

The background features a complex geometric pattern of overlapping triangles in various shades of blue and purple. In the upper-left quadrant, there is a semi-transparent map overlay showing a grid of land parcels, with a yellow and purple color scheme. The text is centered on the right side of the slide.

Fort Wayne GIS Evolution

Craig Patterson, EMA

Agenda

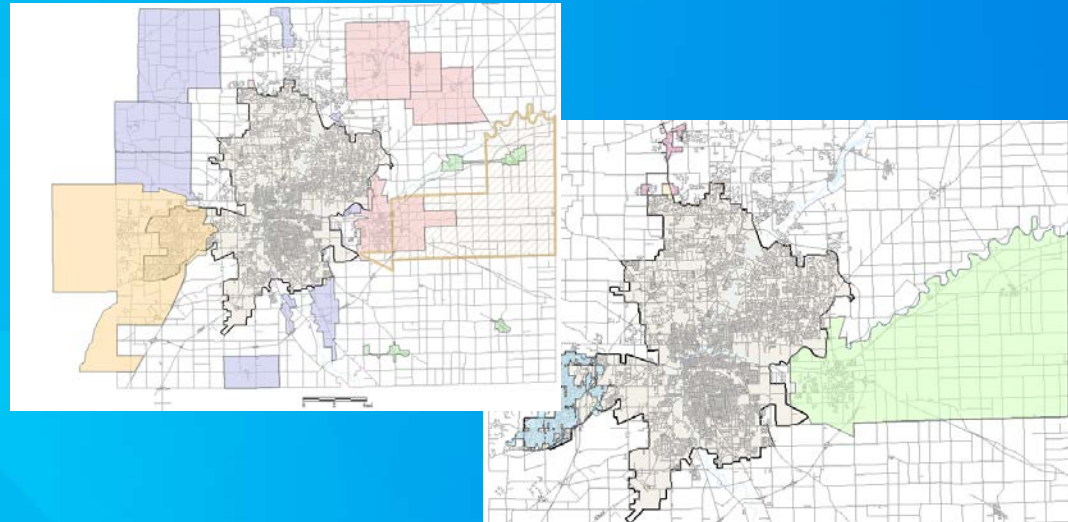
1. **Overview of Fort Wayne City Utilities**
2. **Challenges**
3. **Solution**
4. **Takeaways**
5. **Next Steps**

Section 1

Overview of Fort Wayne City
Utilities

Fort Wayne City Utilities Breakdown

- County Seat of Allen County, Indiana
- Water Services - Provides Water for 250,000 residents
- Sanitary Sewer Services – Service area covers 161 square miles and 19 square miles of combined sewers. Approximately 1,400 miles of sewer mains
- Storm Sewer Services - 600 miles of storm mains, ditches, open channels and drains. Serves approximate 72,200 residents



Project Objectives

- Migrate GIS database to Esri format
- Redesign GIS database to more traditional model
- Automate synchronization between GIS and Hansen asset inventories (In Progress)
- Add mapping capabilities to Hansen (In Progress)



Section 2

Challenges

Challenges

- Custom designed GIS Database Model
 - Designed in the 1980's
 - Needed to move to a standard model
 - Originally only contained point features



Challenges

- FWCU managed asset attributes within custom IMS database
 - Pipe attributes stored on connected nodes
 - The database hardware was failing

D470 [D470.ECF]
File Edit Setup Options Help

MODE:F ACTION: []

01 Structure ID L38_185 Class ST Group MH Size 0 Type Material PC
Manufact. Rim Elevation 0.00 Status Casting: Type Manufact.

02 Seg ID 9544 Int Cd ROW ID
Street Address:
03 0 SHARON DR

04 In City C Loc. Class
Out Fall Pipe Down Stream

05 Inv. 815.19 Diam. 30 Struct. L38_323

Incoming	Invert	Diameter	Upstream Str
07	0.00	15	L38_186
08	0.00	12	L38_187
09	815.19	30	L38_188
10	0.00	0	0
11	0.00	0	0
12	0.00	0	0
13	0.00	0	0

06 Service Area
Pump Station NA
Regulator NA
Date Installed 06/06/1994
Date Replaced
Contractor AL Design I
Res. No. 498-1992
Work Order No.
Board Ord. No.
SSES ID 0
Last Maint. Date

