

Final Report

Version 8 Statewide Parcel Map Database Project

July 30, 2022 | *Appendix B Updated: July 12, 2023

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OVERVIEW

The **Version 8 Statewide Parcel Map Database Project** (V8 Project) was a joint effort between the Wisconsin Department of Administration (DOA) Division of Intergovernmental Relations and the Wisconsin State Cartographer's Office (SCO). This document describes the V8 Project, which ran from January 2022 to June 2022 as part of the Statewide Parcel Map Initiative established by Act 20 of 2013.

Project Objectives Achieved

- Create an updated statewide parcel database and map layer by integrating county-level datasets.
- Provide for download of parcel database and display map layer online.
- Continue implementation of standard for parcel data known as the "Searchable Format," which is tied to Wisconsin Land Information Program grant funding for local governments.
- Assess and communicate county progress in achieving the Searchable Format.

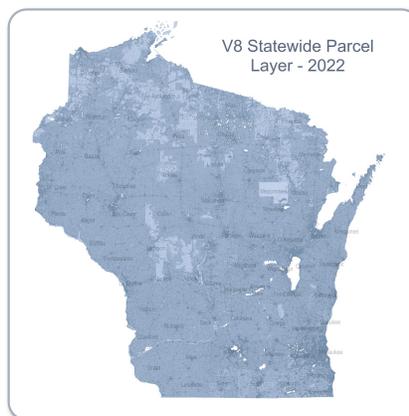
The V8 Project successfully aggregated all known digital parcel datasets within the state, resulting in a statewide GIS parcel layer of **3.5 million parcels**. The statewide data was standardized to meet the Searchable Format and made publicly available online on June 20, 2022. The V8 Project represents another successful step in the Statewide Parcel Map Initiative, an effort important for improving the quality of Wisconsin's real estate information, economic development, emergency planning and response, and other necessary citizen services.

PROJECT BACKGROUND

The V8 Project was another phase in the incremental approach of the Parcel Initiative—improving the statewide parcel map with each annual iteration. The V8 Project builds upon the experience of the LinkWISCONSIN and V1-V7 Projects. V8 was the seventh round of implementing standards for data submissions—the Searchable Format—which the legislature directed the Department of Administration to create in coordination with counties as part of Act 20 of 2013. In the Searchable Format, county data submittal is ready for immediate aggregation into the statewide parcel layer. Counties are to achieve the Searchable Format for parcel and tax roll data each year by March 31st.

TECHNICAL APPROACH

The technical approach taken by SCO staff involved several steps, including preparation and ingest, local-level processing, aggregation, state-level processing, and quality assurance/quality control. To support counties in achieving the Searchable Format, SCO developed a tool called the *Validation Tool* that counties are required to run in order to validate their data against the schema, as well as a suite of other geoprocessing tools. Once the statewide layer was created, data was distributed in several formats via a custom website and a web-based



mapping application. The web app allows someone without GIS software to view and search the statewide parcel map.

BENCHMARK PROGRESS ASSESSMENT

The final V8 layer represents progress over previous years. Three counties have yet to complete their digital parcel mapping—Buffalo, Burnett, and Crawford—notable progress, as that figure is down from 12 counties in 2014. Assessment and analysis of county data was conducted, with attention to what must be done for a county to meet the Searchable Format. The majority of counties came close to meeting the Searchable Format in their V8 data submissions. Very few met the Searchable Format exactly, with only 22%, or 16 of 72 counties, submitting data that did not require

additional processing to meet all Searchable Format requirements. The remaining 78% of counties either required follow-up to obtain missing data or had processing steps performed on their behalf to get the data into the Searchable Format.

In addition to parcels, several other GIS data layers were collected as part of a collaboration with the UW-Madison Robinson Map Library. For V8, **486** new county data layers were cataloged, archived, and made available through the data portal [GeoData@Wisconsin](mailto:GeoData@Wisconsin.gov).

RECOMMENDATIONS

Recommendations to improve and achieve better efficiency, accuracy, and final products include defining "integration" for PLSS and encouraging integration of PLSS coordinates into the parcel fabric, updating the Validation Tool and the V9 web app, establishing a new hosting mechanism for parcel data, and encouraging counties to link to the statewide parcel map from their county websites. Recommendations for the V9 project do not include changing the schema in a way that would alter county workflows. There are some recommendations that relate to future policy considerations. These recommendations are designed to be minimally disruptive for counties, yet ultimately lead to a statewide parcel layer that continues to improve with each annual iteration. ■

1 PROJECT BACKGROUND

1.1 Background

The **Version 8 Statewide Parcel Map Database Project** (V8 Project) was a joint effort between the Wisconsin Department of Administration (DOA) Division of Intergovernmental Relations and the State Cartographer's Office (SCO) that ran between January 1, 2022 and December 31, 2022.

Wisconsin Act 20 of 2013 created statutory directives through s. 59.72 and s. 16.967 for the state and local governments to coordinate on the development of a statewide digital parcel map, which is referred to as the Statewide Parcel Map Initiative, or Parcel Initiative. One of the statutory requirements was for DOA to determine a "**Searchable Format**" for parcel data and for all county data to be posted online in this standard. V8 is the sixth round of requesting that counties submit local data in the Searchable Format.

The V8 Project followed successful collaboration between DOA and SCO on similar efforts. In the past, DOA and SCO have partnered on a project to create statewide parcel and address point layers for the LinkWISCONSIN Address Point and Parcel Mapping Project (2013-2014), the Version 1 (V1) Project (2015), the Version 2 (V2) Project (2016), the Version 3 (V3) Project (2017), the Version 4 (V4) Project (2018), the Version 5 (V5) Project (2019), the Version 6 (V6) Project (2020), and the Version 7 (V7) Project (2021).¹

The V8 Project continued the approach of improving with each annual iteration through a process that allows for much involvement and collaboration with data contributors, who are primarily county land information offices, and data users—a wide array of persons from state agencies, private companies, and other entities and individuals.

1.1.1 V8 Project Goals

As part of the implementation planning for the statewide digital parcel map, the goals of the V8 Project were established in a memorandum of understanding (MOU) between DOA and SCO.

