VERSION 1.0

State of Connecticut's GIS Parcel Data Creation Guidance and Specifications

Connecticut GIS Office

CONNECTICUT Policy and Management

Executive Summary

The Connecticut GIS Parcel Data Creation Guidance and Specifications ("Parcel Guidance") is a technical document developed by the GIS Advisory Council's **Parcel Data Creation Working Group** in collaboration with the Connecticut GIS Office. It provides a consistent framework and quality standard for creating, maintaining, and updating parcel GIS data, ensuring uniformity and interoperability across the state.

High quality data of land records and cadastral information are a linchpin of governance and policy both with local communities and for the State of Connecticut, supporting functions such as land administration, taxation, zoning, emergency response, environmental and infrastructure planning, and economic development. Despite its importance, variations in data collection methods, source materials, and updating cycles have historically led to inconsistencies. Each year, Connecticut's Councils of Government collect digital parcel files and standardized CAMA data from their member municipalities, in accordance with C.G.S. 7-100l. The reporting also meets the requirements with C.G.S.12-62(i) for municipalities in a revaluation year. Through voluntary cooperation, the Office of Policy and Management (OPM) receives copies of these datasets, which the GIS Office then integrates into a single standardized dataset for public access. The GIS Office does not alter any municipal parcel files but ensures they are formatted consistently for ease of use. Since spatial accuracy and data completeness vary by municipality and COG, the GIS Office continues to work with stakeholders to improve data quality, interoperability, and accessibility, ensuring that Connecticut's parcel data can be effectively used across multiple levels of government, private industry, and public applications. To learn more about statewide parcel data, visit: https://geodata.ct.gov/pages/parcels

This document serves as both a foundational guide for new GIS practitioners and a technical reference for experienced professionals. Its goals are to:

- Provide a common framework for discussion on parcel data management to improve collaboration among professionals and stakeholders.
- Promote consistency in parcel data standards (including attribute fields, metadata, and database structures) to enhance interoperability.
- Facilitate the creation of accurate and comprehensive GIS and tabular datasets for taxation, land-use planning, economic development, infrastructure design, emergency response, and other applications.
- Improve data quality through spatial accuracy, error reduction, and long-term data integrity measures.
- Establish best practices for parcel modifications and updates, such as splits, merges, right-of-way adjustments, among others.
- Ensure parcel data can be integrated and aggregated across multiple levels of government, to support broader planning and policy efforts.
- Support the use of parcel data by government agencies, private industry, and non-governmental organizations to deliver services and drive economic value.

Thank you to all the contributors to this document:

Ashley Benitez (GIS Coordinator, OPM)

Jacob Conshick (Geographic Information Systems Analyst, City of New Haven)

Thad Dymkowski (Transportation Supervising Planner, CTDOT)

Leah Hodges (GIS Analyst, OPM)

Alfredo Herrera (Geographic Information Officer, OPM)

Kristen Labrie (GIS Project Manager, Tighe&Bond)

Eric Lindquist (Water Resources Planner, DPH)

Meg McGaffin (US Manager of Geospatial & Data Solutions, SLR Consulting)

Mark Hoover (GIS Director, MetroCOG)

Carl Zimmerman (Program Manager, NYC Department of Youth & Community Development)

Reviewers:

Emily Caltagirone (Professional Services Advisor, Esri)

Marwin Gonzalez (GIS Division Manager, QDS)

Christine Goupil (Policy Development Coordinator, OPM)

Matt Hampel (Regrid)

Katherine Kiyanitsa (Program Manager, Parcels & Civil Boundaries at NYS Office of Information Technology Services)

Aaron Nash (GIS Project Manager, Connecticut Transportation Institute)

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Key Concepts

Acreage: The term acreage can be used to indicate a large parcel of land not necessarily measured in acres. Includes farms, timberland, recreational acreage, idle land, and waste land in rural locations.

Annotation: Graphic text on the map, typically used to display dimensions, lot number, parcel ID, or other necessary information as deemed necessary.

As-built: A survey map or drawing that depicts the parcel including any building footprints, paved areas, and other site features, as it was constructed (reflects any deviations from original plans).

Cadastral data (cadaster): Detailed information about rights and interest in land such as property boundaries, ownership and value.

CAMA: Refers to the Assessor's Computer Assisted Mass-Appraisal software or database. This contains all ownership and other information as it pertains to the property and any structures to establish real and personal property valuations for property tax purposes.

Cardinality: A mathematical phrase that describes the type of relationship between two datasets, determining whether a one-to-one (1:1) or one-to-many (1:many) relationship exists.

COGO (COordinate GeOmetry): A method of parcel creation that involves inputting the parcel line length in feet with decimal inches, and line direction in geographic coordinates. This can be quadrant based decimal degrees or degrees, minutes, seconds. A method for calculating coordinate points from surveyed bearings, distances, and angles.

Datum: A reference system that defines the position of geographic coordinates on the Earth's surface.

Domains: In a geodatabase, a mechanism for enforcing data integrity. Attribute domains define what values are allowed in a field in a feature class or nonspatial attribute table.

Feature class (feature layer): In ArcGIS, a collection of geographic features with the same geometry type (such as point, line, or polygon), the same attributes, and the same spatial reference. Feature classes can be stored in geodatabases.

Feature datasets: In ArcGIS, a collection of feature classes stored together that share the same spatial reference.

Frontage: The portion of the tax parcel that abuts the road right of way.

Geodatabase (.gdb): A database or file structure used primarily to store, query, and manipulate spatial data. Geodatabases store geometry, a spatial reference system, attributes, and behavioral rules for data. Various types of geographic datasets can be collected within a geodatabase, including feature classes, attribute tables, raster datasets, network datasets, topologies, and many others. Geodatabases can be of type personal, file, or enterprise.

Georeferencing: The process of assigning spatial coordinates to an image or other unreferenced dataset by aligning it with a known coordinate system. This is typically achieved by identifying control points on the unreferenced data and matching them to corresponding locations on a georeferenced map or dataset.

GIS representative tax records: A property record in the CAMA that is created solely for the purposes of creating a 1:1 match with parcel geometry. Typically referred to as a “placeholder” record. It contains no value information or tax data.

Heads-up digitizing: A GIS data creation method in which a user manually traces geographic features from a georeferenced raster image, such as an aerial photograph, scanned paper map, or survey, using a computer screen and a digitizing tool. This technique is commonly used to digitize parcel boundaries, infrastructure, and other spatial features when precise coordinate-based data (e.g., COGO or GPS) is unavailable.

Hillshade: Hillshading creates a three-dimensional effect that provides a sense of visual relief for cartography, allowing for the definition of ridges, crevasses, and valleys.

Mismatch: A scenario that occurs when a parcel polygon record does not have a corresponding CAMA record, and vice versa. Typically, a "mismatch report" is generated showing all of the mismatches that exist between the two data files.

Metadata: Information associated with GIS data files that provides contextual details. Metadata can include source, coordinate system, attribute definitions, date/time, origin, standards, and other relevant properties.

Metes and bounds: Designation of distance and direction for parcel lines on a map. A system used to describe a parcel land based on a beginning at a known reference point, proceeding to a point on the perimeter of the property being described, and then tracing the boundaries until one returns to the first point on the perimeter, usually a corner.

Parcel Identification Number (or Parcel ID): the unique identifier that is associated with each distinct parcel.

Parcel lines: also known as arcs, are the boundary lines that define the edges of a land parcel. These lines represent the legal limits of ownership

Parcel merge: Combining two or more adjacent parcels to form a new larger parcel. It is often shown with a "Z" on the map between the merging parcels. The prevailing parcel should be designated to specify which parcel is absorbing which.

Parcel split: dividing a parcel into two or more new parcels.

Parent parcel: Primary parcel that encapsulates smaller sub-units, such as in a condominium complex. Can also refer to the original parcel before a split, merge or other spatial change.

Planimetrics: Related to physical features found within a tax map, such as buildings, sidewalks, driveways, out buildings, etc.

Raster: A data file format that represents data in grid cells such as aerial imagery, digitally scanned map imagery, or other such as land use, soil type, land cover, etc. Also known as continuous data.

Schema: The organizational framework for a database that depicts and explicitly states details about the data it contains such as field name, data content type (numerical, textual, etc.), character limitations, etc.

Snapping: The process of moving a feature to match or coincide exactly with another point or feature's coordinates when your pointer is within a specified distance (tolerance). Commonly used to increase accuracy when using a variety of tools including editing, georeferencing, and measure tools.

