

Working with FME

Michael Fashoway, Joshua Dorris
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Outline

- Overview of ETL and FME
- Demo translations
- BMSC use of FME
 - Structures and Addressing
 - Transportation and Geodetic Control

Common Problems

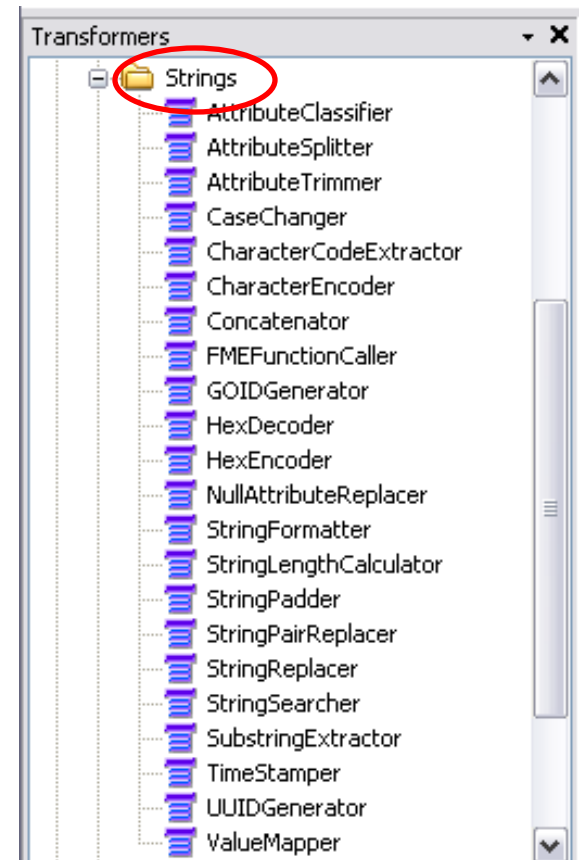
- Common data problems:
 - Issues converting CAD data to GIS
 - Can't merge multiple datasets together or load data into a shapefile or geodatabase because of different attribute names and/or data types
 - Export or import a format that isn't supported
 - Any of the above plus a need to perform one or more geoprocessing steps (ex: reproject data)
- ETL tools deal with just these types of problems

ETL and FME

- ETL stands for *Extract, Transform and Load*
 - Extract data from a source, transform it to fit a user's needs, then load the data into a destination
- FME is a spatial ETL software application
 - FME stands for “Feature Manipulation Engine”
 - FME can read, write and manipulate both tabular and spatial data
 - FME has many transformers for operating on attribute tables, text strings, xml and more
 - FME also has some of the same geoprocessing capabilities that ArcGIS does (buffer, projection transformations, clip, overlay...)

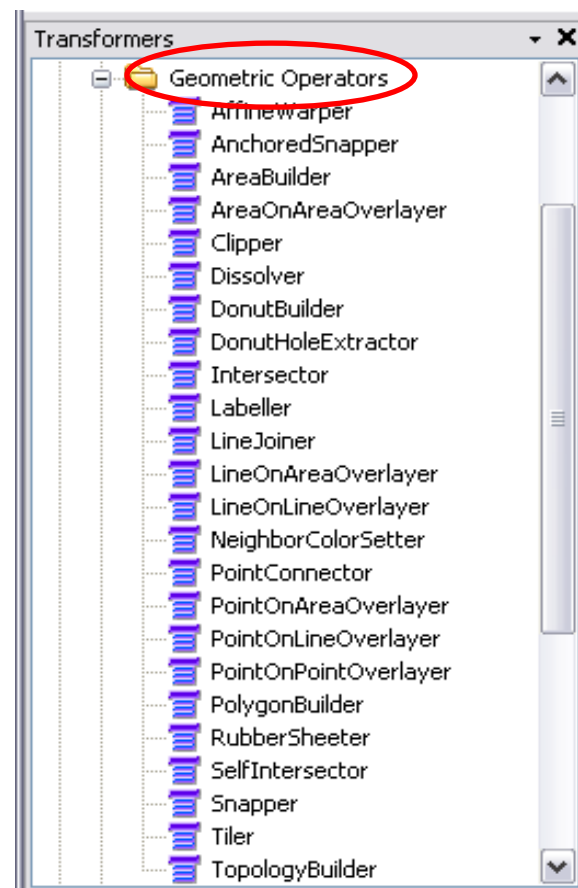
Attribute transformers

- Attribute operations
 - Join attributes to features
 - Rename attributes
 - Create new attributes
 - Filter/query by attributes
 - Concatenate
- Example: join attributes to features, then filter based on the attributes to load a subset of data (road type = 'paved')



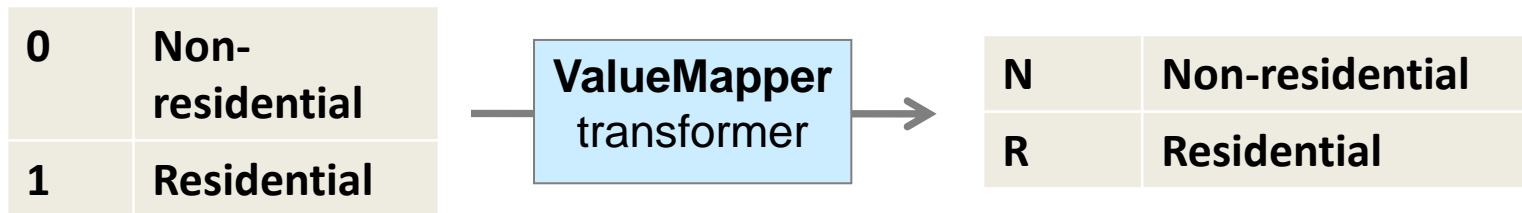
Spatial transformers

- Spatial operations
 - Alter or build features
 - Detect changes between two sets of input features
 - Overlay and intersections
 - Raster operations
- Example: find updated features in a new version of a dataset and load into ArcSDE

