



Part of The Silvacom Group™



The Parcel Puzzle

Manitoba Hydro's Integrated Property Parcel Mapping GIS Project

WHO IS MANITOBA HYDRO?

- The major energy provider for Manitoba
- Lowest electricity rates in Canada
- 14 hydroelectric generating stations
- Extensive infrastructure to support production and delivery





THEIR PROJECT

- Driven by internal GIS business needs
- Build a key GIS data set – Property Parcel Fabric
- ESRI's cadastral fabric model
- From existing disparate data



PROJECT DELIVERABLES

Phase 1

- Data inventory & gap analysis
- Logical and physical model design
- Design a **repeatable** solution

Phase 2

- Build overarching python control program
- Build FME workspaces

Phase 3

- Create the **property parcel fabric**
- Quality assurance

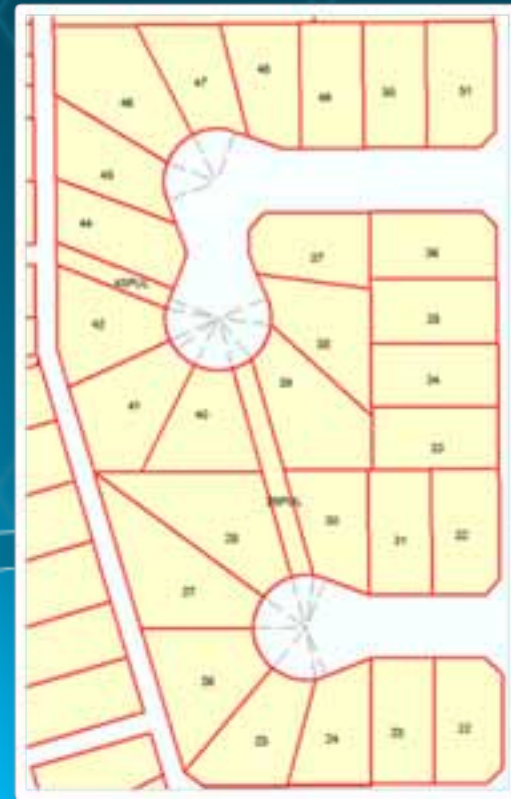


WHAT IS A CADASTRAL/PARCEL FABRIC?

Plans of Survey



GIS Cadastral Fabric



BENEFITS OF THE CADASTRAL FABRIC

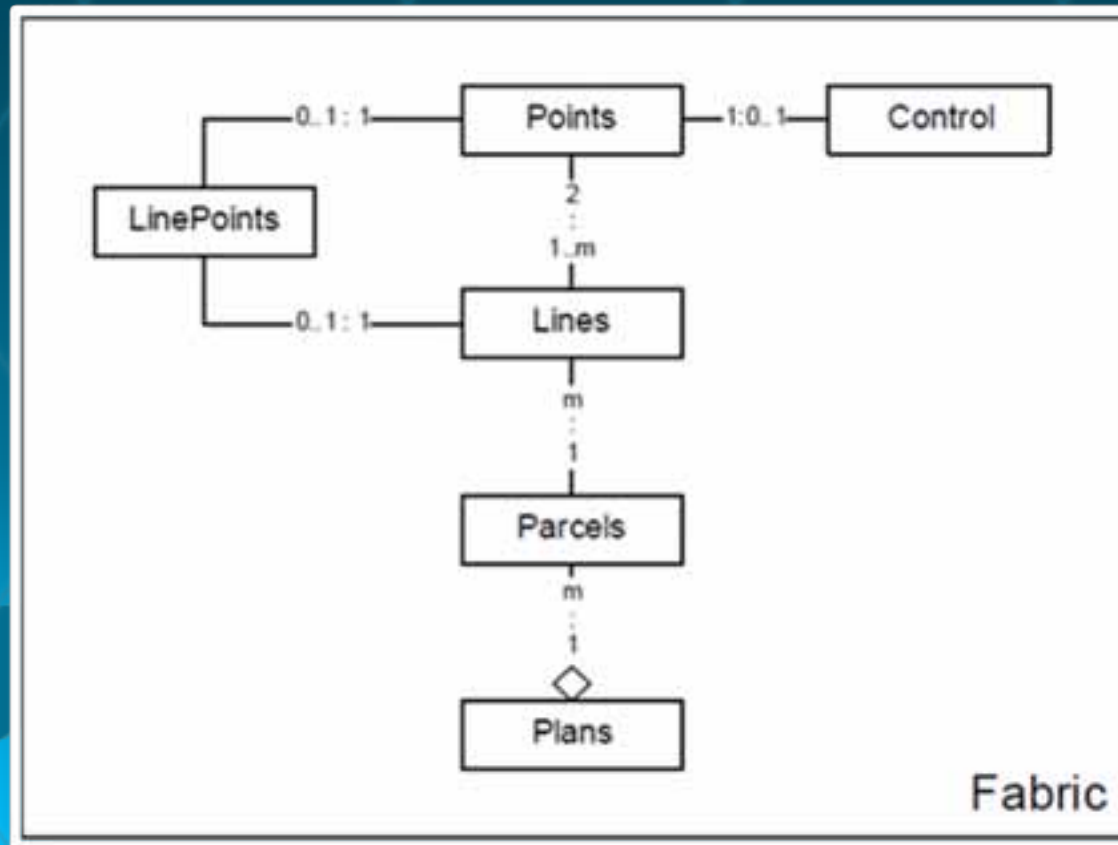
- Standardized data format
- Ability to improve spatial accuracy
- Vertical integration



