Wisconsin Department of Transportation

Right-Of-Way (ROW) Data Modernization Project

Plat Digitization Documentation

Katie Ginther, Cartographic Specialist, WisDOT

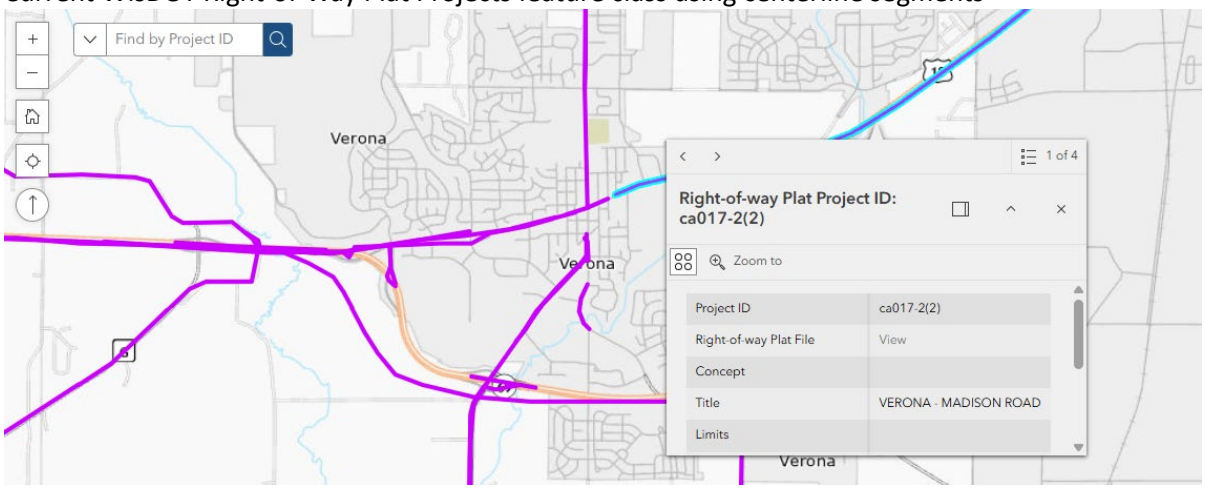
March 2026

Contents

Project Overview

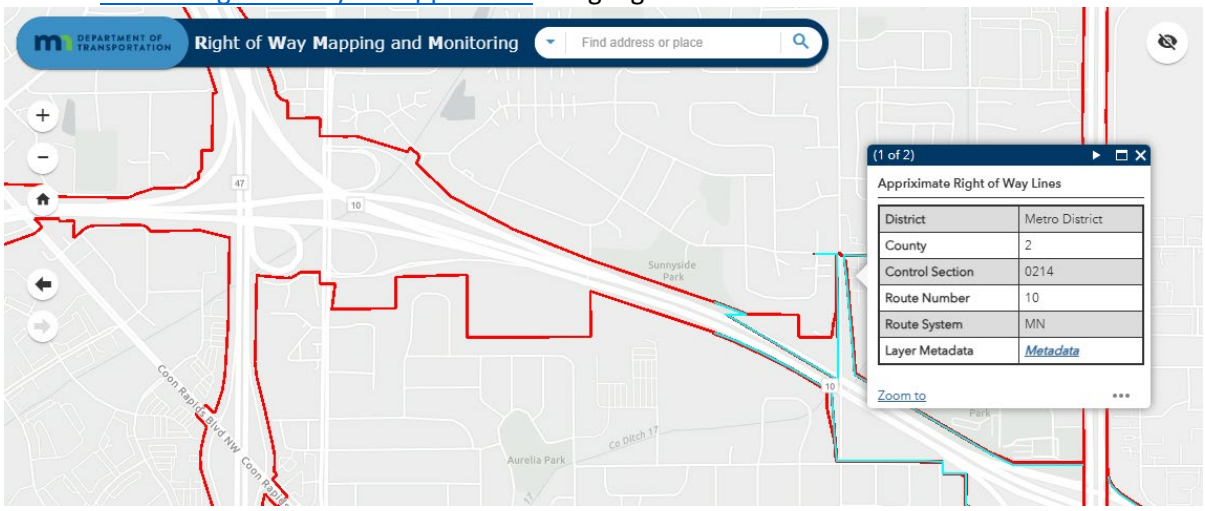
The official Wisconsin Department of Transportation (WisDOT) controlled right-of-way (ROW) boundaries have never been mapped. These boundaries currently can only be found by referencing a large variety of plats ranging from 1905 to present day. An earlier effort was made to create PDFs of the plats and to catalog them in a GIS layer by tagging them to highway centerline segments. Project planners and designers can now find the plat associated with a highway segment but still need to download and view the scanned plat and map their own ROW boundaries. A digitized ROW will allow WisDOT employees and contractors to import the approximate existing WisDOT ROW boundaries directly into their workspaces.

Current WisDOT Right-of-Way Plat Projects feature class using centerline segments



For this project, every ROW plat page will first be georeferenced. Then, digitizers will extract linework from the plats to create a single feature class of all the current ROW boundaries. The results will look similar to the below application from the Minnesota Department of Transportation.

Current MNDot Right-of-Way GIS application using digitized ROW boundaries



Project Timeline

The plat sheets are currently being georeferenced by the State Cartographer's Office (SCO). They are working through the state one DOT region at a time beginning with the Southeast Region. Once all the plats – or a sizeable amount of the plats – are complete for the region, WisDOT will provide consultants with the

georeferenced files for digitization. The following plan outlines a path for completing the digitizing for the entire state. This plan staggers the georeferencing and digitizing work by WisDOT region.