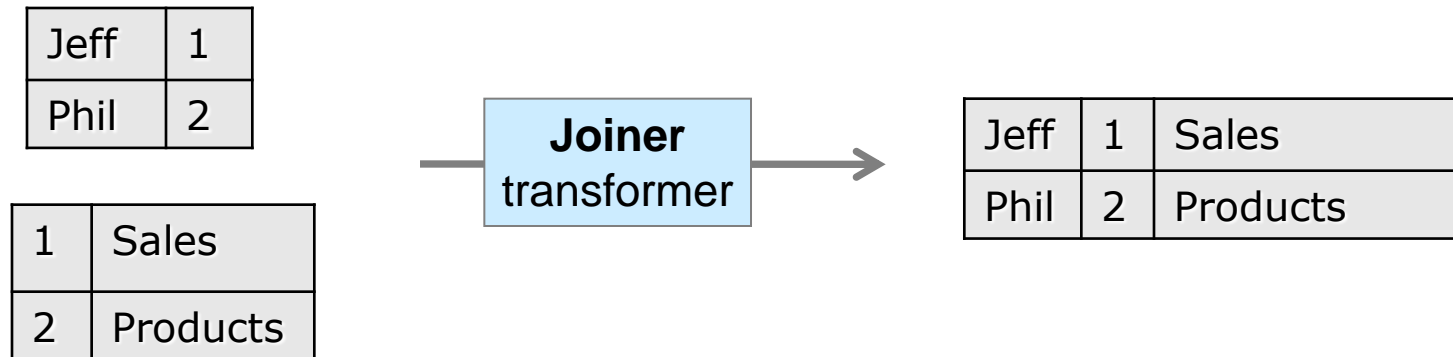


Example transformers

- Translate coded values

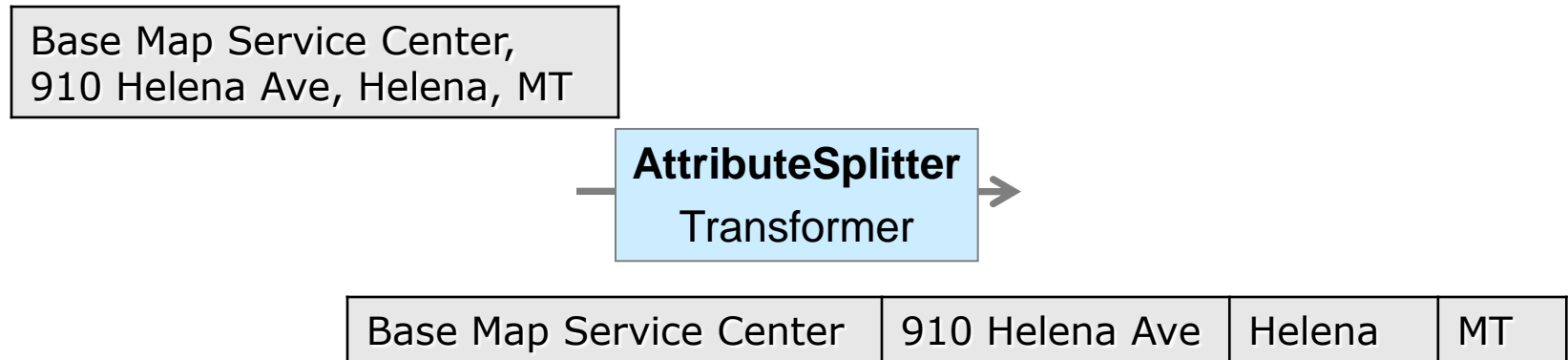


- Join data from multiple sources

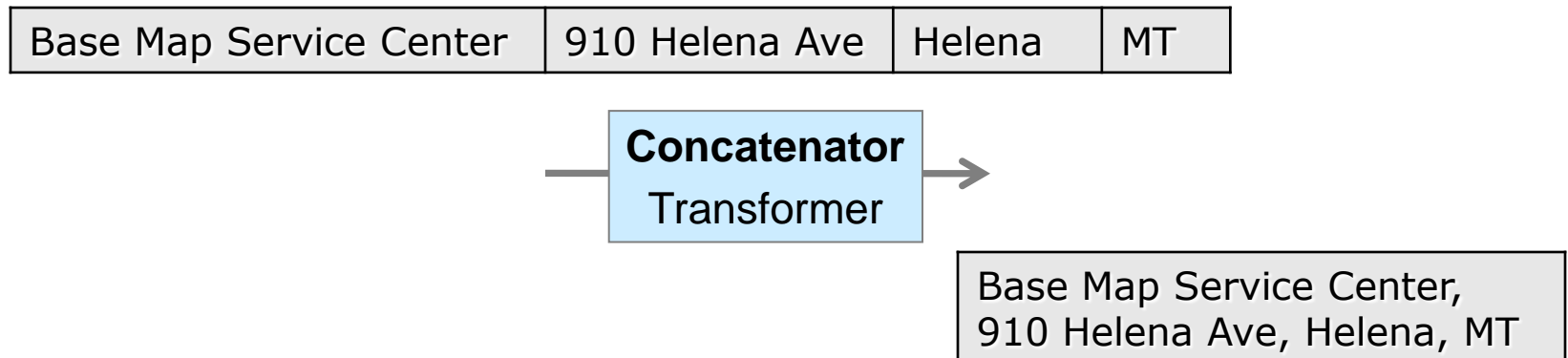


Example transformers

- Split a single attribute into multiple attributes



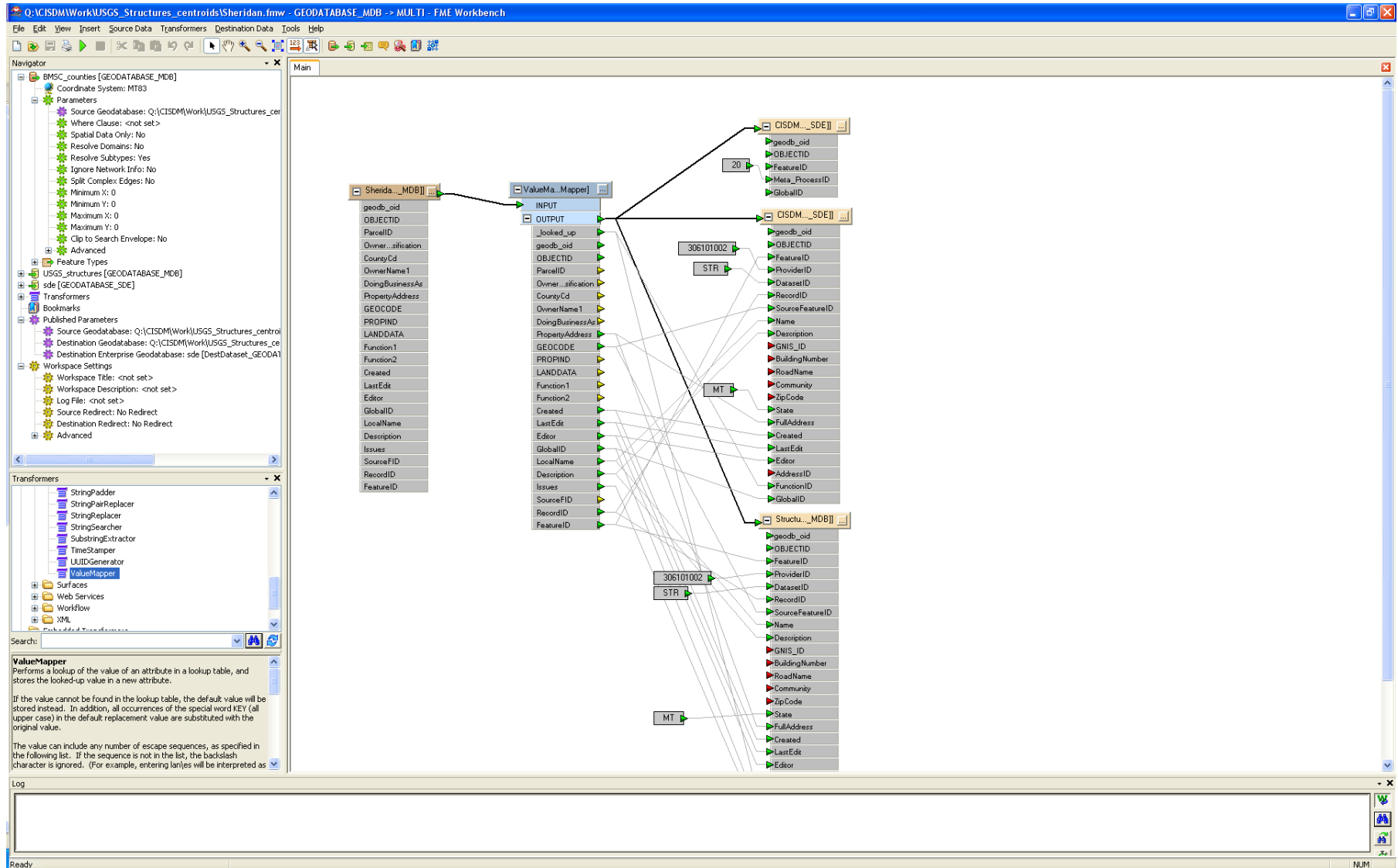
- Concatenate attributes



Overview of ETL process

- Build the translation using FME Workbench, a graphic interface similar to Model Builder
 - Step 1: Extract – add a source dataset to the workspace
 - Step 2: Transform – add one or more transformers to make the desired changes to the data
 - Step 3: Load – loaded the transformed data into a destination dataset

FME Workbench



Demos

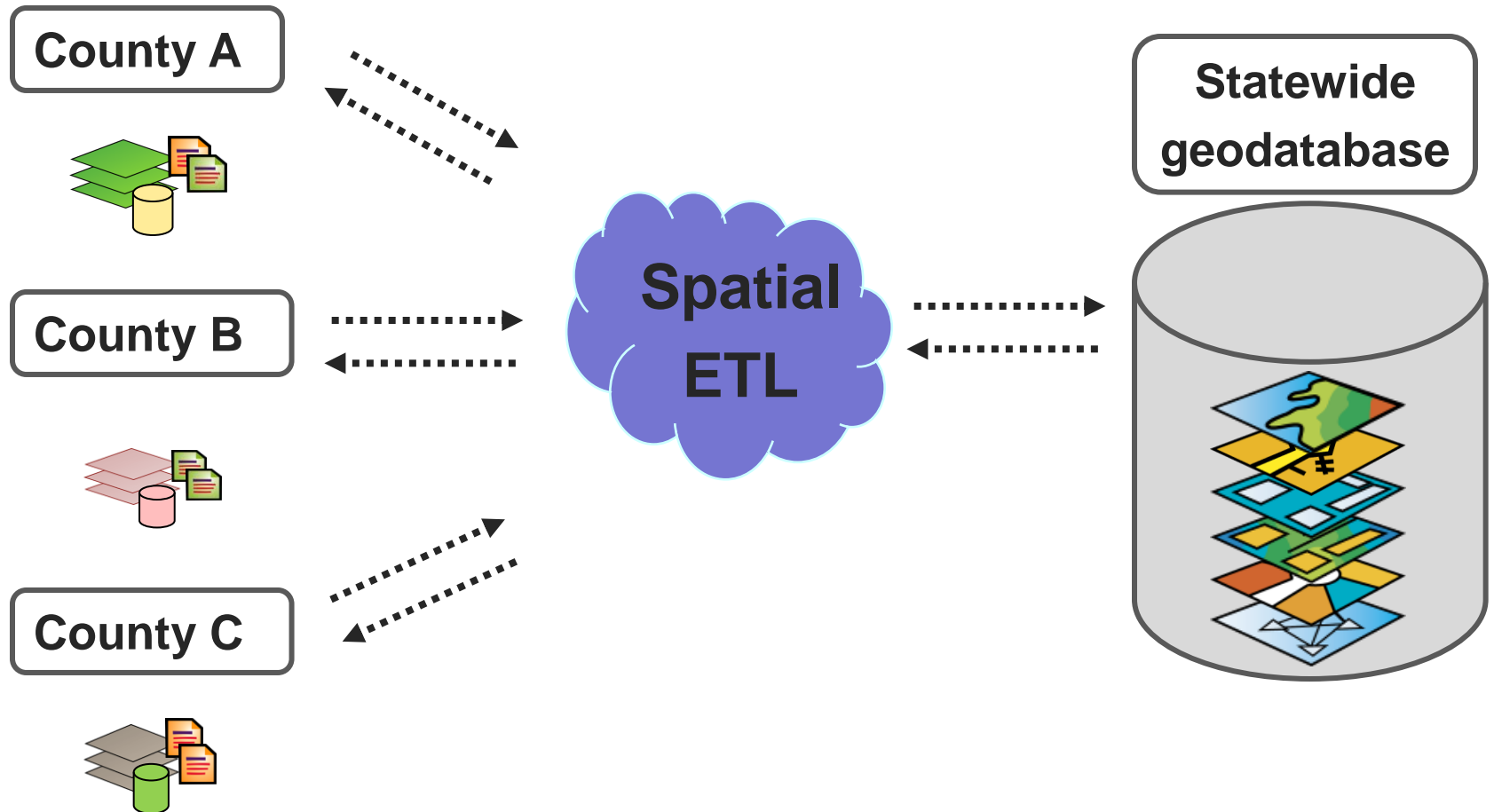
- Convert road data in CAD format to GIS
 - File format conversion
- Create road lines from GPS coordinates
 - Import text file of GPS coordinates
 - Create points from coordinate
 - Create line from the points
 - Join lines to a database to add attributes