Shapefile: a digital vector storage format for storing geometric location and associated attribute information of geographic features.

Spatial adjustment: A function used to transform, align, and refine vector data, including rubber sheeting and edgematching. It is commonly applied when adjusting CAD drawings, parcel data, or other vector datasets to fit a spatial reference system. Spatial adjustment allows for precise alignment of features by shifting, scaling, or warping data to match control points or reference datasets. Rubber sheeting and edgematching are typically used for transforming AutoCAD data that is placed at coordinate 0,0. For best results, use 4 or more locations that equally surround the area being digitized to minimize distortion of shape and size. It is distinct from **georeferencing**, which specifically applies to raster imagery and involves assigning spatial coordinates to a scanned image or unreferenced dataset.

Stakeholders: Refers to the primary users and contributors to the GIS parcel data. This may include various municipal department heads, as well as residents.

Surveys: Spatially exact representations of tax parcels collected using accurate survey methods. Surveys can be provided in varying gradients of accuracy. An A-2 survey is a survey map/plan that is prepared by a licensed surveyor who attests that the conditions appearing on the survey show the conditions on the site as built up to the date of the map. Compilation Surveys, or Class “D” Maps, can be prepared when there is sufficient existing mapping around the entire subject property. This mapping may include information in the form of actual survey maps or adequate boundary descriptions in deeds. A class 1A is required to be accurate within 20 feet horizontally and three feet vertically, while a class 2C is 50 feet horizontally and 20 feet vertically.

Topology: Refers to the arrangement that constrains how point, line, and polygon features share geometry. For example, street centerlines and census blocks share geometry, and adjacent soil polygons share geometry. Topology defines and enforces data integrity rules (i.e., there should be no gaps between polygons). It supports topological relationship queries and navigation (i.e., navigating feature adjacency or connectivity), supports sophisticated editing tools, and allows feature construction from unstructured geometry (i.e., constructing polygons from lines). (Sources: 1)

Vector: Refers to a representation of the world using points, lines (polylines), and polygons. It is also known as discrete data.

1 Stakeholders and Collaboration

Parcel mapping is an ongoing, collaborative process that requires continuous updates and coordination among multiple departments. Using this document alongside other municipal data management guidance will help avoiding working in isolation and ensuring that parcel data remains accurate, consistent, and useful for a wide range of applications.

Practitioners work with various stakeholders who play key roles in maintaining land records and cadastral information. Effective collaboration is essential for data accuracy and integration. For example, collaborating with the Assessors' Department can ensure that updates between the inventory system and the GIS are accurate and properly synced, while working effectively with the Engineering Department can help ensure that parcels and addresses used for public safety are correct and accurate. The parcel data creation and digitization process for GIS in Connecticut involves, among others, the following stakeholders (Refer to the **Appendix** for example responsibilities):

- Municipal Clerk
- Assessor
- Building Department
- Planning and Zoning Department and the local Housing Authority Office
- Engineering and Public Works Departments
- GIS Department
- Emergency Management including the Fire Marshals' Offices
- Tax Collector's Office
- Parks' Department

2 Understanding Land Records

Accurate parcel data is the foundation of land administration, taxation, zoning, and planning. At the municipal level, land records are maintained through a combination of GIS parcel geometry and CAMA (Computer-Assisted Mass Appraisal) data, which contains property data attributes and valuations. Understanding how these two datasets interact is necessary for maintaining an accurate, usable parcel dataset. Following established guidance, standards and schemas improves data consistency, interoperability, and usability. **This section discusses land records, linking parcel geometry to Assessor's information, and cardinality.**

2.1 What is a Land Record?

A land record consists of two key components:

- **Parcel Geometry (GIS Data):** A geometric description or **spatial representation** of land parcels, including boundaries, topology, and relationships to adjacent properties. This geometric and boundary information about the land record or survey is usually stored separately in a spatial format within a GIS system.
- **CAMA Information (Assessment Data)**: A **tabular database** managed by the Assessor's Office, containing property information such as sales, ownership details, land use, property valuations, and other characteristics. The computer-assisted mass appraisal (CAMA) system is an essential tool used in property appraisal and assessment to manage property data attributes and valuations. Typically, CAMA systems comprise four components: data management, valuation, performance, and administration.

2.2 Linking Parcel Geometry and CAMA Information

To effectively use parcel GIS and CAMA data, they must be joined by a unique identifier that is often called a parcel ID or parcel identification number (PIN). It is crucial to design and name parcel attributes in a way that enables a seamless join to CAMA information, and thereby unlocking critical functionality for visualization, mapping, and analysis. GIS professionals should coordinate with the Assessor to identify which CAMA field contains the unique identifier that consistently and accurately represents each individual assessment record to be shown in the parcel layer. In many municipalities, this unique identifier may not follow the traditional Map-Block-Lot structure, it may have been established by using legacy conventions or following an internal numbering system. While these approaches vary, the recommended solution is to implement a consistent identifier system that supports strong linkages between CAMA and GIS. This could include structured IDs that reflect relationships, for example, prefixing by town code (e.g., 053-0012345), assigning a "_MAIN" suffix for condo master parcels (e.g., 053-C100-MAIN). In general, these are recommended fields and information to include in the parcel attributes and metadata to ensure that each record is uniquely represented and easily joinable across datasets (see *Feature-Level Schema* for more*)*:

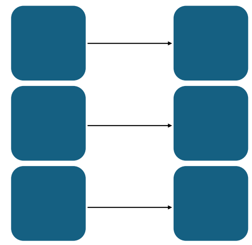
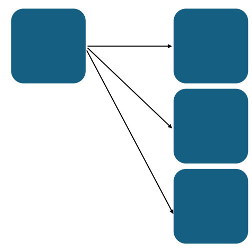
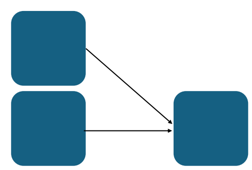
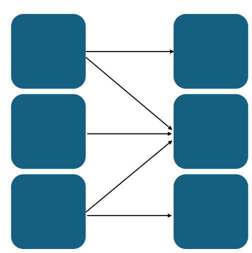
- A unique identifier field that is structured consistently used across systems to prevent mismatches.
- Standardized attributes for comprehensive analysis and classification of properties such as land use codes, zoning classification, and parcel type.
- Metadata documenting the date of data acquisition and updates.
- Metadata describing the use of fields to perform joins between the CAMA and Parcel dataset (e.g., "the linking ID was developed by combining MBL in the CAMA and adding the town code prefix "162").

2.3 Cardinality and Geometry

The cardinality between two datasets specifies how records in one dataset relate to records in another, describing the numerical relationship between objects in an origin class and those in a destination class. In parcel mapping, cardinality refers to how GIS parcel polygons (geometry) correspond to CAMA assessment records and vice versa (see Table 1). To support better integration, transparency, and analytical functionality, it is recommended maintaining **1:1 cardinality between parcel geometry and assessment records**. This structure makes the parcel layer more effective for:

- Spatial joins with Assessor's data
- Abutter notifications
- Address mapping
- Supporting spatial analysis (e.g., filtering, querying)

Table 1. Overview of Cardinality Relationships for Parcel Data

One-to-One (1:1)	Each parcel polygon has a single corresponding record in the CAMA database. Used for standard parcel properties where each lot is assessed as a single entity.	
One-to-Many (1:M)	A single parcel polygon links to multiple CAMA records. This is common in cases like: - Condos or trailer parks: Units are taxed separately but share a parent parcel. - Leased properties: One parcel may have multiple tenants, each with a separate assessment.	
Many-to-One (M:1)	Multiple parcel polygons link to one CAMA record. This applies to properties with several lots under one ownership, such as: - Garages or outbuildings that can be mapped separately but belong to a main property.	
Many-to-Many (M:M)	Occurs when multiple parcels are linked to multiple records in the CAMA database. This setup is uncommon in standard parcel mapping. Many-to-Many situations may arise (but should be avoided) in cases like: - Multi-use commercial buildings with separately taxed units sharing parcel boundaries. - Properties with multiple owners and assessments, such as cooperative housing.	

3 Data Sources

Parcel updates should follow a structured methodology, relying on authoritative sources such as survey maps, or geo-referenced AutoCAD files. Lower-accuracy sources (e.g., paper tax maps, GPS data) should only be used when higher-quality data is unavailable. Parcel editors should adhere to the latest guidance and standards to maintain data accuracy and consistency. Common sources for parcel updates include Municipal Clerk survey maps, AutoCAD files, property deeds, and original printed tax maps. The most suitable source depends on availability, accuracy requirements, and project needs. The combination of data quality and editing methodology determines the overall reliability of the dataset. Regardless of your data source, it is best practice to notate where your data came from when entering in new spatial information. This can best be done by having an attribute in your attribute table that describes in one or two words the source of your data. **Below is a breakdown of common sources, their uses, limitations, and pros and cons.** The Drawing Methods by Source Type section describes how to use these sources to draw parcel boundaries.