- **Meet statutory objectives and track progress.** The statewide parcel layer is built in an iterative fashion. V8 will continue to track the progress made with investments to local governments, specifically on benchmarks for parcel dataset development. A goal is to design an appropriate monitoring and evaluation framework to evaluate progress on the four benchmarks for parcel data:
 - Benchmark 1 – Parcel and Zoning Data Submission
 - Benchmark 2 – Extended Parcel Attribute Set Submission
 - Benchmark 3 – Completion of County Parcel Fabric
 - Benchmark 4 – Completion and Integration of PLSS
- **Incremental and continuous improvement.** Improvement of the statewide parcel layer itself, as well as the workflow and methods for each step in the aggregation process, with each new version of the layer. Exploration of areas for improvement should be based on research. As with the database, the hosting and display should keep pace with current technology and be continually improved to meet users' needs. Intake and aggregation process should be replicable and become more efficient with time, facilitating other improvements and/or opportunities for value-added products.
- **Outreach and technical assistance to counties.** This may take the form of further development of existing technical tools or the creation of new tools for counties and municipalities to use. It could also involve virtual or site visits and direct assistance.
- **Lean government principles and efficiency.** The V8 Project should seek to create and realize efficiencies in general, eliminate waste, and integrate or collaborate with other state GIS services where possible. An objective for this project is to move toward a more efficient, automated process for data aggregation where the locus of standardization labor is on the data contributors rather than the aggregator. Such a process would require fewer state resources be dedicated to the aggregation process and thereby reduce state costs for sustaining the statewide digital parcel map.
- **Responsiveness to public needs and economic development goals.** Evaluate parcel layer user suggestions and implement improvements where feasible.



¹ See V7 Final Report (2021 December); V6 Final Report (2020 October); V5 Final Report (2019 September); V4 Final Report (2018 November); V3 Final Report (2017 November); V2 Final Report (2016 November); V1 Interim Report (2016 June); V1 Final Report (2015 November); and Final Report: LinkWISCONSIN Address Point and Parcel Mapping Project (2014 September).

1.1.2 Project Timeline and Milestones

V8 Statewide Parcel Map Database Project Milestones	
Date	Version 8 Project Milestone
12/17/2021	V8 Call for Data
01/01/2022	V8 Project formal expenditure period start
01/03/2022	Begin county data preparation assistance/outreach
01/17/2022	V8 workflow documentation draft
03/15/2022	Written overview of V9 Validation Tool concept
03/31/2022	V8 data submissions due
06/10/2022	Draft V8 database for purposes of QA/QC
06/24/2022	Any V8 parcel map web app updates complete
06/30/2022	V8 parcel map available online
07/31/2022	V8 final report with final V8 workflow documentation and Validation Tool plan
09/16/2022	Final E4 PLSS database
09/30/2022	E4 PLSS final report, documentation, and publication ready
10/31/2022	Draft V9 data Validation Tool ready
11/15/2022	V9 data Validation Tool finalized
11/30/2022	V9 call for data ready
12/31/2022	County outreach for V9 conducted
12/31/2022	E4 PLSS final end-user feedback appendix ready

1.1.3 Project Team

V8 Statewide Parcel Map Database Project Team	
Howard Veregin, Project Co-Lead	Wisconsin State Cartographer's Office
Peter Herreid, Project Co-Lead	Wisconsin Department of Administration
Ana Wells	Wisconsin State Cartographer's Office
David Vogel	Wisconsin State Cartographer's Office
Thomas Kazmierczak	Wisconsin State Cartographer's Office
Hayden Elza	Wisconsin State Cartographer's Office
Branton Kunz	Wisconsin State Cartographer's Office (student)
Davita Veselenak	Wisconsin Department of Administration

1.1.4 Outreach

V8 Conference Presentations and Outreach To-Date	
73rd Wisconsin Society of Land Surveyors (WSLS) Annual Institute January 2022	Wisconsin County Surveyors Association (WCSA) Annual Membership Meeting Presentation
Wisconsin Land Information Association (WLIA) Annual Conference February 2022	Land Information Officers Network Annual Meeting, DOA and SCO updates
Wisconsin Land Information Council (WLIC) February 2022	WLIP program updates
V8 County Assistance/Outreach Sessions March 2022; Virtual	Individualized assistance offered and provided as requested; <i>Parcel Submission Assistance Webinar</i> , March 24, 2022
Wisconsin Land Information Association (WLIA) Spring Regional Meeting May 2022	WLIP updates at Land Information Officer Network meeting; <i>The Ashland County Building Inventory Project: Barriers to Acquiring Digital Assessment Data in Wisconsin</i> - Howard Veregin, Ann Buschhaus
State Agency Geospatial Information Committee Meeting July 8, 2022	<i>V8 Statewide Parcel Layer Update</i> - David Vogel
County Visits April-June 2022	10 county site visits in April-June 2022 - Peter Herreid

1.2 Documentation and Communication of Standards

The Submission Documentation set forth the required data submission standards for the V8 Project. There are four benchmarks listed by the WLIP Strategic Initiative grant application:

- Benchmark 1 – Parcel and Zoning Data Submission
- Benchmark 2 – Extended Parcel Attribute Set Submission
- Benchmark 3 – Completion of County Parcel Fabric
- Benchmark 4 – Completion and Integration of PLSS

Together, Benchmark 1 and 2 make up the Searchable Format. The Searchable Format is detailed in the Submission Documentation.

Figure 1. V8 Submission Documentation

1.2.1 New for V8

All attribute names, definitions, domains, and other schema requirements remained the same (for V8) as last year. A few minor changes and updates were at the beginning of the Submission Documentation and below.

- **Validation Tool Updated.** Our project partners at the State Cartographer's Office have updated the Validation Tool that counties are required to run in order to validate their data against the schema. Submitters must run the tool in FINAL mode before they can submit. **Counties must download the new version of the Validation Tool, then run it.** The Submission Form (an ".ini" file) is produced by running the Validation Tool in FINAL mode and is a mandatory component of the data submission.
- **Submit Most Current *Finalized* Data as of Extraction Date.** This is not a "new" requirement for V8; it is a clarification. V8 parcel data can be extracted on December 31, 2021 or after (January 1–March 31, 2022). When it is exported, the most current, finalized data should be extracted. The following are considered **valuation-related (assessor-assigned) attributes**:



CNTASSDVALUE, LNDVALUE, IMPVALUE, MFLVALUE, ESTFMKVALUE, NETPRPTA, GRSPRPTA, PROPCLASS, AUXCLASS, & ASSDACRES.

