

# Living the Parcel Fabric Life

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Livingston County GIS

# Livingston County GIS

- I started at Livingston County in July 2013
- The GIS Department consists of two people
  - GIS Technician
  - Addressing Official / Mapping Technician
- Began the Parcel Fabric Conversion in early 2014
- Been maintaining data within Parcel Fabric since April 2014
- Livingston County contains about 86,000 parcels
  - Rural Metes and Bounds Parcels
  - Suburban Development
  - Dense “small town” central business districts
- Parcel data is published to a map service which is used within an internal mapping application by county permitting departments.
  - Parcel Viewer Plus

# What will be covered?

- The reasoning behind Parcel Fabric adoption
- Preparing the data for conversion into parcel fabric
- Brief explanation about the process of loading data into Parcel Fabric
- Customizations to improve compatibility with existing schema
- Maintaining data post conversion (Demo)
- Python Scripting to update the county's internal web mapping application



# Shortcomings of the Existing Workflow

- While there was an existing topology, parcels with less detailed property descriptions were modified to fit with neighboring parcels which caused weird jogs and slivers.
  - Many of these jog/sliver issues are under 1ft in length
  - The likely cause may be the result of topology or closure fixes due to the lack of relationship between parcels
- Drawing / Splitting Parcels was cumbersome to complete
  - COGO editing was used when possible with new splits and combinations however less experienced GIS editors may have used heads-up digitizing.
  - No really way to easily shift or stretch neighboring parcels.



# Shortcomings of the Existing Workflow

- **We were manually maintaining several datasets at once**
  - Subdivisions / Condominiums
  - Tax Parcels
  - Dimension Lines
  - Historical Tax Parcels
- **High risk for mistakes and data loss**
  - Cutting and pasting between datasets
  - Lots of fields to manually update
- **Limited documentation**
  - There is a huge binder outlining the initial parcel conversion but maintenance documentation was somewhat minimal
- **Due to utilizing a custom methodology, troubleshooting issues could be more difficult**

# Parcel Fabric... But Why?

- The move to Parcel Fabric was being explored before I started at the county.
- We needed a more streamlined solution to replace our current workflow as it was cumbersome to maintain parcels.
- Parcel Fabric provides an opportunity for some automation to minimize data entry and future drawing errors while improving the overall workflow and data quality.
  - Automatically Maintains Dimensions
  - Easy Historical Parcel Archive
  - Parcels relate to Lots and Subdivisions which relate to PLSS Sections and PLSS Townships mainly because Parcel Fabric is based on Lines and Points.



# Parcel Fabric... But Why?

- Parcel fabric includes plenty of resources such as documentation, demos, and tools to utilize for conversion and actual use
  - White Papers
  - Workflows, Tools and Scripts
  - Likely Future Software Support, or at least conversion tools
  - Troubleshooting resources available through forums and Esri Support
- Specialized Editing Tools
- Subdivisions and Sections can be integrated to improve the overall accuracy
- Parcels are adjusted to fit during the joining process.

# What Datasets are in the Parcel Fabric?

- Existing Data that was converted

- PLSS Townships
- PLSS Sections
- Subdivisions and Condominiums
- Tax Parcels
- Historical Tax Parcels

- New Data

- Lots and Units
  - Most subdivisions and condominiums have been added
  - Quality checks on this data is still required
- Encumbrances
  - Easements added as needed/requested