BMSC Use of FME

- Themes:
 - Structures Framework
 - Master Address Database
 - Transportation Framework
 - Geodetic Control Framework
- Uses
 - Migrate provider data into Framework schemas
 - Load data into ArcSDE databases
 - Discover what features changed in updated datasets

Data migration use case

Migrate data to a common data model



Structures and Addresses

- BMSC maintains a statewide structures database and is beginning work on a statewide address database
- Both databases largely based on data from local governments
- Different projections
- Different file formats
- Different database schemas
 - Column names
 - Data types
 - Coded values

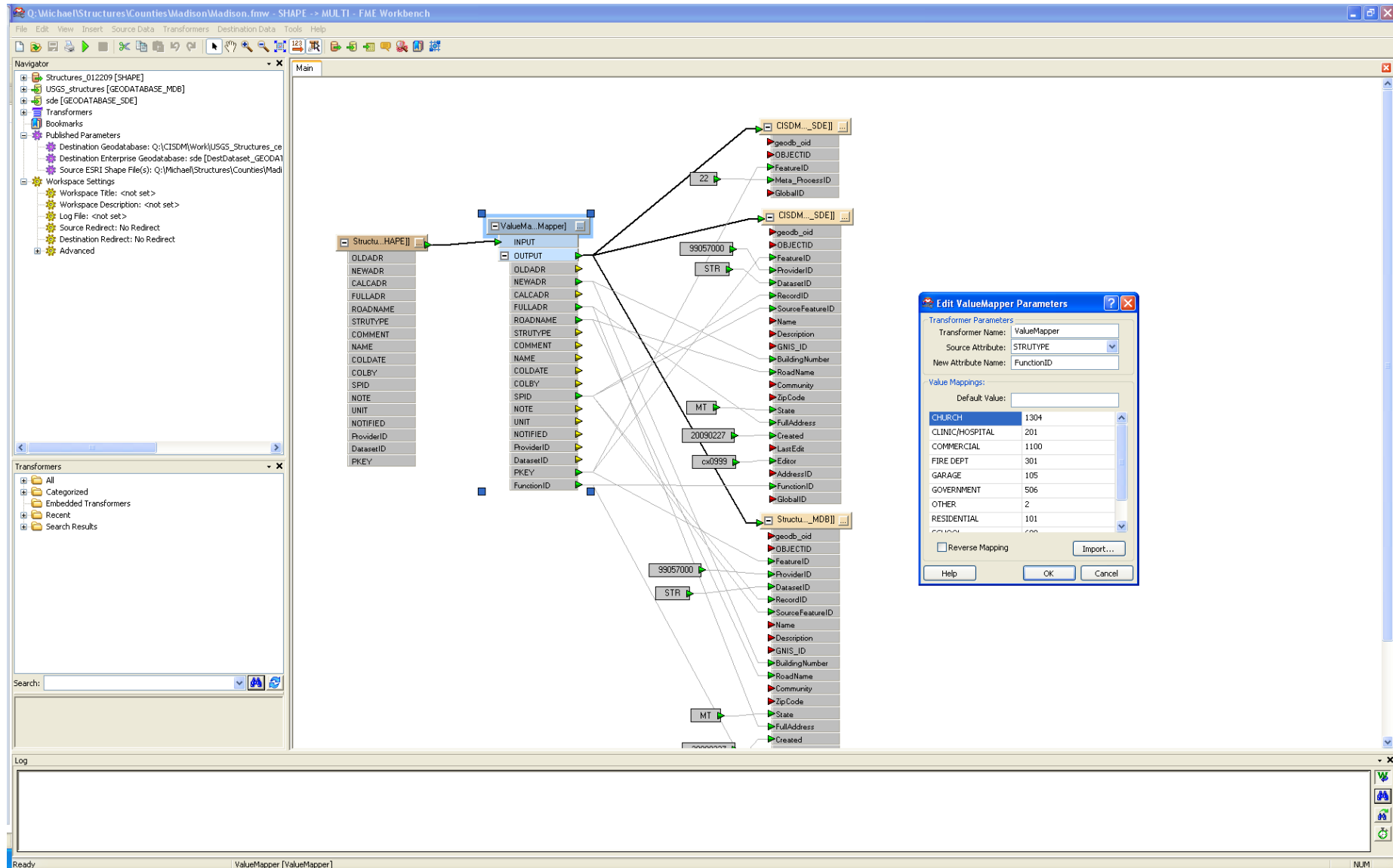
Structures and Addresses

- Usually, for a single data provider these differences do not change from one data submission to another
- Using FME, all these transformations can be easily linked together to run in a sequence with a single button click
- Setup a workspace once, run many times
- Faster than performing all the steps individually but also reduces the chances for errors

Structures and Addresses

- Coded values (domain) problem
 - Structures are usually assigned a type (1 = house, 2 = hospital, 3 = bank, etc.)
 - Codes usually vary, or they may be strings instead of integers
- ValueMapper transformer
 - Crosswalks one set of values to another using a lookup table

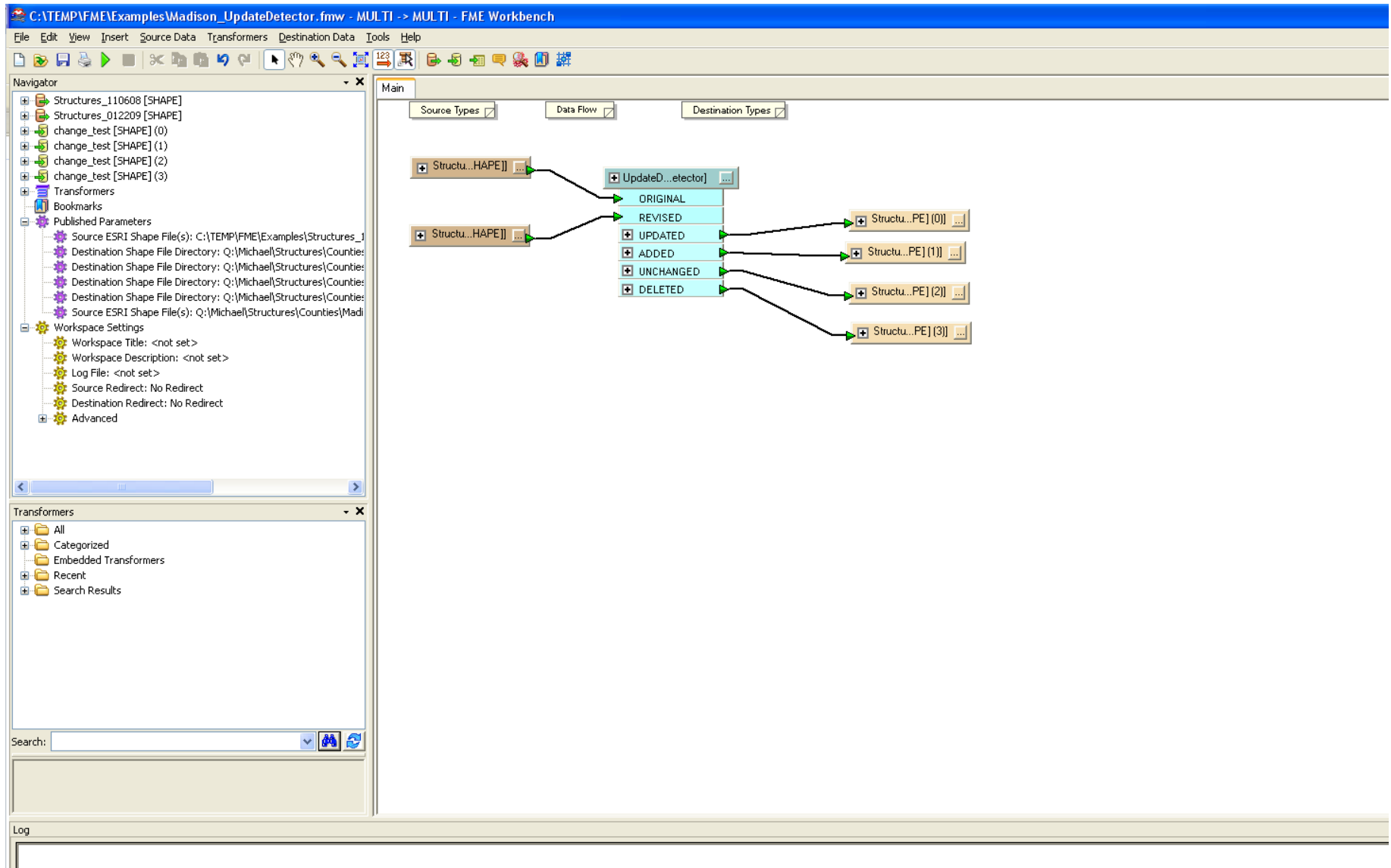
Structures and Addresses



Structures and Addresses

- Change detection problem
 - Usually data providers send a copy of the entire dataset, most of which hasn't changed
 - In order to avoid deleting all their data and reloading, need to discover what has been added, deleted or modified
- UpdateDetector
 - Detects changes between two input datasets, the original and the new version, then features are output to different ports based on tests

