

Mylar Tax Maps to the Parcel Fabric In Morrow County

Richard Kotapish, GISP

President, Geo-centric Consulting, Inc.

James Branch

GIS Director, Lake County GIS Department

Maps, Apps and Bridging Gaps

**2016 Ohio GIS Conference
September 28 – 30, 2016**



**Hyatt Regency Columbus
Columbus, Ohio**

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

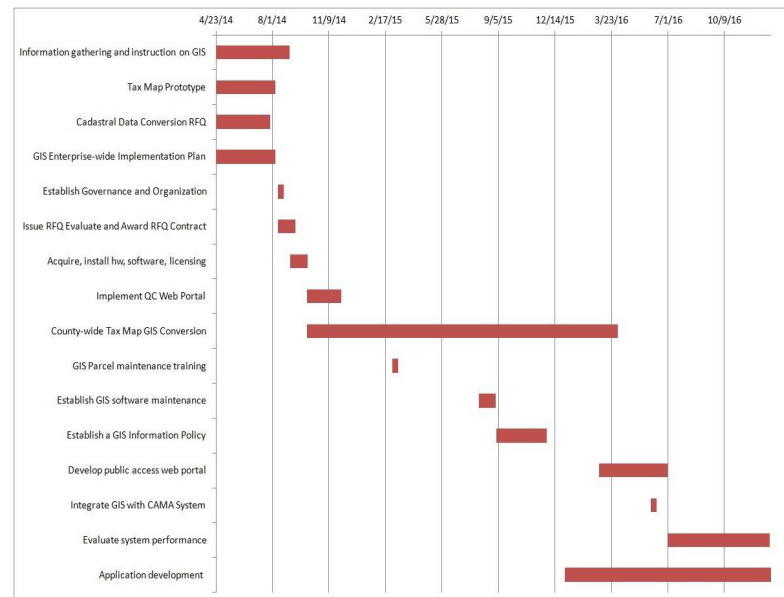
Parcel Management Workflows

Governance and Organization Structure

Morrow County Project

Implementation Plan

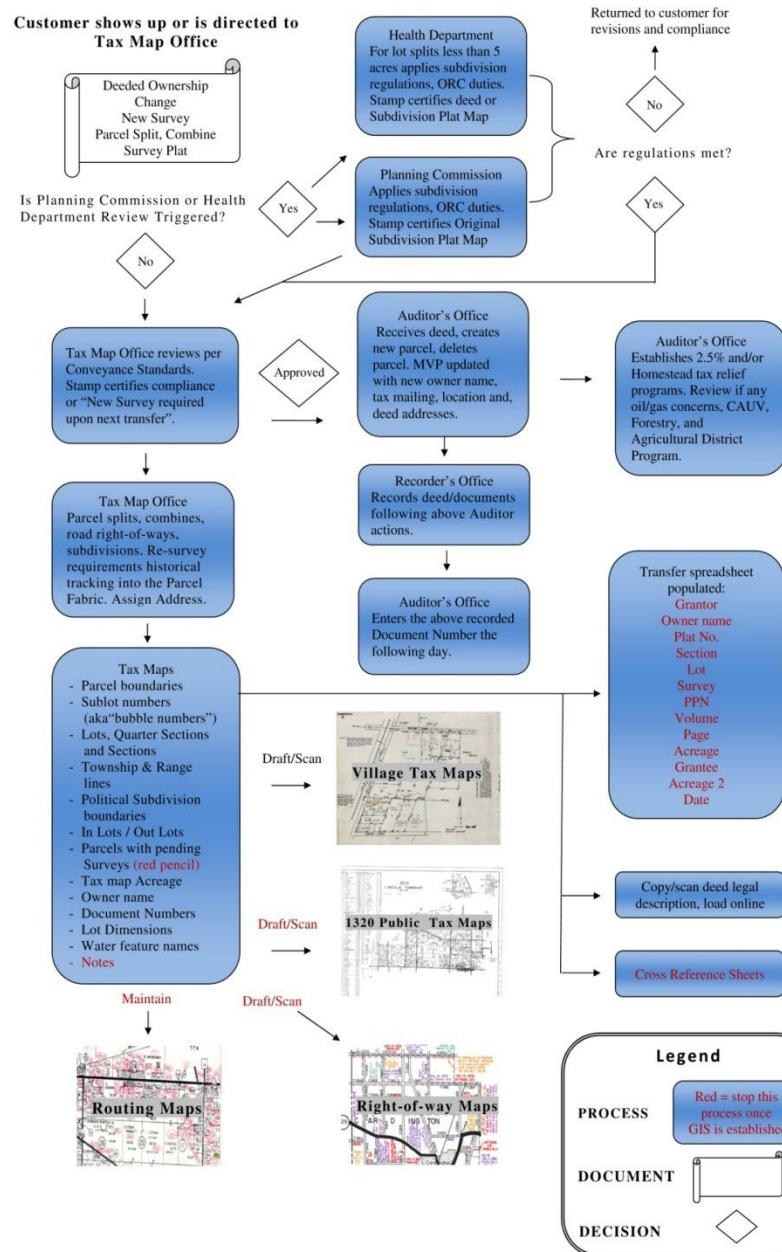
Detailed Task List for 2014, 2015 1nd 2016