	Georeferencing Region	Digitizing Region	Est. Number of Plat Sheets
Year 1	Southeast	-	
Year 2	Northwest	Southeast	6,300
Year 3	North Central	Northwest	6,600
Year 4	Northeast	North Central	6,600
Year 5	Southwest	Northeast	7,500
Year 6	-	Southwest	11,000
			38,000

Production Overview

WisDOT needs the complete ROW boundaries digitized from the georeferenced plat pages. WisDOT expects consultants to be using ArcGIS Pro 3.3.1 or higher for the digitization process and have experience using COGO tools. For each highway section, consultants will:

1. Import all available georeferenced plat sheets
2. Determine which sheets to digitize to correctly map the existing ROW boundaries
3. Map all ROW boundaries, access control, and permanent easements
4. Enter attribute values for each line segment

The intent is to map all WisDOT's permanent interests associated with State Highways. Examples of permanent interests include Fee Right-of-Way, Access Control, Permanent Limited Easements, Highway Easements, etc.

Consultants should work county-by-county within the WisDOT region. This approach will add efficiency by avoiding having to constantly switch between spatial reference systems. Georeferenced plats will be organized by region, county, and township.

NOTE: If at any point in the organizing or production process it appears that a plat is missing, contact WisDOT immediately to determine if a plat can be located. Do not continue to work on the segment until the plat has been located or it has been determined that no plat exists.

Begin the digitizing process by starting with the newest plat and the highest quality level and work backwards to the oldest plat and lowest quality level. This will enable production staff to begin the digitization process with the most accurate data and use higher quality levels to aid in the digitization of lower quality levels. This approach will lead to higher expected accuracies of the ROW lines. Only digitize the ROW on the newest and highest quality level for a given highway segment. If an older plat falls in an area where the ROW is already digitized, the plat does not need to be digitized. Use the field 'SIGNING_YEAR' in RW_Plat_Projects to determine which plat to start with.

For consistency purposes on a statewide level, having staff that are familiar with plats and with using ArcGIS Pro COGO tools will be necessary to complete the project efficiently and to the desired outcome. The recommended production staff and their roles are outlined below:

- Project Manager/Project Lead – Overall project manager to coordinate with client and production staff.
    - Serve as main point of contact with WisDOT.
    - Track budget, schedule, scope.

- Production Lead(s): Senior GIS Analyst and/or Surveyor – Staff experienced with the platting process who have the knowledge of how to read a plat.
    - Quality control review of production work.
- Production Staff: Mid-Level GIS Techs – Production staff with base knowledge of platting process, COGO tools, and able to extract information from plats with guidance from production lead. Staff will need to be trained on the items needing to be digitized and accurately populating the attributes.
    - Digitize plats based on quality levels.
    - Accurately populate attributes.

Quality Level Determination

Quality levels are determined by the digitizer and are based on the qualifiers outlined. Digitizers do not have to surveyor experience but should be familiar with the platting process and understand how to find this information on a plat.

Quality Level	Description
Computed	These first two levels have the highest level of accuracy and are to be used on newer plats whenever possible.
1	Quality 1 is surveyed ROW and will be derived from a closure report file. This will be considered a survey grade accuracy of +/- .3 feet (likely to achieve +/- .1 feet). This quality level is reserved for new, incoming plats being processed internally by WisDOT.
2	Quality 2 is computed ROW from a Transportation Project Plat from the year 2012 or newer. The plat will consist of survey grade coordinates on section corners and ROW points or the ability to calculate the ROW points with little difficulty or ambiguity. The coordinate system must be clearly defined and easily replicated. Example: NAD83(2011) Wisconsin County Coordinate System, Brown County. The plat copy will need to be clear and legible. If the plat copy is of poor quality and parts aren't clearly legible, then the quality level will be degraded to Quality Level 4A. Quality Level 2 desired accuracy +/- 1 foot
Offset from Centerline	Level 3 can be used to a high degree of accuracy when using high resolution imagery and plats with long, straight stretches of ROW.
3A	Quality 3A is drawn by offsetting lines from a digitized centerline. This quality level is best used on older plats that cover a large area of ROW. The ROW boundary on these plats is usually hard to accurately digitize at such a large scale, but the widths are consistently marked and easy to decipher along the ROW. Quality Level 3 desired accuracy +/-5 feet (dependent on pixel resolution of WROC orthos used for digitizing the centerline and the clarity of the width descriptions on the plat)
3B	Quality 3B is assumed 66-foot-wide ROW based on statute. This quality level will only be used if gaps along the ROW corridor occur, no plat exists to cover the area, and 66-foot-wide ROW can be assumed with a high degree of confidence. Contact WisDOT prior to using Quality Level 3 procedures to ensure no plat exists.

	Quality Level 3 desired accuracy +/-5 feet (dependent on pixel resolution of WROC orthos used for digitizing)
Digitized from Plat Linework	Quality Level 4 is broken down into three sublevels based on the criteria listed below. Each quality level process will be based on digitizing the ROW from the georeferenced plat.
4A	Plats do not meet the requirements of Quality Level 2 but have survey grade section corner coordinates, a good quality and legible scan, and the coordinate system is well defined and able to be replicated. Coordinate System must be NAD83(1991) adjustment or newer. Quality Level 4A desired accuracy, +/- 5 feet
4B	Plats are of lessor quality and no coordinate system is listed on the plat or cannot be readily replicated. Survey grade section corner coordinates are not listed on the plats, but there are some section corners with accurate bearings and distance ties to the new ROW and/or alignment. All measurements on the plat to the nearest .01 of a foot for distances and nearest second for bearings. Quality Level 4B desired accuracy, +/- 5-10 feet
4C	Plats are of poor quality, and ties to the section corners are to the nearest foot or less. Bearings and distances on the plat are to the nearest minute for bearings and nearest tenth (0.10) of a foot or less for distances. Quality Level 4C desired accuracy, +/- 10-15 feet
5	Quality Level 5 is estimated from parcel mapping. This quality level could replace Quality Levels 4B or 4C when the county GIS has a defined ROW depicted in the parcel mapping and the parcel mapping matches occupation when compared to WROC orthoimagery and georeferenced plat. Quality Levels 1, 2, and 4A must also match county GIS within +/-10 feet for Quality Level 5 procedures to be used. Local knowledge of the county and area within the county will be needed to help determine the accuracy of the county parcel mapping. Quality Level 5 desired accuracy, +/-10 feet. (Accuracy will vary by county and by corridor within the county)
Connecting Lines	Quality Levels 6 and 7 are line segments used to join adjacent plat pages or gaps at road intersections to create a continuous ROW.
6	Quality Level 6 is only to be used for assumed ROW to fill gaps between plats when Quality Level 3 (assumed 66 feet) doesn't match visual evidence from WROC orthoimagery. Examples of visual evidence are fence lines, sidewalks, buildings, etc. Used for scenarios where ROW is different than the assumed 66 feet based on comparison to orthoimagery.
7A	Quality Level 7A is to be used to join small gaps in ROW lines between plats. Gaps should be 10 feet or less. If gaps exceed 10 feet, a review of ROW needs to be done to ensure accuracy of computations and georeferencing.
7B	Quality Level 7B is to be used to join gaps at road intersections to create ROW polygons.