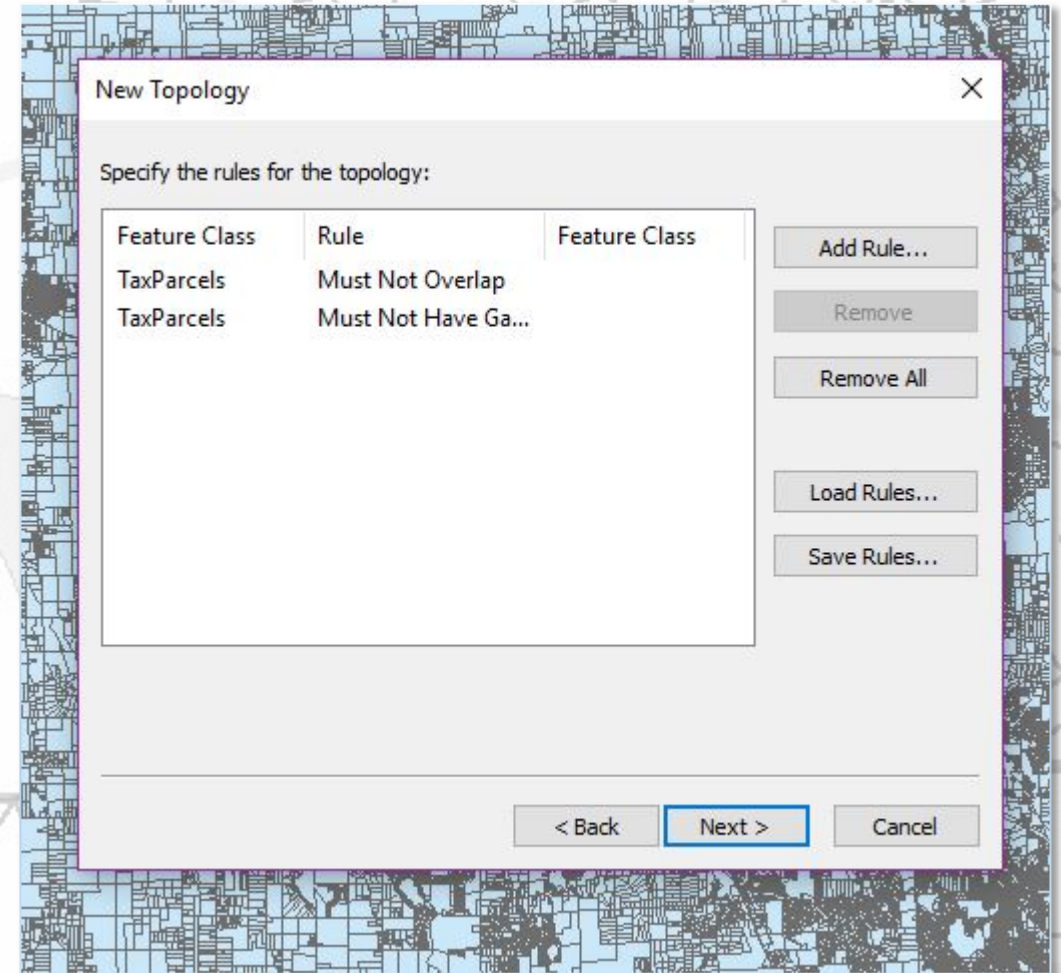
- Existing Dimensions Data was not converted

- Early conversion testing revealed that the dimensions lines were not compatible with the parcel polygons.
- Dimension lines did not exist for the entire county
- New dimension lines were generated from a processed polygon dataset.
- Dimension line are currently generated from Parcel Fabric



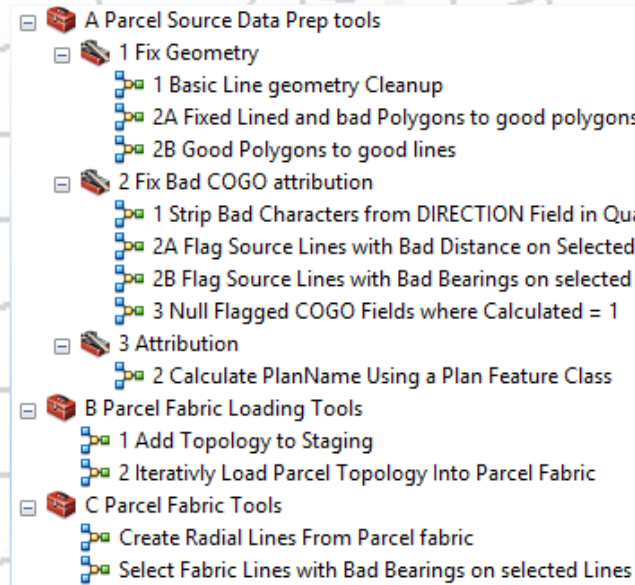
# Prepping Existing Data for Parcel Fabric

- Perform basic topology fixes in all of the dataset being loaded into the Parcel Fabric
  - Remove Gaps
  - Remove Overlap
- Resolve as many topology errors as possible manually.
- “Batch Processing” or automating these types of topology fixes could potentially introduce geometry errors