Morrow County Project

Implementa

Morrow County Parcel Management Workflows



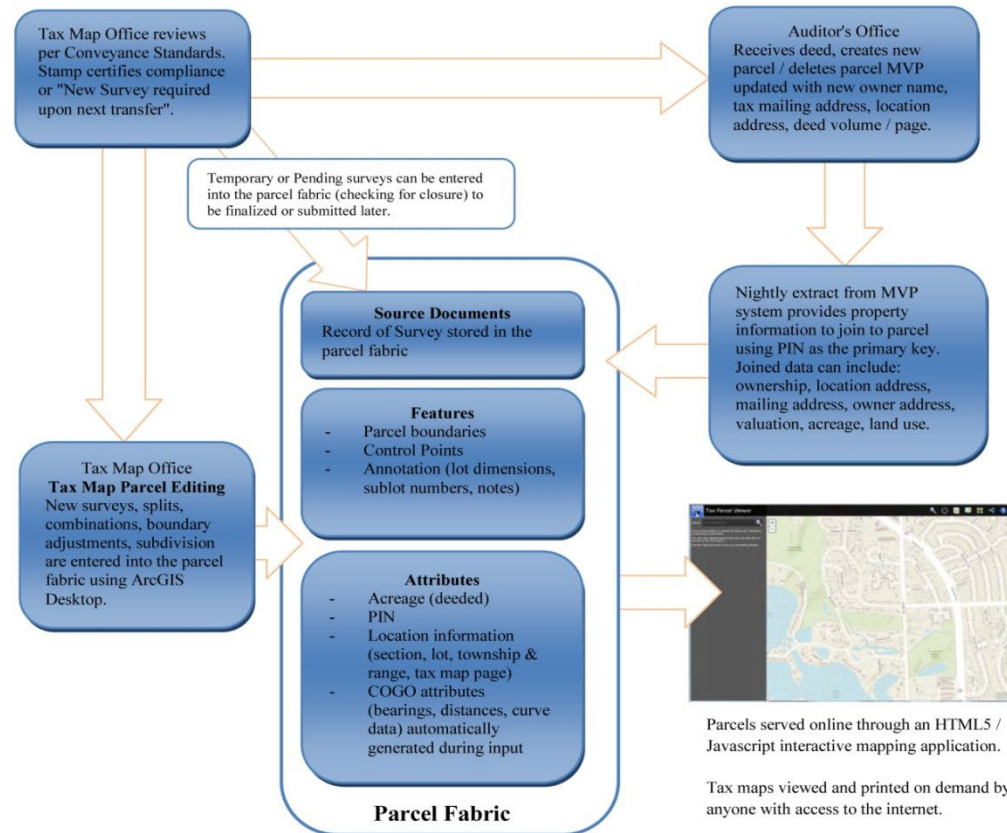
Improvements

Morrow Project

Implement

ents

Parcel Maintenance Workflow



Redundancies / Steps eliminated from existing workflow:

- No need to draft & scan physical tax map
- 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

Morrow County Project

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.

Morrow County Project

Data Conversion RFP

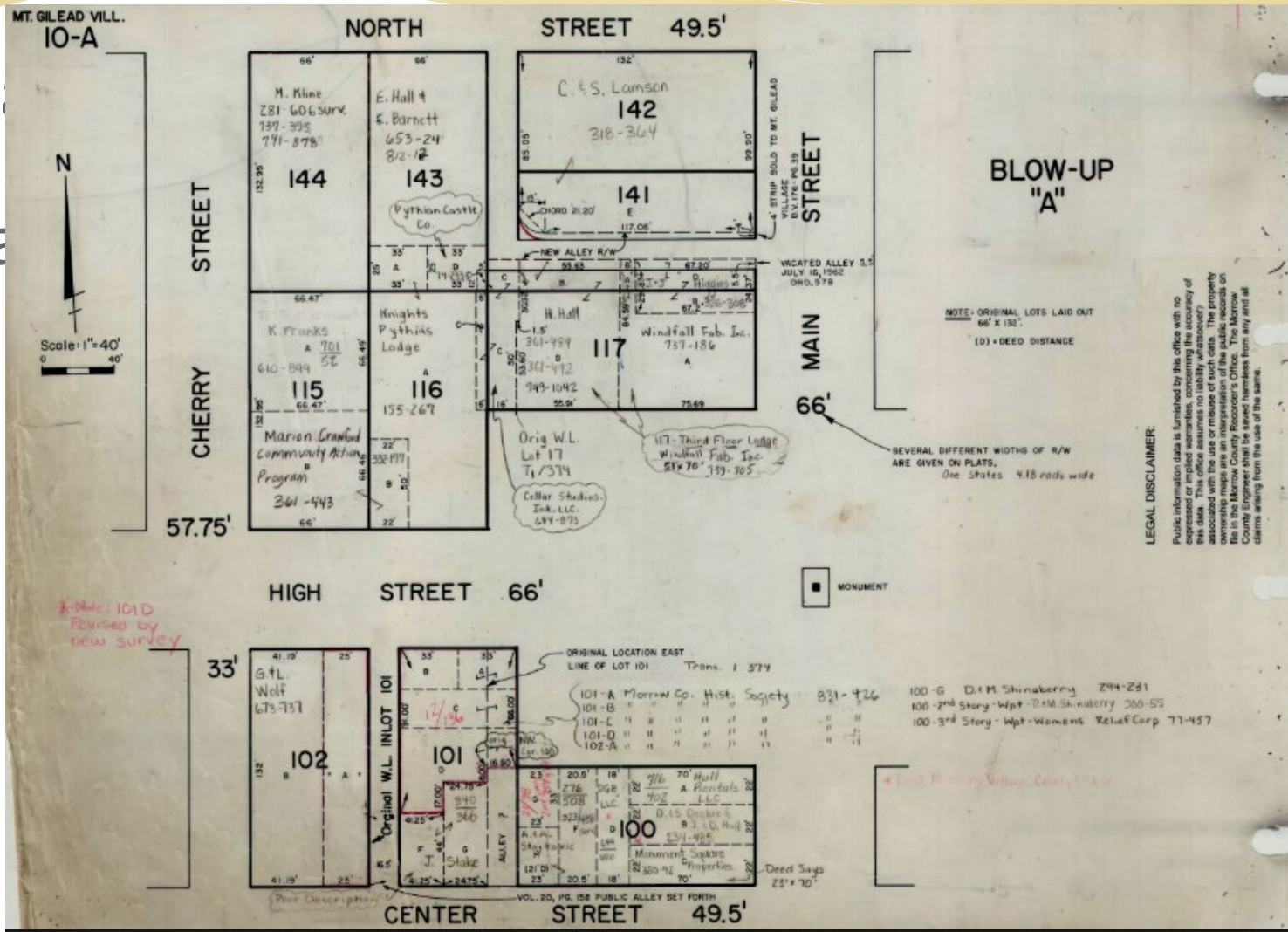
- * Source document conversion, reports and manuals
- * QA/QC and Public Access Web Portals
- * Amazon EC2 Cloud GIS
- * GIS Systems Integration
- * Implementation , Training and Support

Morrow County Project

Data Conversion

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

Further research needed – **0.8%** (224 remaining)