Process Overview

Provided Project Data and Files

Georeferenced Plat File Database

A file database of the georeferenced ROW plats will be provided to the consultant. The plats are organized following this structure:

Region > County > Township > Project ID

Within the Project ID folder are two folders: **PDF** and **TIFF**. The PDF folder contains the complete plat packet as well as the extracted, individual georeferenced plat sheets PDFs. The TIFF folder contains the final exported georeferenced TIFFs.

The county and township were assigned to a project based on which contained the ***majority*** of the ROW project. It is important to note that the many projects span multiple townships and sometimes multiple counties. The assigned county and township are for tracking purposes only.

Every plat sheet – from 1905 to current day – will be georeferenced and made available to the consultant. However, only the current, existing ROW boundary needs to be digitized. Consultants will have to review every plat connected to a section of highway to determine which contain the relevant information. There is rarely one ROW plat that reflects the complete, current extent of the ROW boundaries. The current extent will be the result of years of small adjustments via multiple plats.

Each plat sheet has been named with the project ID and sheet number.

rwplat(ProjectID)_(SheetNumber)

RW_Plat_Projects Feature Class

RW_Plat_Projects is the current feature class used by WisDOT to track plat projects. This polyline feature class contains every plat book tagged to its corresponding highway segment. These segments are the rough extent of each plat book. This feature class will be useful for querying project IDs and tracking progress. The Project ID field matches the project folder and file names in the plat file database.

ArcGIS Pro Setup

Spatial Reference System

Consultants should work county-by-county within the assigned region. Set the map to the WISCRS county system for the county being worked on (ex. NAD 1983 (2011) WISCRS Brown (US Feet)). This will be the system used to COGO newer plats. Georeferenced plat PDF and TIF files will also be in county coordinates.

Reference Layers

In addition to the WisDOT-provided data and file, the following GIS reference layers will be necessary for accurate digitizing.

- **WROC Imagery**
    - WisDOT recommends using the Wisconsin Regional Orthoimagery Consortium (WROC) imagery as your aerial basemap throughout the project. While the resolution varies by county, overall WROC is the highest resolution statewide imagery available.
- **Statewide Parcel Dataset**
    - The latest statewide parcel dataset from the State Cartographer's Office (SCO) should be used as a reference layer for digitizing. There should be no need to download any county or city specific

parcel data. Be aware that the accuracy and confidence in the parcel data does vary greatly by county.

- **Public Land Survey System (PLSS) Data**
    - The Public Land Survey System data from SCO should also be used as reference. PLSS section corners on a plat are used as starting points for metes and bounds directions and, therefore, will be very useful in the COGO process.

Instructions by Quality Level

The method used to digitize will depend on the age, completeness and scan quality of the plat. The following quality chart breaks down all acceptable methods of digitizing with their corresponding accuracy level. Whenever possible, consultants should use the metes and bounds on the plat with COGO tools to get the highest level of accuracy.

Quality Level	Description
1	• Internal WisDOT process for mapping new plats.
2	• Since this method has the highest accuracy level, use this first whenever possible. • For any highway segment, start with the newest plat and COGO as much information as possible (newly acquired, existing, and local ROW). This high quality linework will then serve as the foundation for digitizing older, lesser quality plats. • Create ROW polylines using COGO tools in the most efficient procedure possible – using coordinate tables, bearings, and distances from traverse, or station/offsets from recreating the alignment. • Reference countywide parcel data, PLSS data, and WROC orthoimagery to the working drawing to QC calculations.
3	• This method is useful for large stretches of rural highway with only older plats for reference. The linework on these older plats may be blurry or hard to read, but the road widths are clearly marked. It may also be used in areas where plats are missing but a 66-foot ROW can be confidently assumed. • Digitize the centerline of the road using the WROC orthoimagery. • Create the ROW polylines by offsetting the centerline on each side of the centerline by half of the ROW width.
4	• This method is to be used for plats that do not include enough information for Level 2 or 3. Levels 4A 4B, and 4C all use the same process. Quality levels are assigned based of the confidence in the manual digitizing. • Create ROW polylines by digitizing the lines using the georeferenced plat as a guide. Carefully trace all linework, snapping to any existing Level 1 or 2 linework or PLSS data where possible. • Reference parcel data, PLSS data, and WROC orthoimagery to the working drawing to QC linework.
5	• This method can be used only when the parcel data in the area of interest contains accurately mapped ROW boundaries. • If the parcel ROW data is well defined and determined to meet the accuracy levels of Quality Level 4A or better, then Quality Level 5 may be used in lieu of Quality Level 4B or 4C.

	• Create ROW polylines by snapping to parcel lines or by extracting ROW lines from the parcel GIS layer. Easements and access control are not likely to be included in parcel data and will need to be digitized separately. • Accuracy of parcel data will vary by county and areas within the county.
6	• Quality Level 6 is assumed ROW and to be used when no plats are available and statutory 66 feet does not match visual occupation compared to WROC imagery. • Use visual evidence and occupation from WROC imagery to fill gaps in the ROW. • Examples of visual evidence are sidewalks, fence lines, buildings, etc. • This method is to be used as a last resort only.
7A	• Quality Level 7A is to be used to join small gaps between plats that are 10 feet or less. • Draw line segments by snapping to existing linework to fill in the gaps.
7B	• Quality Level 7B is to be used to join gaps at road intersections to create ROW polygons. • Draw line segments by snapping to existing ROW corners to cover the gaps of intersecting roads.