ESRI'S CADASTRAL FABRIC MODEL

Logical Model

Point → Line → Polygon Relationships

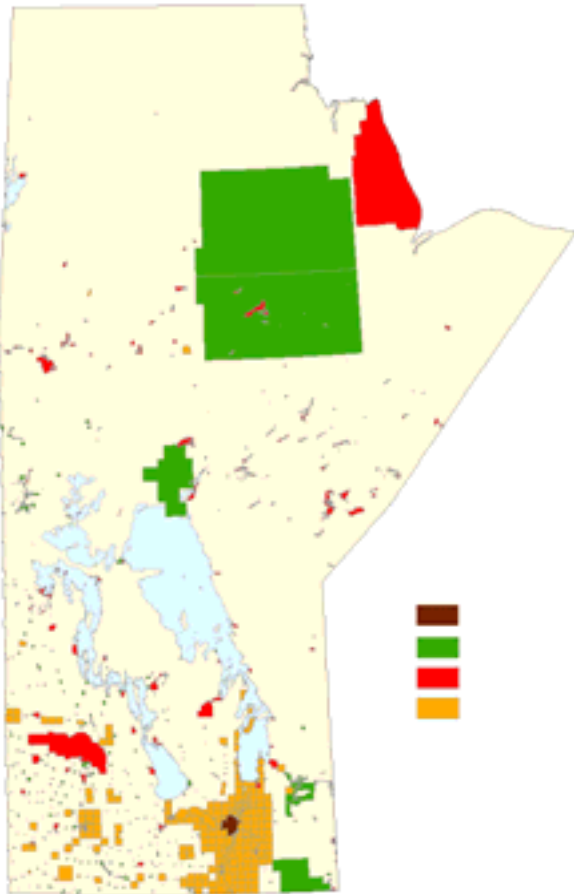


GAP ANALYSIS

- What source data format provides the best foundation?
- Data gaps in coverage
- Feature attribution
- Projections & format (CAD and shape)
- Arc detection
- Distance and bearing attribution
- Spatial integration
- Fabric data model extensions