D
Ta

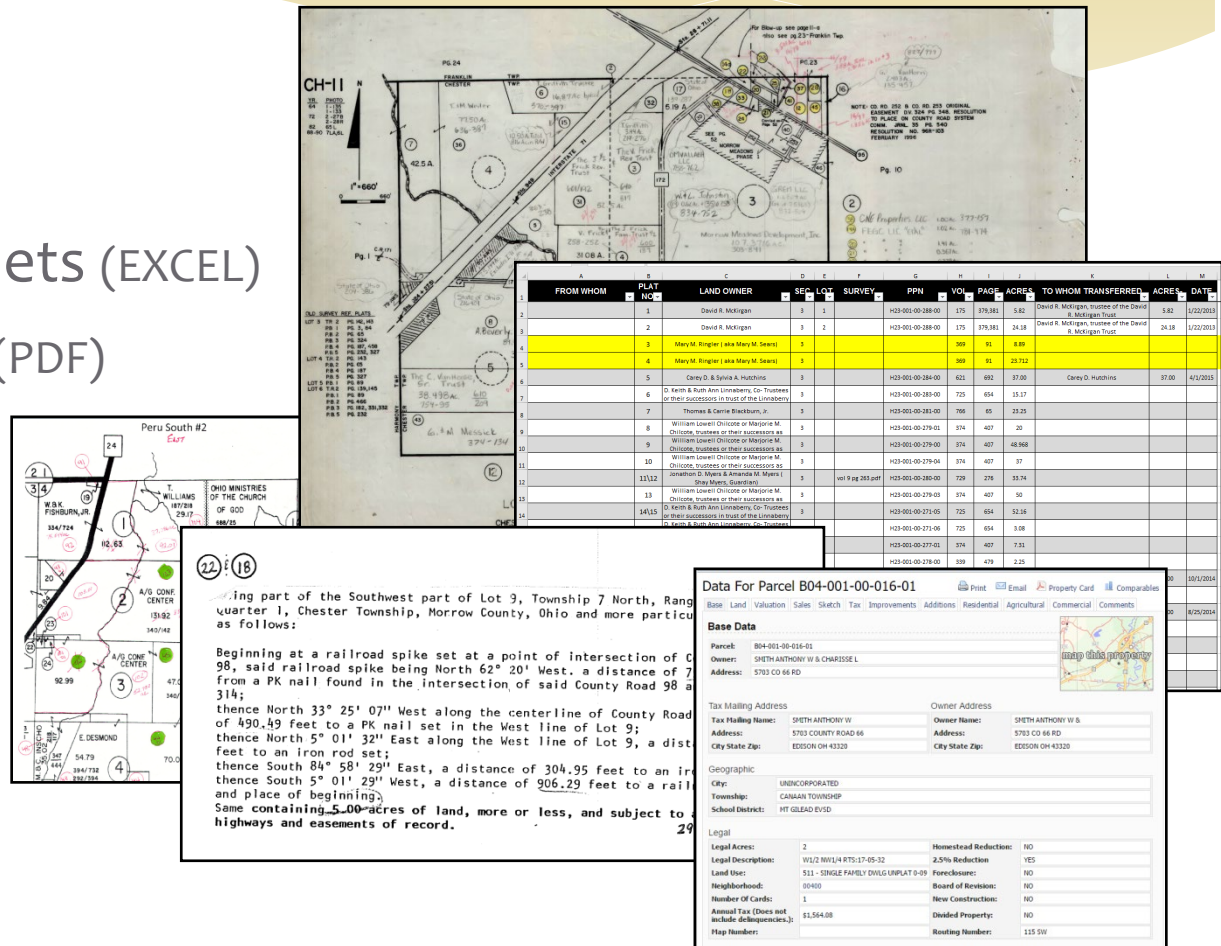
Morrow County Project

Data Conversion

PLAT NO.	LAND OWNER	SEC.	LOT	SURVEY	PPN	VOL.	PAGE	ACRES
55	Roger & Brenda Beall	12		vol 9 pg 524.pdf	G19-001-00-341-01	286	136	0.83
56	Jessica L. Abdon & Elizabeth M. Shiflet, co-trustees or their successors as trustees of the Shiflet	12		vol 11 pg 326.pdf	G19-001-00-347-01	756	531	3.368
57	Donald & Connie McNamee	12			G19-001-00-331-01	300	472	1
58	Billy & Doris McManis	12		vol 9 pg 407.pdf		328	614	0.733
60	Bruce & Deborah M. Campbell	12		vol 9 pg 408.pdf	G19-001-00-345-01	389	606	1.212
61	Roger & Brenda Beall	12		vol 10 pg 125.pdf		286	136	0.245
62	David R. Wise	12		vol 10 pg 124.pdf		242	245	0.246
63	Billy & Doris McManis	12		vol 9 pg 407.pdf		328	614	
64	Robert & Donna Hoelscher	12		vol 10 pg 123.pdf		317	502	0.304
65	Rick & Jan Lower	12		vol 10 pg 431.pdf	G19-001-00-329-01	335	824	1.282
66	Donald & Rhonda Graham	12		vol 10 pg 507.pdf	G19-001-00-346-01	315	486	2.661