For valuation-related attributes, the December 2021 tax roll information will be the most current, **finalized** data—so that is what should be submitted. Any different valuation-related values generated after December 2021 would be tentative, not-yet-finalized values which yet to have completed the assessment process, so they should **not** be submitted. See Figure A-2 on page 8 for more.

For polygon geometry and **non-valuation-related attributes**—such as OWNERNAME1—values should be what is currently in the land information system as of the date of data extraction, even if you perform the data export in 2022. In other words, a "historic" owner name is not required; there is no requirement that the owner name submitted match the name that appeared on the 2021 tax bill.

- **Null the Valuation-Related Attributes for New Parcels/Splits.** New parcels/splits, as depicted in Figure A-2, should have null valuation-related (assessor-assigned) attributes, including Exempt/Special AUXCLASS records. The assessor assigns the value for Exempt codes (AUXCLASS X1-X4) or confirms it with DNR for Special MFL/FCL codes (W1-W9) through the regular assessment process. Therefore, whether taxable PROPCLASS records or Exempt/Special AUXCLASS records, new parcels/splits should have null values for valuation-related (assessor-assigned) attributes, because the assessment process is not completed until year's end.
- **Do Not Populate PARCELDATE with a Uniform Date for All Records.** For PARCELDATE, if a value for the date of an individual parcel's last geometric edit exists in the county's land info system, the PARCELDATE field should be populated. To be useful for end users, a date value that represents an individual parcel's geometric editing date is preferable over a uniform date for the entire parcel dataset. The following text has been added to the PARCELDATE schema definition:
Do not populate with the "cut date," the date the data was extracted/exported for V8 submission, **NOR the parcel dataset's last known geometric editing date.**
- **Consider Reusing SITEADDRESS Elements and PARCELID Values from V7.** As a suggestion for V8 and not a requirement, one method to help reduce the amount of effort involved with parsing and standardization of the SITEADDRESS elements might be to obtain the SITEADDRESS elements and PARCELID values from last year's standardized statewide parcel data, in a table. This table could then be joined to the current year parcels and the already parsed elements could then be copied over.
- **Submit PLSS Data and Other Layers.** If the county has the PLSS attributes listed in Appendix C in a digital tabular format, including a **corner number** attribute, they should be submitted. For V8, DOA is continuing to combine the V8 data request with Jaime Martindale of the UW-Madison Robinson Map Library (RML). Therefore, we are requesting a few other layers (listed in Appendix D), in addition to parcels with tax roll attributes.
- **Zoning Data Submission Requirements.** For V8, counties only need to submit three layers of county-maintained zoning data: 1) General, 2) Shoreland, and 3) AirportProtection. These may be submitted AS IS, except for a DESCRIPTION/LINK field requirement.
- **Searchable Format.** Counties will need to meet the Searchable Format in order to execute their 2022 WLIP Strategic Initiative Grant and receive the payment. In some cases in which a county does not meet the Searchable Format requirements with their V8 submission or fails to rectify errors from prior years' Observation Reports, the county may need to re-submit data and/or alter its 2022 grant agreement to address deficiencies in its parcel layer or native data.
- **Clarified Documentation.** The V8 documentation has been revised. Discard any old documentation and links. Replace with this updated Submission Documentation and V8 links. An optional activity for V8 is to take contemporaneous notes on the data prep, grooming, and submittal process. Notes can be submitted to DOA in any file format zipped up in the submission package. To avoid flags in the Validation Tool and ensure that data submissions meet the Searchable Format requirements called for by state statute 59.72(2), counties will need to carefully read the entirety of this documentation before preparing data submissions. ■

1.3 Call for Data

The official V8 data request was sent to each county land information officer on **December 16, 2021** via email, and appears as Figure 2. It included a link to the Submission Documentation, which serves as a manual detailing the requirements of the Searchable Format.

Dear LIO,

On behalf of the Department of Administration, I am writing to request a subset of your GIS data. The data acquired through this request will be used to develop a statewide parcel layer for the next version of the Statewide Parcel Map Database Project, Version 8.

All counties must submit parcel/tax roll data in the Searchable Format standard no sooner than December 31, 2021 and no later than March 31, 2022. To be accepted, submissions will need to meet the specifications for the Searchable Format and be free from any of the errors noted on the county's previous Observation Reports. A successful data submittal adhering to the Searchable Format is necessary in order to execute your county's 2022 Strategic Initiative Grant agreement and receive payment.

SUBMISSION DOCUMENTATION & V8 WEBPAGE

The [V8 checklist](#) summarizes the data request. The digital PDF checklist contains hyperlinks to attribute definitions and links to the full schema. Although there are no changes to the schema, a page titled [New for V8](#) summarizes what's new.

You will want to read the Submission Documentation in full, in order to understand the details of the V8 request. In addition, the [V8 webpage](#) contains all the necessary submission information, and links to several tools to help you format your data.

SUBMIT PLSS + OTHER LAYERS

Again for V8, all counties must **also submit PLSS corner data** (per Appendix C), and **additional GIS layers for RML** (Appendix D), which are being requested in order to aid in analysis of the statewide layer and as part of a collaborative effort with the UW-Madison Robinson Map Library.

VALIDATE WITH VALIDATION TOOL

The updated tool you must run before you submit your data, the Validation Tool, can check your data for deviations from the schema and is also required to create the mandatory Submission Form.

SUBMIT DATA THROUGH WISE-DECADE

After prepping your data and running the tool to create your Submission Form, submit your data to the WISE-Decade platform. Log in using your WISE-Decade credentials from the Legislative Technology Services Bureau.

Please note that collection for municipal boundaries and/or municipal wards will be from January 5th–19th as part of the U.S. Census Bureau's CBAS collection. This collection is also conducted through the WISE-Decade platform.