Project Deliverables

ROW_Polyline Feature Class

ROW_Polyline is the digitized ROW polyline feature class. WisDOT will provide consultants with the feature class template. Consultants will create a ROW_Polyline feature class for each county in WISCRS coordinates and deliver to WisDOT when the county is complete. WisDOT will review and append consultant data to the authoritative layer. The data dictionary below details the layer attributes. Detailed instructions on how to fill in the attributes are included later in this document.

Feature Layer Name: ROW_Polyline

Feature Type: Polyline

Definition: This feature layer will contain digitized polylines representing right of way boundaries derived from digitized WisDOT plats and imported closure reports.

Spatial Extent: Statewide

Update Frequency: Continuous

Coordinate System: NAD 1983 HARN Wisconsin TM (Meters)

ATTRIBUTES

Field Name	Type	Label (alias)	Domain	Definition
OBJECTID	OID	Object ID		Auto-generated polygon identifier
SHAPE	Geometry	Shape		Auto-generated
PLAT_ID	String	Plat ID		Main plat project ID from RW_Plat_Projects

RELATED_ID	String	Related ID		Any related plat or project IDs
PLAT_PAGE	Short	Plat Page		Plat page number from source plat
PLAT_TYPE	String	Plat Type	PlatType	Type of plat
PROJECT_TITLE	String	Project Title		Project title from source plat
REVISION	Date	Last Revision Date		Last noted revision or amendment date on source plat
SIGNING_YR	Date	Signing Year		Plat certification year
QUALITY_LEVEL	String	Quality Level	Quality	Level of accuracy of feature
ROW_STATUS	String	ROW Status	ROWStatus	Status of ROW ownership
INTEREST	String	Permanent Interest Type	InterestType	Type of permanent interest shown on source plat
ACCESS_CTRL	String	Access Control	AccessType	Type of access control shown on source plat
HIGHWAY_PRE	String	Highway Prefix		Highway name prefix
HIGHWAY_NAME	String	Highway Name		Highway name
HIGHWAY_HIST	String	Highway Historic Name		Historic highway name and number, if applicable
COUNTY	String	County		Name of county
REGION	String	DOT Region	Region	Two letter DOT region
PLAT_PDF	String	Plat PDF Link		Link to original plat PDF
PLAT_GEOTIFF	String	Plat GeoTIFF Link		Link to coordinate correct GeoTIFF of individual plat page
COMMENTS	String	Comments		Text field for supplemental information
SHAPE_LENGTH	Double	Shape Length		Auto-generated
CREATED_USER	String	Created User		Auto-generated
CREATED_DATE	Date	Created Date		Auto-generated
LAST_EDITED_USER	String	Last Edited User		Auto-generated
LAST_EDITED_DATE	Date	Last Edited Date		Auto-generated

DOMAINS

Domain Name	Code	Description
Quality	1	Surveyed ROW closure reports
	2	Computed ROW from past plat
	3A	Offset from centerline
	3B	Assumed 66’ per statue
	4A	Digitized, high confidence georeference
	4B	Digitized, medium confidence georeference
	4C	Digitized, low confidence georeference
	5	Estimated from county parcel mapping
	6	Assumed ROW based on visual evidence
	7A	Extrapolated line segments generated for continuity where no data exists
	7B	Extrapolated line segments generated for continuity to enclose polygons
Region	NW	Northwest

	NE	Northeast
	SW	Southwest
	SE	Southeast
	NC	Northcentral
PlatType	TP	Traditional Plat
	TPP	Transportation Project Plat
	AE	Acquisition Exhibit
AccessType	AA	Access Restricted by Acquisition
	AP	Access Restricted by Previous Project or Control
	SA	No Access by Statutory Authority
	NH	No Access New Highway
	NA	Not applicable/Unknown
InterestType	ACC	Access Only
	PLE	Permanent Limited Easement
	RDE	Restricted Development
	ROW	ROW (FEE or HE)
ROWStatus	DOT	DOT controlled, state highway
	NON	Non-DOT, local connecting road
	UER	Uneconomic Remnant, revisit
	REV	Revisit, to be surplused/acquired

Digitizing Instructions

The PLAT_PDF and PLAT_GEOTIFF fields will be populated by WisDOT. All other applicable fields should be populated by consultants before submitting data to WisDOT. The following fields can be populated by joining on Project ID to RW_Plat_Projects: PROJECT_TITLE, REVISION, SIGNING_YR, HIGHWAY_PRE, HIGHWAY_NAME, COUNTY, REGION. For the data to be properly displayed and filtered, the QUALITY_LEVEL, ROW_STATUS, INTEREST, and ACCESS_CTRL fields must be consistently and accurately populated for every line segment.

A project may span multiple counties. Lines should be split at county borders so the data can be properly filtered by county. Lines do NOT need to be split at any other political boundary (muni, township, etc).

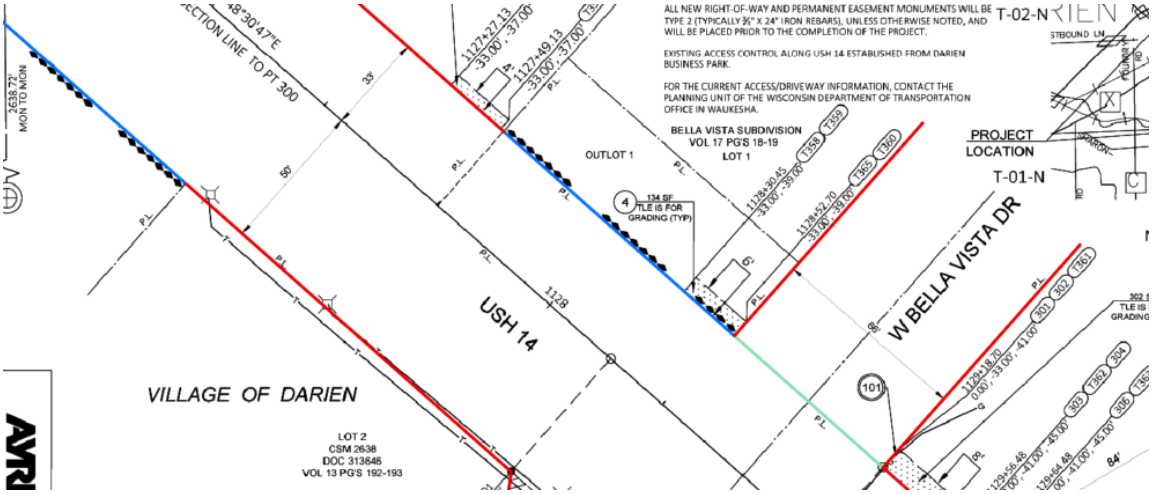
ROW (FEE or HE)