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

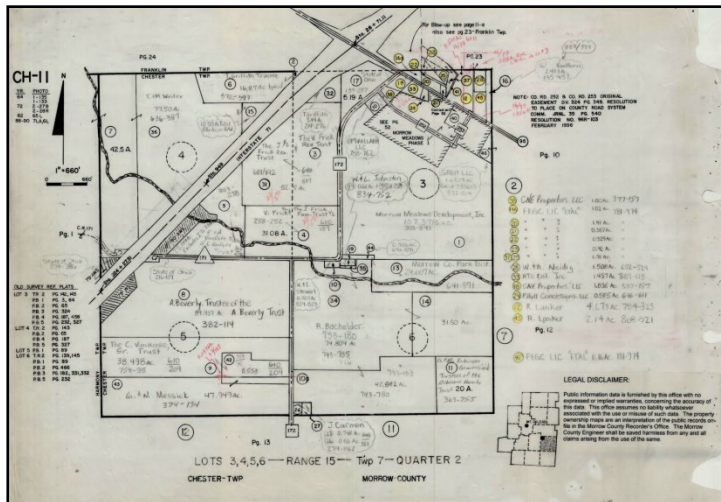
Additional Layers

Morrow County - Parcel Conversion

Georeference Scanned Tax Maps

Data Conversion

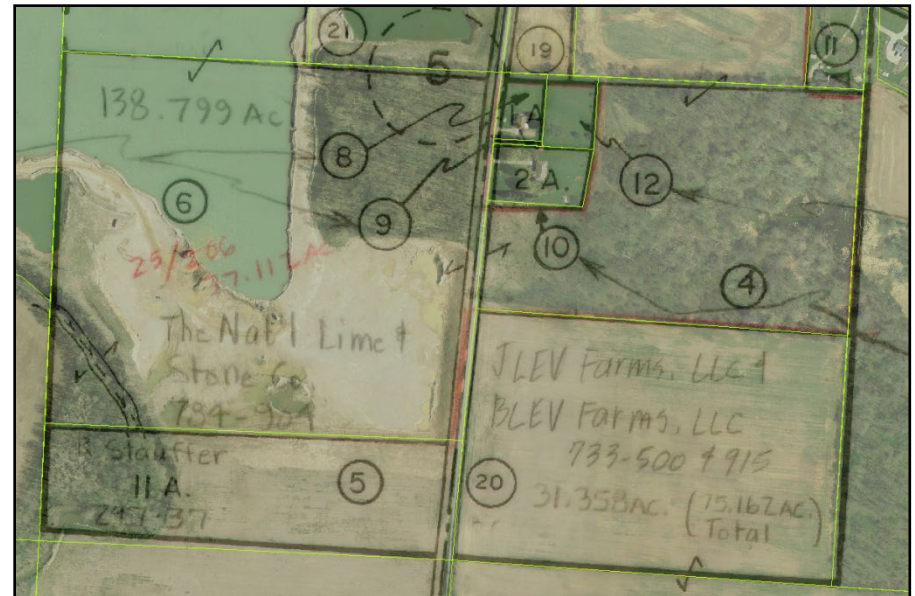
- * ~ 1,025 Scanned Tax Maps
- * Converted from PDFs to TIFs
- * Georeferenced using LBRS Road Centerlines and 2013 Orthoimagery



Morrow County - Parcel Conversion

Digitize Parcels

- * 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

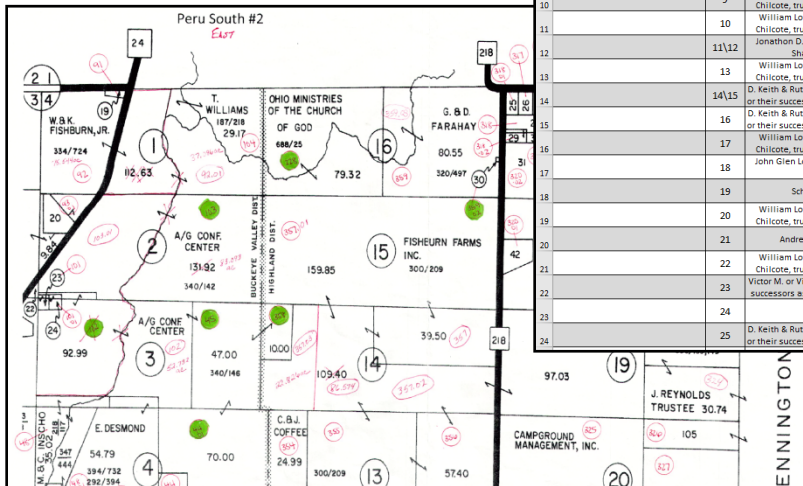
Assign Attributes

- * 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



FROM WHOM	PLAT NO.	LAND OWNER	SEC.	LOT	SURVEY	PPN	VOI	PAGE	ACRES	TO WHOM TRANSFERRED	ACRES	DATE
1	1	David R. McKigan	3	1		H23-001-00-288-00	175	379,381	5.82	David R. McKigan, trustee of the David R. McKigan Trust	5.82	1/22/2013
2	2	David R. McKigan	3	2		H23-001-00-288-00	175	379,381	24.18	David R. McKigan, trustee of the David R. McKigan Trust	24.18	1/22/2013
3	3	Mary M. Ringler (aka Mary M. Sears)	3				369	91	8.89			
4	4	Mary M. Ringler (aka Mary M. Sears)	3				369	91	23.712			
5	5	Carey D. & Sylvia A. Hutchins	3			H23-001-00-284-00	621	692	37.00	Carey D. Hutchins	37.00	4/1/2015
6	6	D. Keith & Ruth Ann Linnaberry, Co-Trustees or their successors in trust of the Linnaberry	3			H23-001-00-283-00	725	654	15.17			
7	7	Thomas & Carrie Blackburn, Jr.	3			H23-001-00-281-00	766	65	23.25			
8	8	William Lowell Chilcote or Marjorie M. Chilcote, trustees or their successors as	3			H23-001-00-279-01	374	407	20			
9	9	William Lowell Chilcote or Marjorie M. Chilcote, trustees or their successors as	3			H23-001-00-279-01	374	407	48.968			
10	10	William Lowell Chilcote or Marjorie M. Chilcote, trustees or their successors as	3			H23-001-00-279-01	374	407	20			
11	11	William Lowell Chilcote or Marjorie M. Chilcote, trustees or their successors as	3			H23-001-00-279-01	374	407	20			
12	12	William Lowell Chilcote or Marjorie M. Chilcote, trustees or their successors as	3			H23-001-00-279-01	374	407	20			
13	13	William Lowell Chilcote or Marjorie M. Chilcote, trustees or their successors as	3			H23-001-00-279-01	374	407	20			
14	14	D. Keith & Ruth Ann Linnaberry, Co-Trustees or their successors in trust of the Linnaberry	3									
15	15	D. Keith & Ruth Ann Linnaberry, Co-Trustees or their successors in trust of the Linnaberry	3									
16	16	D. Keith & Ruth Ann Linnaberry, Co-Trustees or their successors in trust of the Linnaberry	3									
17	17	William Lowell Chilcote or Marjorie M. Chilcote, trustees or their successors as	3									
18	18	John Glen Long (Jack & Marilyn Long Life Estate)	3									
19	19	Schade Properties, LLC	3									
20	20	William Lowell Chilcote or Marjorie M. Chilcote, trustees or their successors as	3									
21	21	Andrew J. & Rachel A. Taylor	3	4								
22	22	William Lowell Chilcote or Marjorie M. Chilcote, trustees or their successors as	3									
23	23	Victor M. & Vivian L. Davis, trustees or their successors as trustees of the Davis Family	3									
24	24	Penny Hanners	3									
25	25	D. Keith & Ruth Ann Linnaberry, Co-Trustees or their successors in trust of the Linnaberry	3									

Data for Parcel B04-001-00-016-01

Base Land Valuation Sales Sketch Tax Improvements Additions Residential Agricultural Commercial Comments

Base Data

Parcel: B04-001-00-016-01
Owner: SMITH ANTHONY W & CHARISSE L
Address: 5703 CO 66 RD

Tax Mailing Address

Tax Mailing Name: SMITH ANTHONY W
Address: 5703 COUNTY ROAD 66
City State Zip: EDISON OH 43320