Please submit your V8 parcel/tax roll data package by **March 31, 2022**.

FEEDBACK AND HELP

For some of the questions you might have, personalized assistance may be available by contacting us. For technical questions, you can email the State Cartographer's Office at help@sc0.wisc.edu or call 608-262-3065. Feel free to contact me with general questions as well.

We realize that a substantial amount of work goes into this annual data submittal. WLIP Strategic Initiative grants were designed to aid in this task. As with the numerous end users who have shared positive feedback as reported in the [V7 Final Report](#), we sincerely appreciate your efforts to help make another year's statewide parcel layer a success.

Thank you,

Peter Herreid
608-267-3369
Grant Administrator
Wisconsin Land Information Program

Figure 2. V8 Call for Data

1.4 V8 Assistance/Outreach & Validation Tool Concept

1.4.1 V8 Assistance/Outreach

For V8, an outreach element was included with the project:

County data preparation assistance/outreach. Conduct outreach with and offer assistance to counties that have in the past experienced problems preparing data. Focus should be on a small subset of counties that have encountered recurring problems with data submissions, those that are characteristic of specific types of problems that occur across multiple counties, and those that are representative of the most common tax parcel software vendors in the state. The goal is to better understand what challenges counties face preparing and submitting parcel and tax roll data, provide solutions where possible, and document roadblocks so that they may be targeted in the future.

Regarding data preparation assistance/outreach, all counties were encouraged to ask for assistance, if they so chose, in the call for data. Individualized assistance with data preparation was provided as requested, as a handful of counties did (particularly in the case of two new land information officers). On March 24, 2022, there was a *Parcel Submission Assistance Webinar* which one county LIO participated in as a listener.

1.4.2 Validation Tool Concept

For V8, the MOU added a new provision to update the Validation Tool with a draft *V9 Validation Tool Concept*:

Future-oriented validation tool concept. In preparation for the V9 data submission, research and explore options for a revamped tool for data validation. Provide a written overview of the tool concept which takes into account the content and format of any reports outputted by the tool. In collaboration with DOA, arrive at an agreed-upon approach and include a plan for the tool as part of the final project report. For V9, provide an automated tool for validation that is aligned to the plan for the tool concept, while still within the scope of SCO capabilities and project timeline.

A draft document outlining the tool concept and development was created by the technical team in March of 2022. A variety of options for developing an updated version of the Validation Tool were explored. Various Python libraries for creating custom guided user interfaces (GUIs) were researched and tested, along with options for creating executables allowing for easy tool execution.

The underlying logic and code of the existing tool makes extensive use of Arcpy, the Python site package for ArcGIS. The current reliance on this site package, as well as ESRI licensing requirements, constrained the GUI library options that were available for the development of the updated version tool. Tkinter was selected as the best option for creating an updated tool interface.

The first phase of the updated Validation Tool for V9 is anticipated to focus on a cleaner and modernized interface, as well as reducing the need for external files (i.e., the *Explain-Certification.txt*). In addition, there will be an emphasis on continuing to strengthen the logical data checks that are performed on the parcel data to ensure higher quality data submissions. Goals for a later phase of the tool update will focus on improved output reports and data observations feedback. This later phase will most likely be fully fleshed out and implemented in the updated tool for the V10 submission.

2 TECHNICAL APPROACH

This chapter describes the strategy or a high-level version of the approach employed by the technical team in processing and aggregating local-level data for inclusion in the V8 final deliverable and statewide parcel map.

2.1 Tool Development

2.1.1 Updated Validation Tool

V8 featured a tool built by the State Cartographer’s Office that counties were required to use before submitting data. The Validation Tool checked data for deviations from the schema, and was also required to create the mandatory Submission Form.

Data submitters could run the tool in test mode to flag potential errors in the data. The tool was run again in final mode in order to create the ".in!" Submission Form, a required part of the submission package.

For more details or to download the tool, see the Validation Tool Guide.

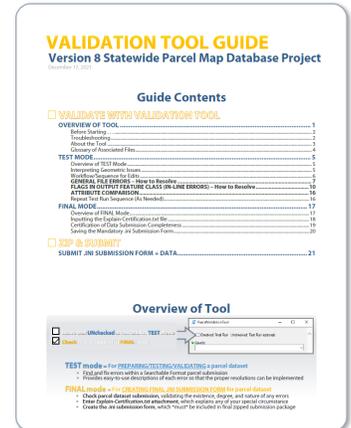


Figure 3. Validation Tool Guide

Validation Summary Page

The Validation Tool was updated for V8. It displays validation test results in a browser-displayed page called the "Validation Summary Page." The Validation Summary Page is a html file with a summary of Validation results that allows the user to visualize the potential errors observed in the dataset. This file opens automatically in a user’s web browser upon completion of running the Validation Tool.

The Validation Summary Page provides a general overview of the condition of the dataset. It summarizes error status for "GENERAL FILE ERRORS" and for "FLAGS IN OUTPUT FEATURE CLASS (IN-LINE ERRORS)." The parcel data is ready for submission upon completion of an error-free Validation Tool test mode run and a corresponding Validation Summary Page file that says no errors have been found.

Validation Summary Page - Vernon

Summary of possible errors found by the Validation Tool, for which you must:

- Eliminate.** Eliminate the flags. Go back to the output feature class to resolve each error by making the data consistent with the schema specs in [Submission Documentation](#), or,
- Explain.** Provide explanations in writing for any legitimately missing/non-conforming data in the [Explain-Certification.txt](#) file.