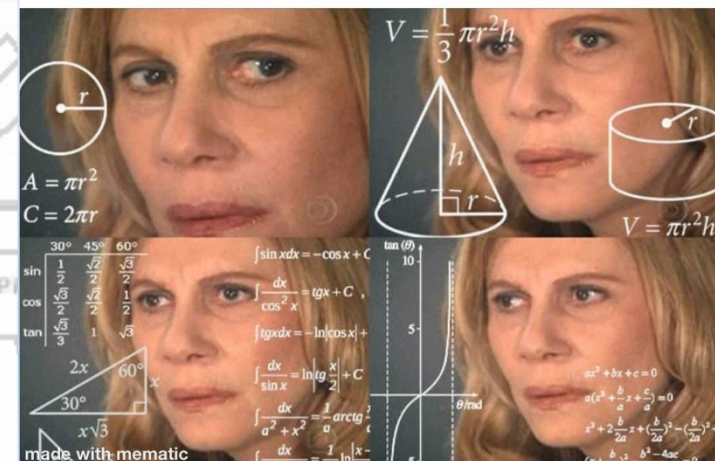
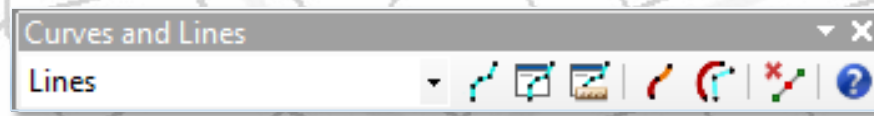


# Prepping Existing Data for Parcel Fabric

- Run Parcel Source Data Prep Tools
- Run Curves and Lines Tools line features generated
- Some tools were not used as they were not applicable to my process so your methodology my vary.
- Always review resulting output with an authoritative version to verify that the data is correct.

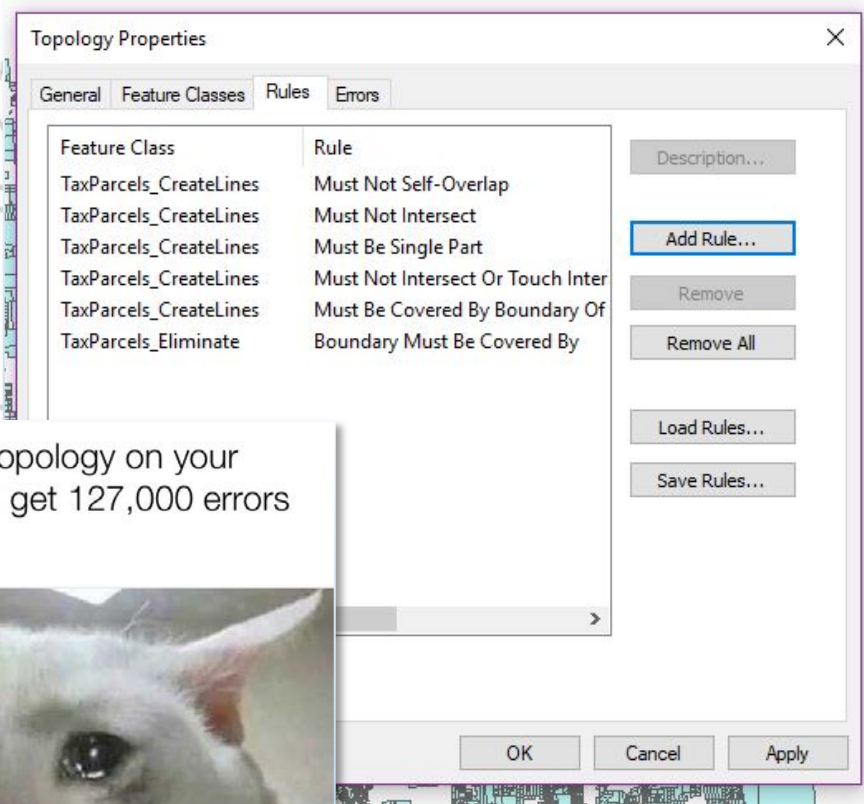


Reading the White Paper and looking over the geoprocessing models to complete your Parcel Fabric Conversion