Owner Address

Owner Name: SMITH ANTHONY W &
Address: 5703 CO 66 RD
City State Zip: EDISON OH 43320

Geographic

City: UNINCORPORATED
Township: CANAAN TOWNSHIP
School District: MT GILEAD EUSD

Legal

Legal Acres: 2
Legal Description: 1/2 NW1/4 RTS-17-05-32
Land Use: 511 - SINGLE FAMILY DWLG UNPLAT 0-09
Neighborhood: 00400
Number of Cards: 1
Annual Tax (Does not include delinquencies.): \$1,564.08
Map Number:

Homestead Reduction: NO
2.5% Reduction: YES
Foreclosure: NO
Board of Revision: NO
New Construction: NO
Divided Property: NO
Routing Number: 115 SW

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

Morrow County - Parcel Conversion, Parcel Fabric Upload

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

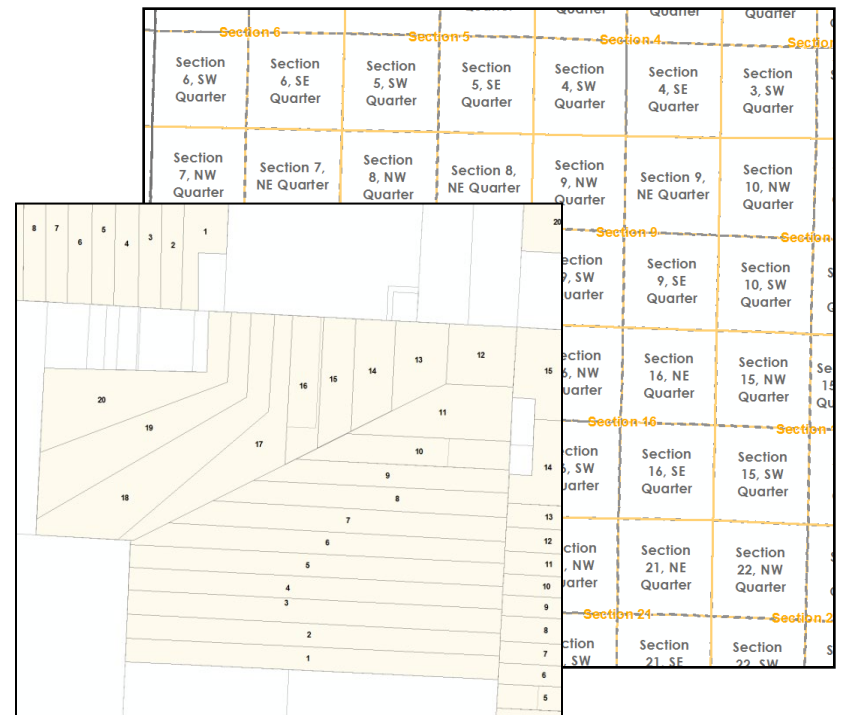
Add Fields to Parcel Fabric (cont.)

- * 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



Morrow County - Parcel Conversion, Parcel Fabric Upload Staging File Geodatabase

- * 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**
<http://desktop.arcgis.com/en/arcmap/latest/manage-data/editing-parcels/dataloading-polygons.htm>
- * 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

Morrow County - Parcel Conversion, Parcel Fabric Upload Load Topology to Parcel Fabric

- * '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

Morrow County - Parcel Conversion, Parcel Fabric Upload Join Attribute Data

- * 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 ...)

Tax Parcels										
TM_ID	TM_ID_TYPE	TM_Owner	TM_Page	TM_Jurisdiction	TM_Documents	TM_Survey	TM_Notes	TM_Acreage	A_Owner	
5	Bubble	The C. Holtrey Rev. Liv. Trust	CD-24	Cardington Township	724-809	<Null>	A_Fixed	30	HOLTREY DONALD E JR & CAROL TRUSTEES	
6	Bubble	The C. Holtrey Rev. Liv. Trust	CD-24	Cardington Township	724-809	<Null>	<Null>	56.5	HOLTREY DONALD E JR & CAROL L TRUSTEES	
7	Bubble	The C. Holtrey Rev. Liv. Trust	CD-24	Cardington Township	724-809	<Null>	<Null>	10.085	HOLTREY DONALD E JR & CAROL L TRUSTEES	
8	Bubble	D & V VanHouten & R. Brokaw	CD-24	Cardington Township	302-315; 370-62; 382-169; 382-600; 382-701; 749-1031	<Null>	A_Fixed	68.08	VAN HOUTEN DUANE & ETAL	
9	Bubble	D & V VanHouten & R. Brokaw	CD-24	Cardington Township	302-315; 370-62; 382-169; 382-600; 382-701; 749-1031	<Null>	A_Fixed	6.035	VAN HOUTEN DUANE ETAL	
13	Bubble	F & C Barber	CD-24	Cardington Township	289-130	<Null>	<Null>	1.92	BARBER FREDERICK E AND CHARLOTTE A	
12	Bubble	J Hall & The F & L Anthony Trust	CD-24	Cardington Township	335-905; 724-782	<Null>	<Null>	75.229	HALL JUNE M AND	
1	Bubble	D & M & J Mattix	CD-24	Cardington Township	763-942	<Null>	A_Fixed	1.785	MATIX DARYL L ETAL	
17	Bubble	R & M Mattix	CD-24	Cardington Township	763-940	<Null>	<Null>	1.785	MATIX RICHARD & MARTHA	
14	Bubble	D & M & J Mattix	CD-24	Cardington Township	763-942	<Null>	<Null>	1.722	MATIX DARYL L ETAL	
2	Bubble	McClintock Sisters Ltd Part	CD-24	Cardington Township	394-516	<Null>	A_Fixed	68.08	MCLINTOCK SISTERS LIMITED PARTNERSHIP	
10a	Bubble	T Bailey	CD-24	Cardington Township	392-768	<Null>	A_Fixed	6.22	BAILEY TERESA COLLEEN	
10b	Bubble	T Bailey	CD-24	Cardington Township	392-768	<Null>	<Null>	6.22	BAILEY TERESA COLLEEN	
10	Bubble	R & M Baker	L-15	Lincoln Township	319-687; 383-1995Surv	<Null>	<Null>	45.31	BAKER RODNEY E & MONICA L	
12	Bubble	The Mathews Keystone Inheritance Trust	L-15	Lincoln Township	677-567	<Null>	<Null>	17.86	MATHEWS MARK & DAVE CO-TRUSTEES	
14	Bubble	The Mathews Keystone Inheritance Trust	L-15	Lincoln Township	677-567	<Null>	<Null>	4.686	MATHEWS MARK & DAVE CO-TRUSTEES	

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

Morrow County - Parcel Conversion

Resolve Duplicate Parcel Numbers (cont.)