GENERAL FILE ERRORS	FLAGS IN OUTPUT FEATURE CLASS
<p>Geometric File Error: None. Geometric Misplacement Flag: None. Coded Domain Fields: None.</p> <p>Missing CONAME: None. Missing PARCELSRC: 3 missing values in this field. Populate Missing PARCELSRC for [dataset]. Missing PARCELFIPS: 3 missing values in this field. Populate Missing PARCELFIPS for [dataset].</p> <p>TAXROLLYEAR "2021" (Expected year value): 100.0% TAXROLLYEAR "2020" (Previous year value): 0.0% TAXROLLYEAR "2022 or 2023" (Future year values): 0.0% TAXROLLYEAR (Other year values): 0.0%</p> <p>PARCELDATE FLAG : 98.04% of all records contain uniform PARCELDATE values. Review Submission Documentation.</p>	<p>General Element Errors: 5 possible errors found. See the attribute table in the output feature class to resolve these.</p> <p>Address Element Errors: 6 possible errors found. See the attribute table in the output feature class to resolve these.</p> <p>Tax Element Errors: 13 possible errors found. See the attribute table in the output feature class to resolve these.</p> <p>Geometric Element Errors: None.</p> <p>ERROR SUM: 24</p> <p>*There are detailed error messages associated with these flags, which have been added to your output feature class.</p> <p>Scroll to the far right of the attribute table to see descriptions of each error so that the proper resolution can be implemented.</p> <p>or "IN-LINE ERRORS" are summarized here, and detailed in an output feature class</p>

PARCELDATE FLAG NEW FOR V8

GENERAL FILE ERRORS are summarized in the text of the *Validation_Summary_Page*.

ATTRIBUTE COMPARISON

GREATER INCREASE/DECREASE IN RECORD VALUE COMPLETENESS

Figure 4. Validation Summary Page (example). This displays in full "GENERAL FILE ERRORS" and summarizes error status for "FLAGS IN OUTPUT FEATURE CLASS."

2.1.2 Geoprocessing Tool Development

To support counties in achieving efficient and accurate adherence to the standards in the Submission Documentation, the SCO developed a suite of publicly available geoprocessing tools using the ArcGIS ArcPy Module, Python 2.7, and open source libraries. In total, seven tools were created, and made publicly available through the data submission webpage.

The tools were supported under ArcGIS version 10.3 through version 10.6. Each of these tools were designed to enable efficient solutions to the most common and time-consuming problems related to preparing parcel and tax roll data to be submitted in the statewide schema. Accompanying the tools were user guides that documented how to prepare the data, run the tool, and troubleshoot if necessary.

- **Address Parsing Tool.** Allows the user to parse site addresses from one long string into sub-address elements. Data submitters might use this tool if SITEADDRESS data is not available as fully parsed address elements as required by the Searchable Format.
- **DOR XML Parse Tool.** Allows the user to translate Department of Revenue Tax Roll XML into a GIS table. For tax roll data in XML format that is to be used for parcel submission.
- **Data Standardize Tool.** Allows the user to standardize file geodatabase feature class data via the creation of a lookup table through a two-tool sequence. The first tool is used to create a summary table of a field. This table is edited and subsequently used as input to the secondary tool. The output of the second tool includes all original field domains as well as newly standardized domains in a new field.
- **Condo Stack Tool.** Allows user to model condominiums by stacking condo parcel geometries by owner. A data submitter might use this tool to model condo parcel geometries to match tax roll records with a 1:1 relationship.
- **Class of Property Dissolve Toolset.** Allows the user to format class of property data to statewide schema definitions. This suite of tools may be helpful if a submitter wishes to reformat their class of property information so as to meet the requirements of the schema definitions of PROPCCLASS and AUXCLASS. This tool also handles various common formats that class of property exists as and may be helpful if the submitters data exists in one of these formats.
- **Null Fields And Set To Uppercase Tool.** Allows the user to format all attributes within a feature class to <Null> and UPPERCASE. This tool may be helpful to a submitter if they wish to format their blank fields or fields annotated with a specific string to a true SQL <Null> or if they wish to set all fields to UPPERCASE alpha characters.
- **Field Mapping Workflow Documentation.** Allows a user to map parcel or zoning attributes to the statewide schema. This is not a tool but rather a guide that may be useful to a submitter if they have PARCEL or ZONING data formatted to the schema specifications, but the fields do not have the appropriate FIELD NAME, ALIAS NAME, DATA TYPE, or PRECISION.
- **Summary Table Guide.** Not a tool but a guide for GIS software summary tables, to examine data in preparation for submitting Searchable Format data. This guide is of particular use for cleaning, validating, and standardizing data.

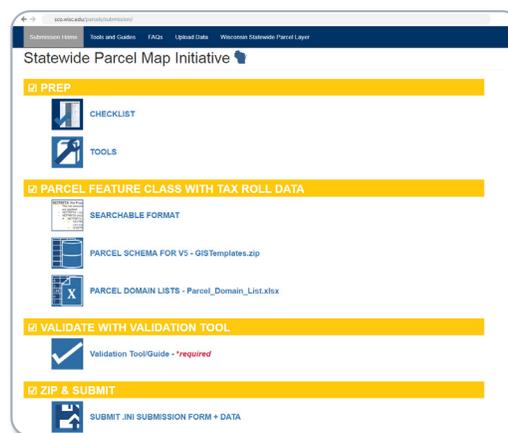


Figure 5. V8 Data Submission Webpage with Links to Schema and Tools

The following table displays the number of downloads for each of the respective tools:

Tool Download Stats								
	# of Downloads V1 (2015)	# of Downloads V2 (2016)	# of Downloads V3 (2017)	# of Downloads V4 (2018)	# of Downloads V5 (2019)	# of Downloads V6 (2020)	# of Downloads V7 (2021)	# of Downloads V8 (2022)
Validation Tool	Not applicable	Not applicable	108	118	84	117	112	95
Address Parsing Tool	Not available	Not available	48	46	36	27	37	34
DOR XML Parse Tool	Not available	Not available	24	36	17	34	24	31
Data Standardize Tool	Not available	Not available	28	27	22	40	39	29
Condo Stack Tool	Not available	Not available	21	19	9	16	15	19
Class of Property Dissolve Toolset	Not available	Not available	20	19	13	20	22	17
Null Fields and Set to UPPERCASE Tool	Not available	Not available	51	59	52	34	57	50
Field Mapping Workflow Documentation	Not available	Not available	36	34	21	19	18	17
Summary Table Guide	Not available	Not available	13	11	11	22	13	9

Note. Source of data is Google Analytics. Numbers represent unique downloads. Validation Tool began with V3 in 2016.