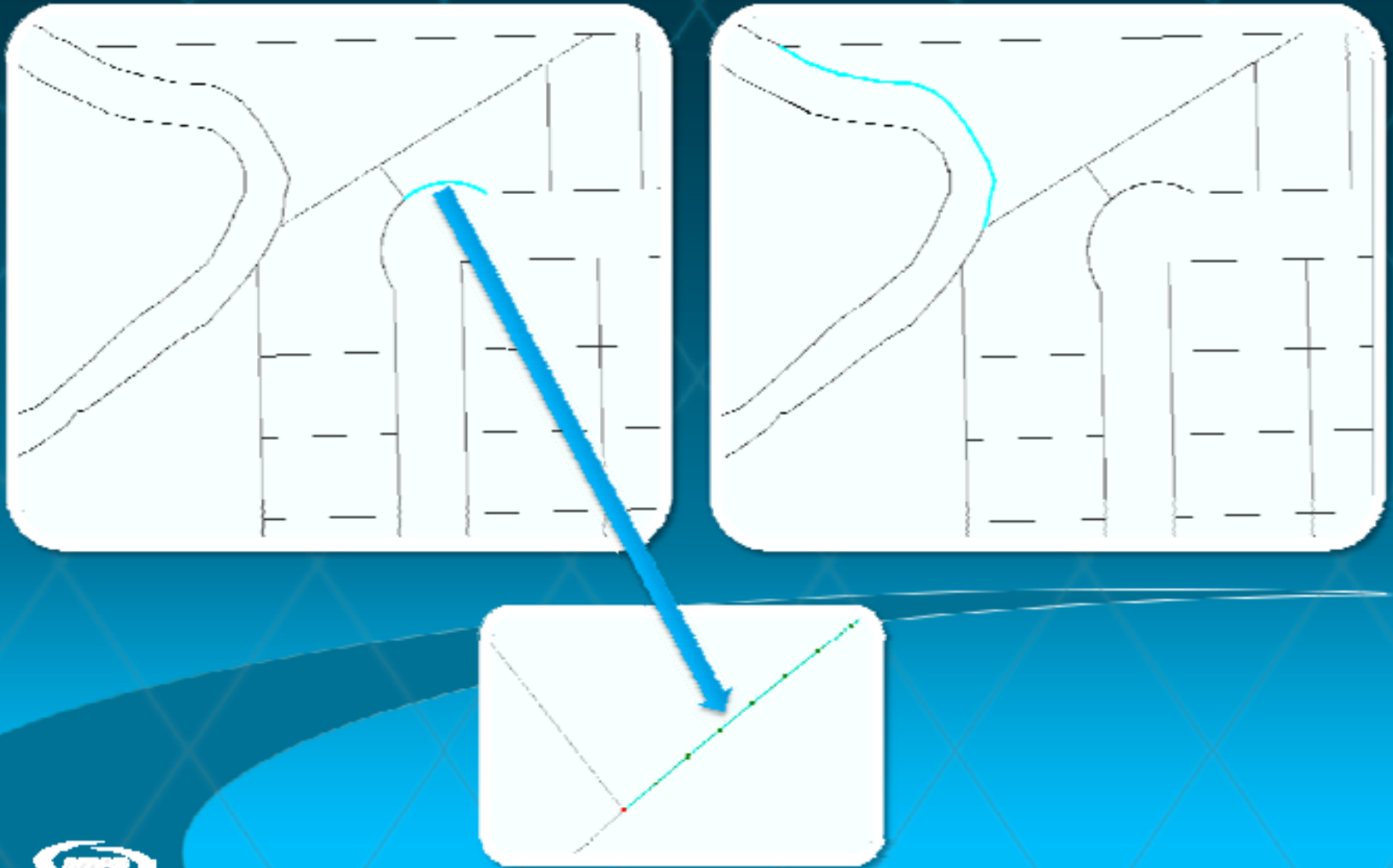
EXISTING SOURCE DATA



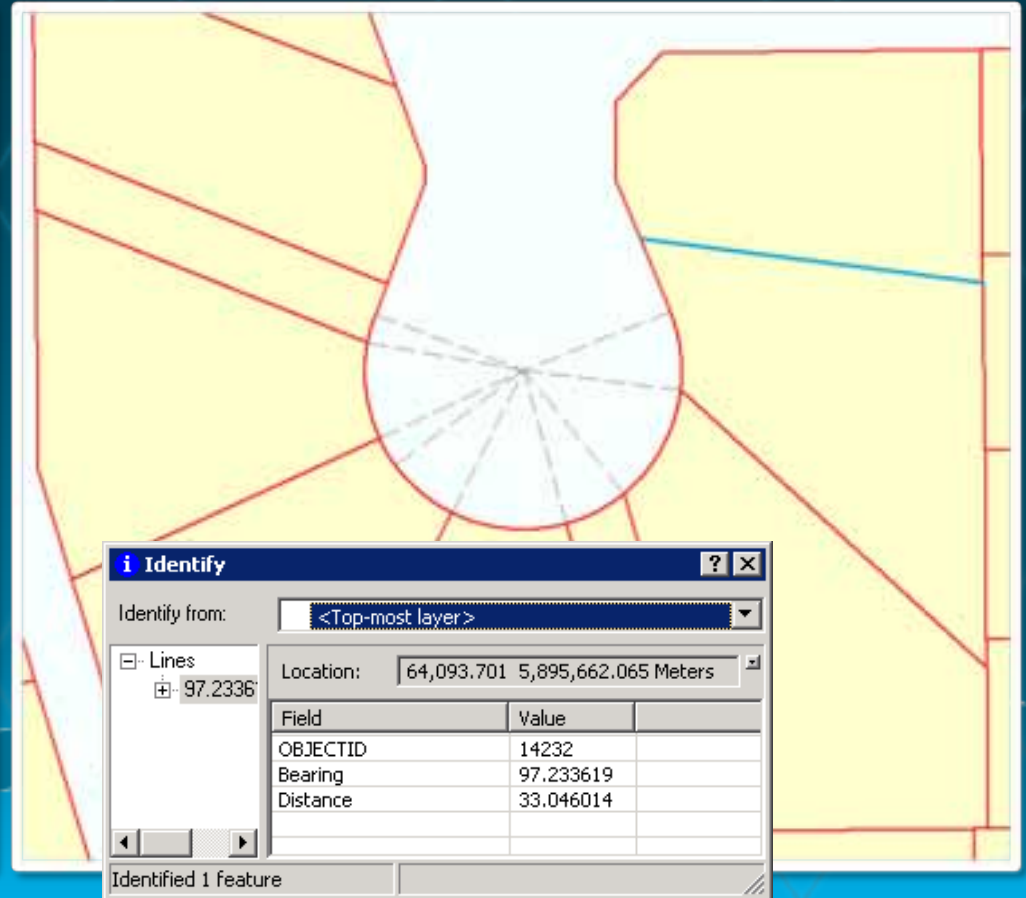
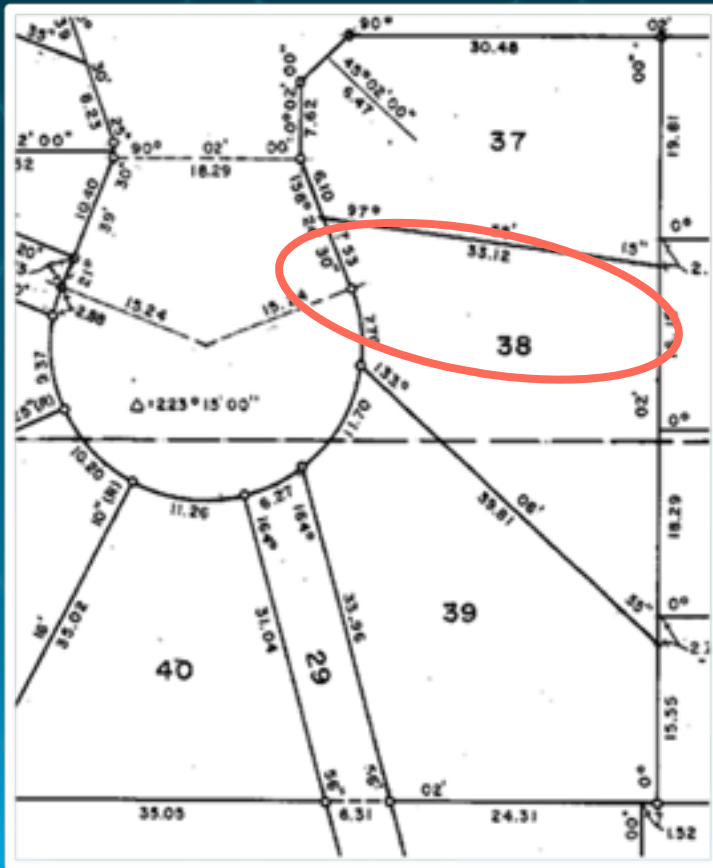
| Source Provider | Areas | Parcels |
|---|------------|--------------------|
| City of Winnipeg (Shape files) | 1 | 236,941 |
| Province of Manitoba (CAD/Shape files) | 281 | 266,186 |
| Canada Lands (Shape files) | 278 | 11,016 |
| Manitoba Hydro (CAD files) | 299 | 184,638 |
| Township Grid (CAD/Shape files) | 35 | 825,612 |
| TOTAL | 894 | 1.5 million |