- * 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

Morrow County - Parcel Conversion

Enter Lot Dimensions

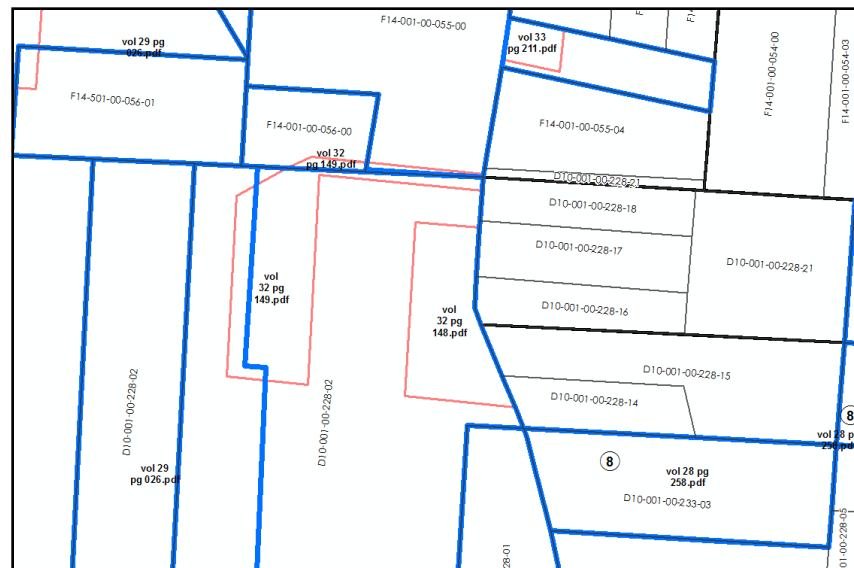
- * The Parcel Fabric can store recorded distances on parcel lines in spite of geometry lengths.
- * Due to this functionality, lot dimensions were entered for all sublots for labeling purposes rather than using static annotation.
- * 54,634 dimensions entered.



Morrow County - Parcel Conversion

Digitize Pending Surveys

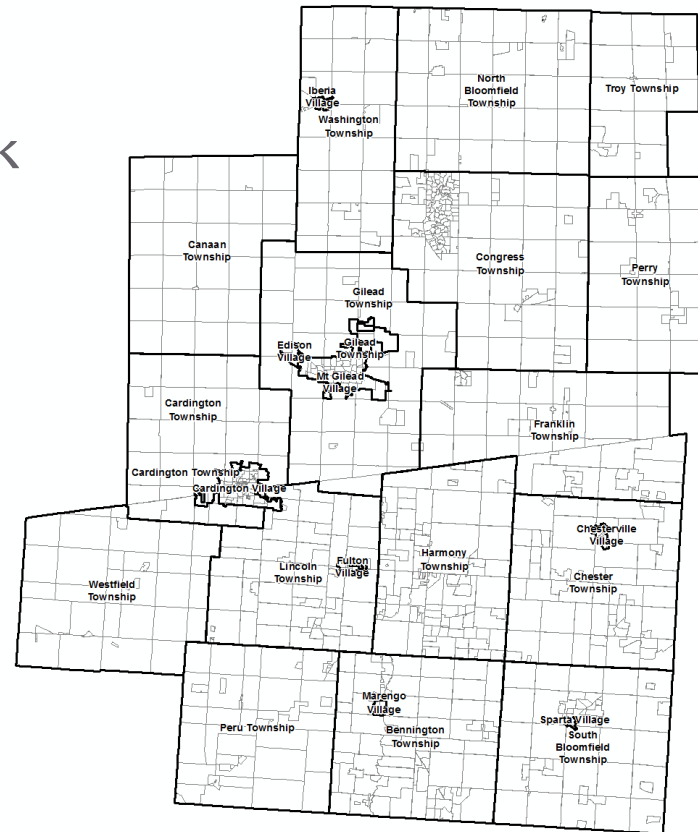
- * Pending and Unrecorded Surveys are sometimes draw on the Tax Maps
- * These were digitized into the Parcel Fabric as Historic (future) parcels



Morrow County - Parcel Conversion

Additional Layers

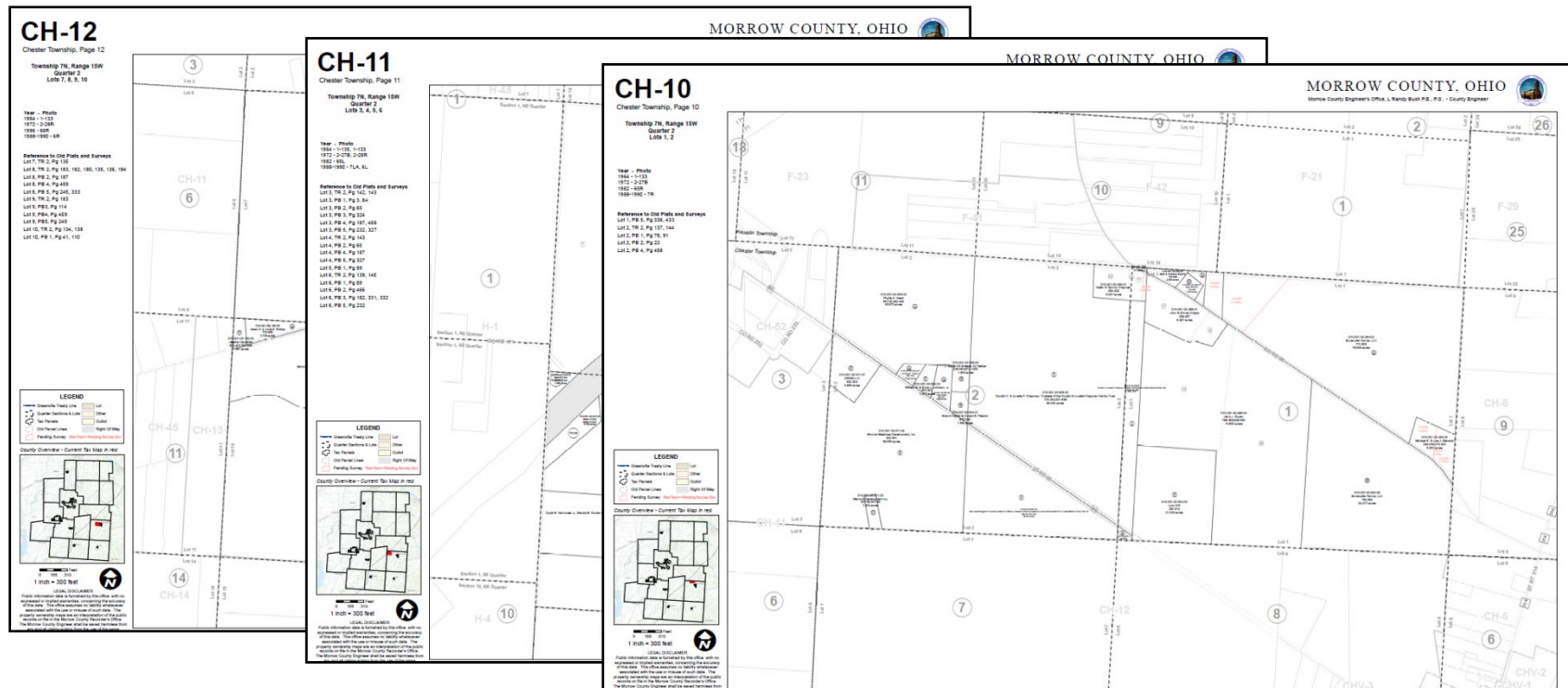
- * Tax Map Index
 - * Critical to Tax Map Mapbook
- * Jurisdictions
- * School Districts
- * Tax Districts