2.1.3 Preparation and Ingest

In the data request, land information officers were asked to submit data to the Legislative Technology Services Bureau (LTSB) of the Wisconsin State Legislature, through their WISE-Decade platform. WISE-Decade is LTSB's suite of mapping tools designed to assist counties and municipalities with legislative and legal requirements as required by state statute. Some file uploads were also accommodated using UW-Madison's enterprise Box.com account through an alternative upload widget.

The ingest phase began after the call for data. An automated email notification was sent to the project team any time a data submission to the WISE-Decade platform occurred. Once notified, the technical team would download the data via FTP login through Windows Explorer. After download, the data underwent a brief inspection, was documented as submitted, and then classified within the project's file directory. Depending on the amount of data submitted at any given time, the new data would either be assessed immediately or be queued for assessment according to the date the data was received. Also, upon receipt of data, the county data directory was backed-up locally, while additional data backups were routinely made to an external drive throughout the development phases.

Robinson Map Library and Other GIS Data

For other, non-parcel GIS layers, the Robinson Map Library (RML) also performed an intake assessment of submitted GIS datasets. For V8, **486 other layers feature classes were added to GeoData@Wisconsin**—comprised of rights-of-way; roads/streets/centerlines; hydrography; address points; buildings/building footprints; land use and parks/open space; trails; and other recreation data. RML staff and students write thorough and complete metadata for all of the data layers, archive them, and make them available for download on GeoData@Wisconsin.

2.1.4 Intake Assessment

Once data was copied to local directories, the required .ini Submission Form was automatically ingested into the technical team's master intake spreadsheet. This .ini file played an important role in cataloging the data submitted. Information obtained from the .ini file included feature class names, condo modeling format, submitter name and email address, generic error counts, completeness relative to V8 data, and a section that allowed contributors to explain unsolvable errors, missing data, and other known issues present within the data submitted.

Next, the team recorded general notes related to attribute quality and completeness, geometric location, and other issues observed. The focus of this assessment was to determine if data met the submission requirements and establish what processing steps would need to be performed to get the data into the Searchable Format for aggregation, as the majority of counties did not submit data that exactly matched the Searchable Format.

To document the internal team intake workflow, a summary-level workflow documentation was created and is updated on a regular basis.

Showstop, Re-Approach, and Resubmit Requests

If, upon internal team discussion, it was determined that data was missing or incomplete, the county was re-approached and asked to resubmit corrected data or provide justification for the missing data. Several counties had to be re-approached to obtain data missing from initial submission, to get clarification on peculiar data observations, and for the correction of erroneous data. In total, **approximately 19 emails were sent to resolve issues related to the fitness of data submissions**. In a few cases, multiple follow-up emails were required to an individual county before their data submission could be deemed complete and proceed past the initial assessment phase.

V8 Versus Previous Re-Submits and Clarifications							
	V3 (2017)	V4 (2018)	V5 (2019)	V6 (2020)	V7 (2021)	V8 (2022)	Change
# of counties that had to be re-approached	29 counties (40%)	38 counties (53%)	19 counties (26%)	26 counties (36%)	27 counties (38%)	15 counties (21%)	↘ -12 fewer counties
# of emails sent to resolve issues	83 emails	60 emails	24 emails	34 emails	39 emails	19 emails	↘ -20 fewer emails

For V8, any intake issues that required county follow-up were sent to DOA via email so that a follow-up email could be sent to the county, under a "showstopper" umbrella for either for missing data, questions to counties, or clarifications on the data submission.

After it was determined that the data submitted could be efficiently manipulated and processed, detailed processing steps were written and recorded in a Microsoft OneNote notebook. These steps provided the team with the information needed to massage the data into the final format and prepare it for the aggregation phase.

2.1.5 Geometric Gap Analysis

To identify gaps in the statewide parcel coverage where digital parcels do not exist, a manual inspection was performed on every dataset. It is the responsibility of the county to integrate all available parcel datasets into their parcel data submission, even if the municipal jurisdiction (city, village) is the data steward for the parcel dataset.

The geometric incompleteness of the V8 statewide parcel layer and the **3 counties yet to complete county-wide digital parcel mapping** are summarized in the table below.

V8 Gaps Summary		
County	Number of Munis with Gaps	Municipalities with Gaps in Parcel Coverage
Buffalo	5	Part of: Alma (C), Buffalo (C), Fountain City (C), Milton (T), Nelson (T), plus several small gaps in various townships
Burnett	3	Part of: Swiss (T), Union (T), West Marshland (T), plus few small gaps in Grantsburg (T) and Anderson (T)
Crawford	5	Part of: Mount Sterling (V), Gays Mills (V), Seneca (T), Wauzeka (T), Wauzeka (V)

For V8, there was no missing geometric data in the form of gaps where parcel data is maintained by a municipality but not aggregated to county-level parcels. However, some tax roll data that is maintained by municipalities independent of counties presented some challenges.

2.2 Independent Data Stewards

V8 Tax Roll Gaps Summary / Independent Municipalities	
County	Municipalities with Independent Tax Roll Data and/or Independent Parcel Geometries
Ashland	City of Ashland
Dane	City of Madison
Dodge	City of Watertown
Douglas	City of Superior (performs export for Douglas County)
Eau Claire	City of Eau Claire
Fond du Lac	City of Fond du Lac
Langlade	City of Antigo
Manitowoc	City of Manitowoc (Transcendent Technologies), City of Two Rivers (Patriot Properties, Inc.)
Milwaukee	City of Milwaukee, City of Wauwatosa, and all other municipalities
Outagamie	City of Appleton
Racine	City of Racine
Rock	City of Beloit, City of Janesville
Rusk	City of Ladysmith
Washington	City of West Bend
Waukesha	City of New Berlin, City of Waukesha, City of Brookfield
Winnebago	City of Oshkosh, City of Neenah, City of Menasha

- Note.**
- * This list is not exhaustive. Other municipalities that maintain parcel and/or tax roll data independently of the county may exist.
 - The fact that a county is listed here does not necessarily indicate that the county submission was incomplete—rather, it shows that extra effort was required by either the county and/or the project team to acquire and/or format the municipal data.
 - DOA seeks information on additional independent municipalities. Please send information to WLIP@wisconsin.gov.
 - **Locating Property Information and Tax Assessment Data in Wisconsin** - Reference page 4 of the V8 Attribute Schema documentation for hyperlinks that you can use to locate data.

