Mylar Tax Maps to the Parcel Fabric
In Morrow County

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Maps, Apps and Bridging Gaps
Morrow County
Stats

407 Square Miles
23 Political Subdivisions
Just under 28,000 parcels
(Initially 25,000 parcels)
Esri software user
Morrow County
Project

* Implementation Plan
* Data Conversion RFP
* Data Conversion
* GIS Infrastructure Implementation
Morrow County Project

Implementation Plan
System Architecture / Technology
GIS Software Infrastructure: In-house or out-sourced?
Hardware Recommendations
Software Recommendations
Parcel Management Workflows
Governance and Organization Structure
Morrow County Project

Implementation Plan

Detailed Task List for 2014, 2015 1nd 2016
Parcel Maintenance Workflow

**Implementation Plan**

**Workflow Improvements**

- Morrow County
- Project

**Tax Map Office**
- Tax Map Office reviews per Conveyance Standards.
- Stamps certify compliance or “New Survey required upon next transfer.”

**Temporary or Pending surveys can be entered into the parcel fabric (checking for closure) to be finalized or submitted later.**

**Source Documents**
- Record of Survey stored in the parcel fabric

**Features**
- Parcel boundaries
- Control Points
- Annotation (lot dimensions, sublot numbers, notes)

**Attributes**
- Acreage (deeded)
- PIN
- Location information (section, lot, township & range, tax map page)
- COGO attributes (bearings, distances, curve data) automatically generated during input

**Parcel Fabric**

**Audit’s Office**
- Receives deed, creates new parcel / deletes parcel MVP updated with new owner name, tax mailing address, location address, deed volume/page.

**Nightly extract from MVP system provides property information to join to parcel using PIN as the primary key.**
- Joined data can include: ownership, location address, mailing address, owner address, valuation, acreage, land use.

**Parcels served online through an HTML 5 / Javascript interactive mapping application.**
- Tax maps viewed and printed on demand by anyone with access to the internet.

**Redundancies / Steps eliminated from existing workflow:**
- No need to draft & scan physical tax maps
- No need to update 1320 public tax maps
- No need to draft & scan right-of-way maps
- No need to record owner’s name, document numbers
- No need to draft pending surveys twice
- No need to maintain transfer spreadsheet
- No need to develop & maintain cross reference spreadsheets
- No need to maintain separate record of survey
- No need for Auditor to manually cross reference parcels for routing maps

**Efficiencies / Benefits created:**
- 24/7 access to tax maps
- Tax Map and Auditor parcel identification reconciled
- Improved parcel boundary accuracy through coordinate geometry input
- Digital parcel dataset available for other applications and analysis
Data Conversion RFP

Parcel Fabric

* Parcel boundaries
* Sublot numbers (aka “bubble numbers”)
* Lots, Quarter Sections, & Sections
* Township & Range lines
* Political Subdivision boundaries
* In Lots / Out Lots
* Parcels with pending surveys (red pencil)
* Tax map Acreage
* Owner name
* Document Numbers
* Lot Dimensions
* Water feature names
* Notes

NOTE: There are NO Parcel Identification Numbers (PIN) on the Tax Maps. The Auditor’s Office maintains the PINs.
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Data Conversion RFP

* Source document conversion, reports and manuals
* QA/QC and Public Access Web Portals
* Amazon EC2 Cloud GIS
* GIS Systems Integration
* Implementation, Training and Support
Data Conversion

Completeness of Parcel Number assignment - **99.7%**
(89 remaining)

Further research needed – **0.8%** (224 remaining)
Morrow County Project
## Morrow County Project

### Data Conversion

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Morrow County
Source Documents

- Tax Maps (PDF)
- Transfer Spreadsheets (EXCEL)
- Legal Descriptions (PDF)
- Surveys (PDF)
- Routing Maps (PDF)
- Auditor’s Website
Morrow County - Parcel Conversion

Overview

Data Conversion
Georeference Scanned Tax Maps
Digitize Parcels
Assign Attributes
Assign Auditor’s Parcel Number
Upload to Parcel Fabric
Resolve Duplicate Parcel Numbers
Enter Lot Dimensions
Digitize Pending Surveys
Additional Layers
Morrow County - Parcel Conversion

Georeference Scanned Tax Maps

Data Conversion

- ~ 1,025 Scanned Tax Maps
  - Converted from PDFs to TIFs
  - Georeferenced using LBRS Road Centerlines and 2013 Orthoimagery
Parcels digitized based on ‘Apparent Lines of Occupation’.

Source documents (surveys, legal descriptions) referenced if georeferenced tax map was unclear.
Morrow County - Parcel Conversion

Digitize Parcels (cont.)

- Tax Parcels: ~27,500
- Sublots, ROWs: ~12,000
- PLSS: 2,101
- Historic (combinations, pending): ~6,100
- Total polygons: ~47,630
Morrow County - Parcel Conversion

Assign Attributes

* Attributes assigned while digitizing
  * Tax Map Page
  * Jurisdiction
* Attributes assigned from Transfer Spreadsheets and other sources
  * Owner Name
  * Document Numbers
  * Acreage
  * Parcel Number
Morrow County - Parcel Conversion

Assign Auditor’s Parcel Number

- Parcel Assigned from one of many sources
- Transfer Spreadsheets
- Routing Maps
- Auditor’s Website
Morrow County - Parcel Conversion

Parcel Fabric Upload - Overview

* Add fields to default Parcel Fabric schema
* Create other Cadastral layers from Parcel base
* Load Parcel layer into Staging File Geodatabase
* Fix Topological Errors
* Load data into Parcel Fabric
* Join attribute data to Parcel Fabric
Add Fields to Parcel Fabric