Structures and Addresses



Data migration use case using FME:

Populate MCPD

- Geodetic Control provides spatial reference for dataset alignment within a spatial reference frame
- Supports placement of all other framework layers
- Height modernization program started
- Geodetic Control Working Group goal develop a web-based application for public access and download, and allow land surveyors to upload control points to the Montana Control Point Database
- GCWG developed control point database and spreadsheet for collecting control point information
- Database and spreadsheet work together to standardize a MT control point data exchange file format and provide a data content standard

Data migration use case using FME: Populate MCPD

- How to migrate the existing 5000+ MCPD records in 70 Excel worksheets to MCPD on SDE?
- Each Excel worksheet represents one project and contains 3 tabs: surveyor, point, project
- Need to move data into tables (surveyor, point, project) and into feature class (control points)
- Utilized FME to move values from Excel to SDE

Data migration use case using FME: Populate MCPD

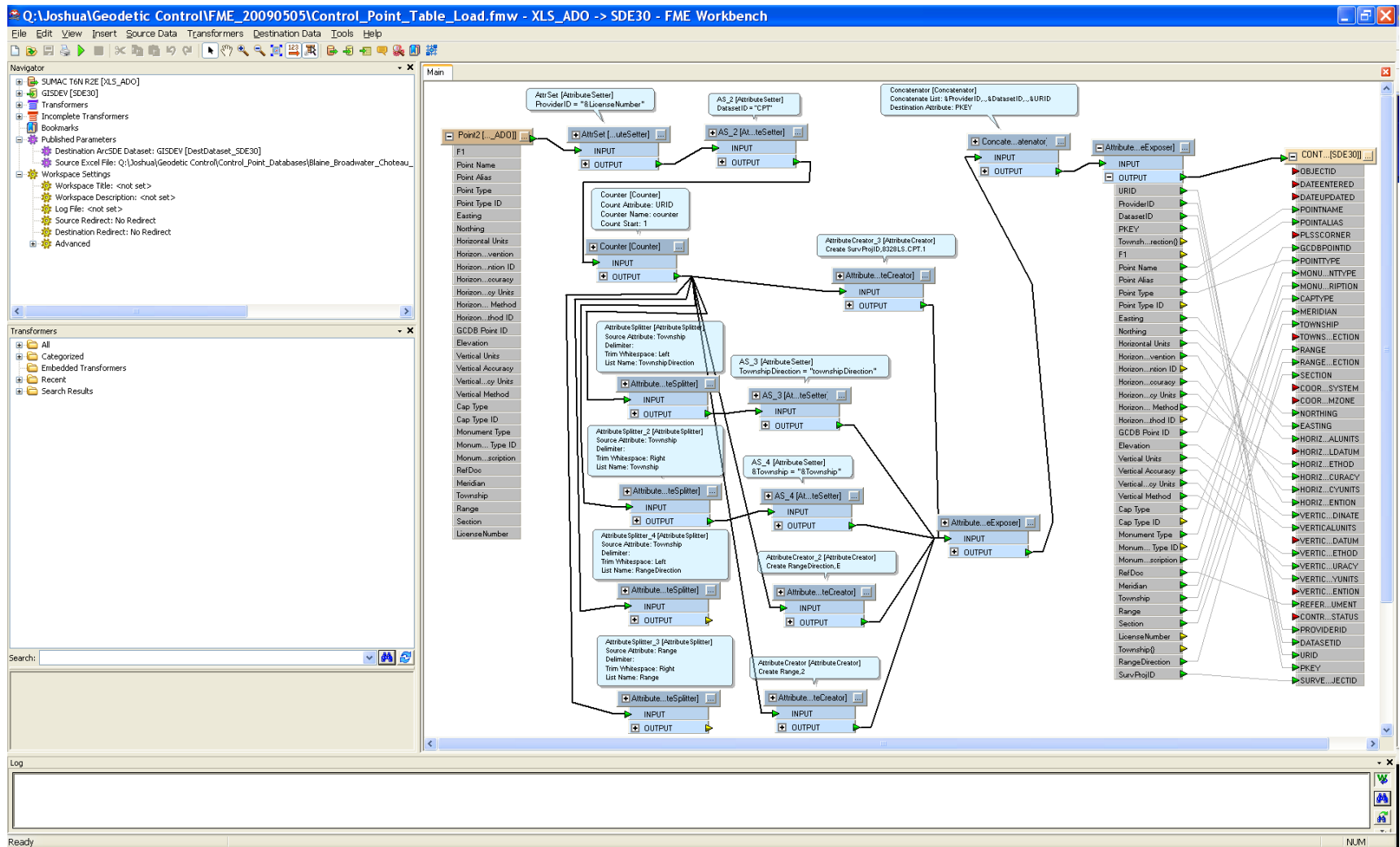
MTContolPointDatabase_DJA_North_Centralproject2007.xls [Compatibility Mode] - Microsoft Excel														
Home Insert Page Layout Formulas Data Review View														
From Access From Web From Text From Other Sources Existing Connections Refresh All Properties Edit Links Connections Sort Filter Reapply Advanced Text to Columns Remove Duplicates Data Validation Consolidate What-If Analysis Group Ungroup Subtotal Show Detail Hide Detail Outline														
Get External Data Data Tools														
AA83														
Point Name	Point Alias	Point Type	Eastings	Northing	Horizontal Units	Horizontal Acc. Convention	Horizontal Accuracy	Horizontal Accuracy Units	Horizontal Method	GCDB Point ID	Monument Description	Township	Range	E
1		Horizontal Control Stati	677982.123	478413.489	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS		1" RPC - DJA CP			
2		Horizontal Control Stati	492802.390	474903.885	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS		1" RPC - DJA CP			
4		Horizontal Control Stati	400539.453	396715.728	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS		1" RPC - DJA CP			
5		Horizontal Control Stati	396921.914	487213.285	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS		1" RPC - DJA CP			
6		Horizontal Control Stati	589684.100	479228.566	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS		1" RPC - DJA CP			
7		Horizontal Control Stati	387646.435	490153.448	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS		2" ALUM CAP - MDT 5WW			
8	100100	Section Corner	399468.786	396173.055	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0320n0060E100100	3 1/4" BRASS CAP 240N		40W	
9	100300	Section Corner	488081.335	474386.279	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0040W100300	3 1/4" ALUMINUM C 320N		60E	
10	100340	Quarter-Section Corner	399616.391	400186.156	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0320n0060E100340	3 1/4" BRASS CAP 240N		40W	
11	100400	Section Corner	488114.150	475994.517	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0040W100400	3 1/4" ALUMINUM C 320N		60E	
12	100440	Quarter-Section Corner	399673.548	401792.940	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0040W100440	3 1/4" BRASS CAP 240N		40W	
13	100640	Quarter-Section Corner	399801.706	404997.736	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0320n0060E100640	3 1/4" BRASS CAP 240N		40W	
14	100700	Section Corner	489208.602	480760.783	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0040W100700	SET STONE		320N	
15	200340	Quarter-Section Corner	401169.550	400152.051	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0320n0060E200340	ASPHALT AND RM 240N		40W	
16	300300	Section Corner	491202.622	474326.513	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0320n0060E300300	3 1/4" ALUMINUM C 320N		60E	
17	300340	Quarter-Section Corner	491216.790	475131.089	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0320n0060E300340	3 1/4" ALUMINUM C 320N		60E	
18	300400	Section Corner	491230.977	475935.734	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0320n0060E300400	3 1/4" ALUMINUM C 320N		60E	
19	340300	Quarter-Section Corner	492007.769	474312.282	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0320n0060E340300	3 1/4" ALUMINUM C 320N		60E	
20	400300	Section Corner	492811.192	474298.207	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0040W400300	5/8" REBAR		320N	
21	400700	Section Corner	404657.577	405427.297	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0040W400700	TEE POST & DISK		240N	
22	500300	Section Corner	405991.761	399164.732	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0040W500300	ASPHALT AND RM 240N		40W	
23	600500	Section Corner	407749.885	402308.605	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0040W600500	1 1/4" YPC		240N	
24	700100	Section Corner	409074.554	395801.795	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0280n0030W700100	5/8" REBAR		240N	
25	2140200	Quarter-Section Corner	411273.802	435865.734	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0280n0030W140200	3 1/4" ALUMINUM C 280N		30W	
26	2300600	Section Corner	413694.872	442220.150	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0050W2300600	3/4" REBAR		280N	
27	2300640	Quarter-Section Corner	393373.022	405245.332	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0280n0030W2300640	ASPHALT AND RM 240N		50W	
28	2400240	Quarter-Section Corner	415346.745	436537.019	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0280n0030W400240	SET STONE - ALUM 280N		30W	
29	2400400	Section Corner	415416.970	438956.301	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0050W400400	1 1/2" COPPER-WE 280N		30W	
30	2400700	Section Corner	395019.954	405821.168	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0280n0030W400700	2" ALUM CAP		240N	
31	2500300	Section Corner	416986.455	437286.141	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0280n0030W500300	2 3/4" ALUMINUM C 280N		30W	
32	2500400	Section Corner	417040.198	438901.570	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0280n0030W500400	NAIL & ALUMINUM 280N		30W	
33	2500500	Section Corner	417088.951	440509.113	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0280n0030W500500	2" BRASS CAP		280N	
34	2600100	Section Corner	418490.584	434004.573	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0050W600100	3 1/4" ALUMINUM C 280N		30W	
35	2600100	Section Corner	397866.886	396234.790	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0280n0030W600100	3 1/4" BRASS CAP		240N	
36	2600300	Section Corner	418588.886	437225.742	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0050W600300	3 1/4" ALUMINUM C 280N		30W	
37	2600340	Quarter-Section Corner	398049.021	400249.814	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0050W600340	1 1/4" YPC		240N	
38	2600400	Section Corner	398042.551	401049.810	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0280n0030W600400	3 1/4" BRASS CAP		240N	
39	2600440	Quarter-Section Corner	418673.075	439642.432	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0280n0030W600440	3 1/4" ALUMINUM C 280N		30W	
40	2600640	Quarter-Section Corner	418772.862	442873.287	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0240n0050W600640	SET STONE		280N	
41	2640200	Quarter-Section Corner	398729.458	397807.082	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0280n0030W640200	1" YPC		240N	
42	2700100	Section Corner	420106.728	433948.768	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0160E700100	3 1/4" ALUMINUM C 280N		30W	
43	3100300	Section Corner	585091.053	482990.704	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0050W100300	2" ALUMINUM CAP		330N	
44	3100440	Quarter-Section Corner	392156.318	489054.789	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0050W100440	2 1/2" BRASS CAP		330N	
45	3100540	Quarter-Section Corner	392214.382	490665.634	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0050W100540	1 3/4" LEAD CAP		330N	
46	3100600	Section Corner	392242.560	491473.323	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0160E100600	1 1/4" YELLOW PLA 330N		50W	
47	3200100	Section Corner	586697.269	479765.882	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0050W200100	3 1/4" BRASS CAP		330N	
48	3200700	Section Corner	393906.205	493008.906	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0050W200700	1 1/4" YELLOW PLA 330N		50W	
49	3400240	Quarter-Section Corner	396963.151	485653.798	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0050W400240	5/8" REBAR		330N	
50	3400300	Section Corner	396961.890	485457.226	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0050W400300	2" ALUMINUM CAP		330N	
51	3400500	Section Corner	397010.712	489676.449	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0160E400500	2" ALUMINUM CAP		330N	
52	3500200	Section Corner	591535.295	481379.002	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0050W500200	SET STONE		330N	
53	3500300	Section Corner	398502.837	488399.290	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0050W500300	3 1/4" BRASS CAP		330N	
54	3600400	Section Corner	400161.057	487956.379	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0150E600400	1 1/4" ORANGE PLA 330N		50W	
55	4140200	Quarter-Section Corner	576221.153	481397.121	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0060W140200	SET STONE		330N	
56	4200440	Quarter-Section Corner	384131.400	489328.311	Meters	Network Horizontal Accuracy	0.03	Meters	Geodetic GPS	MT20T0330n0060W200440	3 1/4" ALUMINUM C 330N		60W	