The focus of this project is to digitize all WisDOT-controlled ROW boundaries to the high level of accuracy possible. This includes both fee and highway easements. The desired output is continuous polylines along every ROW boundary in the state highway system. WisDOT plans to generate polygons from the polyline layer. Therefore, all linework needs to be snapped together and gaps between plat pages or projects filled in.

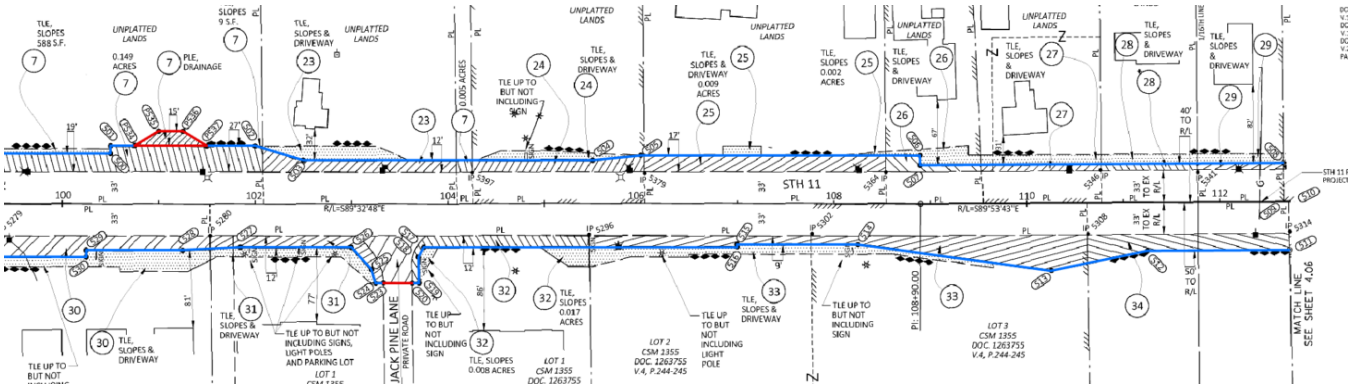
Access Control

Please refer to the project key for access type symbols. Since we are working with 100+ years of plats, the symbols used may not be uniform across projects. In most cases, access boundaries will follow the ROW. If access is being symbolized along a ROW or permanent easement, map the ROW/easement and tag the linework with the appropriate access type in the ACCESS_CTRL field.

ROW lines should be split where access type changes so the segments can be appropriately tagged.

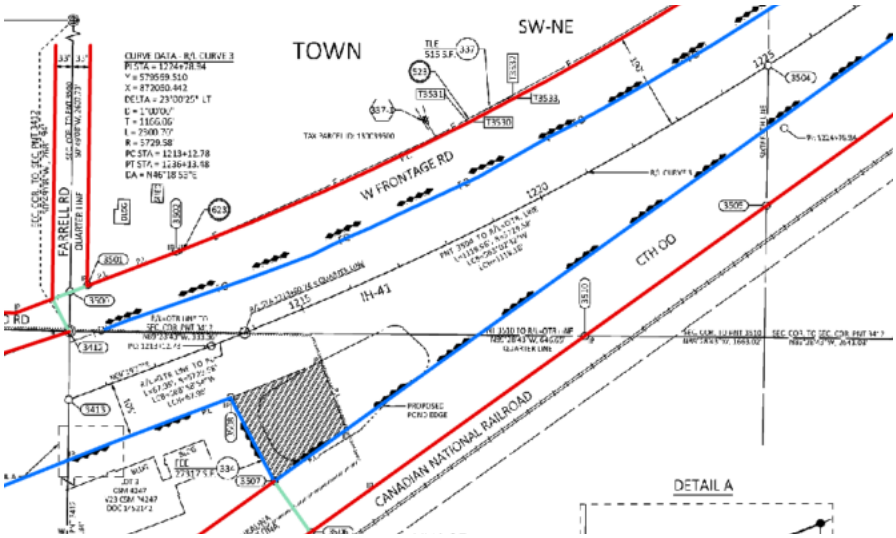


Access symbols may be displayed as a continuous line of symbols or as short, repeating segments of symbols. Do not split the ROW line at every repetition of the symbol. Instead, tag the entire stretch. Access control does not need to be precisely mapped. It is being mapped/tagged to alert planners and engineers that access control exists along the ROW and that further research will be needed.



The blue line is all the same access control and while it appears to be along a TLE in several spots, it should be tagged to the ROW.

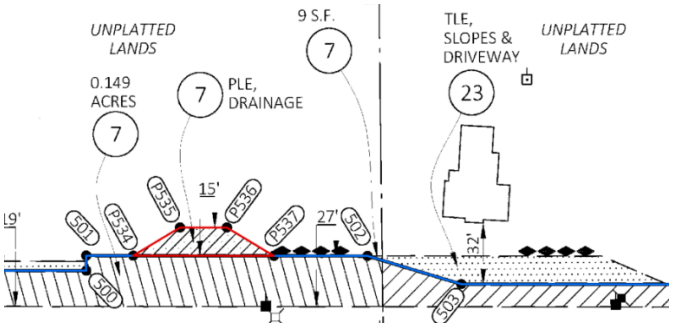
There are cases where access control does not follow the ROW. This is especially common along frontage roads. If the access appears purposely offset or separate from the ROW, digitize the linework separately and enter ACC (access only) in the INTEREST field. ACC lines should also have the access type tagged in the ACCESS_CTRL field.