CIRCULAR ARC RECONSTRUCTION



DISTANCES AND BEARINGS

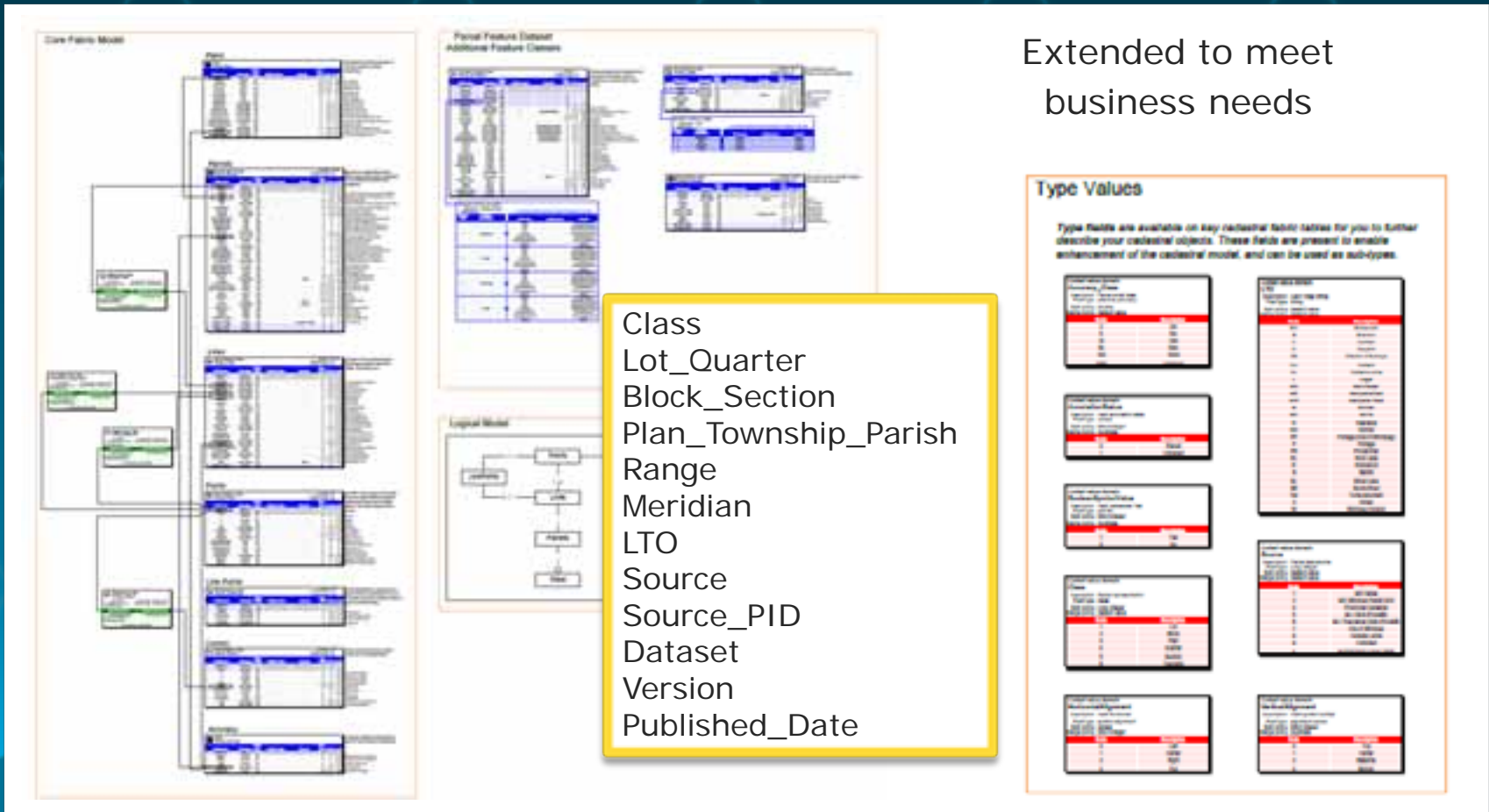


SPATIAL INTEGRATION

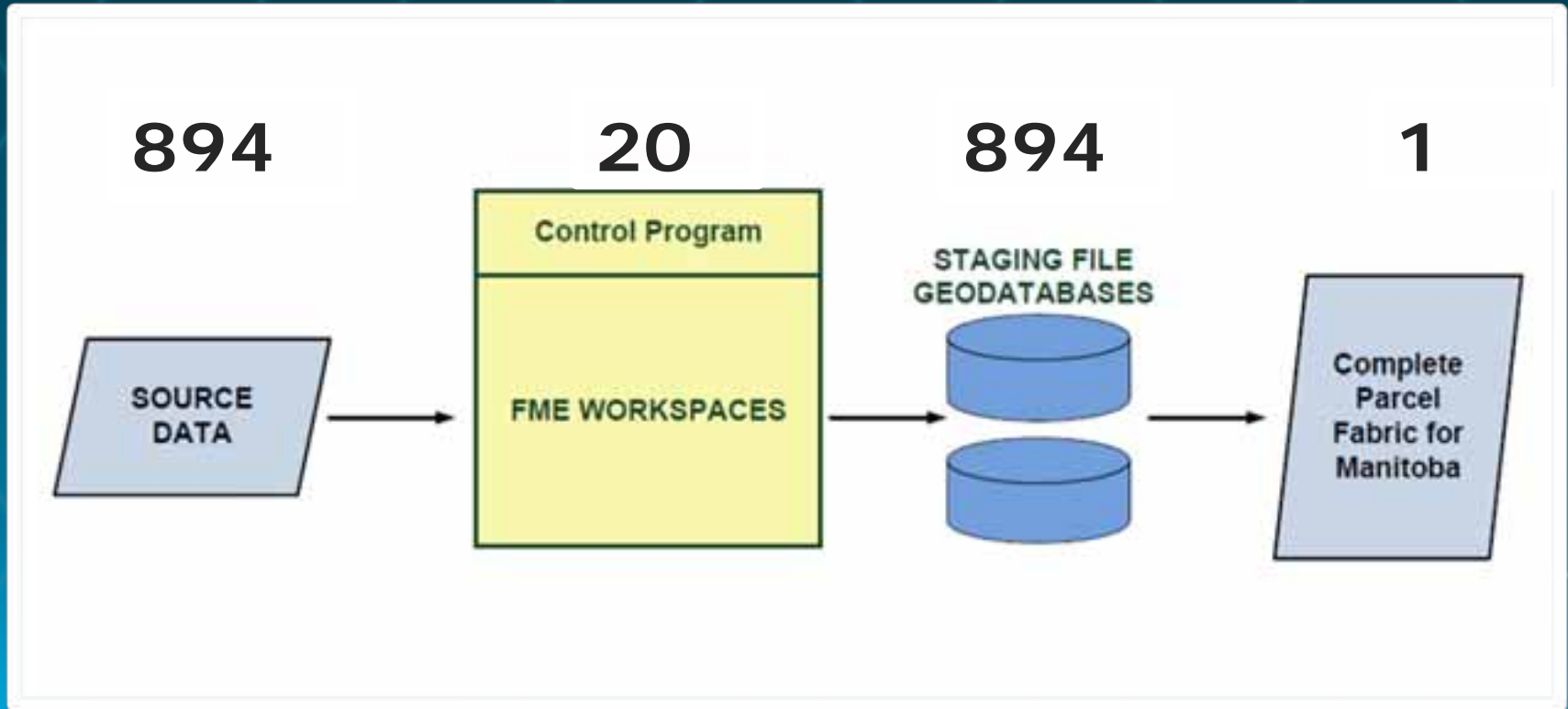


LOGICAL & PHYSICAL MODEL DESIGN