Drawing No.
SY-11281
As Built N

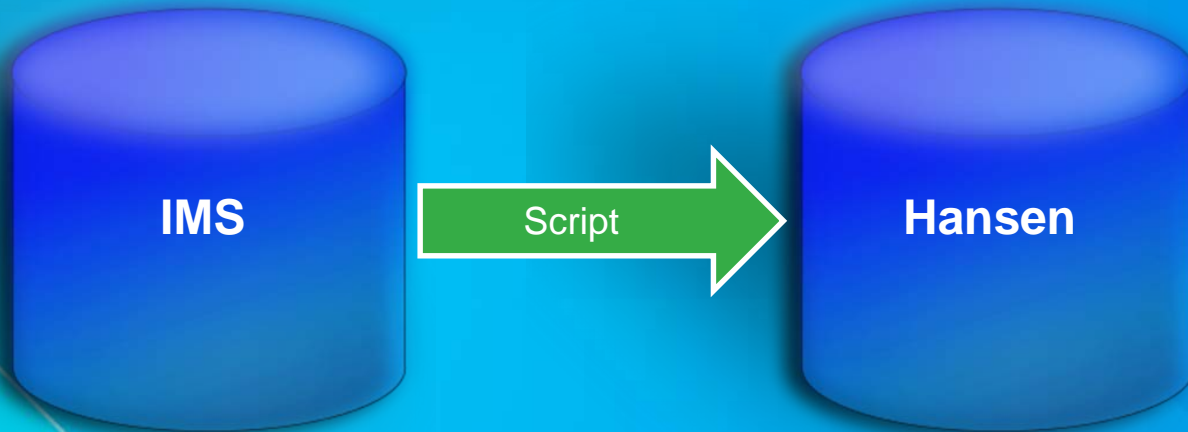
14

EMU/470 Copyright (c) 1987-1997 by Rhintek, Inc.



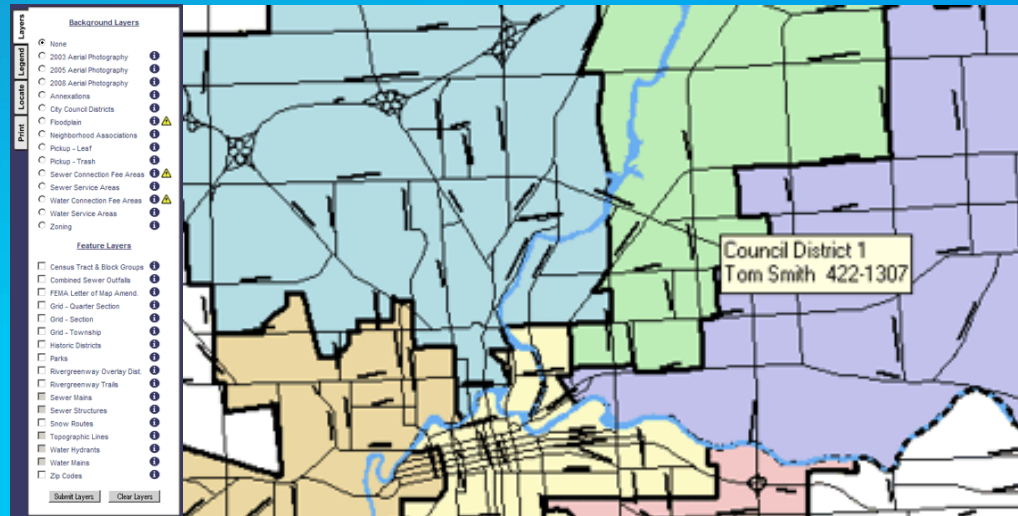
Challenges

- Synchronization of asset data between IMS and Hansen databases was difficult
 - Script was used to move data between IMS and Hansen
 - Script often would fail to run



Challenges

- Utility had developed custom online mapping solution to show work activities
 - Work Activities were not displayed in real time
 - Could not be used for planning maintenance activities