3.1 Survey Maps/Plans (Town Clerk Records) – Highest Accuracy

Property survey maps (often called A2 Surveys) are legal records conducted by professional surveyors that provide exact property measurements and angles. Line lengths, directions, and angles allow for COGO-based parcel updates. They are often the basis of the legal description of a parcel boundary.

Pros: *Highest accuracy for measurable distance and area; often includes additional information for attribution such as address, lot number, area.*
Cons: *Many parcels lack surveys, and existing ones must be adjusted and digitized to reflect easements and wetlands; horizontal accuracy is limited unless control points are shown on the survey; COGO can be time-consuming for large areas; typos can corrupt COGO linework; survey dates must be checked for updates.*

3.2 AutoCAD (.DWG) Files – Highly Accurate (If Georeferenced)

AutoCAD is a widely used computer-aided design (CAD) software that creates vector-based technical drawings for engineering, architecture, and surveying applications. In parcel mapping, AutoCAD files (.DWG format) are often provided by municipal engineering departments or consultants as a source for updating property boundaries.

While AutoCAD drawings can be highly accurate, they may lack geographic reference (e.g., placed at arbitrary or default coordinates such as 0,0 instead of real-world locations). It is recommended to set coordinate system before creating linework in AutoCAD. When importing into GIS, spatial adjustment may be required, which can introduce error if not handled correctly. Additionally, AutoCAD files often contain multiple types of linework (e.g., roads) in a single file, requiring users to filter and extract only the relevant parcel lines. This is best accomplished by looking in the AutoCAD line file, under the Layer attribute. A good AutoCAD technician will assign different datatypes (parcel, lot, right of way, etc.) under a different Layer name. Select by Layer name to pull the line work you want to transform into a GIS feature. Ensure that all the lines you want to transform are brought over. These lines must then be snapped to existing parcel data and manually attributed, as AutoCAD files do not include built-in parcel attributes.

Pros: *Highly precise when correctly spatially adjusted; retains original survey accuracy.*
Cons: *Errors can be introduced if not spatially adjusted correctly; lacks built-in attribution; parcel boundary lines must be manually identified and extracted from other features in the CAD file.*

3.3 Paper Maps – Moderate Accuracy

Municipalities often begin GIS parcel development using their original paper tax maps as a source. These maps, typically printed on paper or mylar, may have been manually updated by municipal staff over the years. While not as precise as modern digital sources, they can serve as a fairly accurate foundation for an initial parcel dataset and are one of the most efficient methods for creating a full-municipality parcel layer. If the paper maps are of survey grade, they could be used to more accurately adjust parcel geometries across large areas, providing a higher degree of spatial accuracy than typical tax maps. Some tax maps include parcel dimensions, which can be used to generate annotation data. To integrate these maps into a GIS system, they should first be scanned and georeferenced (typically by aligning them to visible features in aerial imagery), then digitized. Once the initial digitization is completed, parcels should be updated using more accurate sources (e.g., survey maps, AutoCAD files) to refine boundaries and ensure that changes reflect current conditions.

Pros: *Efficient for building an initial parcel dataset; can capture rights-of-way (ROWs) and easements.*
Cons: *Accuracy varies by source; often outdated; limited attribution (typically only lot number and acreage).*

3.4 Property Deeds – Variable Accuracy

Many Assessors consider property deeds an authoritative source for drawing GIS parcels due to their status as the official legal description, though their usefulness can vary. They can be valuable for updating and maintaining parcel data, especially when surveys or other source materials are unavailable. Deeds often include line lengths and, in many cases, directions and interior angles. In some cases, historic deeds may use older measurement units such as chains, links, and rods, which require careful conversion and interpretation. Deeds rarely contain addresses or map-block-lot numbers, and their legal language can be complex. The age of the deed will impact the accuracy of the data. There are two situations where deeds can be valuable:

- **For older parcels**, where the deed description may be the only available record of the parcel's shape.
- **When a deed references a map**, which, if located, can provide a more reliable source for defining parcel.

Pros: *Useful for historic parcels; may reference survey maps that provide additional details.*
Cons: *Could be difficult to interpret; missing key parcel attributes (e.g., address, lot number).*

3.5 GPS Data – Variable Accuracy

While raw GPS data alone is not used to define parcel boundaries, it can be valuable for identifying precise X/Y coordinates of corner pins, particularly in large rural parcels. When used correctly, high-accuracy GPS devices can improve the horizontal accuracy of parcel polygons constructed using COGO. To ensure accuracy, GPS data should always be integrated with other sources, such as aerial imagery or survey records. When incorporating GPS data, it is important to verify the collection method, device precision, and datum reference. Survey-grade GPS equipment with centimeter-level accuracy is recommended for parcel mapping, as opposed to consumer-grade devices, which typically have meter-level accuracy and are not suitable for precise boundary work.

Pros: *Useful for verifying parcel locations in the field; can supplement missing survey data.*
Cons: *Accuracy varies depending on collection method; not suitable as a primary data source for parcel boundaries.*

3.6 Updating Parcels Cartographically without Source Data

Parcel boundaries should be updated whenever new or higher-quality source data becomes available. In cases where authoritative sources (e.g., surveys, deeds) conflict, consult with the municipal Assessor or other relevant stakeholders to determine the most appropriate representation of the boundary.

In certain instances, formal source data such as survey maps or digital CAD files may be unavailable. However, parcels may still be updated using Assessor-provided instructions derived from deed descriptions. In these cases, hand-drawn changes—

such as simple splits or boundary adjustments marked directly on a paper map—may be incorporated into the GIS dataset, provided the Assessor has verified the changes and supplied sufficient dimensional information. These cartographic updates, though lacking in formal geodetic precision, may be suitable for incorporation when the scope of the change is limited and the update is clearly supported by legal documentation. The resulting parcel geometry must continue to reflect a legally defensible and ethical depiction of property lines. Such edits should be documented and flagged for future refinement when higher-accuracy data becomes available.

3.7 Summary

Regarding data sources for creating or updating parcels, legal survey maps provide the most accurate and efficient method. AutoCAD files, when sourced from surveyed data, are also reliable and should be grouped with survey maps as an efficient method for parcel creation. Tax maps may vary in accuracy. While some may serve as a reference, older hand-drawn tax maps are generally less reliable than deeds containing COGO (Coordinate Geometry) information. Not all deeds provide usable COGO data, but many do, making deed research a valuable source when survey maps are unavailable. While raw GPS data is not a preferred source for defining parcel boundaries, it can be useful for improving the horizontal accuracy of a polygon by locating property markers, particularly in large areas where other sources are unavailable.

Table 2. Summary of Methods and Accuracy of Sources for Update

Source	Method	Accuracy
Survey	COGO	Very High
Survey	Digitize	High
AutoCAD (known datum)	Manual	High
AutoCAD (unknown datum)	Manual	Medium
Tax Maps	Digitizing	Low
Deeds	Manual	Variable
GPS	Variable	Variable
Hand drawn	Manual	Low

4 Creating and Updating Parcel Data

4.1 General Parcel Modifications

Parcel data must be regularly updated to reflect changes in property boundaries, ownership, or legal status. These edits are typically informed by Assessor records, deeds, surveys, and other official sources. The frequency of updates varies by municipality and depends on workflow, staffing, and budget. Coordination between GIS professionals and Assessors is key to maintaining its accuracy, traceability and usefulness. In the course of parcel data maintenance, there may be instances of property consolidation and property subdivision. **As a best practice, it is recommended to include the authoritative source document designating the parcel modification such as a deed or map on file.** Subdivisions will often involve the use of COGO techniques (see "COGO") or heads up digitizing utilizing a spatially adjusted digital scan of a source map or some combination of both

4.1.1 Common Modifications

- **Merges (Joins):** When parcels are merged, the Assessor should specify which parcel ID and attributes will be retained in the new configuration. This may not always be the largest or geometrically dominant parcel. Document the retired parcel ID, referencing the deed or subdivision map authorizing the change.
- **Splits (Subdivisions):** New parcels created from a split must be assigned a unique parcel ID by the Assessor. Use COGO techniques (see COGO Section) or heads-up digitizing (based on georeferenced survey maps) to define new boundaries. Attribute each new parcel carefully and link back to the source document. In all cases, make sure that the annotation (dimensions, lot numbers, and other map text) is modified to the new configuration as needed.
- **Lot Line Adjustments:** Smaller revisions may be based on new surveys or deeds. Update geometry, attributes, and annotation as needed.