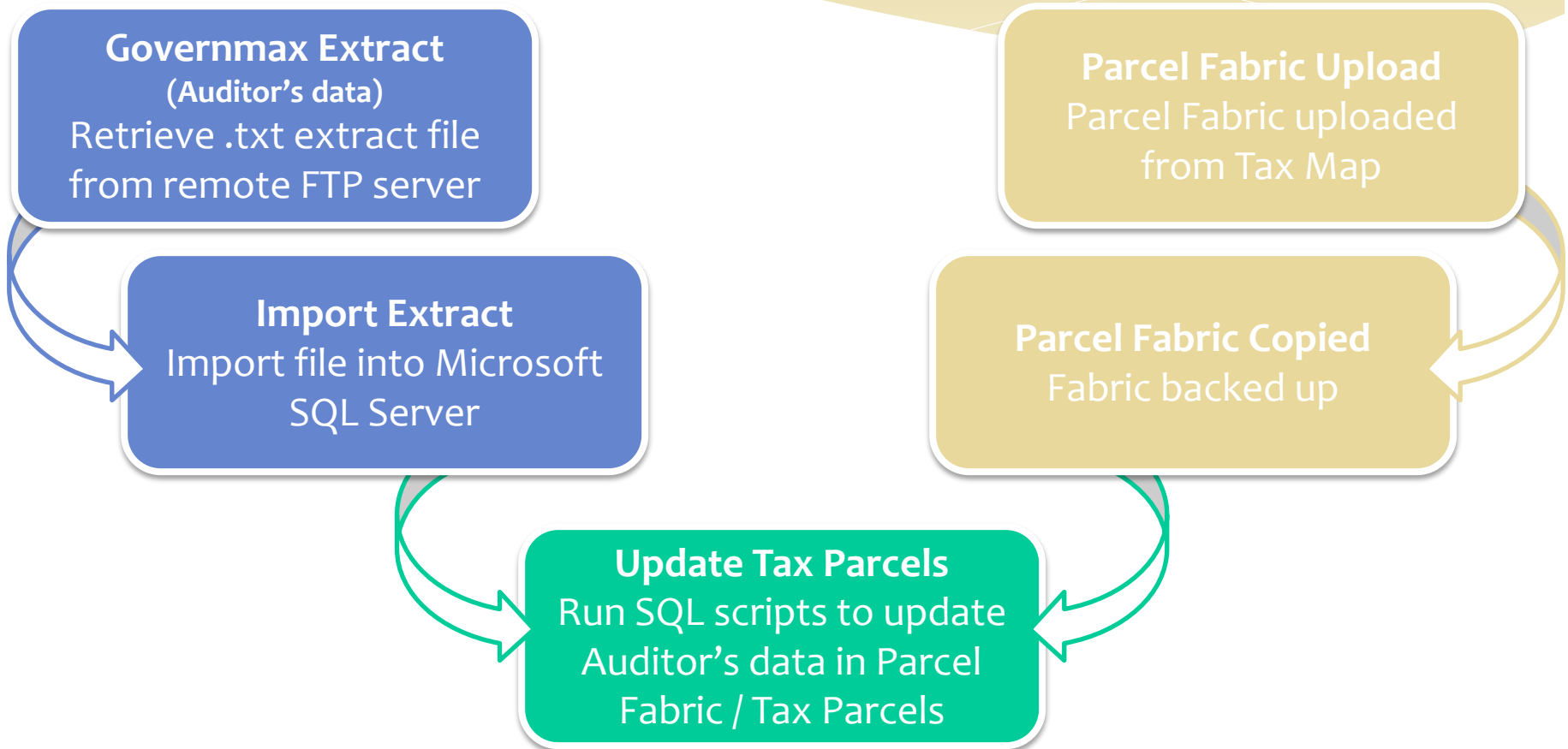
Morrow County

New Tax Maps

- * 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



Morrow County

GIS Infrastructure – Internal Use

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

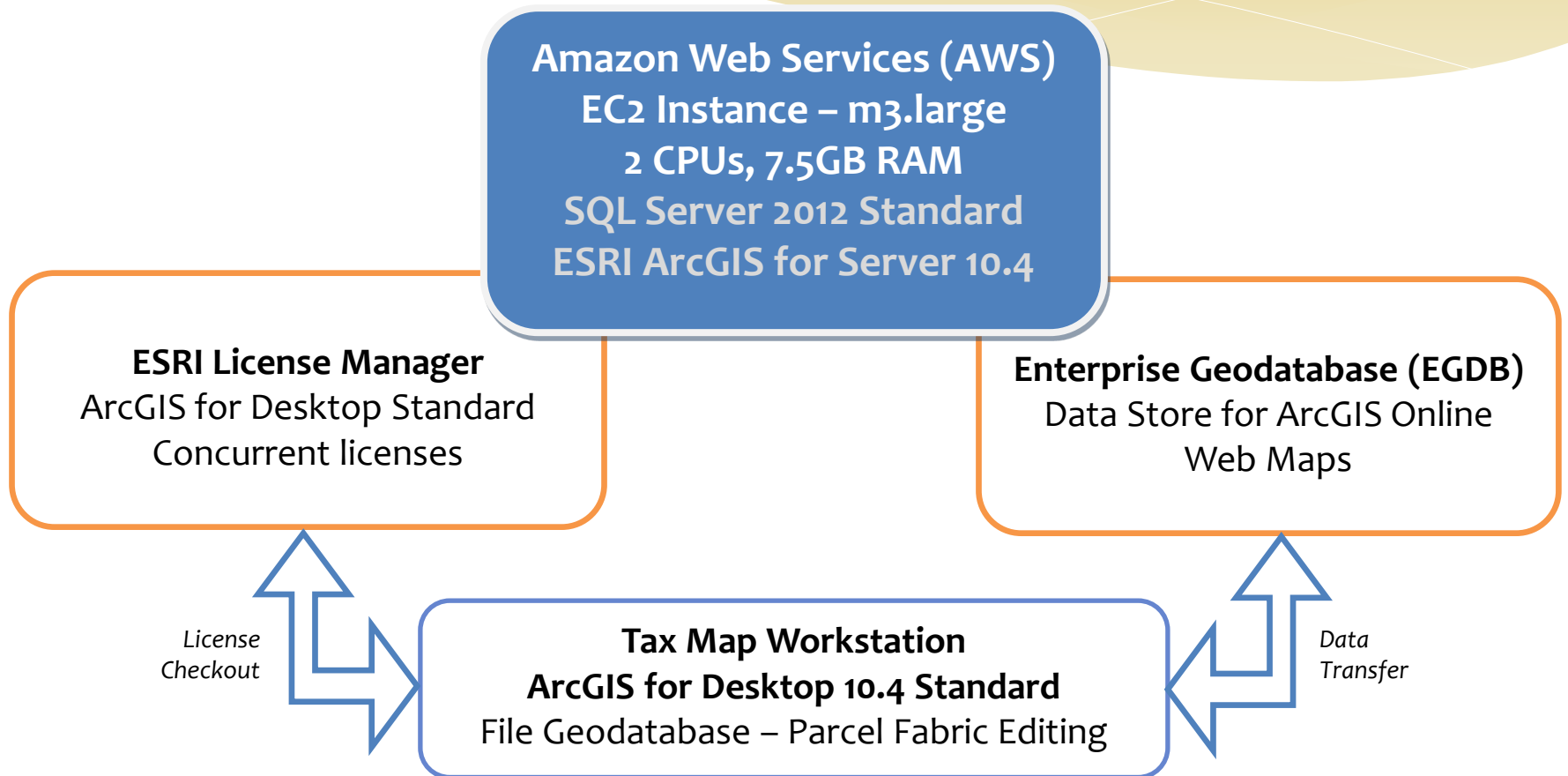
ESRI License Manager
ArcGIS for Desktop Standard
Concurrent licenses

Enterprise Geodatabase (EGDB)
Data Store for ArcGIS Online
Web Maps

*License
Checkout*

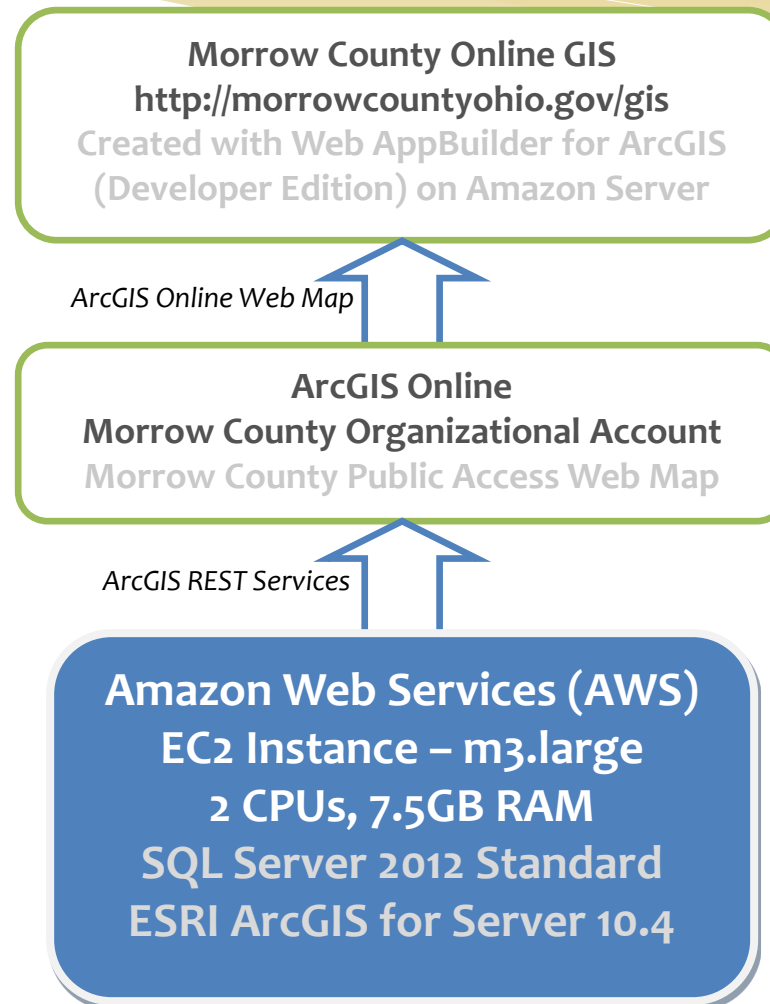
Tax Map Workstation
ArcGIS for Desktop 10.4 Standard
File Geodatabase – Parcel Fabric Editing

*Data
Transfer*



Morrow County

GIS Infrastructure – External Use



Morrow County GIS Website

Morrow County GIS Love life. Live rural. Auditor Engineer

Search: B04-001-00-042-00

Show search results for B04-001...

Layer List

- Operational Layers
 - ☒ Parcel Related
 - ☒ Tax Parcels

Tax Parcels: B04-001-00-042-00

PIN: [B04-001-00-042-00](#)
Tax Map ID: 9
Documents: 269-625
Tax Map Page: CA-27
Jurisdiction: Canaan Township
School District: Mt Gilead EVSD
Survey:
Owner: BUSH HAROLD
Property Address: 2771 CO 27 RD
Mailing Address: 2571 COUNTY ROAD 27
EDISON OH 43320
Land Use:
Acreage: 80.00000

[Zoom to](#)

Map Labels: Canaan Township, Cardington Township

Scale: 0.2m

Coordinates: 40.553 -82.871 Degrees