Section 3

Solution

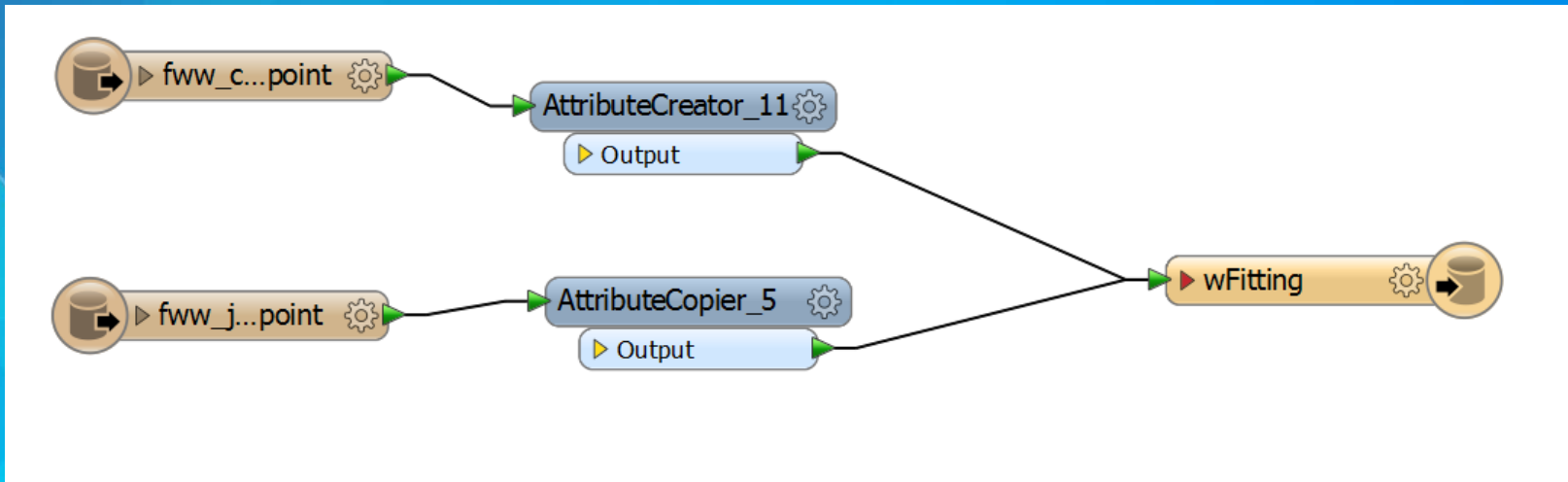
Convert existing GIS database to Esri Format

- New Data Model Based on Local Government Model
- Created a Spatial ETL Package
 - Special type of FME Workbench
 - User-created Geoprocessing tool
 - Transforms data between different data models and different file formats



Spatial ETL Transformations

- Merged multiple feature classes into single feature class
 - Junctions and Plugs were merged into wFitting



Spatial ETL Transformations

- Used AttributeValueMapper to convert attribute values to match the value in Hansen
 - Example – Manufacturer

AttributeValueMapper Parameters

Transformer

Transformer Name: AttributeValueMapper

Attribute Selection

Source Attribute: ims_h_mfg

Destination Attribute: MANUFACTURER

Default Value: KEY

Mapping Parameters

Mapping Direction: Forward (Source To Destination)