Data migration use case using FME: Populate MCPD

Transformers used:

- **Attribute creator** – (*SurveyorProjectID*)
- **Attribute setter** – (*ProviderID, DatasetID, Township, Range*)
- **Attribute splitter** – (*Township, Range*)
- **Attribute concatenater** – (*PKEY*)
- **Counter** – (*URID*)

Data migration use case using FME: Populate MCPD



Data migration use case using FME: Populate MCPD

ArcCatalog - ArcInfo - Database Connections\GISDEV_CX0633.sde\MCPD.CONTROL_POINT

File Edit View Go Tools Window Help

Location: Database Connections\GISDEV_CX0633.sde\MCPD.CONTROL_POINT

Stylesheet: NPS Metadata Editor

Contents Preview Metadata NPS Metadata Editor

ArcToolbox

- 3D Analyst Tools
- Analysis Tools
- Cartography Tools
- Conversion Tools
- Coverage Tools
- Data Interoperability Tools
- Data Management Tools
- Geocoding Tools
- Geostatistical Analyst Tools
- JoshuaTools
- Linear Referencing Tools
- Mobile Tools
- Multidimension Tools
- Network Analyst Tools
- Samples
- Schematics Tools
- Server Tools
- Spatial Analyst Tools
- Spatial Statistics Tools
- Tracking Analyst Tools

GISB.OwnerClassification_Gen

- GISB.RELATETEMP
- GISB.SDETEMP416_16779
- GISB.SDETEMP416_16780
- GISB.SDETEMP416_16781
- GISB.SDETEMP416_16782
- GISB.SDETEMP416_16783
- GISB.SDETEMP416_16784
- GISB.SDETEMP416_16785
- GISB.SDETEMP416_16787
- GISB.SDETEMP416_16874
- GISB.SDETEMP416_16876
- GISB.SDETEMP416_16907
- GISB.SDETEMP538_22786
- GISB.SDETEMP538_22787
- GISB.SDETEMP538_22788
- GISB.SDETEMP833_34418
- GISB.STREAMS
- GISB.TEMP_ONE_QUAD
- GISB.TIGER_ROAD
- MCPD.CAP_TYPE
- MCPD.CONTROL_POINT
- MCPD.CONTROL_POINT_STATUS
- MCPD.ControlPoint_Point
- MCPD.ControlPointHasControlPointPoint
- MCPD.HORIZONTAL_ACCURACY_CONVENTION
- MCPD.HORIZONTAL_DATUM
- MCPD.HORIZONTAL_METHOD
- MCPD.HORIZONTAL_UNITS
- MCPD.LOOKUP_TABLE_TEMPLATE
- MCPD.MERIDIAN
- MCPD.MONUMENT_TYPE
- MCPD.POINT_TYPE
- MCPD.PROJECT_COORDINATE_SYSTEM
- MCPD.STATE_PROVINCE
- MCPD.SURVEYOR
- MCPD.SURVEYOR_PROJECT
- MCPD.SurveyorHasSurveyorProjects
- MCPD.SurveyorProjectHasControlPoints
- MCPD.VERTICAL_ACCURACY_CONVENTION
- MCPD.VERTICAL_DATUM
- MCPD.VERTICAL_METHOD
- MCPD.VERTICAL_UNITS
- TSMYS.SRS\$