# Prepping Existing Data for Parcel Fabric



When you run topology on your parcel data and get 127,000 errors



## • Parcel Fabric Loading Tools

- Add Topology to Staging with the following rules

- [Line feature class] Must Be Covered By Boundary Of [Polygon feature class]
- [Line feature class] Must Not Self-Overlap
- [Line feature class] Must Not Self-Intersect
- [Line feature class] Must Be Single Part
- [Line feature class] Must Not Intersect Or Touch Interior
- [Polygon feature class] Boundary Must Be Covered By [Line feature class]

- Clean up topology
- Iteratively Load Parcel Topology Into Parcel Fabric

# Customizations

- Insert and Enhance Domain Tables

- Add Fields to the Attribute Table

- Tax Parcels

- Long\_PID
    - Short\_PID
    - GIS\_Acres
    - In\_Date
    - Split\_From
    - Combined\_From
    - Edit\_Type
    - Source
    - Edit\_Request
    - Comments
    - Technician
    - Facility\_ID

- Subdivisions / Condominiums

- LiberPage
    - Plan\_No
    - CAD\_Code
    - Subtype

Parcel Type	7
Parcel Identification Num	11-25-400-045
Stated Area	1.116 ac
Legal Start Date	<Null>
Legal End Date	<Null>
Created By	SLETTIERI
System Start Date	1/5/2015 2:41:29 PM
System End Date	<Null>
Modified By	SLETTIERI
Modification Date	2/18/2016 11:50:02 AM
LONG_PID	11-25-400-045
SHORT_PID	-045
In_Date	<Null>
Split From	<Null>
Combined From	<Null>
Edit Type	<Null>
Source	<Null>
Edit Request	<Null>
Edit Date	4/24/2014
Technician	<Null>
Comments	<Null>
FacilityID	P18649

- Attribute Assistant

- Parcel Fabric was not initially supported
  - Used for populating “duplicate” fields
    - Long\_PID
    - In\_Date
  - Auto calculates other fields
    - Short\_PID
    - Technician

- These customizations helped maintain compatibility with existing workflows and applications

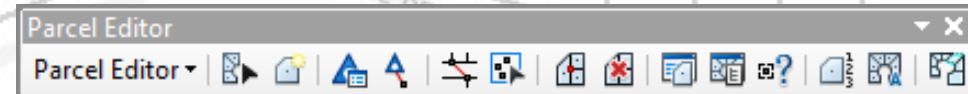


# Parcel Editing - DEMO

When you finally get a Parcel Fabric that not only looks alright but doesn't crash and burn when you open an edit session