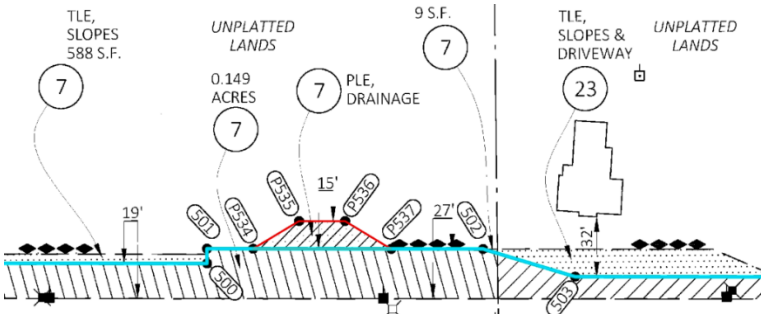
Permanent Limited Easements

Permanent Limited Easements (PLE) should be mapped as an enclosed polyline separate from the ROW line. Do not cut the ROW line for PLEs. Enter PLE in the INTEREST field.

Temporary Limited Easements (TLE) should *NOT* be digitized or included in the within the ROW boundary.



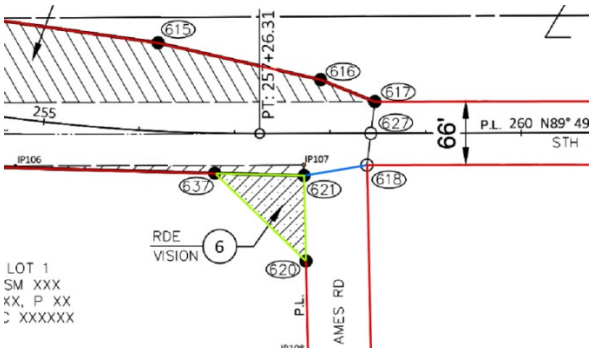
PLE is a separate, closed polyline. TLE is not mapped.



ROW line runs through the PLE.

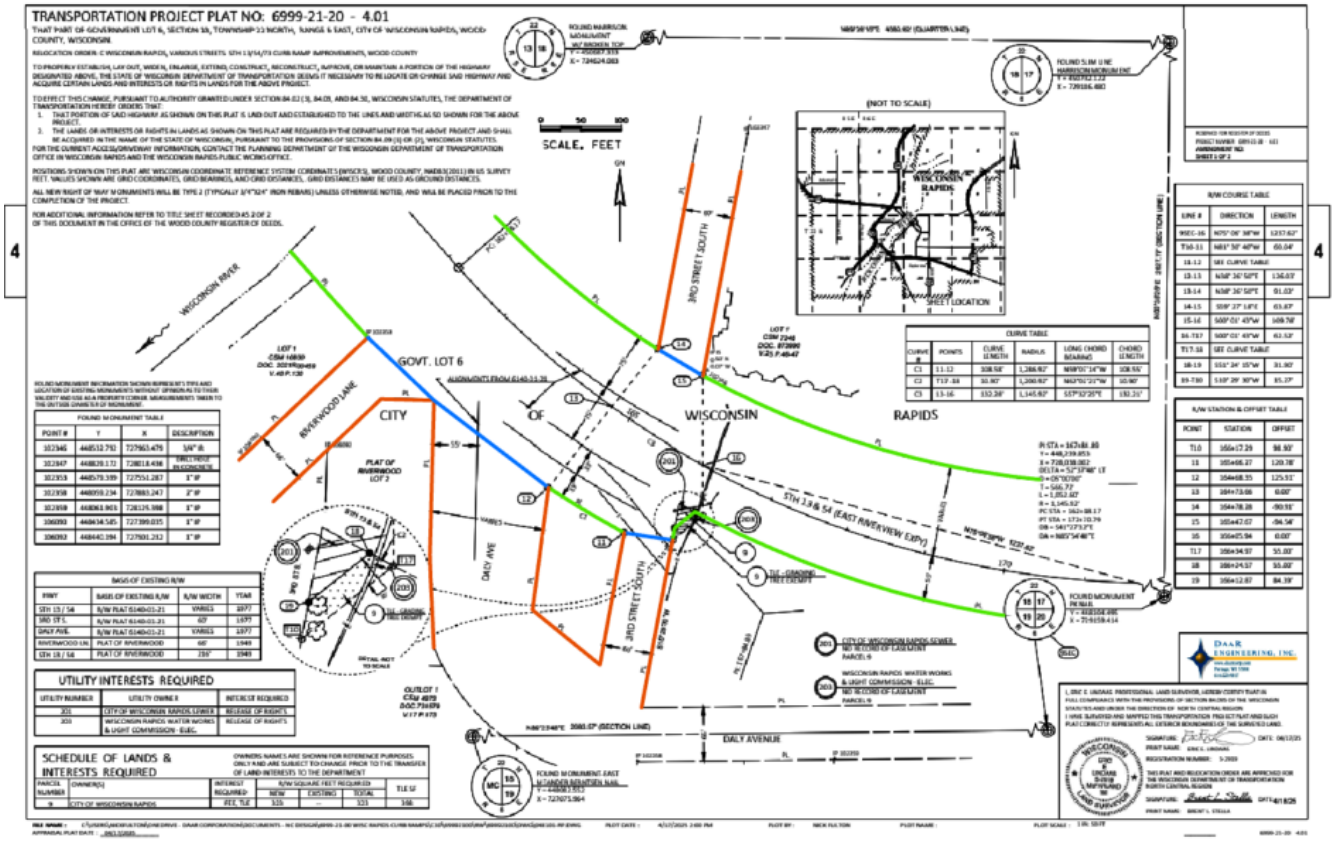
Restricted Development Easements

Like PLEs, Restricted Development Easements (RDE) should be mapped as an enclosed polyline separate from the ROW line. Do not cut the ROW line for RDEs. Enter RDE in the INTEREST field.