GISDEV_GISB.sde

GISDMZ_GISB.sde

GISPRD_CX0633.sde

GISPRD_GISB.sde

Database Servers

GIS Servers

Interoperability Connections

Scalar References

Search Results

Toolboxes

POINTNAME	POINTALIAS	PLSSCORNER	GCPBPOINTID	POINTTYPE	MONUMENTTYPE	MONUMENTDESCRIPTION	TOWNSHIP	TOWNSHIPDIRECTION	RANGE	RANGEDIRECTION	SECTION
00A5	NW S.5	Yes	200700	Section Corner	Iron Post	BLM	6	N	2	E	5,6
0E13	SW S.3	Yes	400600	Section Corner	Iron Post	BLM	6	N	2	E	3,4,9
00J9	NW S.16	Yes	300500	Section Corner	Iron Post	BLM	6	N	2	E	8,9,1
0L25	E QUARTER S.13	Yes	700440	Quarter-Section Corner	Iron Post	BLM	6	N	2	E	13
0M11	S QUARTER S.16	Yes	340400	Quarter-Section Corner	#5 Rebar	RES-4126S	6	N	2	E	16,21
0M17	SE S.15	Yes	500400	Section Corner	Iron Post	UNKNOWN	6	N	2	E	14,15
0R17	SW S.23	Yes	500300	Section Corner	Iron Post	UNKNOWN	6	N	2	E	22,23
0R25	SE S.24	Yes	700300	Section Corner	Iron Post	BLM	6	N	2	E	24,25
0V13	SW S.27	Yes	400200	Section Corner	Iron Post	BLM	6	N	2	E	27,28
0Z17	SW S.35	Yes	500100	Section Corner	Iron Post	BLM	6	N	2	E	35
V170	3.25 MDOH AC	Yes	500200	Section Corner	Aluminum Post		33	N	19	E	26,27
V130	3.25 MDOH AC	Yes	400200	Section Corner	Aluminum Post		33	N	19	E	27,28
Z800	Marked Stone	Yes	300100	Standard Corner	Marked Stone		33	N	19	E	SC 32
V100	3.25 MDOH AC	Yes	100200	Section Corner	Aluminum Post		33	N	19	E	EAST
R500	3.25 MDOH AC	Yes	200300	Section Corner	Aluminum Post		33	N	19	E	19,20
R130	3.25 MDOH AC	Yes	400300	Section Corner	Aluminum Post		33	N	19	E	21,22
N170	3.25 MDOH AC	Yes	500400	Section Corner	Aluminum Post	Fd. Mon. does not match Cor.	33	N	19	E	14,15
J170	3.25 MDOH AC	Yes	500500	Section Corner	Aluminum Post		33	N	19	E	10,11
N250	Marked Stone	Yes	700400	Section Corner	Marked Stone		33	N	19	E	EAST
J250	Marked Stone	Yes	700500	Section Corner	Marked Stone		33	N	19	E	EAST
A250	Marked Stone	Yes	700700	Township Corner	Marked Stone	Improperly marked as "1,4"	33	N	19	E	NE S.
E190	Marked Stone	Yes	540600	Quarter-Section Corner	Marked Stone		33	N	19	E	1,4 S.
A100	Marked Stone	Yes	100700	Township Corner	Marked Stone	Found rebar w/ YPC alongside	33	N	19	E	NW S.
N500	Rebar w/ AC	Yes	200400	Section Corner	#5 Rebar		33	N	19	E	17,18
Z700	3.25 BLM BC	Yes	240100	Standard Corner	Iron Post		25	N	9	E	S.C.
E600	T-Bar	Yes	200600	Section Corner	Cast Iron		25	N	9	E	5,6,7
Z170	3.25 BLM BC	Yes	500100	Standard Corner	Iron Post		25	N	9	E	S.C.
Z210	3.25 BLM BC	Yes	600100	Standard Corner	Iron Post		25	N	9	E	S.C.
V250	3.25 BLM BC	Yes	700200	Section Corner	Iron Post		25	N	9	E	EAST
A250	3.25 MDOH AC	Yes	700700	Township Corner	Aluminum Post		25	N	9	E	NE CO
R170	Marked Stone	Yes	500300	Section Corner	Marked Stone		24	N	8	E	22,23
L130	Rebar	Yes	400400	Quarter-Section Corner	#5 Rebar		24	N	8	E	1,4 S.
J130	Marked Stone	Yes	400500	Section Corner	Marked Stone		24	N	8	E	9,10
R130	3.25 AC	Yes	400300	Section Corner	Aluminum Post		24	N	8	E	21,22
R210	Marked Stone	Yes	600300	Section Corner	Marked Stone		24	N	8	E	23,24
V190	Marked Stone	Yes	540200	Quarter-Section Corner	Marked Stone		24	N	8	E	1,4 S.
Z190	Marked Stone	Yes	540100	Quarter-Section Corner	Marked Stone		24	N	8	E	S,1,4
V210	Marked Stone	Yes	600200	Section Corner	Marked Stone		24	N	8	E	25,26
A210	Rebar	Yes	600700	Section Corner	#4 Rebar	Found alongside a mound of	24	N	8	E	NW CO
C800	STONE	Yes	300640	Quarter-Section Corner	Marked Stone		9	N	3	W	N1,4
C130	STONE	Yes	400640	Quarter-Section Corner	Marked Stone		9	N	3	W	3,4
G250	GLO BC	Yes	700540	Quarter-Section Corner	Iron Pipe		9	N	3	W	E1,4
J500	7686S AC	Yes	200500	Section Corner	#5 Rebar		9	N	3	W	7,8,1
J170	BLM BC	Yes	500500	Section Corner	Iron Pipe		9	N	3	W	10,11
L500	BLM BC	Yes	200440	Quarter-Section Corner	Iron Pipe		9	N	3	W	17,18
N130	4546S AC	Yes	400400	Section Corner	#5 Rebar		9	N	3	W	15,16
E250	3.25 MDOH AC	Yes	700600	Section Corner	Aluminum Post		25	N	9	E	EAST
E230	3.25 BLM BC	Yes	640600	Quarter-Section Corner	Iron Post		25	N	9	E	1,4 S.
J230	3.25 BLM BC	Yes	640500	Quarter-Section Corner	Iron Post		25	N	9	E	1,4 S.
G210	3.25 BLM BC	Yes	600540	Quarter-Section Corner	Iron Post		25	N	9	E	1,4 S.
J190	3.25 BLM BC	Yes	540500	Quarter-Section Corner	Iron Post		25	N	9	E	1,4 S.
J170	3.25 BLM BC	Yes	500500	Section Corner	Iron Post		25	N	9	E	10,11
Z210	Marked Stone	Yes	600100	Standard Corner	Marked Stone	with rebar and rpc alongside	25	N	8	E	S.C.
Z230	Marked Stone	Yes	640100	Standard Corner	Marked Stone	with rebar and rpc alongside	25	N	8	E	S.C.
R170	T-Bar	Yes	500300	Section Corner	Cast Iron		25	N	8	E	22,23
N170	3.25 BLM BC	Yes	500400	Section Corner	Iron Post		25	N	8	E	14,15

Record: 1 56 Show: All Selected Records (of *2000) Options

Preview: Table

Data migration use case using FME: Populate MCPD

Summary: FME utilized to extract data from one format (Excel), transform it into another (SDE), and load into database

- Workspaces can be saved so next time simply make connections
- Parameters can easily be modified to suit incoming schemas

Transportation Framework

- Montana Transportation Framework model contains transportation features, and address ranges and road attributes tables
- Utilizes a federated approach to creation and maintenance of data
- New provider data has varying schemas
- Provider's road segments have address ranges
- Framework address ranges in table

Transportation Framework

[illegible]

How move address values from Provider dataset to Framework Address Ranges table?

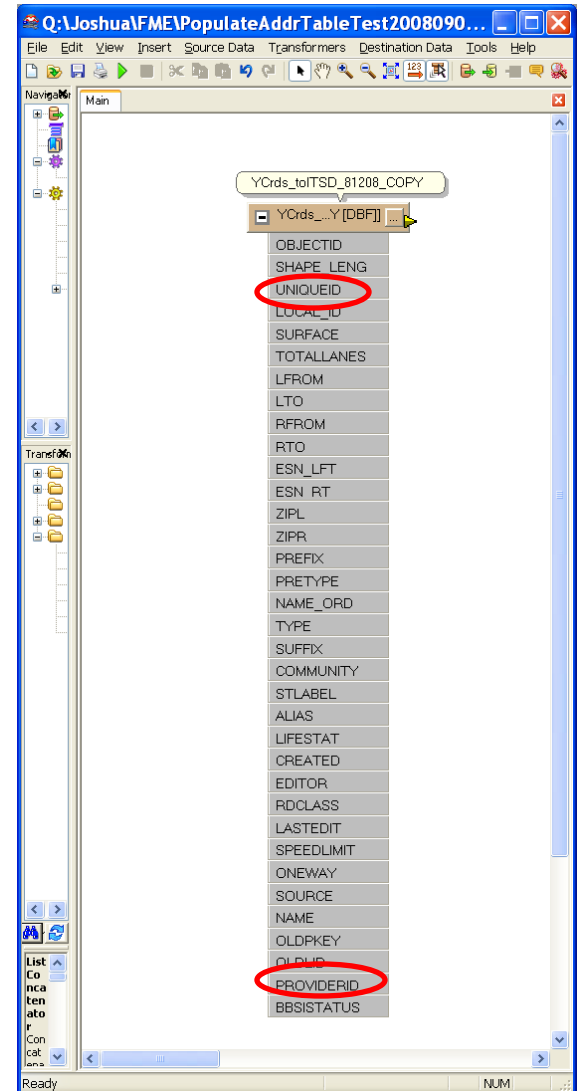
Address Ranges Table



?