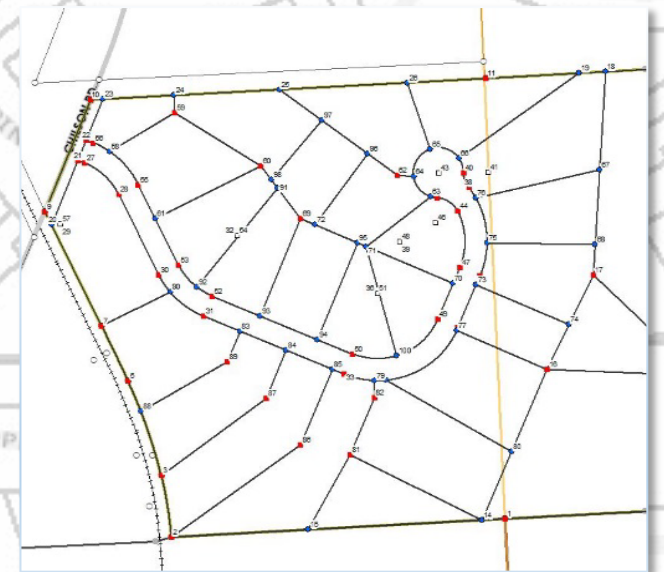
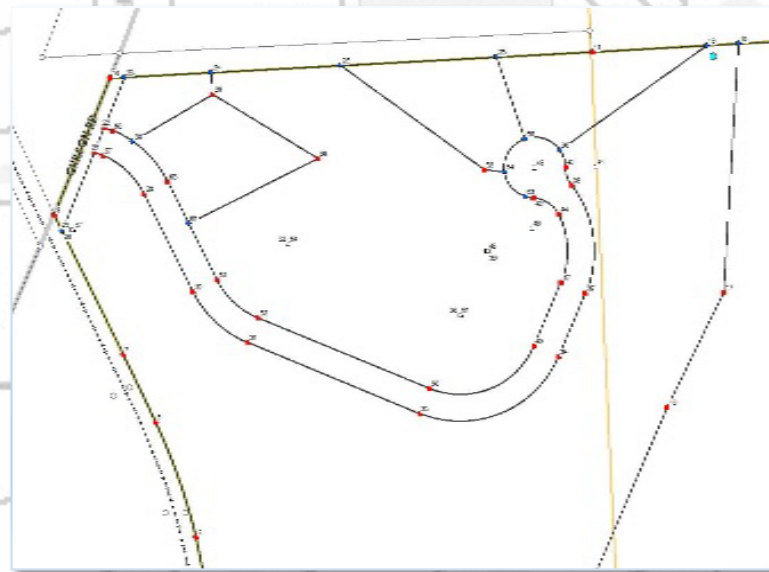
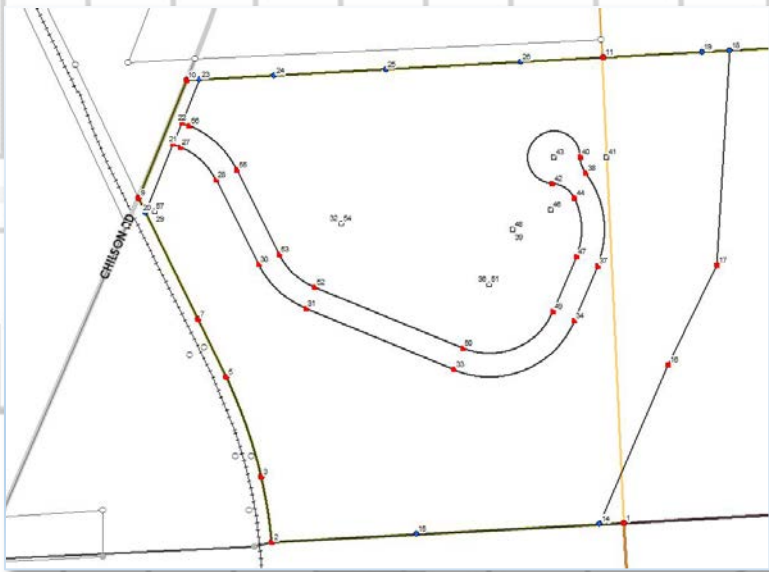


- Parcel Fabric and its components
- Tour of the Parcel Editing Toolbar
- Creating a New Parcel
- Joining a Parcel to the Fabric
- Splitting a Parcel
- Combining a Parcel
- Marking a Historical Parcel
- Merging Courses
- Adding a Line Point
- Deleting a Line Point
- Regenerating Fabric
- Combining Line/Radius Points
- Activating Digitizing Mode
- Resolving Commonly Encountered Geometry Issues