Extended to meet
business needs

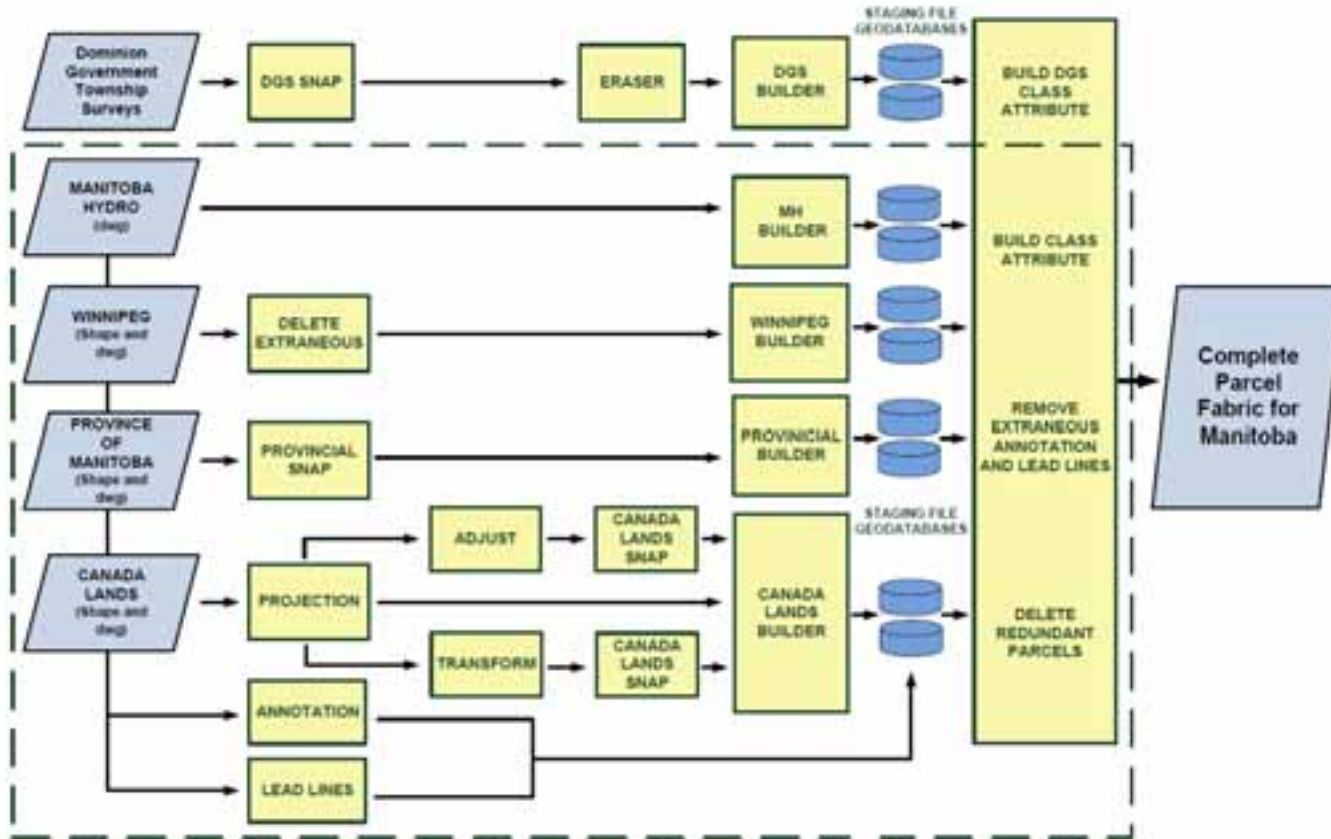


REPEATABLE WORKFLOW



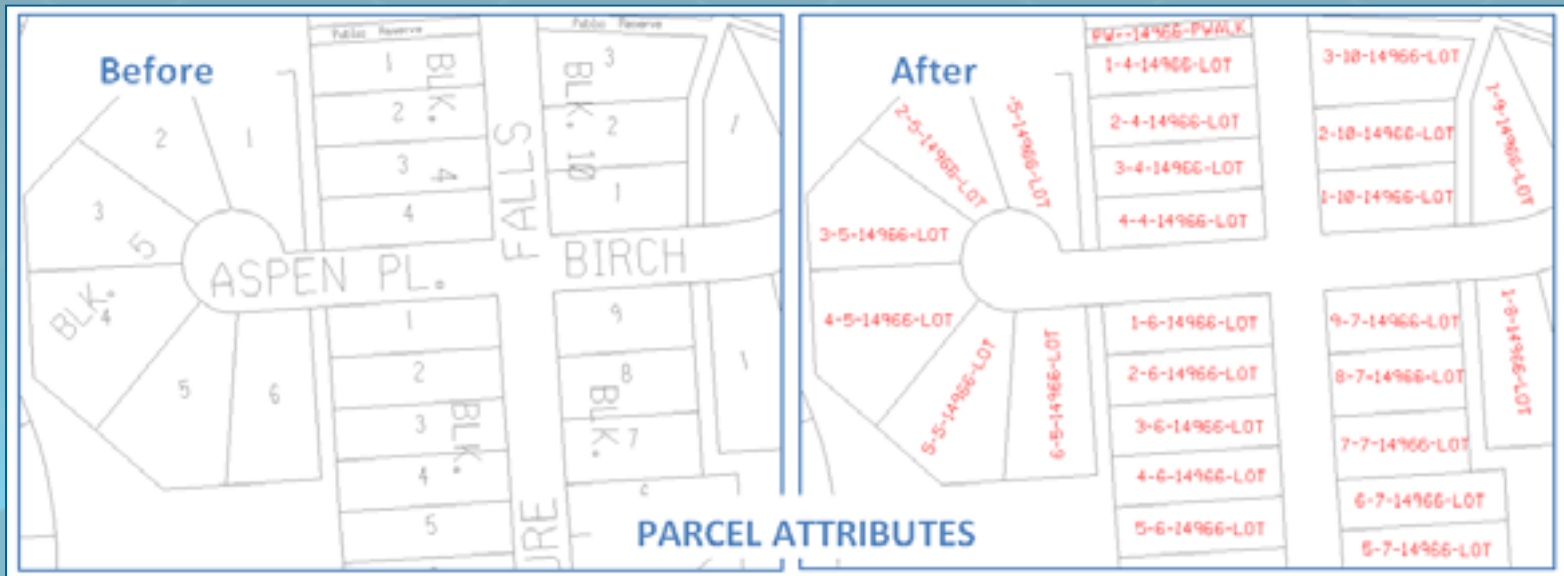
REPEATABLE WORKFLOW

Source  Fabric