- **Right of Way Vacation/Take:** when portions of existing parcels are taken for Right of Way purpose or when portions of Right of Way are given back to property owner.
- **Other modifications** commonly provided by the Assessor include simple annotation and attribution updates (to resolve a mismatch, for example), address changes, road name changes, and the addition of easements.
- **Topological Corrections:** These corrections are done outside of an official spatial change to the parcel feature class. These commonly occur when a municipality is attempting to correct, topological gaps, overlaps, dangles etc.
- **Updating planimetrics is not recommended to be part of this process.** Surveys may have buildings on them, but these are not as-builts and the ultimate placement of buildings and other planimetric features may change and are better explained and adapted through other methods.

4.2 Parcel Management Tools

A range of GIS software tools are available to support the ongoing maintenance of parcel data. The choice of tools depends on the volume of updates, staffing capacity, licensing availability, and long-term maintenance goal. If a municipality conducts infrequent updates or has limited GIS staffing, parcel data can be effectively managed using any standard GIS software to manipulate polygon layers while using snapping and topology tools. To support more complex workflows such as historical tracking, coordinated updates across departments, or editing of related cadastral features (e.g., easements, ROWs), more structured environments may be required.

Tools like ESRI's Parcel Fabric (available as an extension in ArcGIS Pro) provide a records-driven framework with built-in support for topology, versioning, and change tracking. The tool also benefits from multi-user editing environments (e.g., enterprise geodatabases) and is best suited to municipalities or regions with consistent editing needs and moderate to advanced GIS capacity. To fully leverage Parcel Fabric, users should have an understanding of geodatabase structure, topology concepts, and ideally access to a network of surveyed control points. The complex and often irregular parcel geometries found in many New England towns can present challenges for accurate implementation of Parcel Fabric[1]. In addition, many municipalities in Connecticut currently lack the density of surveyed control points needed to support robust fabric adjustment. In towns where adequate control does exist, implementing Parcel Fabric adjustment may be feasible and worth further exploration; however, this capability is not yet consistent statewide.

4.3 Topology

Topology in GIS is the set of rules and behaviors that model how spatial features share geometry and maintain spatial relationships, such as connectivity, adjacency, and containment. Topology enables automated geometric validation by systematically checking and enforcing spatial accuracy, integrity, and consistency without manual inspection. Topology can be used for detecting and correcting digitizing errors, such as lines that appear to meet but do not connect properly at intersections. Just as maintaining a standardized table format is important for parcel data, validating the quality of parcel linework is equally important. This is achieved through topological rules that define permissible spatial relationships between features (e.g., no overlaps, no self-intersections). At a minimum, parcel lines should not have dangles; all lines must connect by joining, meeting, or intersecting with at least two other lines. When parcel polygons are generated from lines, proper topological structure ensures that the resulting shapes are closed, contiguous, and free from gaps or overlaps with neighboring parcels.

[1] See ***Metes and Bounds*** in the *Key Concepts* and *References and Resources* Sections.

Ensuring Spatial Integrity

Creating a valid topology is one of the most important steps in maintaining spatial integrity. It helps ensure that parcel boundaries line up correctly, there are no gaps or overlaps, and shared edges remain consistent. Without topology, even small errors can compound over time and reduce the reliability of the dataset. Here are some **recommendations for minimizing topological errors and maintaining topological integrity during and after editing:**

Maintaining topology check always turned on.

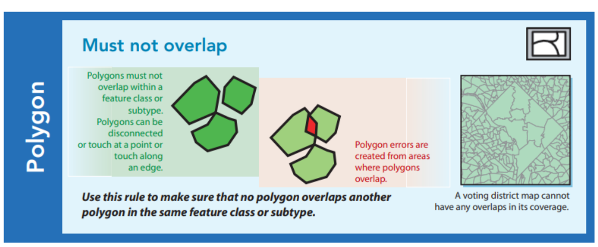
Snapping lines to the correct locations to ensure proper connectivity.

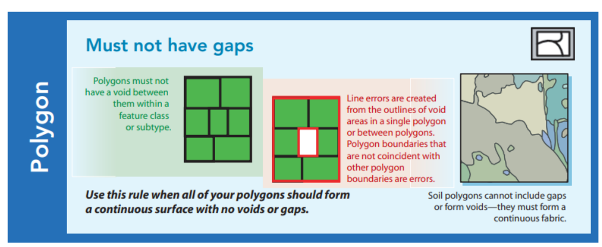
Running a topology check using software tools during editing or as a final quality control step.

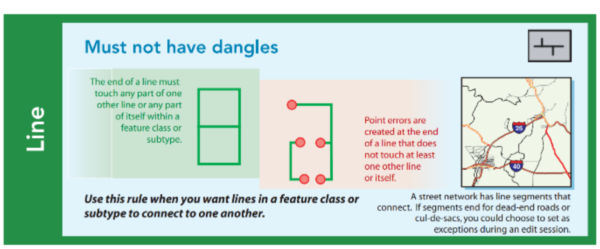
Inspecting parcel polygons for slivers, or small gaps between adjacent polygons, by sorting data by area size to identify and correct small polygons.

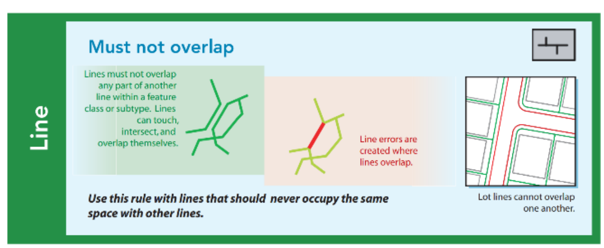
Validating topology at the end of parcel change workflow.

Example Topology Rules[2]









[2] ***ArcGIS Geodatabase Topology Rules.*** See full list at: https://pro.arcgis.com/en/pro-app/latest/help/editing/pdf/topology_rules_poster.pdf

4.4 Municipal Boundaries

When creating or updating parcels that fall along a municipal boundary, it is important to follow a consistent, transparent approach to maintain statewide alignment. The following steps can be taken to ensure accuracy and consistency:

- **If the parcel survey includes a survey of the municipal boundary:** Adjust the parcel geometry to align with the surveyed boundary line. Notify both the GIS Office and the neighboring municipality to ensure coordination and consistency.
- **If the parcel survey does not include a resurvey of the municipal boundary**: Align the parcel geometry with the existing municipal boundary. Use authoritative sources such as the CTDOT's municipal boundary layer[3].

Stakeholders involved in parcel mapping and municipal boundary management, including those in municipal GIS offices, are encouraged to review their internal boundary data against CTDOT's official municipal boundary layer and communicate with CTDOT and the GIS Office about any discrepancies. If discrepancies are found, reconciling those differences collaboratively can improve data quality and reduce future conflicts.

4.5 Choosing the Right Data Format: Shapefile, Geodatabases and Parcel Fabric

There are three primary file formats for maintaining parcel data: **shapefiles**, **geodatabases and Parcel Fabric**.

- **Shapefiles** are a legacy GIS format that includes a spatial file, a projection file and an attribute file. A shapefile may be compared to a manila folder while a file geodatabase would be the equivalent to a filing cabinet. This type of file is useful for basic GIS data storage and sharing. Shapefiles should not be used as a master dataset for critical entities because they have several limitations, such as:

[3] **Municipal Boundaries** can be found here: https://geodata.ct.gov/datasets/CTDOT::ctdot-municipalities/about and at https://geodata.ct.gov/datasets/ctmaps::ct-municipalities-with-fips/about (with FIPS attribution).

  - Field name length restrictions
  - No built-in support for advanced elements such as topology, domains, relationship classes, attachments, metadata and associated tables
  - Separate files required for attributes and spatial data
- **(Recommended) Geodatabases** are data storage files for both raster and vector data and may consist of feature datasets in (thematically grouped layers), feature classes (your layers), tables among other types of files There are two types of geodatabases (table 2). This storage file offers better data integrity with:
  - Centralized storage for geometries, attributes, and metadata at each level (geodatabase, feature dataset, and/or feature class or layer)
  - Support for topologies, domains, and version control (within an enterprise database)
  - Scalability for enterprise-level data management

Table 3. Geodatabase Types

File Geodatabase	Stores spatial data in a folder-based system on a computer. Limited to single-user editing.
Enterprise Geodatabase	Hosted on a database server (e.g., SQL Server, PostgreSQL, Oracle) to support multi-user access, versioning, and unlimited storage (server-dependent).