# New Subdivisions / Condominiums

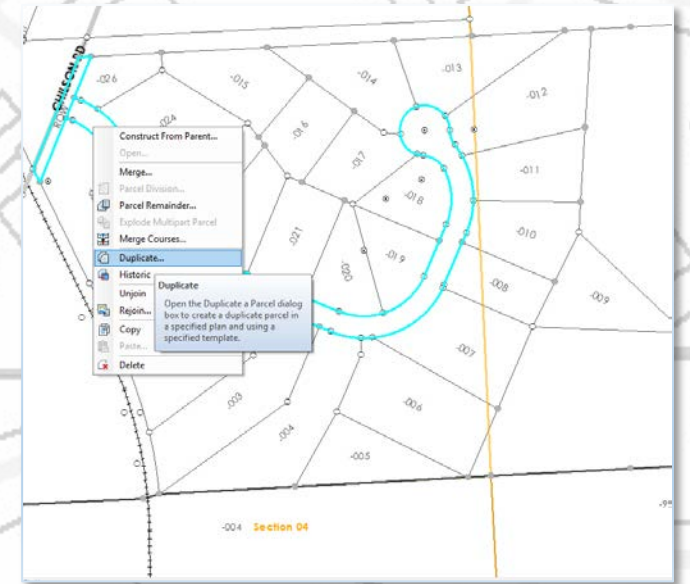
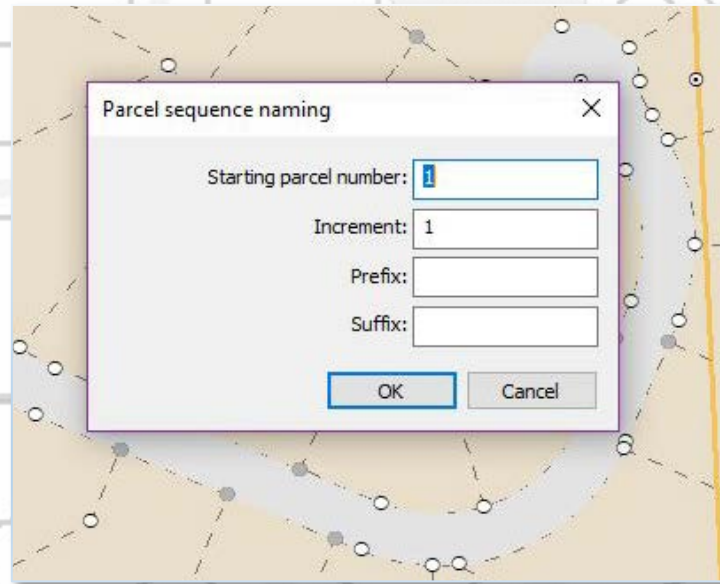
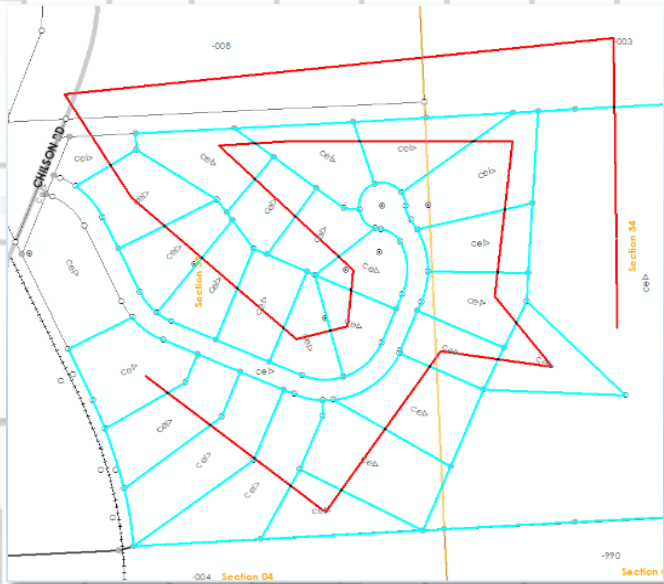
- Similar to parcels, but just on a larger scale.
- Draw the new development's boundary.
- Split the development into smaller parcels, usually I start with the Right-of-Way and move to the lots.