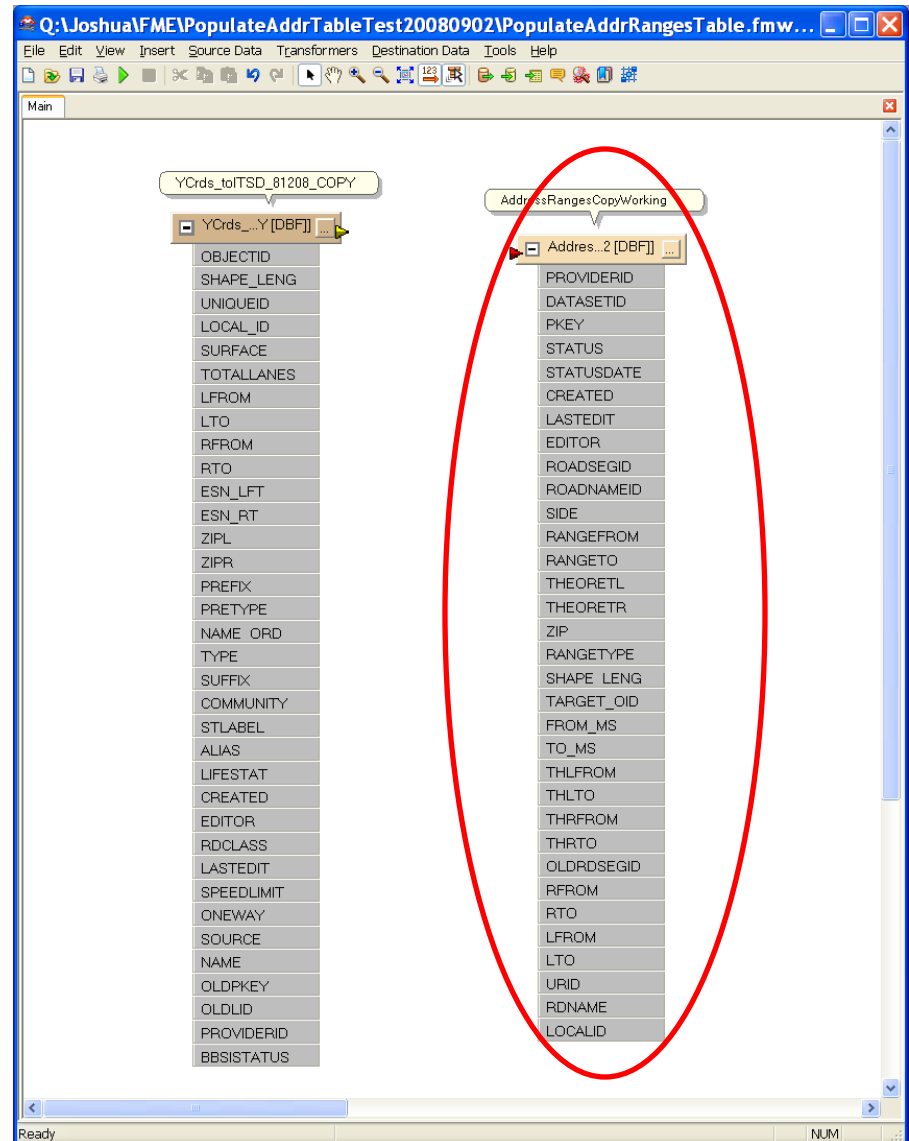
Transportation Framework

- Bring new dataset into workspace
- Add transformers -
AttributeSetter –
ProviderID
AttributeConcatenator -
UniqueID