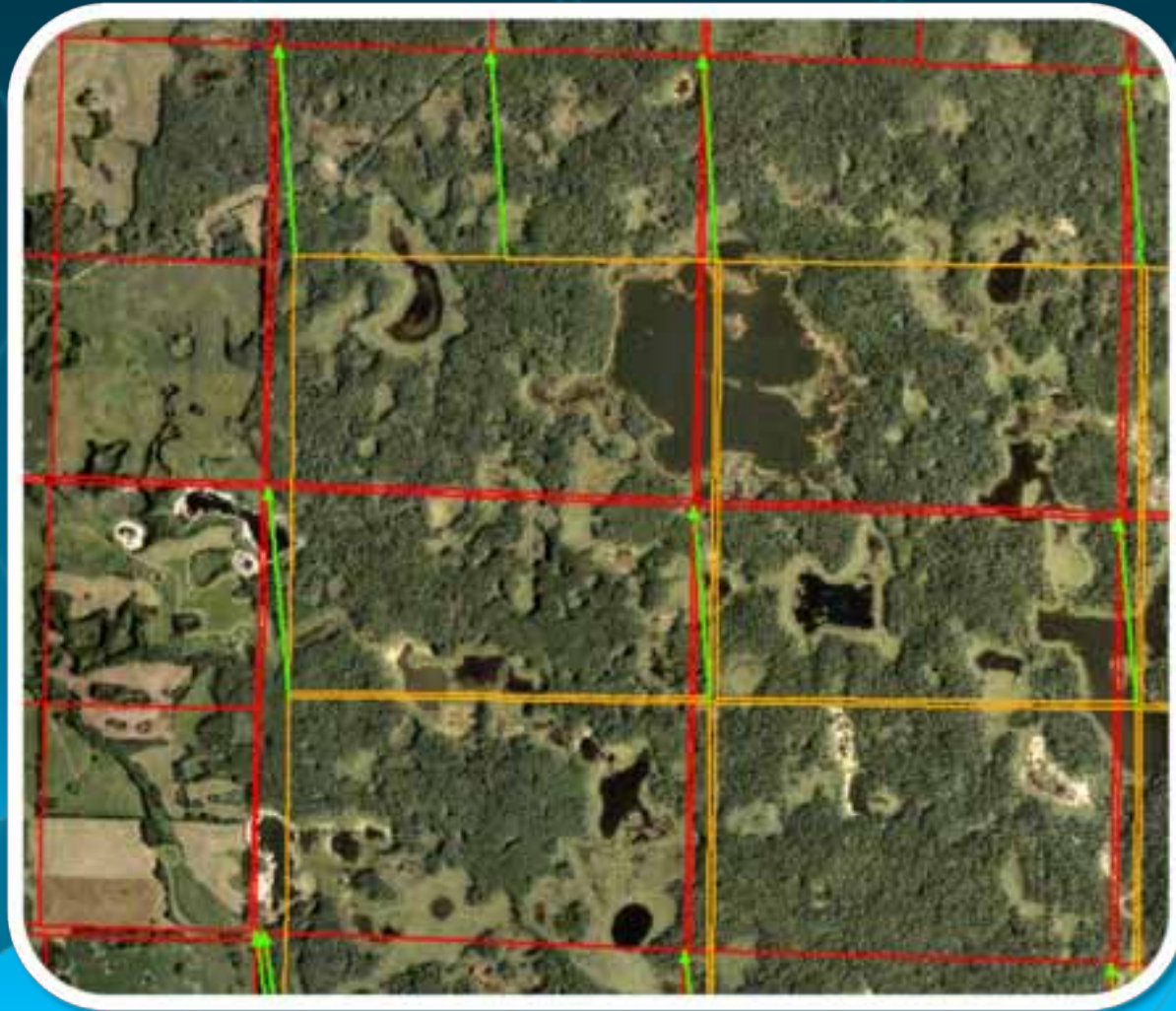


CAD DATA PRE-CLEANING

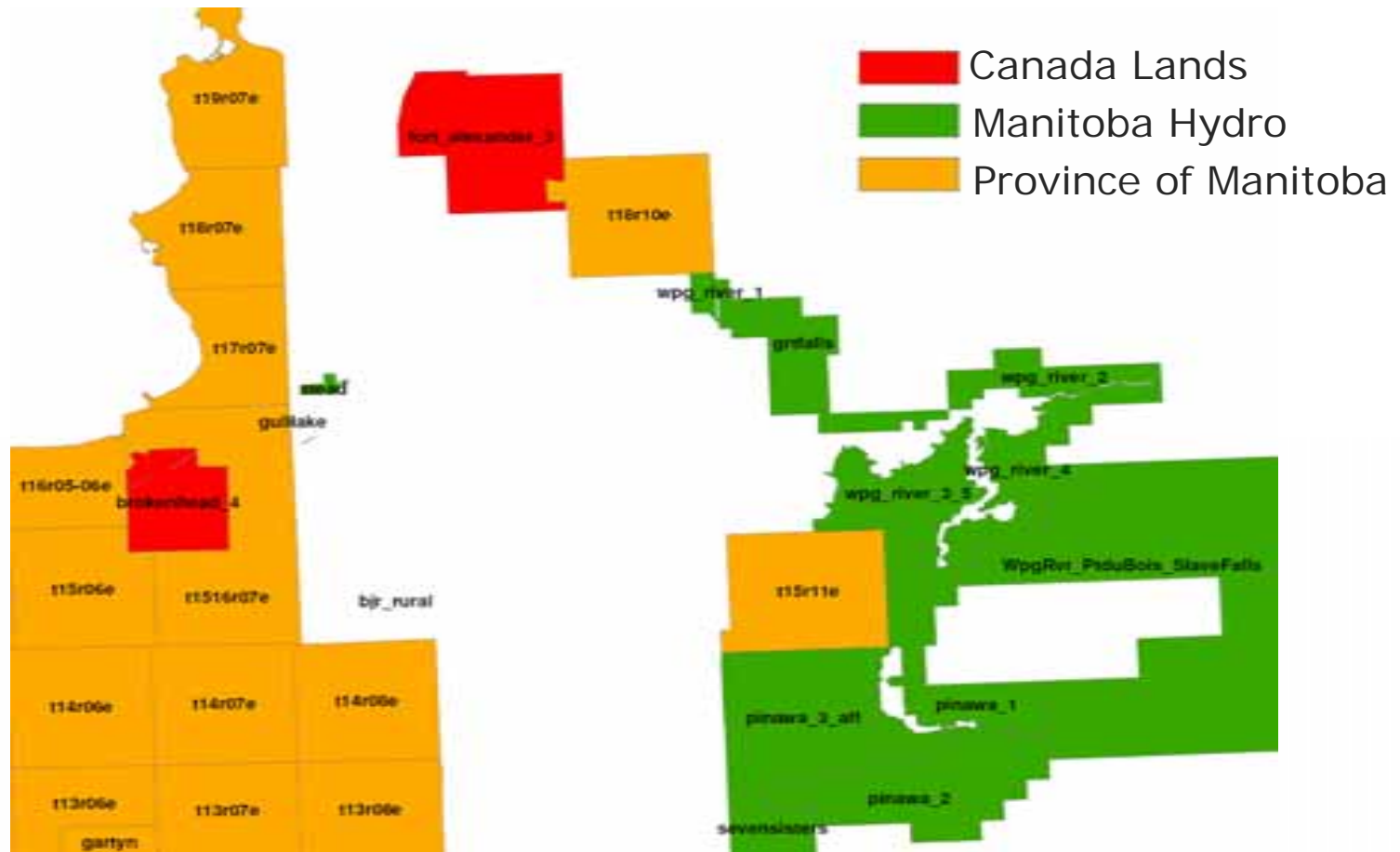
- Standardizing CAD layers
- Parcel polygon attribution (lot, block, plan)
- Pre-cleaning topology