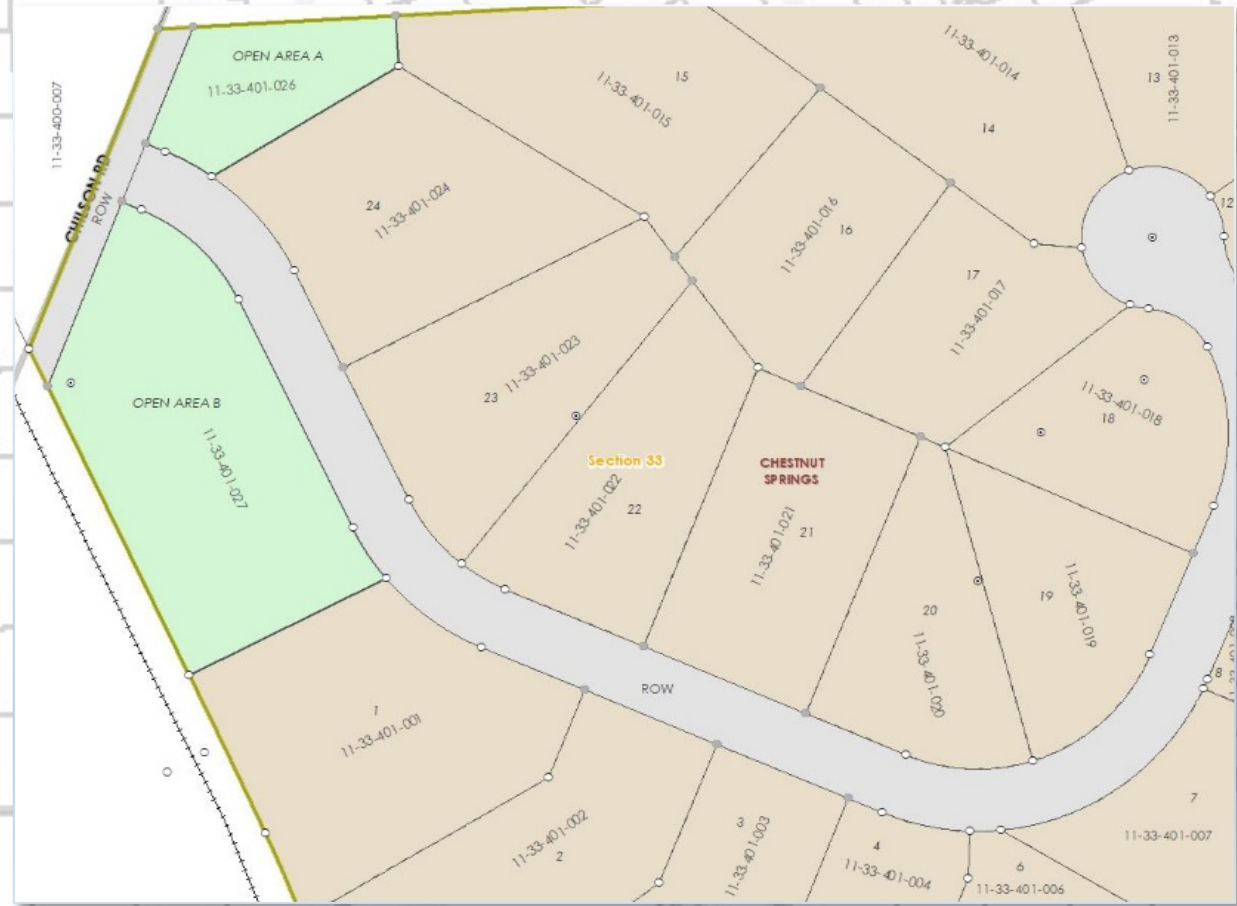
# New Subdivisions / Condominiums

- Once lots have been drawn, naming is completed using the name tool
  - Other Attributes are completed
- Lots are duplicated and edited as needed to represent the parcels.
  - Use naming tool for Parcel ID assignment
  - Complete associated Parcel Attributes



# New Subdivisions / Condominiums

- Once the parcels and lots have been drawn and attributed, you have a completed development with Lots, ROWs, Parks, and Parcels.
- All items will relate to each other.
- Some minor clean-up of new parcels as well as neighboring parcels may be required.
- It gets much easier the more developments that you complete.





# Processing Parcel Edits for use by County Permitting Departments

- Built a processing model within Model Builder to convert Parcel Fabric to an internal use enterprise GIS layer called “Production Parcels”.
- Converted the processing model to Python Script for background processing
- Set up a scheduled task that runs nightly to update an enterprise GIS layer
- Updated ArcGIS Server Map Service to include “Production Parcels” which is available in an internal county web application called “Parcel Viewer Plus”



# What was learned?

## What would I do differently?

- Gain a better understanding of how joining works before diving head first into editing.
- Split or modify “grid type” (Downtown Howell) Right-of-Way parcels so prevent errors during the loading process.
- Line Strings can be frustrating to resolve, especially with curves
- Better utilization of the Curves and Lines Toolset.
- Exercised more care when using the Merge Courses tool with Metes and Bounds Parcels
- Better documentation of the overall conversion process.

After joining the new parcel to the fabric and all the parcels around it are now trash



# The Future of Parcel Fabric

- **Further data clean-up and improvement**
  - Continue to fix joining issues that exist with parcels (mostly western/rural townships)
  - Resolve minor geometry issues
  - Merge courses on parcels that were split unnecessarily
  - Remove Line Strings when necessary
- **Adapt the current dataset to work within the Parcel Management functionality that will eventually be included with ArcGIS Pro**
- **Incorporate Remonumentation data in the Parcel Fabric as control points**



# Contact Me!

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