* Fields added to Parcel Fabric
  * TM_ID – ‘Bubble’ or Lot number
  * TM_ID_Type – ‘Bubble’ or ‘Lot’
  * TM_Owner – Owner on Tax Map
  * TM_Page – Tax Map Page
  * TM_Jurisdiction – Community parcel is in
  * TM_TaxDistrict – Tax District name
  * TM_SchoolDistrict – School District name
  * TM_Documents – Current documents for parcel
  * TM_Survey – Reference to current scanned survey
  * TM_Notes – Miscellaneous notes
  * TM_Pending – Flag to denote pending survey
  * TM_Historic – Flag to denote parcel for labelling
  * TM_Acreage – Tax Map acreage
Morrow County - Parcel Conversion, Parcel Fabric Upload

Add Fields to Parcel Fabric (cont.)

* Additional Fields added to Parcel Fabric
  * A_Owner – Auditor’s Owners Name
  * A_PropertyAddress – Auditor’s Property Address
  * A_MailingAddress – Auditor’s Mailing Address
  * A_Landuse – Auditor’s Land Use Classification
  * A_Acreage – Auditor’s Acreage
Morrow County - Parcel Conversion, Parcel Fabric Upload
Create Other Cadastral Layers

* PLSS Layers
  * Township & Range
  * Quarters & Sections
  * Lots & Quarter Sections
  * (Morrow County is covered by 3 different land survey systems – Congress Lands 1795-1804, Congress Lands 1819, & US Military District 1796-1802)

* Sublots – Lots & Outlots
* Layers are loaded into Local Government Information Model Staging Geodatabase
* ESRI Parcel Fabric Seminars
* ArcMap for Desktop Help – Manage Data / Editing / Editing parcels / Local Government Information Model / **Load parcel polygons**
  

* Following this workflow allows the topology to be validated and the features to be classified correctly
Morrow County - Parcel Conversion, Parcel Fabric Upload

Validate Topology

* [Lines] Must Be Covered By Boundary Of [Polygon]
* [Lines] Must Not Self-Overlap
* [Lines] Must Not Self-Intersect
* [Lines] Must Be Single Part
* [Lines] Must Not Intersect Or Touch Interior
* [Polygon] Boundary Must Be Covered By [Lines]
* Often found it was easier to edit source data and reload data than edit through topology interface
‘Load A Topology To A Parcel Fabric’ tool

Data is loaded from the Staging Geodatabase after topology has been validated and the features have been classified – Tax Parcel, Lots, Quarter Sections, etc.

The Local Government Data Model automatically applies a default symbology and configuration for the defined cadastral types.
For fields outside the default Parcel Fabric schema, the source data is joined based on the parcel identification number (PIN) and attributes are Field Calculated over into the ‘TM’ fields created previously (TM_ID, TM_Owner, etc . . .)
Morrow County - Parcel Conversion

Resolve Duplicate Parcel Numbers

- Duplicate Parcel Numbers – Multiple Causes
  - Parcel overlaps Tax Map pages
  - Legitimate Combination (One Legal Description)
  - Erroneous Combination (Multiple Legals, One PIN)
Morrow County - Parcel Conversion
Resolve Duplicate Parcel Numbers (cont.)

* Parcel overlaps Tax Map pages
  * Parcels marked as valid duplicates
  * Adjacent pages noted
* Legitimate Combination (One Legal Description)
  * Individual pieces are displayed separately on Tax Map with distinct bubble or lot numbers despite a valid combination
  * These pieces were combined and old polygons marked Historic
Erroneous Combination (Multiple Legals, One PIN)

Decades ago a previous County Auditor combined adjacent parcels with the same ownership regardless of legal descriptions.

These parcels were marked with a distinct phrase in TM_Notes to be isolated later and corrected in the Auditor’s database.
The Parcel Fabric can store recorded distances on parcel lines in spite of geometry lengths.

Due to this functionality, lot dimensions were entered for all sublots for labeling purposes rather than using static annotation.

54,634 dimensions entered.
Pending and Unrecorded Surveys are sometimes drawn on the Tax Maps.

These were digitized into the Parcel Fabric as Historic (future) parcels.
Morrow County - Parcel Conversion

Additional Layers

- Tax Map Index
- Critical to Tax Map Mapbook
- Jurisdictions
- School Districts
- Tax Districts
The Parcel Fabric & Tax Map Index was used to create a ‘new’ tax map mapbook. These maps also acted as checkplots.
Morrow County
Parcel Updates

Governmax Extract
(Auditor’s data)
Retrieve .txt extract file from remote FTP server

Import Extract
Import file into Microsoft SQL Server

Parcel Fabric Upload
Parcel Fabric uploaded from Tax Map

Parcel Fabric Copied
Fabric backed up

Update Tax Parcels
Run SQL scripts to update Auditor’s data in Parcel Fabric / Tax Parcels
Morrow County
GIS Infrastructure – External Use

Morrow County Online GIS
http://morrowcountyohio.gov/gis
Created with Web AppBuilder for ArcGIS (Developer Edition) on Amazon Server

ArcGIS Online Web Map

ArcGIS Online
Morrow County Organizational Account
Morrow County Public Access Web Map

ArcGIS REST Services

Amazon Web Services (AWS)
EC2 Instance – m3.large
2 CPUs, 7.5GB RAM
SQL Server 2012 Standard
ESRI ArcGIS for Server 10.4
Morrow County GIS Website