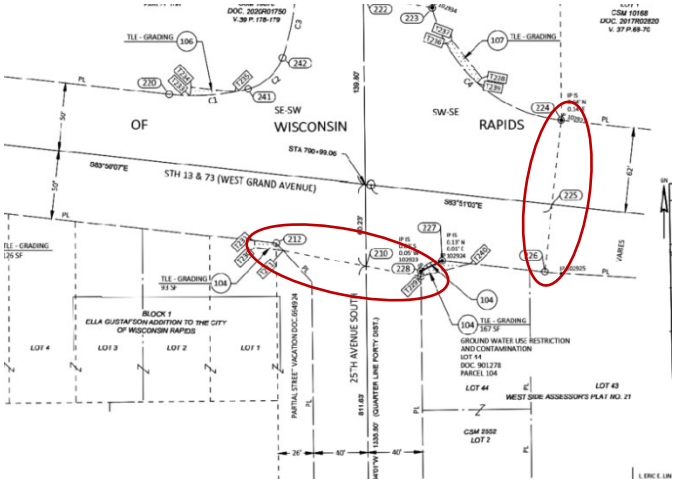
Local Roads

Public local roads and public alleys that intersect highways should be digitized. They often are not included in the metes and bounds directions, so will generally need to be manually digitized at a Level 4 quality. Local roads that do *NOT* intersect the highway, private roads and alleys, and driveways do not need to be digitized. Local road segments can be cutoff at about 200-300 feet from the highway intersection. Lines should be split at intersection points with the DOT ROW and tagged as NON in the field ROW_STATUS. INTEREST and ACCESS_CTRL fields should be populated in the same manner as DOT-owned ROW. A 7B connecting lines should be snapped to the ends of the local road segments to create a continuous DOT ROW boundary.

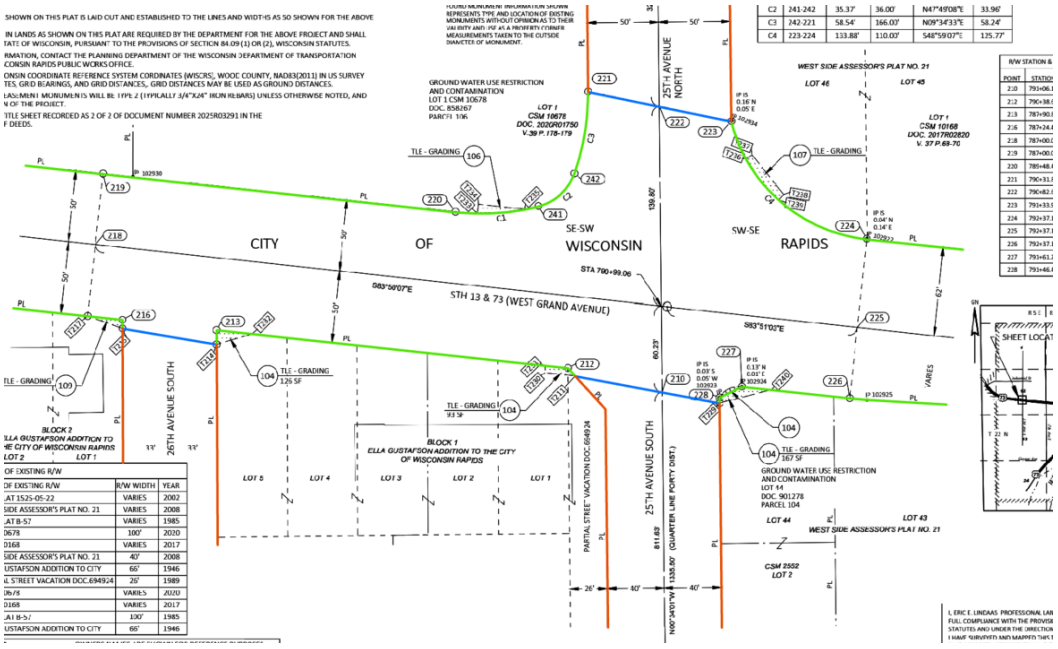


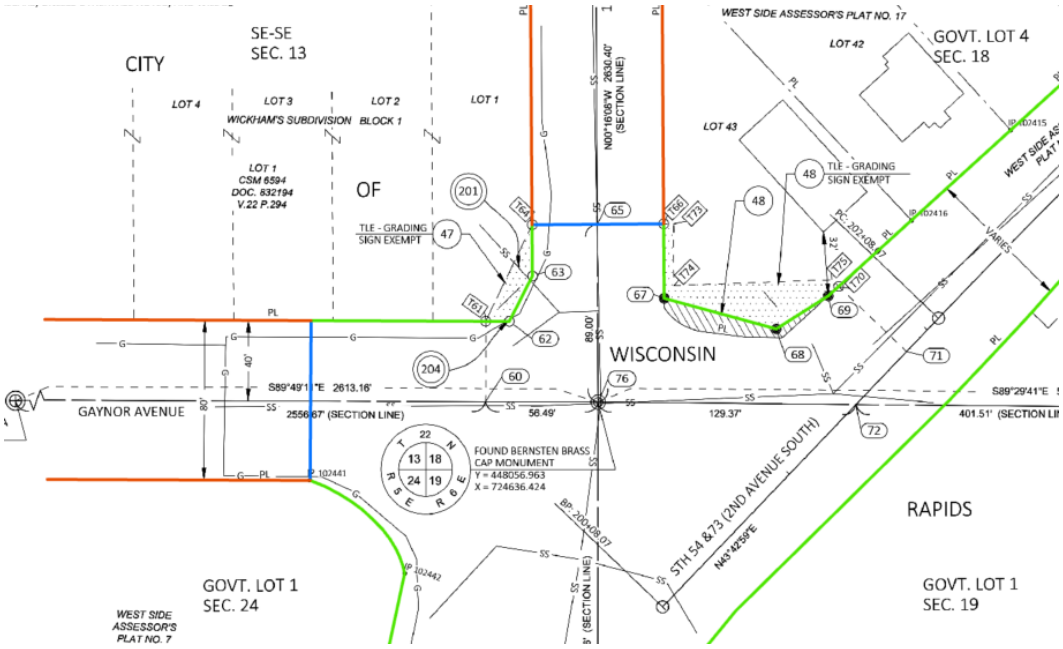
In the above example, the cutoff of point between local roads and the highway is clear and simple. In many cases, it can be challenging to determine where this cutoff point should occur. Plats often show ROW acquisitions and access control that continue onto local roads. This is especially common with large intersections with curved edges and roundabouts. If tie lines are shown on the plat and within approximately 50 feet of the intersection,

use them as the cutoff point. If no tie lines exist, use your best judgement to split the line at a reasonable point close to the intersection. Intersections of two DOT-owned highways should NOT be split or capped with 7B connectors.