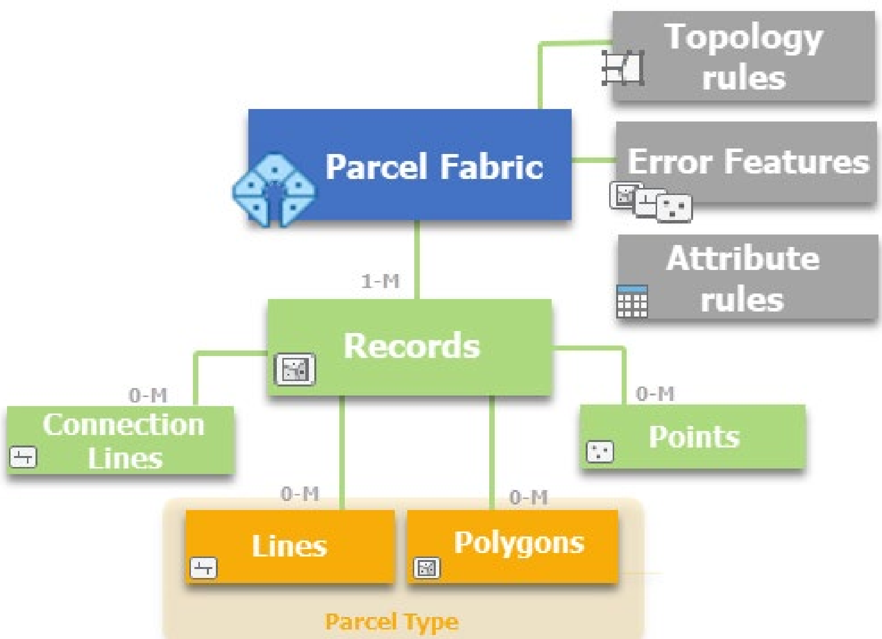
- **Parcel Fabric**[4] is a data model and editing framework in ArcGIS Pro that manages parcels, easements, and related cadastral data. A parcel fabric can be created in a file geodatabase, mobile geodatabase, and an enterprise geodatabase. It is stored in a feature dataset that will adhere to geodatabase topology rules and attribute rules to define parcels and model their behavior. Geodatabase topology rules define spatial relationships between parcel features. Attribute rules can be configured to define additional behavior for parcels and

[4] **See *Section 4.2 Parcel Management Tools*.** In Connecticut, the utility of certain Parcel Fabric capabilities (particularly adjustment and survey-based workflows) is constrained by the prevalence of metes-and-bounds data and limited availability of surveyed control points.

enforce data quality. In addition to standard file geodatabase settings, parcel fabric includes:

- Parcel type feature classes: Polygon and Line for each parcel type
- Records (polygon) feature class
- Connections (line) feature class
- Control Points (point) feature class
- Adjustment feature classes
- Validation Error feature classes and table

Parcel Fabric Data Model[5]



[5] ***ArcGIS Pro, Parcel Fabric Data Model.*** *Source: https://pro.arcgis.com/en/pro-app/latest/help/data/parcel-editing/aboutparcelfabricschema.htm*

4.6 Drawing a Parcel Boundary

Where to Start?	**Point-Based Approach (Not Recommended)** This method starts with creating a point file and placing a point for each parcel, containing its attributes. Parcel lines are drawn separately, and polygons are built from the lines. Attributes are transferred from the points to the polygons. **Line or Polyline-Based Approach** Parcels are drawn in as lines either being COGO'd in from surveys, digitized from paper maps, or imported directly from AutoCAD files. These lines can then be transformed into polygons. The benefit of keeping a copy of your parcels in a polyline format is to keep COGO information on each line that is entered. You must have enabled COGO on your feature class. Topology rules are limited in a line feature class, and it is recommended that a copy of your data be stored as polygons. **Polygon-Based Approach** Parcels are drawn directly as polygons. It's recommended to maintain a separate working polygon layer to prevent accidental deletion or corruption of the official parcel data. Once reviewed and validated, finalized parcels are added to the official dataset. This method offers greater flexibility when geometry is the primary focus. **Parcel Fabric Approach (Esri)** With Esri's Parcel Fabric in ArcGIS Pro, parcels are managed within a connected network of polygon and polyline features that relate to their records. Parcels are created, edited, or retired in response to changes in the record. Each parcel feature is linked to its source record, which allows for tracking parcel lineage and integration with external recording systems. When a record is first created, it has no geometry. As parcels are added or assigned to that record, a record polygon is generated and updates automatically to include the shapes of associated parcels.

General Recommendations

Coordinate System

Use a State Plane coordinate system to maintain consistency with state datasets.

Enable Snapping and Topology

Avoid gaps, slivers, and overlaps by using snapping tools and topology rules throughout editing.

Review: Topology Section

Use Consistent Attribution

Include key fields like Parcel ID and parcel type.

Review: Feature-Level Metadata Section

Edit in a Working Copy

Perform edits in a draft layer before committing to the authoritative dataset.

Back Up and Version Your Work

Backup regularly or use versioning to preserve data history.

Validate Before Finalizing

Use geometry and topology checks to catch and correct errors.

Document Your Edits

Record the source, method, and date of changes using metadata or edit tracking fields.

4.7 Drawing Methods by Source Type

4.7.1 Survey Map / COGO

Performing COGO data creation does not require a spatially adjusted survey, however to verify the accuracy of your work or to digitize easement data and/or flagged wetlands, it is helpful and beneficial to do so.

- COGO enables precise parcel creation by entering measured lengths, angles and directions from survey maps.
- A spatially adjusted survey is not required for COGO entry, but it is beneficial for accuracy of placement and digitizing additional elements (e.g., easements, flagged wetlands).
- Verify whether the survey uses true north or magnetic north, as this affects bearing entry and alignment. Most modern surveys use true north, but older maps may require declination adjustment to ensure correct orientation.
- If COGO tools are unavailable in a GIS platform, direction, deflection, and distance methods can be used as an alternative for parcel digitization.

Steps:

- Parcel creation begins with a known starting point, such as a section corner, control point, or existing boundary. If necessary, coordinates can be entered manually or snapped to an existing feature.
- Each boundary segment is entered using the COGO traverse tool, requiring:
  - Bearings or azimuths (e.g., N45°30'15"E).
  - Distances (e.g., 250.00 feet).
  - Direction to indicate movement along the boundary.
- A closure check ensures that the last segment connects properly to the starting point. If a minor misclosure exists, software tools can make slight adjustments while preserving dimensions.
- Once all boundary lines are entered, a polygon is generated from the COGO lines, and topology validation ensures no gaps, overlaps, or distortions.

- It is recommended (but not mandatory) that initial COGO entry occur in a separate feature class from your parcel features.
    - You can enter COGO as a line or polygon in a separate feature class.
    - These features can be copied to a parcel feature class or replace existing parcel features when verified to be correct or approved.
- Run a topology check to identify and correct overlaps and errors.

4.7.2 Survey Map / On-Screen (Heads-Up) Digitizing

- When digitizing parcels from a survey map, a high-resolution digital raster file of the scanned survey should be used to view the dimensions.
- Georeferencing should be performed using existing parcel lines or identifiable features such as roads, buildings, utility or other discernable features that do not change over time. It is not recommended to use features such as water bodies, for example.

Steps:

- Once the image is georeferenced, enable snapping and digitize line segments according to survey dimensions.
- Either trace lines manually or generate specific line lengths based on the survey and rotate them to align properly.
- Once digitization is complete, replace old parcel lines, snapping surrounding parcels to the updated geometry.
- **Prioritize accuracy!** Lines based on COGO should take precedence over tax map-derived lines.
- Attribute points or polygons with any feature-level metadata (e.g., source, editor, parcel ID).
- Run a topology check to identify and correct overlaps and errors.

4.7.3 AutoCAD / Known Coordinate System

- If a digital CAD (.DWG) file has a defined and verified coordinate system, it can be directly imported into GIS.
- Lines that correspond to parcel boundaries can be copied directly into a working parcel layer. Be aware of non-parcel features (e.g., text, roads, utility layers).