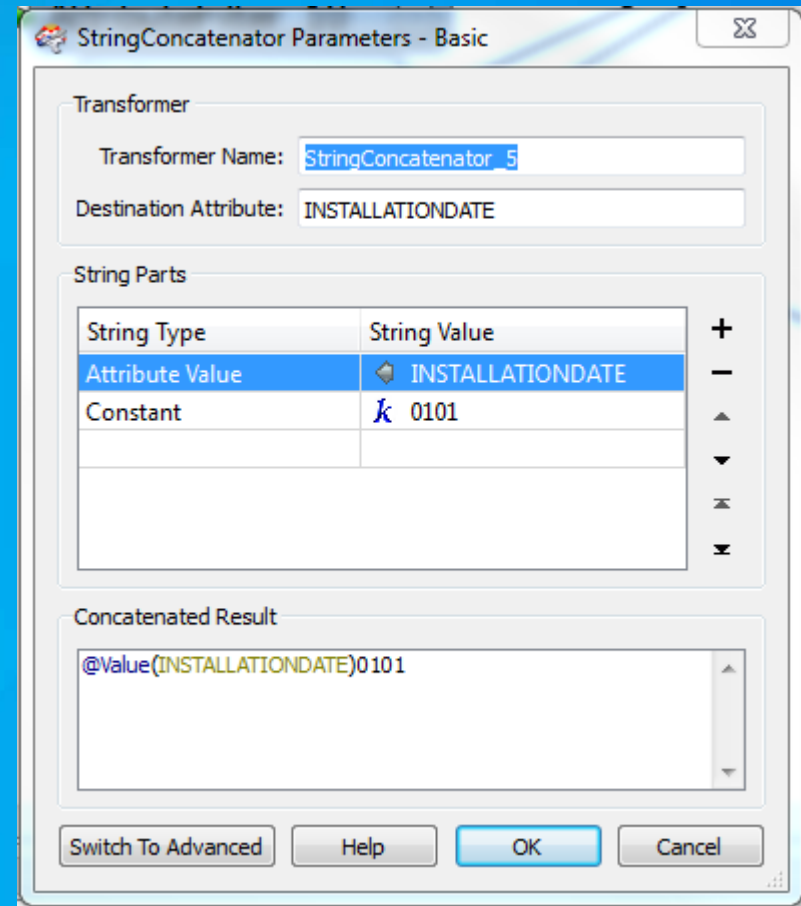
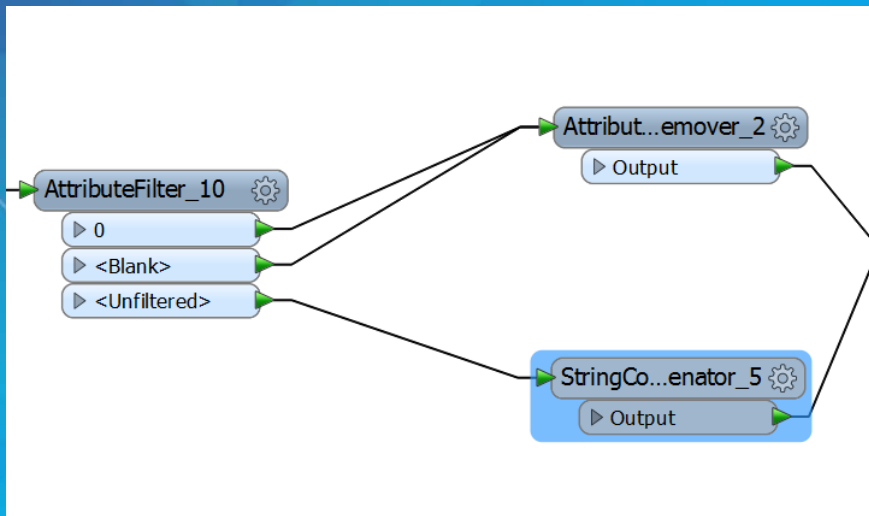
Value Map

Source Value	Destination Value
American-Darling	AMERD
A.P. Smith	APSMI
Clow	CLOW
Eddy	EDDY



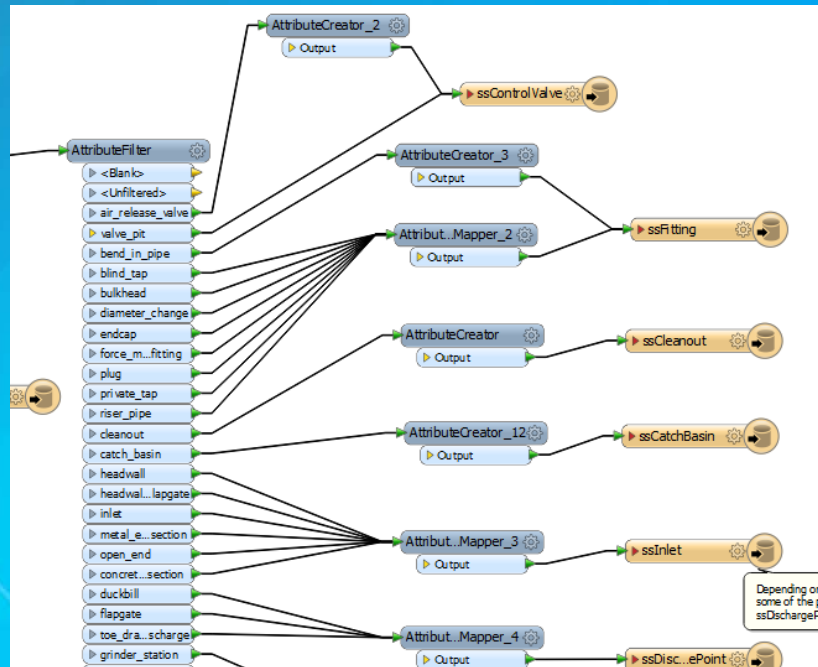
Spatial ETL Transformations

- Conditionally calculated attributes based on value
 - Example – Installation Date