2.2.1 Aggregation

The process of aggregating individual county datasets began upon the completion of all required processing tasks for each county. After verifying these tasks were complete and ensuring that data was in the Searchable Format, the finalized feature class for each individual county was identified and the full path was documented to allow the technical team to run a batch processing tool for aggregation.

Next, a new statewide working database was created that contained a merged feature class consisting of all 72 individual county parcel datasets.

Statewide logic

Statewide logic is tweaked each year, with adjustments and minor function modifications consistent with the schema.

State-level processing was performed on the resulting feature class. This processing included steps such as casting select fields from string to double, construction of the STATEID attribute for all records, creation of LATITUDE/ LONGITUDE fields (populated with values for the inside centroid of each parcel polygon), and general data cleaning tasks (e.g., removal of leading/trailing spaces, converting empty strings to <Null>, setting all attributes to UPPERCASE).

2.2.2 Quality Assurance/Quality Control

Beginning with the V2 call for data in the year 2016, data submitted has been required to meet certain documented standards, which make up the Searchable Format. These attribute field standards, attribute domain standards, and geometric representation standards were assessed as part of the QA/QC phase, as documented in the internal project assessment notes. Maintaining high quality datasets from one version to the next is of paramount importance to the Parcel Initiative. A variety of QA/QC methods were used throughout the project, including manually focused techniques, as well as more automated techniques that allowed for visualization across the entire state.

Manual cleanup techniques and tasks were performed across many of the datasets submitted. These included: address element standardization, address number cleanup, miscellaneous street name element parsing, excess field removal, et cetera. Often, the tasks were completed during the processing phase, prior to aggregation into the statewide feature class.

The automated QA/QC techniques were most often performed after the statewide feature class had been aggregated. With 3.5 million parcels, it is not feasible to manually inspect every record. For this reason, summary tables and a variety of maps were created during this process.

Summary tables were created as a byproduct of the state-level processing and provided a discrete set of domains that existed for a particular attribute field. These tables are particularly valuable for fields such as PREFIX, STREETTYPE, SUFFIX, and PROPCLASS, which have specific attribute domain standards. These tables, used in conjunction with the [Data Standardize Tool](#), allowed for corrections to be made efficiently and accurately. Maps were produced, typically using a choropleth scheme, allowing the visualization of spatial trends within individual municipalities, counties, and statewide. These trends could be hard to observe from the tabular data alone. Maps provided another valuable tool for discovering errors and issues that existed in the data and allowed for corrections to be made.

2.2.3 Final Deliverables

Geometric Coverage

Continued progress is being made in completing the digitization of parcels across the Wisconsin landscape, as indicated by the statistics below.

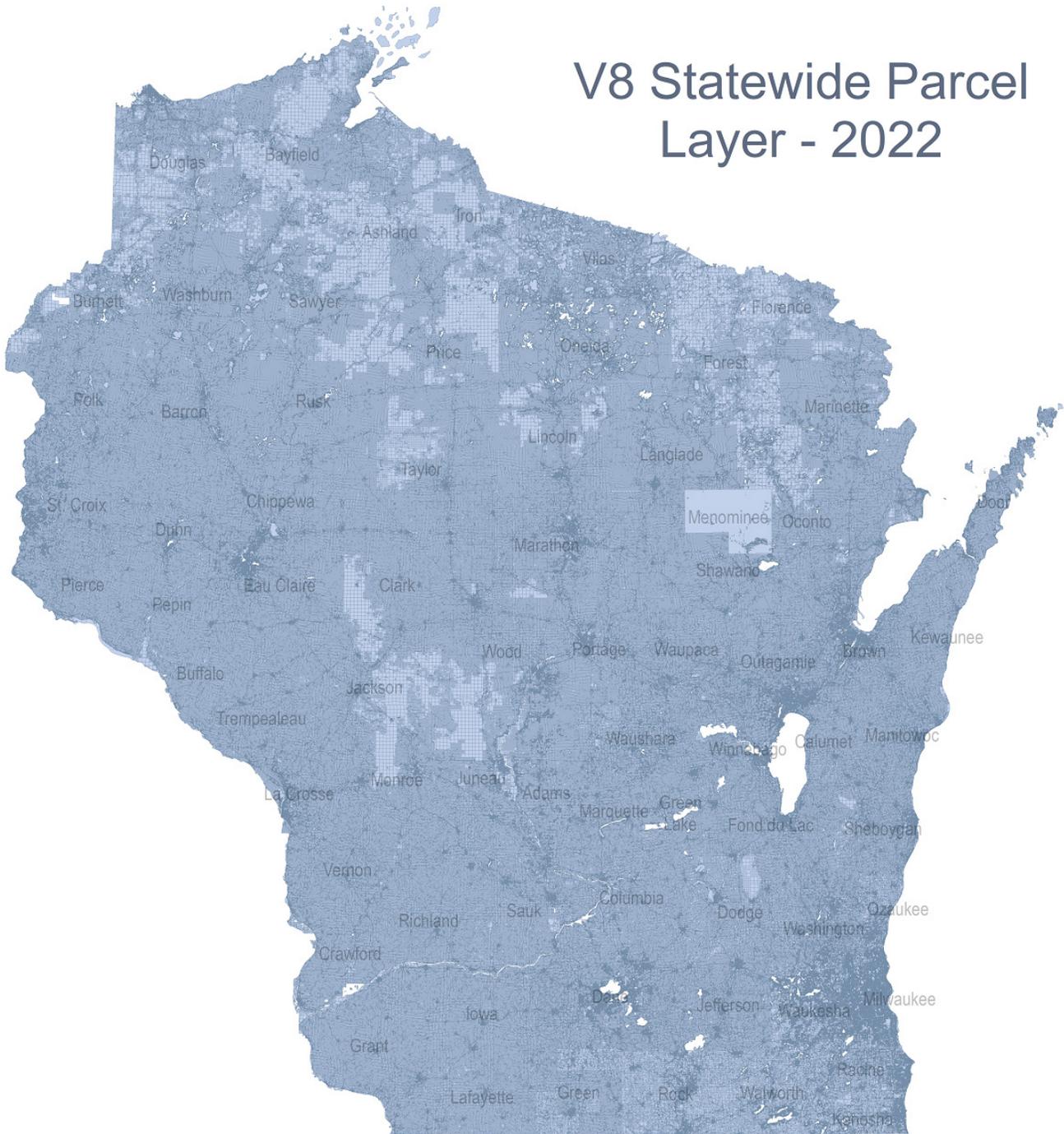
V8 Spatial Coverage Versus Previous Years