Steps:

- Identify and extract parcel boundary lines (filtering out non-parcel lines such as roads).
- Copy and paste relevant lines into the parcel arcs layer. Be aware of non-parcel features accidentally getting included into your layer (e.g., text, roads, utility layers).
- Because AutoCAD lines have high accuracy (see Data Sources section), similar to lines from COGO, prioritize snapping any lower-accuracy parcel lines to the more accurate CAD-derived lines.
- Attribute polygons with any feature-level metadata (e.g., source, editor, parcel ID).
- Use topology tools to identify dangles or gaps. Run a topology validation to ensure final geometry is clean.

4.7.4 AutoCAD / Unknown Coordinate System

- CAD files without a defined spatial reference require spatial adjustment before integration.
- Lines will be accurate in their original location for length, but spatial referencing may introduce some level of error with rotation or scale.

Steps:

- Import the file into GIS and manually align it using control points.
- Find four points of commonality from the AutoCAD linework and parcel features to use to create the georeferenced control points. Best practice would be to start with a control point in an upper corner, followed by the diagonal lower corner, then the opposite upper corner, followed by the last lower corner.
- Adjust rotation and scale as needed (introducing minimal error).
- Extract and integrate parcel boundary lines into the GIS parcel layer.
- Compare line lengths against dimensions in source documents to determine the most reliable snapping strategy.
- Attribute polygons with any feature-level metadata (e.g., source, editor, parcel ID).

4.7.5 Paper Tax Maps

- Paper tax maps are commonly used to develop town-wide parcel datasets.
- To ensure accuracy, scanned tax maps should be georeferenced using the most precise aerial photography available.
- Check for scale information on the map to verify the accuracy of parcel measurements during digitization.
- Some tax maps may be of poor quality, but they still serve as a starting point before refining parcels with more accurate sources.

Steps:

- Start in densely developed areas, where there are more reference points, and work outward.

- Use multiple control points to refine georeferencing as you progress. Use features like road intersections that are easy to match both the map and the reference data. Best practice for first order polynomial georeferenced is to find a control point in each corner of the image of the tax map.
- When shifting and adjusting the scan, avoid stretching the image, which can distort parcel shapes.
- Enable snapping tools (vertex, edge) to reduce topology errors.
- Attribute polygons with any feature-level metadata (e.g., source, editor, parcel ID).
- Additional data such as dimensions, rights-of-way (ROWs), hydrography, and easements can be captured when available.
- Run a topology check to resolve overlaps and gaps, ensuring the dataset is clean and reliable.

4.7.6 Deeds

- Deeds provide legal descriptions of parcels but often surveyed dimensions (such as interior angles, directions and distances) making them difficult to translate directly into GIS.
- It is recommended to search for referenced maps instead. An old subdivision map is often better than relying solely on deed descriptions (meets and bounds).
- If deed descriptions are unclear or inaccurate, seek alternative sources before making updates.

Steps:

- Identify the starting point in the deed (usually described as "beginning at the northeast corner of the land of {owner} and proceeding southeast 123.45 feet to the other land owned by {owner}…").

- Start by generating a line and continue creating the boundaries based on described distances.
- Adjust orientation of the line based on neighboring parcels and aerial imagery.
- Snap new deed-drawn parcel lines to the most accurate existing parcel line (usually a frontage line).
- If surrounding parcel ownership is unclear, research historic ownership records.
- Ensure that line dimensions attributed to the parcel match the descriptions in the deed records while keeping GIS topology intact.
- Validate topology when spatial adjustment is complete.

4.7.7 GPS Data

- Raw GPS data is rarely used as the primary source for parcel updates, but it can be helpful for improving horizontal accuracy by identifying corner points.
- If using GPS data, ensure that known control points are included.

  Best practices for using GPS data in parcel mapping:

  - Evaluate the quality of GPS data—check collection method, accuracy, and datum reference.
  - If GPS corner points are available, use them to adjust existing parcel lines.
  - Manually connect GPS point data into parcel boundaries if needed.
  - If using GPS points to improve spatial accuracy, ensure at least two datum points for proper alignment.

4.8 Parent-Child Unit Properties (1:1 Cardinality, 1:M Geography)

Multi-unit properties such as condominium complexes, trailer parks, industrial parks, and leased commercial spaces are individually owned units located within a larger land parcel (parent parcel) that is managed or owned collectively. These types of properties require special handling in GIS in order to correctly relate to their assessment record. Often, each individual dwelling unit within a parent parcel is represented in the CAMA system as a separate record. There are multiple ways to represent these relationships in GIS, depending on available data and local conventions. The next section outlines best practices and common modeling scenarios to help ensure consistency and accuracy in representing parent-child property structures.

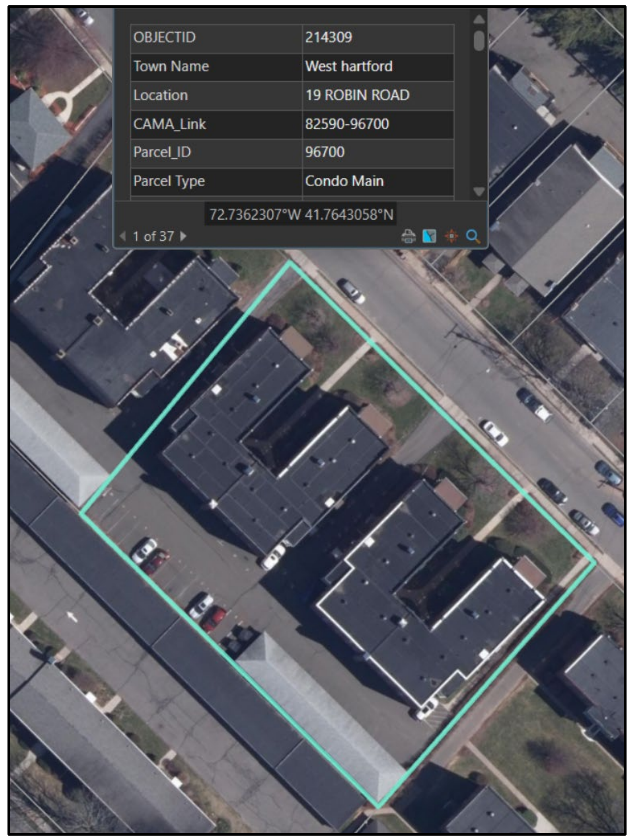
4.8.1 Condominiums and Trailer Parks

A condominium unit is part of a larger building that sits within a parent parcel owned by an entity such as a condominium association. Similarly, in a trailer park, the individual trailers may be owned by separate parties, but the underlying land remains under a single owner.

Two primary methods can be used to represent these relationships in GIS:

1. **Unit Footprints as Individual Parcel Polygons (preferred method):** Each condominium or trailer is represented as an individual polygon overlapping the parent parcel.
2. **Duplicate Parent Parcel Polygons:** The entire parent parcel is duplicated as separate records for each unit, with each record linked to a unique assessment entry.

In both methods, each property record, including the overarching parent owner, will be associated with a singular geometry, providing a 1:1 relationship. However, both methods create overlapping geometries, which typically violate standard GIS topology rules. These overlaps are acceptable in this context and should be **marked as exceptions** in topology validation. In addition, a "GIS Representative" tax record with a zero-dollar valuation may be created in CAMA by the Assessor to maintain a consistent 1:1 relationship between the parcel data and assessment database to ensure correct tax calculations.



Left: Preferred Method. A condo main (yellow) and unit footprints (blue) representing individual ownership of condominium properties.

Right: Entire condo main (blue) duplicated 37 times (in this example) to represent 37 individual ownerships of condo properties in this parcel.

4.8.2 Utility Structures, Land and Cell Towers

If a utility structure, land, or cell tower is located on land owned by a different entity, the parcel may be edited to reflect ownership.

When the utility provider owns the land: The parcel should be cut out as a separate parcel.

If utility provider does *not* own the land: The structure should be overlaid on the existing parcel, with an easement or another designation in a related GIS layer.

If the structure is within a right-of-way (ROW):

Treat it as an island parcel within the ROW.