FME CONFLATION

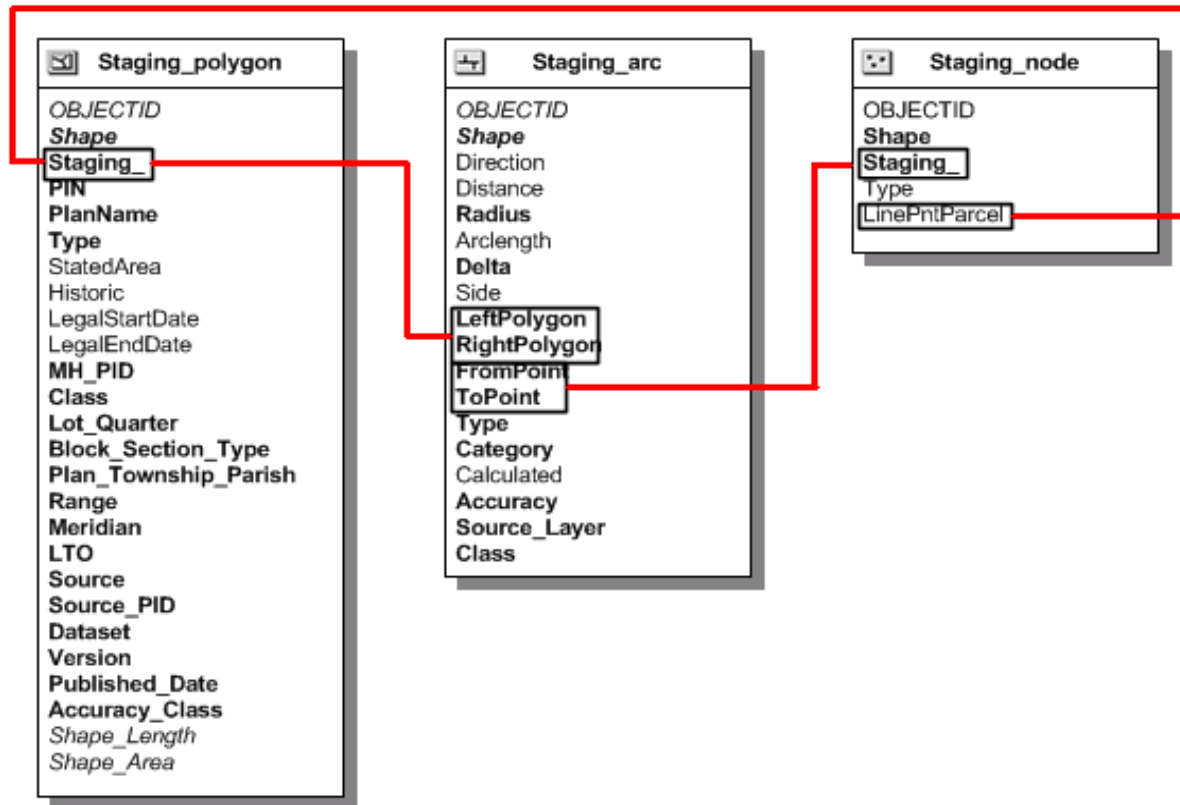


FME EDGE SNAPPING

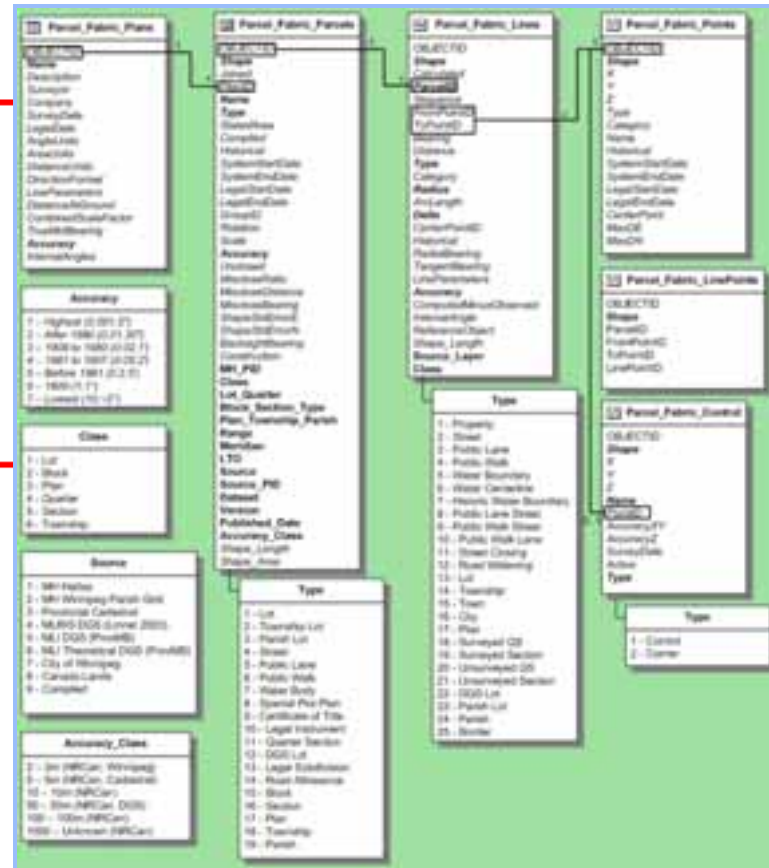
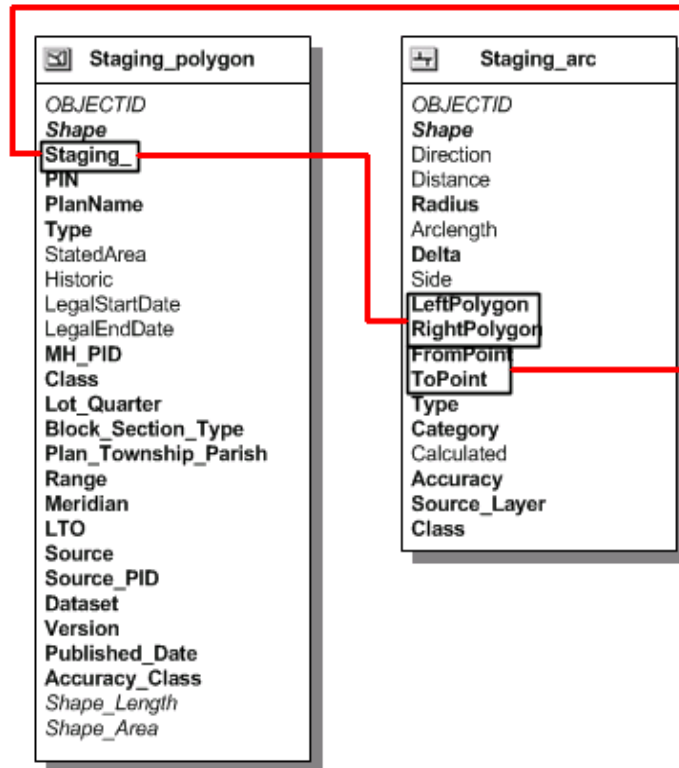


FME BUILDERS

Staging File Geodatabase Structure



LOADING STAGING TO FABRIC



CONTROL INTERFACE

DATASET

| | | | |
|----------------|---|-----------------|---|
| Dataset | <input type="text" value="mooseocoot"/> | Line File | <input type="text" value="M:\Source\Canada_Lands\MOOSEOCOOT\Land_Parcel_Boundary.shp"/> |
| Download Date | <input type="text" value="9/21/2010"/> | Centroid File | <input type="text" value="M:\Source\Canada_Lands\MOOSEOCOOT\Land_Parcel.shp"/> |
| Version | <input type="text" value="3"/> | Annotation File | <input type="text" value="M:\Source\Canada_Lands\MOOSEOCOOT\MOOSEOCOOT.DWG"/> |
| Published Date | <input type="text" value="8/4/2010"/> | Lead File: | <input type="text"/> |
| Accuracy Class | <input type="text" value="100"/> | Comments | <div style="border: 1px solid black; height: 100px; width: 100%;"></div> |
| Source ID | <input type="text" value="8"/> | | |
| Datum | <input type="text" value="NAD83CSRS"/> | | |
| HighPlan | <input type="text"/> | | |
| Snap Tolerance | <input type="text" value="1"/> | | |

PROCESS

| | | | | | | |
|-----------------------|---------------------------------------|---------|--------------------------------|--------------------------------|--------------------------------|----------------------|
| Published Date | <input type="text" value="8/4/2010"/> | | PARCELS | ANNOTATION | LEAD LINES | CONTROL |
| Status | <input type="text" value="Success"/> | STAGING | <input type="text" value="2"/> | <input type="text" value="1"/> | <input type="text" value="0"/> | <input type="text"/> |
| Staging Polygon Count | <input type="text" value="2"/> | FABRIC | <input type="text" value="2"/> | <input type="text" value="1"/> | <input type="text" value="0"/> | <input type="text"/> |
| Process Time (min) | <input type="text" value="4"/> | | | | | |