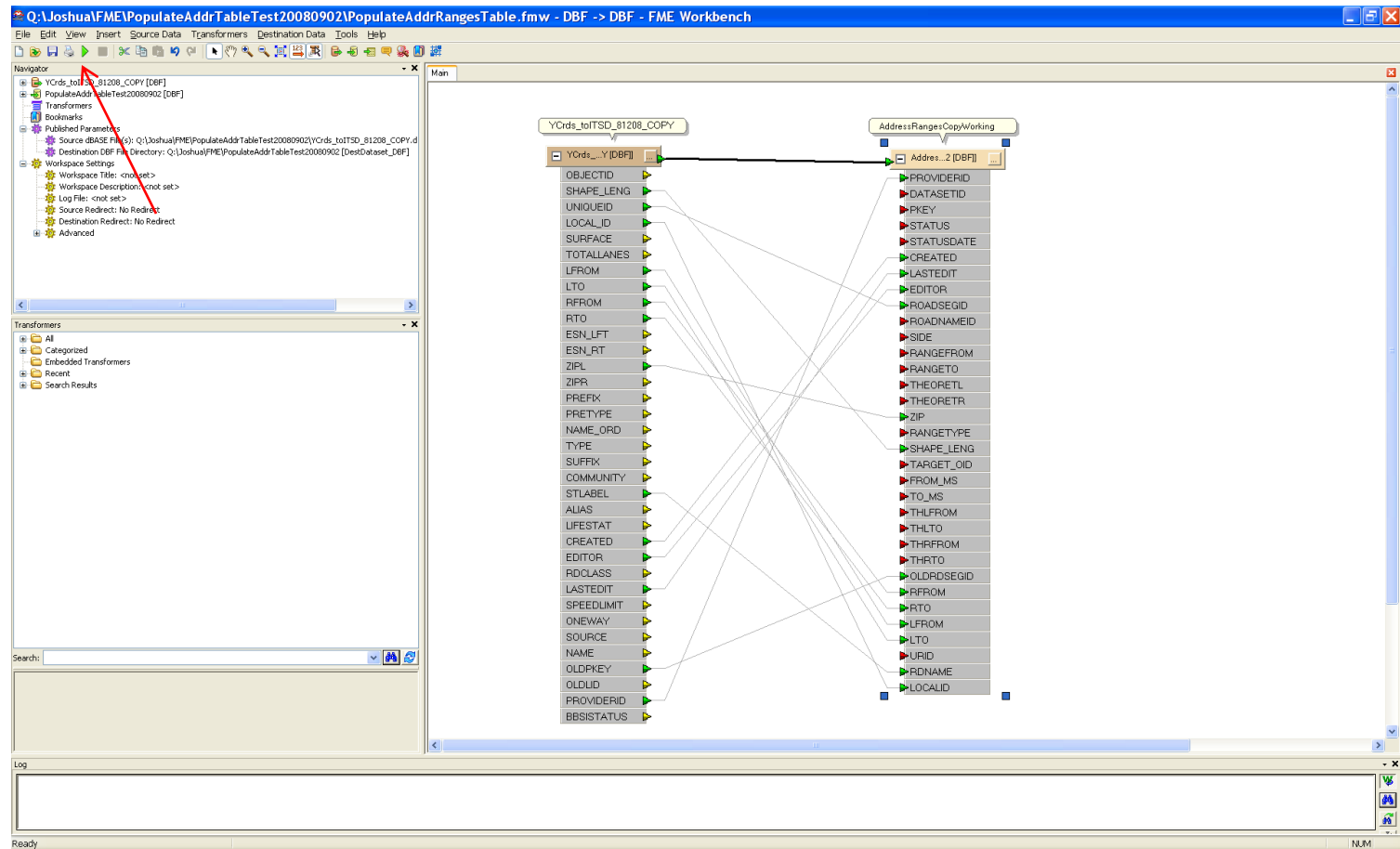
Transportation Framework

- Add destination dataset



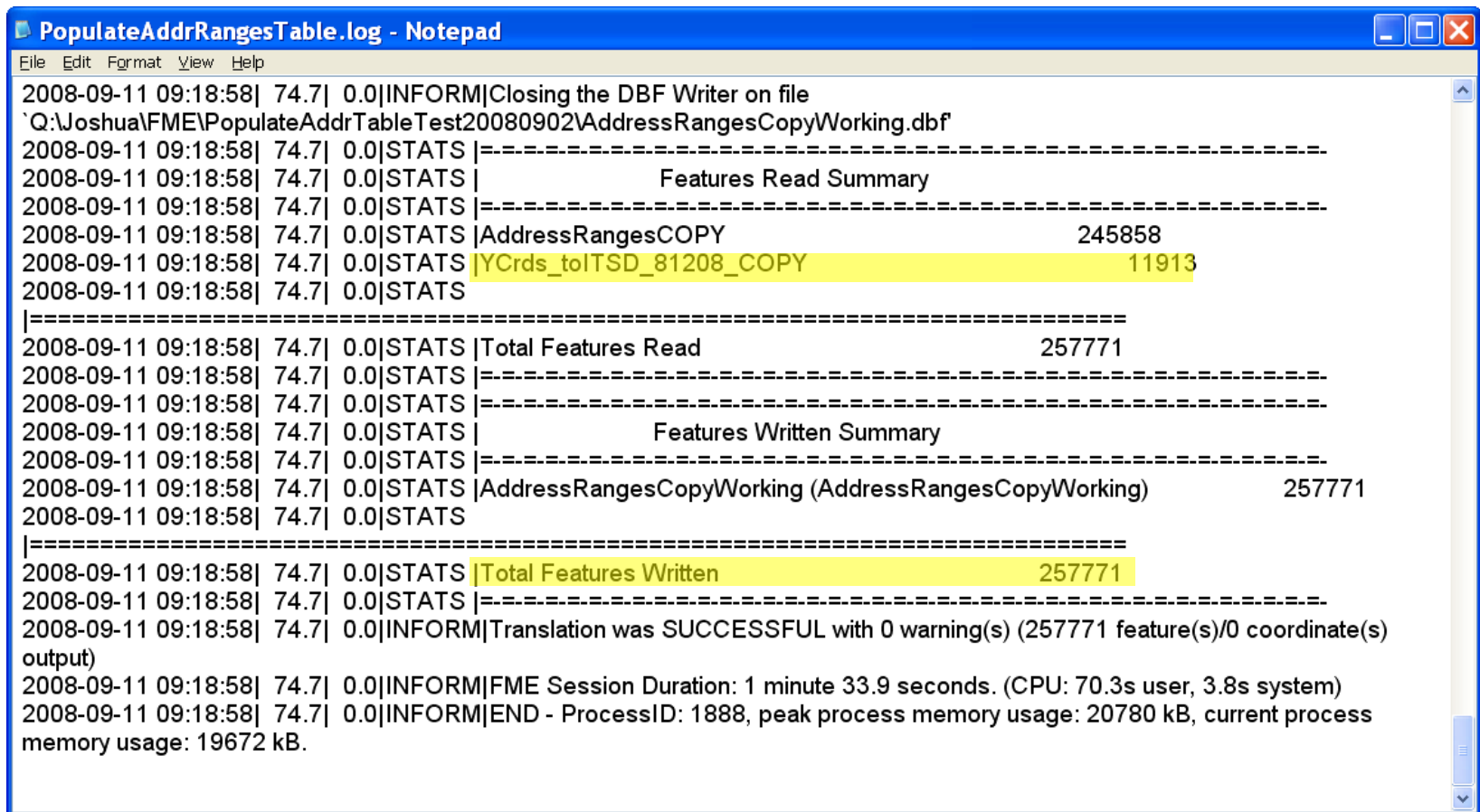
Transportation Framework

- Connect attributes, run translation



Transportation Framework

- View log to ensure new features written



```
PopulateAddrRangesTable.log - Notepad
File Edit Format View Help
2008-09-11 09:18:58| 74.7| 0.0|INFORM|Closing the DBF Writer on file
`Q:\Joshua\FME\PopulateAddrTableTest20080902\AddressRangesCopyWorking.dbf'
2008-09-11 09:18:58| 74.7| 0.0|STATS |=====
2008-09-11 09:18:58| 74.7| 0.0|STATS |Features Read Summary
2008-09-11 09:18:58| 74.7| 0.0|STATS |=====
2008-09-11 09:18:58| 74.7| 0.0|STATS |AddressRangesCOPY                245858
2008-09-11 09:18:58| 74.7| 0.0|STATS |YCrds_toITSD_81208_COPY          11913
2008-09-11 09:18:58| 74.7| 0.0|STATS |=====
2008-09-11 09:18:58| 74.7| 0.0|STATS |Total Features Read                257771
2008-09-11 09:18:58| 74.7| 0.0|STATS |=====
2008-09-11 09:18:58| 74.7| 0.0|STATS |=====
2008-09-11 09:18:58| 74.7| 0.0|STATS |Features Written Summary
2008-09-11 09:18:58| 74.7| 0.0|STATS |=====
2008-09-11 09:18:58| 74.7| 0.0|STATS |AddressRangesCopyWorking (AddressRangesCopyWorking) 257771
2008-09-11 09:18:58| 74.7| 0.0|STATS |=====
2008-09-11 09:18:58| 74.7| 0.0|STATS |Total Features Written              257771
2008-09-11 09:18:58| 74.7| 0.0|STATS |=====
2008-09-11 09:18:58| 74.7| 0.0|INFORM|Translation was SUCCESSFUL with 0 warning(s) (257771 feature(s)/0 coordinate(s)
output)
2008-09-11 09:18:58| 74.7| 0.0|INFORM|FME Session Duration: 1 minute 33.9 seconds. (CPU: 70.3s user, 3.8s system)
2008-09-11 09:18:58| 74.7| 0.0|INFORM|END - ProcessID: 1888, peak process memory usage: 20780 kB, current process
memory usage: 19672 kB.
```


Transportation Framework

- View results

ArcCatalog - ArcInfo - Q:\TransportationFramework\DataForWeb\TransportationFramework_20081124\TransportationFramework_20081124.mdb\AddressRanges_20081124

File Edit View Go Tools Window Help

Location: Q:\TransportationFramework\DataForWeb\TransportationFramework_20081124\TransportationFramework_20081124.mdb\AddressRanges_20081124

Stylesheet: NPS Basic Edit.xsl

Conversion Tools

NPS Metadata

Contents Preview Metadata NPS Metadata Editor

TO_MS LFROM LTO RFROM RTO LOCALID THLFROM THLTO THRTO THRFROM RDNAME

0	900	948	901	949	4200	0	0	0	0	WINSTON ST
0	1000	1048	1001	1049	4200	0	0	0	0	WINSTON ST
0	1050	1098	1051	1099	4200	0	0	0	0	WINSTON ST
0	1100	1198	1101	1199	7000	0	0	0	0	WINSTON ST
0	1200	1298	1201	1299	7000	0	0	0	0	WINSTON ST
0	950	998	951	999	7000	0	0	0	0	WINSTON ST
0	1300	1398	1301	1399	7300	0	0	0	0	WINSTON ST
0	2740	2798	2741	2799	4600	0	0	0	0	WINSLOW AVE
0	2700	2738	2701	2739	4600	0	0	0	0	WINSLOW AVE
0	2800	2872	2801	2873	6700	0	0	0	0	WINSLOW AVE
0	2874	2898	2875	2899	6700	0	0	0	0	WINSLOW AVE
0	1201	1203	1200	1202	5200	0	0	0	0	WINSLOW AVE
0	1205	1249	1204	1250	5200	0	0	0	0	WINSLOW AVE
0	2500	2598	2501	2599	2300	0	0	0	0	WINNE AVE
0	1500	1576	1501	1577	3500	0	0	0	0	WINNE AVE
0	1200	1210	1201	1209	2200	0	0	0	0	WINNE AVE
0	1212	1298	1211	1299	2200	0	0	0	0	WINNE AVE
0	2022	2098	2021	2099	2200	0	0	0	0	WINNE AVE
0	1300	1398	1301	1399	2200	0	0	0	0	WINNE AVE
0	2000	2020	2001	2019	2300	0	0	0	0	WINNE AVE
0	1900	1940	1901	1939	2300	0	0	0	0	WINNE AVE
0	1706	1798	1705	1799	2300	0	0	0	0	WINNE AVE
0	1600	1616	1601	1615	2200	0	0	0	0	WINNE AVE
0	1824	1898	1823	1899	2300	0	0	0	0	WINNE AVE
0	1700	1704	1701	1703	2300	0	0	0	0	WINNE AVE
0	1578	1598	1579	1599	2200	0	0	0	0	WINNE AVE
0	1616	1698	1617	1699	2200	0	0	0	0	WINNE AVE
0	1400	1490	1401	1499	2200	0	0	0	0	WINNE AVE
0	2670	2698	2671	2699	2200	0	0	0	0	WINNE AVE
0	1942	1998	1941	1999	2300	0	0	0	0	WINNE AVE
0	1800	1822	1801	1821	2300	0	0	0	0	WINNE AVE
0	2600	2668	2601	2669	3300	0	0	0	0	WINNE AVE
0	1492	1498	1491	1499	3500	0	0	0	0	WINNE AVE
0	2200	2298	2201	2299	7900	0	0	0	0	WINNE AVE
0	2100	2198	2101	2199	7900	0	0	0	0	WINNE AVE
0	2300	2498	2301	2499	7900	0	0	0	0	WINNE AVE
0	2100	2200	2100	2200	840	0	0	0	0	WINNATE LN
0	2400	2500	2400	2500	13000	0	0	0	0	WINNATE LN
0	2300	2300	2300	2300	13000	0	0	0	0	WINNATE LN
0	2900	3000	2900	3000	1300	0	0	0	0	WINNATE LN
0	600	1100	600	1100	6000	0	0	0	0	WINNATE LN
0	5576	5598	5577	5599	5400	0	0	0	0	WINNATE LN
0	2700	2700	0	0	4100	0	0	0	0	WINNATE LN
0	100	200	100	200	4100	0	0	0	0	WINNATE LN
0	200	400	200	400	11000	0	0	0	0	WINNATE LN
0	100	210	100	210	7900	0	0	0	0	WINNATE LN
0	220	400	210	400	3800	0	0	0	0	WINNATE LN
0	3300	3300	3300	3300	3900	0	0	0	0	WINNATE LN
0	3300	3500	3300	3500	3200	0	0	0	0	WINNATE LN
0	3500	3500	3500	3500	2900	0	0	0	0	WINNATE LN
0	1201	1223	1200	1224	3500	0	0	0	0	WINNATE LN
0	1225	1249	1226	1249	6000	0	0	0	0	WINNATE LN
0	1500	1500	1500	1500	13000	0	0	0	0	WINNATE LN
0	1500	1500	1500	1500	11000	0	0	0	0	WINNATE LN
0	5600	5900	5600	5900	1700	0	0	0	0	WINNATE LN
0	250	300	250	300	3500	0	0	0	0	WINNATE LN

Record: 444 Show: All Selected Records (of 209478) Options

Preview: Table

Sort the values in this field in descending order (Z - A) (9 - 1)

Transportation Framework

Summary:

- Create an FME workbench
- Set schema parameters
- Connect source dataset to destination dataset
- Run...move address ranges from provider datasets to Transportation Framework Address Ranges table