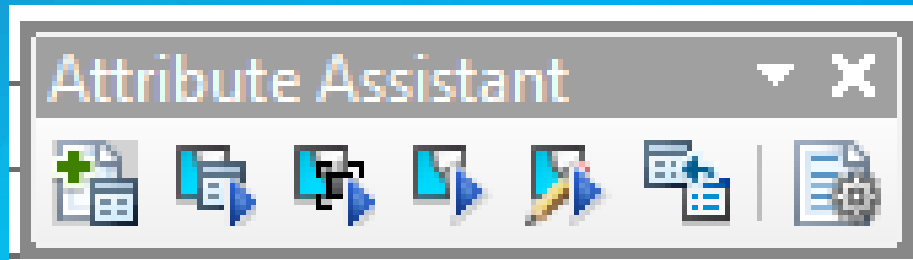
Spatial ETL Transformations

- Split feature class into multiple feature classes based on attribute
 - Example – Point Type



Data Maintenance Procedures Redesigned

- Leveraged Esri's Attribute Assistant Add-in
 - Automatically populate attributes when updating or adding new features to the geodatabase
 - Similar to Feature Templates but more powerful



Attribute Assistant Rules

FacilityID's of Nodes – Sequential id based on quarter section

- Method – GENERATE_ID_BY_INTERSECT
- Argument -
 quarter_sections|Qsect_Name|wSystemValve|4|
 [id] [seq]
- FacilityID's of Pipes – Concatenation of Start and End Node FacilityID's
 - Required three rules
 - FROM_JUNCTION_FIELD, TO_JUNCTION_FIELD, EXPRESSION



Attribute Assistant Rules

Used to Generate Hansen Required Fields

- Populated Hansen Unique Identifiers based on Asset Type
- Entered Default Values for fields required by Hansen

Water Control Valve

Required Field	Unknown/default value
Facility Identifier	
Valve Type	
UNITID	Same as Facility Identifier
COMPTYPE	46
MainCOMPKEY	1
AddressKey	1
SegmentCOMPKEY	1
IntersectionCOMPKEY	1
UNITTYPE	Same as Valve Type



Section 4

Takeaways

Issues Encountered

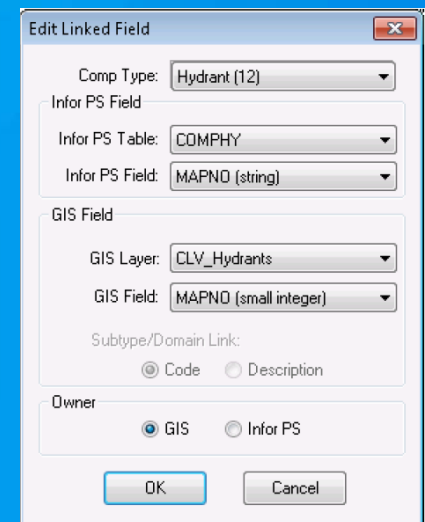
- **Database redesign took much longer than anticipated**
 - It wasn't a simple matter of plugging the existing data into the new data model
 - Field types and sizes needed to be changed to match Hansen
- **Data Extraction tool many iterations**
 - Each conversion iteration required an extensive review by FWCU GIS Team
 - Found some issues with the source data, features had incorrect point type values
- **Attribute Assistant did not work in a multiple user environment**
 - Esri provided a patch to fix issue

Section 5

Next Steps

Hansen GeoAdministrator Tool

- Acts as interface between ESRI and Hansen Databases
- Loads to GIS features as Hansen Assets
- Synchronizes edits to GIS asset features with related Hansen asset record



Hansen Map Drawer

- Provides mapping capabilities to Hansen
- Associates Map Service Layers to related asset type
- Displays locations of work orders and service requests



Questions?

To learn more, please contact
cpatterson@ema-inc.com