A utility parcel contained within a parcel with different ownership

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4.8.3 Leased Properties

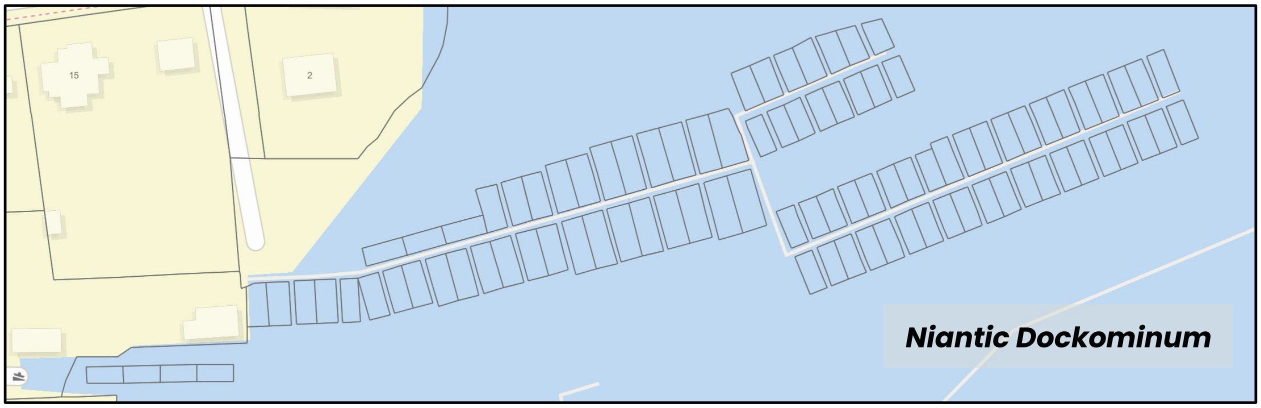
Depending on the legal rights of the lease agreement, a parcel may be owned by one entity while another party (or multiple parties) has full usage rights. This can be represented similarly to condominiums, or a single parcel may be maintained with lessee(s) information stored in the attribute table.

4.8.4 Common-Use Land and Planned Unit Developments (PUDs)

Common-use land and Planned Unit Developments (PUDs) may be represented as individual parcels with multiple ownerships recorded in the attributes or treated similarly to condominium-style parcels. These parcels often include areas such as HOA-managed common land, shared parks, and sometimes structures like garages, outbuildings, or pool houses.

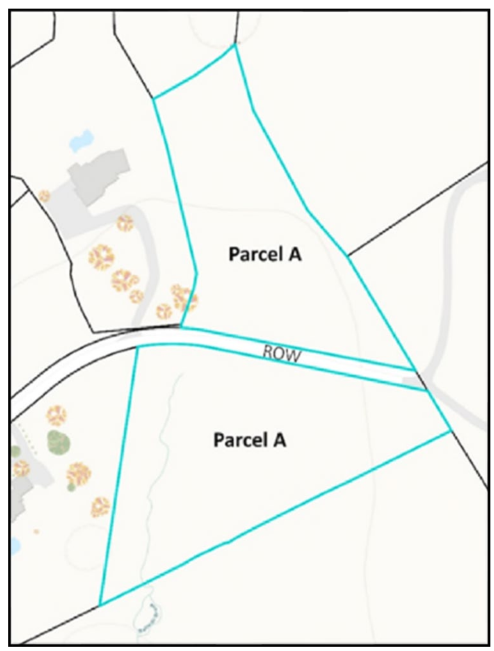
4.8.5 Boat Slips, Clam Beds, and Similar Features

These features can be drawn as singular equal-sized adjacent rectangular polygons for each boat slip within the marina, unless otherwise situated in open water. Property attributes should note owners as appropriate.



4.8.6 Multi-part Non-Contiguous Parcels

In some cases, a single parcel may be physically divided by features such as a right-of-way (ROW), waterbody, or another parcel. Despite the separation. To maintain a 1:1 relationship between parcels and assessment records, a multi-part polygon is recommended. Multi-part polygons allow for a single record to contain multiple non-contiguous sections, preserving the correct linkage to the CAMA database.

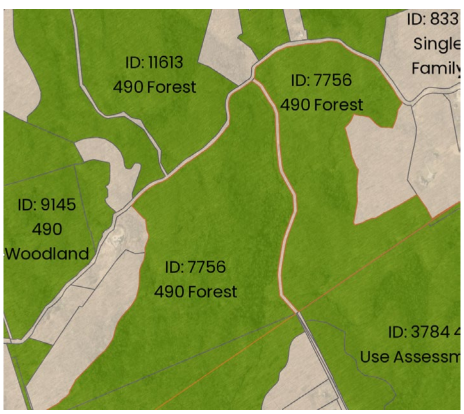


Creating Multi-part Parcels in GIS

For existing parcels, use Editor > Merge to combine polygons into one multi-part feature.
When digitizing new parcels, draw the first polygon, select Finish Part, then add others and select Finish Sketch.

Both methods create a single parcel record, avoiding duplication. Using separate polygons with the same Parcel ID instead of a true multi-part feature can cause duplicate assessment records, mailing errors, incorrect acreage, and issues with searches and spatial queries.

Public Act 490 Properties



PA-490 is Connecticut's current use assessment law, which allows qualified farm, forest, or open space and maritime heritage land to be assessed based on its use value rather than its fair market value or highest and best use for local property taxation purposes.

PA-490 parcels are often managed as a 1:Many in CAMA systems. To maintain accurate 1:1 linkage, represent non-contiguous parcels as multi-part polygons, ensuring proper assessment and record alignment.

4.9 Non-Parcel Features

Municipal parcel datasets often include non-parcel features such as rights-of-ways (ROWs) and water bodies. These features do not function as taxable properties but play a critical role in land administration, planning, and infrastructure management. They also are incredibly important in defining boundaries (parcel, municipal, etc.). The preferred approach is to follow the Connecticut Cadastral & Parcel Data Standard, which recommends explicitly mapping ROWs and water bodies rather than leaving gaps in the dataset.

Why Include These Features?

Transportation planning: ROW boundaries are essential for determining road ownership, jurisdiction, and maintenance responsibilities.

Environmental & municipal planning: Water features influence floodplain management, zoning, and land use decisions.

Data consistency: Omitting these features creates gaps in the dataset, which not only affects the aesthetics of the map but will also affect spatial analysis and topology validation.

4.9.1 Rights-of-Way (ROW)

It is common to come across parcels where the parcel boundary does not align with the paved area of the road. For example, a cul-de-sac could be constructed after a subdivision is complete and the survey has been filed. If there are updated surveys from the cul-de-sac construction be sure to reference those documents. It is best practice to use known control points whenever available.

Misaligned parcel boundary with respect to the road ROW

If there is no source data available and you want to update the boundaries to account for the cul-de-sac, use the following process:

1. Load your road-right-of way/pavement layer onto your map if you have it available and move to step 5, otherwise move to step 2.
2. Create a new empty polygon feature class and name it something relevant such as ROW_Modification, for example.
3. In the new layer draw the road right of way shape as desired.
4. Save your edits.

5. Select the parcels that need to align to the road.
6. Use the split tool and trace the boundary of the road feature to cut the selected parcels. Delete the pieces that are no longer relevant.

4.9.2 Paper Streets

Occasionally, municipalities will designate land in anticipation of a road ROW that may or may not come to fruition, known as “paper streets,” because they only exist on paper. In time, they may decide to “de-authorize” these planned ROW’s and return the land to adjacent property owners (Right of Way vacation). Legal documentation should accompany any such modification specifying the details of the reallocation of land. Parcel lines should be adjusted according to the terms outlined in the documentation, and the newly designated areas can then be merged or dissolved into the appropriate adjacent parcels.

4.9.3 Bodies of Water

Waterbodies can pose unique challenges when they serve as property boundaries as they are constantly changing. Typically, for tidal waterbodies, the boundary is set at the mean highwater line at some point in time. However, navigable waterways such as the Connecticut River have their own set of rules. Property boundaries can shift due to changes in water levels caused by droughts, floods, and changes in access and use. **It is important to consult with your local Assessor and refer to deed and title documents when drafting a parcel with a waterbody boundary.** Tie lines as depicted in surveys, are generally needed to calculate the land area of a parcel with a coastline and therefore should also be reviewed. It is also recommended to use the latest hydrography and imagery dataset. A good resource is the current CT DEEP hydrography dataset which is based on information from USGS topographic quadrangle maps published between 1969 and 1984 so it does not depict conditions at any one particular point in time. If this source is not desirable, you can utilize the hillshade imagery service provided by CT ECO.

Water boundaries changing over time

Aerial imagery offers a powerful lens into how landscapes evolve. Take the Wepawaug River in Milford, for example. The 1934 aerial photograph (top) reveals the river's historical path and surrounding terrain. Fast forward to 2019, the updated aerial imagery shows a close alignment between modern parcel boundaries and current water bodies (bottom). When today's parcel lines are superimposed onto the 1934 image, the contrast is striking, highlighting how both the river's course and the land around it have shifted significantly over the decades.