| | | | | | | | |
|------------------|---|-----------------|----------------------|----------------|---|-----------|---|
| WinnRemExt | <input type="text"/> | ProvCadSnapper | <input type="text"/> | ProvCadBuilder | <input type="text"/> | WinnLead | <input type="text"/> |
| ReprojectCanLand | <input checked="" type="checkbox"/> <input type="text" value="11/30/2010"/> | CanLandSnapper | <input type="text"/> | CanLandBuilder | <input checked="" type="checkbox"/> <input type="text" value="11/30/2010"/> | ClipAnno | <input checked="" type="checkbox"/> <input type="text" value="11/30/2010"/> |
| Transform | <input checked="" type="checkbox"/> <input type="text" value="11/30/2010"/> | DeletePoly | <input type="text"/> | HatlasBuilder | <input type="text"/> | HigherRep | <input checked="" type="checkbox"/> <input type="text" value="11/30/2010"/> |
| Adjuster | <input type="text"/> | WinnipegBuilder | <input type="text"/> | Annotation | <input checked="" type="checkbox"/> <input type="text" value="11/30/2010"/> | | |



SUCCESSFUL COMPLETION

- On time
- On budget
- Repeatable solution
- On-site deployment & customer training



**1,500,000
Parcels**



LESSONS LEARNED

- Collaborative and innovative approach
- Use the best tools available to provide an efficient solution
- Modular design
 - Staging geodatabase
 - FME workspaces



BENEFITS

- Instead of referencing over 890 data sets to make a decision – Manitoba Hydro now has a single GIS parcel fabric layer
- This parcel layer can be updated easily, on an as needed basis ,using a **repeatable** process that functions in a predictable way



THE ROAD AHEAD

- 10 / 10.1 Parcel Fabric Upgrade
- Link to Parcel Registry (Landworks)
- Dynamic Fabric Update
- Receive change only updates from agencies
- Complete provincial parcel fabric



COMPLETING THE PARCEL PUZZLE

Like any challenging jigsaw puzzle, it takes a collaborative approach to fit and assemble the pieces...



QUESTIONS?