Tie lines are circled. Only digitize tie lines that cross intersecting non-DOT roads. Do NOT digitize tie lines that cross DOT-owned highways.



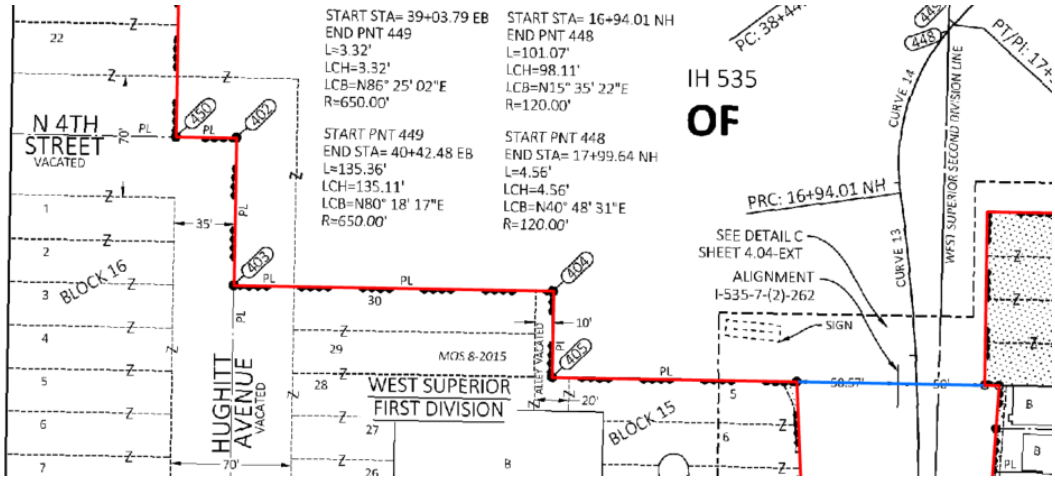


Examples of appropriate use of the 7B connecting lines (in blue).

Connecting Lines

Small gaps in the linework may appear between two adjacent projects. This may be due to slight variations in adjacent georeferenced plat sheets or missing plat sheets. For large gaps of 10 feet or greater, use quality level 6. Trace visual evidence (fences, sidewalks, etc) from imagery to digitize the missing segment and tag appropriately. Please check with WisDOT before digitizing using level 6 to confirm that no plat exists. For gaps less than 10 feet, simply add a segment snapping the two endpoints together and enter 7A in the QUALITY_LEVEL field.

As explained above in the local roads section, the 7B quality level is used to cap intersecting local ROW. If a local connecting road is tagged as 'to be vacated' or 'vacated', it does not need to be capped and the ROW line can continue through.

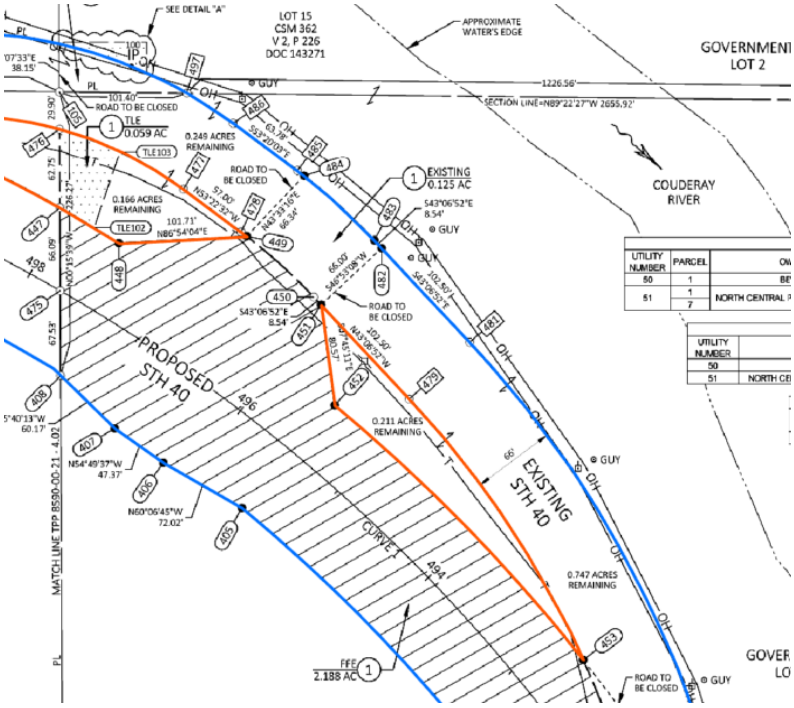


N 4th Street and Hughitt Avenue are vacated and can be drawn as a continuous ROW boundary.

ROW Status

The ROW_STATUS field is to be used to tag ownership of the ROW. This is meant to be general and will eventually be used to filter out non-DOT line segments to create ROW polygons. All connecting local road lines should be split and tagged as NON.

Small remnants may appear in the ROW where ownership is unclear. They should be annotated with the remaining acreage. Draw these as a separate, enclosed polylines and tag them as uneconomic remnants (UER).



For newer plats, it may be possible that the project is still active and all acquistions are not yet complete. In any areas where it is unclear if the acquistion is complete or the ownership is too confusing to determine, tag the lines as REV. WisDOT will review and update as new information becomes available.