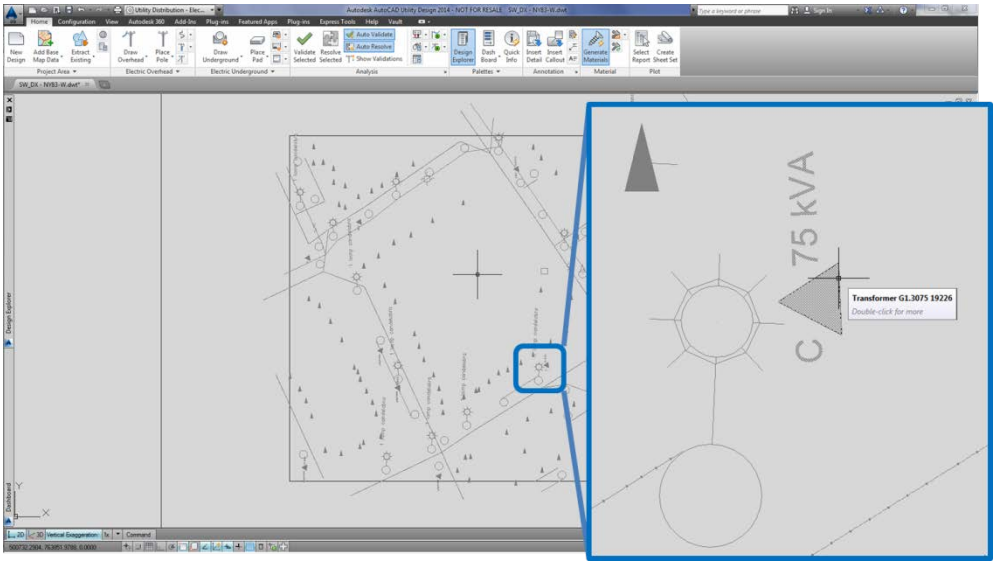
2. Map schemas



3. Select area of Interest



4. Extracted features



Exchange information between AutoCAD Utility Design and GIS

What do you need to do in order successfully exchange data between systems?

- Analyze the source schema
  - Not every GIS schema is same even though it might be ESRI® or Smallworld®
  - Identify anomalies and why its modeled the way it is
  - Question if you really need to round-trip or send that data (feature/ attribute) to AUD
  - Categorize it as simple (1:1) , complex (require preprocessing)
  - Create spreadsheet as result of analysis
- Decide how many features you are round tripping vs. pushing it one way
- Decide if you can "flatten" the model for specific features to make data exchange simpler.
- Decide whether the architecture needs a staging schema instead of operating in source schema directly.
- Define Domain mappings between AUD and GIS
- Use Mapping UI to map the features and attributes.
- Test with small area and verify