4.10 Feature-Level Metadata

Metadata is descriptive data about data. GIS software has tools for database and feature class metadata to describe the quality and history of the database or feature layer. Feature-level metadata refers to information about the quality, accuracy, and history of a specific feature, and is kept in the feature attribution in various fields. Feature-level metadata is used to track the source of a specific parcel. The importance of feature-level metadata cannot be overstated. This information can be used to identify when and who performs the updates, provides a ready reference to anyone using the data, and can indicate the overall quality of the data using the percentage of parcels drawn by different types of methods and sources. Establish naming conventions and use domains where possible to maintain the consistency and quality of your feature-level metadata.

4.10.1 Feature-Level Schema (Attributes)

Edit Date: the date the parcel was drawn or modified. Maintain consistency in how dates are input, for example 20220913 (as text) for September 13th, 2022 or as a formatted date (9/13/2022)

Editor: the name of the individual responsible for creating or modifying the parcel data

EditMethod: this may include a domain for DIGITIZED, COGO, PARTIAL COGO, OTHER

EditType: may include a domain for SPLIT, MERGE, LOT LINE REVISION, ATTRIBUTE UPDATE, etc.

SourceType: the type of source data used to draw the parcel- SURVEY, TAXMAP, DEED, DWG, ASSRNOTES, etc.

SourceName: the name of the source, for example TC1234 (Town Clerk map 1234), BK8PG567 (deed, book 8, page 567), OAK ST SUBDIVISION MAP (the actual name of the map if it does not have a town clerk designation), MainSt_Drawing.dwg (for a CAD file). If source documents have been provided without name, or with just a code from scanning that is meaningless (202209230003.tif), rename the file to something for future identification and reference.

SourceDate: the date of the source, often found on the stamp on municipal clerk surveys, to indicate when the survey was accepted by the town. The date from the surveyor can be used, however it may not reflect the date the parcel change was legally made. Some surveys will have several dates from revisions, use the newest date if there is no stamped data visible.

Parcel_ID: The parcel identification number used by the municipality.

LINK: Unique identifier to be used to link to CAMA database; often the parcel ID.

Parcel_Type: Parcel classification for description. This should include a domain with the following values:

Std_Parcel	A standard parcel representing a single, fee-simple land ownership. This is the most common type of parcel and includes residential, commercial, agricultural, or other typical property classifications.
Condo_Main	The parent parcel for a condominium complex. This represents the overall property footprint or common land associated with the condominium units and typically holds shared ownership or HOA-related attributes.
Condo_Unit	An individual condominium unit within a Condo_Main parcel. Each unit is a separately owned legal entity, often with associated tax and ownership records.
ROW	Right-of-Way parcel used to represent land reserved or dedicated for public or private transportation, utility corridors, or access easements (e.g., roads, railways).
Water	A parcel classified as primarily water-covered area, such as lakes, rivers, reservoirs, or coastal waters.
FLAG	A flagged parcel used to indicate placeholders, or parcels requiring further review or verification.

Appendix

Example responsibilities of stakeholders involved in the maintenance and updating of parcels.

Municipal Clerk: The Municipal Clerk is responsible for maintaining land records including deeds, mortgages, and other legal documents. They provide access to these records to other departments and the public. The Town Clerk may also be responsible for maintaining the parcel maps. Surveying and deeds are often the first step in the process of changing parcels as part of the land record.

Assessor: The Assessor's office is responsible for assessing the value of real property in the town. They maintain property records including ownership, lot size, and property characteristics. The Assessor's office may be responsible for assigning addresses and other identifying information about a parcel that is necessary for linking tabular CAMA data and GIS parcel data.

Building Department: The Building Department regulates building construction and ensures that buildings comply with building codes. They can maintain records of building permits, certificates of occupancy, and other building-related documents.

Planning and Zoning Department: The Planning and Zoning Department is responsible for managing the development of the town. They maintain records of zoning regulations, land use plans, and other planning documents, such as the Plans of Conservation and Development (POCD).

Engineering Department: The Engineering Department is responsible for designing and maintaining public infrastructure, including roads, bridges, and utilities. They may also be responsible for assigning parcel addresses and previously adopting private roads under public responsibility and jurisdiction.

GIS Department: This department is responsible for creating and maintaining digital maps of the town, including parcel maps. They may work with or within other departments to ensure that GIS data are accurate. The GIS Department may also be responsible for publishing GIS data for public use or sharing it with key external stakeholders.

Fire Marshal's Office: The Fire Marshal's Office enforces fire codes and ensures that buildings are safe from fire hazards. They can maintain records of fire inspections and other fire-related documents. Depending on jurisdiction, they may also have the authority to issue certificates of occupancy for a municipality.

Tax Collector's Office: The Tax Collector is responsible for collecting property taxes; as such, they maintain records of tax payments and delinquent taxes.

Department of Public Works: The Department of Public Works is responsible for maintaining public infrastructure including roads, bridges, and utilities. They may work with the Engineering Department to ensure that infrastructure-related GIS data are accurate.

Parks Department: This department is responsible for managing public parks and other recreational facilities. They can maintain records of park locations, amenities, and other infrastructure.

Housing Authority: The Housing Authority is responsible for managing public housing. They maintained records of the housing locations and occupancies.

References and Resources

CAAO: Connecticut's Land Use Value Assessment Law, Public Act 490: A Practical Guide and Overview for Landowners, Assessors and Government Officials	https://caao.com/wp-content/uploads/2016/02/PA_490_Guide.pdf
Choosing the Right Projection for COGO Work in ArcGIS Pro	https://geospatialtraining.com/choosing-the-right-projection-for-cogo-work-in-arcgis-pro/
CT: Administrative Abstract Coding System Pursuant to Section 12-27 of the Connecticut General Statutes	https://portal.ct.gov/-/media/opm/igpp-data-grants-mgmt/igpp-forms/administrative-abstract-coding-system.pdf?rev=8a2f68fb455644ba824af860b3997bcc&hash=0FF63E1A49A92BB915EE6271E7530FFB
CT: Classification of Land as Forest Land (PA 490)	https://portal.ct.gov/deep/forestry/forest-land-taxation/classification-of-land-as-forest-land
CT: Connecticut's Cadastral Standard	https://portal.ct.gov/-/media/datapolicy/gis-office/gis-guidance-documents/ct-cadastral-and-parcel-data-standards-and-guidelines-v1.pdf
CT: PA 490 Recommended Land Use Values and Best Practices	https://portal.ct.gov/-/media/opm/igpp-data-grants-mgmt/igpp-forms/pa-490-recommended-land-use-values-and-best-practices.pdf?rev=4b70990a26dc4e17a3d7076a63345167&hash=3DFA8FCF729A6B0F0810C5FDDAFDB28B
Esri: ArcGIS Parcel Fabric Resources	https://learn.arcgis.com/en/paths/arcgis-parcel-fabric-resources/
Esri Instructor-Led Training: Get Started with CAD Data in ArcGIS	https://www.esri.com/training/catalog/690a488cb94060a899bc21df/get-started-with-cad-data-in-arcgis/

Esri Instructor-Led Course: Working with Parcel Data in ArcGIS Pro	https://www.esri.com/training/catalog/5e5f25188cb2d966e64e3d5d/working-with-parcel-data-in-arcgis-pro/
Esri: Introduction to COGO (ArcGIS Pro)	https://pro.arcgis.com/en/pro-app/latest/help/editing/introduction-to-cogo.htm
Esri: Introduction to the Parcel Fabric	https://pro.arcgis.com/en/pro-app/latest/help/data/parcel-editing/whatisparcelfabric.htm
The Forgotten History of Metes and Bounds, Maureen E. Brady (2018)	https://www.law.nyu.edu/sites/default/files/upload_documents/Brady_Metes_and_Bounds_102818_0.pdf
IAAO: Glossary for Property Appraisal and Assessment (3rd Edition)	https://www.iaao.org/wp-content/uploads/IAAO-Glossary_3rd-Ed_final.pdf
Metes & Bounds vs Public Lands	http://www.surveyhistory.org/metes_&_bounds_vs__public_lands.htm
Understanding COGO: A Beginner's Guide to Coordinate Geometry in ArcGIS Pro	https://geospatialtraining.com/understanding-cogo-a-beginners-guide-to-coordinate-geometry-in-arcgis-pro/
Understanding Survey Measurement Terms	https://www.pointtopointsurvey.com/2010/01/understanding-survey-measurement-terms/
What is a Datum?	https://oceanservice.noaa.gov/facts/datum.html