The preliminary spreadsheet format can be represented by sample given below.,

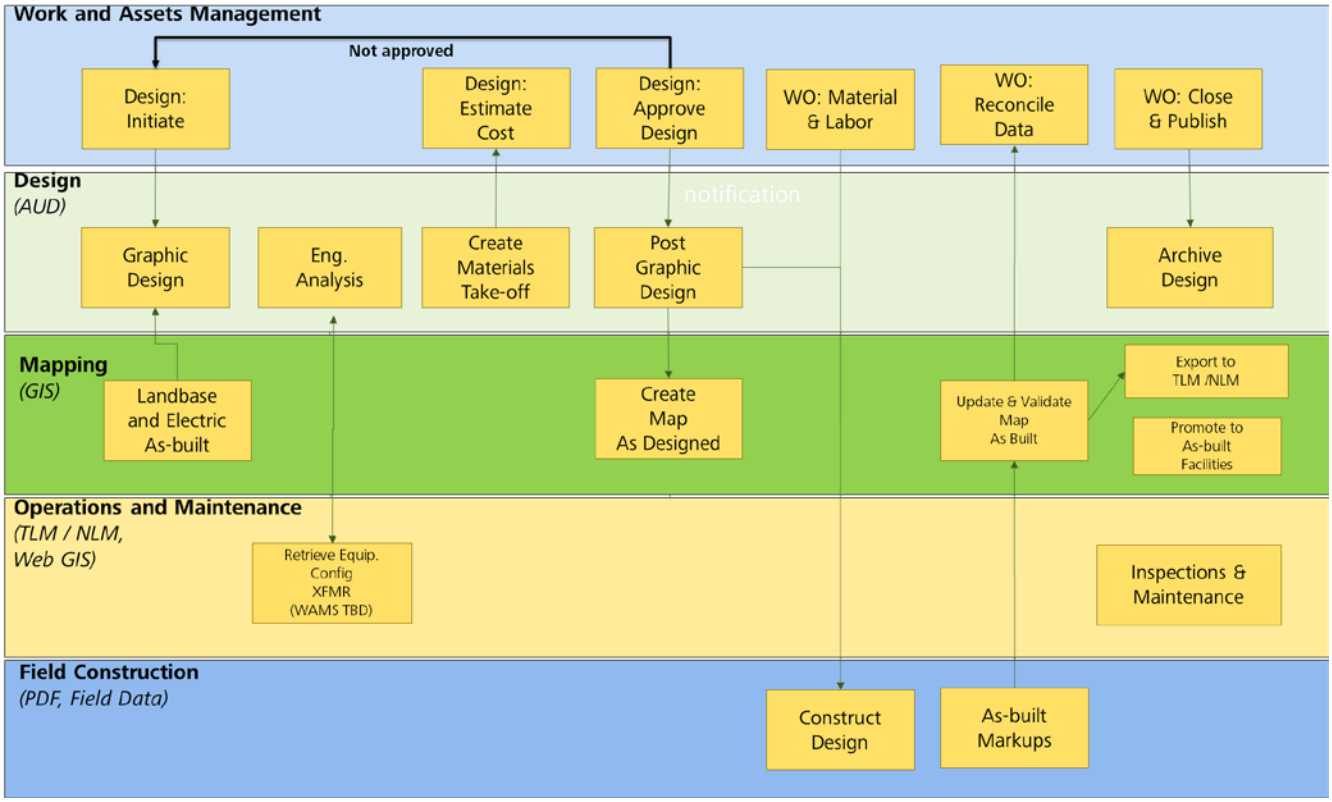
Source Feature Class Name	Type (Geometry-Point, Geometry-Line, Attribute, Join table)	Parent feature/ table	Source Filter	One way/Round-Trip	Volume (# of features)	AUD Feature Class Name	Pre-process Reqd Y/N?
Structure Point	Point	--	Type = "Pole"	Round Trip	50,000	Pole	N
Primary Conductor	Line	--		Round Trip	60,000	Conductor	N
Secondary Conductor	Line	--		Round Trip	100,000	Conductor	N

Explain how AutoCAD Utility Design can be integrated with other systems to extend workflow outside of AutoCAD Utility Design

Anyone who has tried to send data back and forth between systems would agree that it is not easy and there is no one best way to do it.

Integration of AutoCAD Utility Design (AUD) into enterprise systems is key in making enterprise data rich with design intent and helps reduce the backlog.

The figure below shows the typical workflow between AUD and enterprise systems.



Explain how Esri® and Smallworld™ GIS data can be exchanged without data loss.

For exchanging data between Esri® ,Smallworld™ and AUD it is important to understand the purpose of GIS system in your utility. There will be differences in data fidelity and hence model depending on whether GIS is used to map as-builds only vs also feed the outage management system vs asset tracking.

If there is a precedence of designing in GIS environment in your utility then the model will mirror the GIS model, hence might end up having less physical and engineering properties of assets in the model.

It is possible that you will need some kind of adaptor/pre-processor between GIS and AUD in order to make GIS schema simpler.

The ease of mapping will depend on complexity of schema (differences) between the 2 systems.