	V1	V2	V3	V4	V5	V6	V7	V8	Additional Coverage in V8	Percent Additional Coverage in V8
Number of features	3,434,149	3,466,359	3,486,200	3,491,037	3,504,785	3,507,127	3,520,942	3,529,979	9,037 features	0.26%
Coverage (in sq. miles)	53,656	55,280	56,060	56,193	56,403	56,410	56,389	56,426	37 square miles	0.07%

Note. The coverage in square miles calculation does not represent a true 1:1 comparison between the actual area of the state in square miles and total parcel coverage in square miles. In instances where condo parcels are stacked, the square mileage value is inflated. Differences from year-to-year may be present due to varying ways in which non-parcel features and other unparcelled areas are geometrically represented or omitted.

The final parcel layer totaled 3.530 million parcels and is shown in Map 1 on the following page.

V8 Statewide Parcel Layer - 2022



Map 1. Version 8 Statewide Parcel Layer Completed in June 2022

2.2.4 Note on Zoning

Although five publicly available Wisconsin county-administered zoning layers were aggregated as part of the Statewide Parcel Map Initiative for V3 and V2 (in 2017 and 2016), zoning data was **not aggregated** at the statewide level for V4-V8 in 2018-2022.

For information regarding the statewide zoning layers from 2016-2017, please see the Parcel Project Zoning Change Log and page 5 of the V3_Wisconsin_Statewide_Parcels_Schema_Documentation.

Three zoning types were collected for V8—county **general zoning, shoreland, and airport protection.**

The Searchable Format for V8 zoning data entails inclusion of **DESCRIPTION/LINK** information with the submission, in order to provide the user with definitions of the zoning classes.

The table below summarizes the zoning data collection between V2 and V8.

V8 Zoning Data Submitted							
Zoning Type	V2 Number of Datasets Collected (and number with errors)	V3 Number of Datasets Collected (and number with errors)	V4 Number of Datasets Collected (and number with errors)	V5 Number of Datasets Collected (and number with errors)	V6 Number of Datasets Collected (and number with errors)	V7 Number of Datasets Collected (and number with errors)	V8 Number of Datasets Collected (and number with errors)
County General Zoning	14 / 49	21 / 56	7 / 54	4 / 53	6 / 50	8 / 55	5 / 53
Farmland Preservation	16 / 29	12 / 38	not collected				
Shoreland Zoning	16 / 33	18 / 45	4 / 24	0 / 27	3 / 31	2 / 27	1 / 26
Floodplain	15 / 29	17 / 41	not collected				
Airport Protection Zoning	9 / 16	5 / 23	1 / 12	0 / 13	1 / 12	2 / 12	1 / 9
Total errors/TOTAL SUBMITTED	(45%) 70 / 156	(36%) 73 / 203	(13%) 12 / 90	(4%) 4 / 93	(11%) 10 / 93	(13%) 12 / 94	(8%) 7 / 88

Note. In some cases, zoning datasets are only submitted if they differ from the previous year.

Individual county datasets are publicly available through UW-Madison Robinson Map Library’s geospatial data portal, GeoData@Wisconsin. All zoning types are bundled as a single feature class and are indexed on page 22 of the V8_Wisconsin_Statewide_Parcels_Schema_Documentation.

For the most current county zoning data, consult the individual county’s land records websites.

Units of local government can also exercise zoning in Wisconsin, in which case end users might consult municipal/town web mapping sites for municipal-level zoning GIS data. It is generally best to **contact the authoritative jurisdiction** for the most complete zoning data.

2.3 Data Distribution

2.3.1 Database Download Webpage

The data was distributed via two primary means: a website with download links and a web-based mapping application. The V8 database was formally released to the general public on June 20, 2022, through the DOA land information email listserv and the data page at www.sco.wisc.edu/parcels/data.

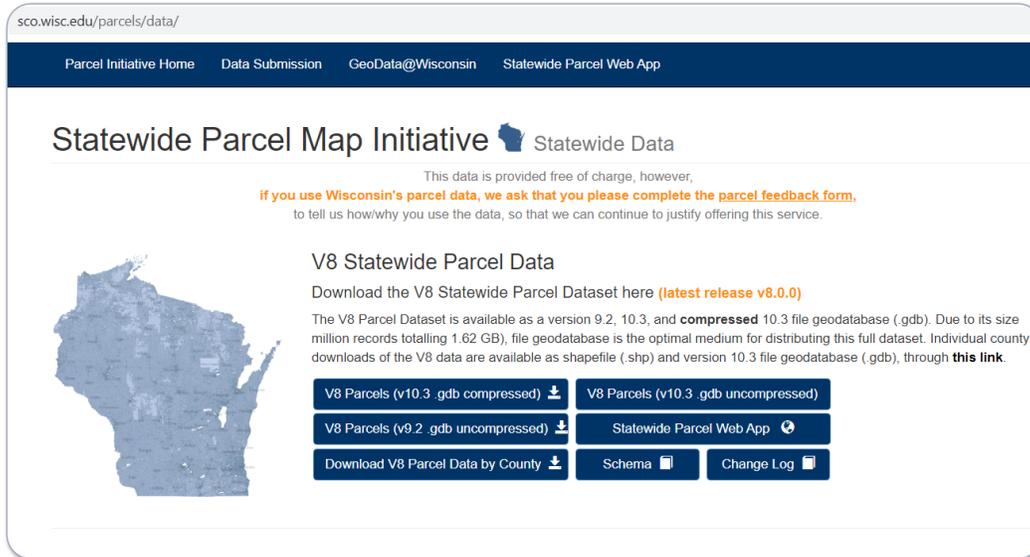


Figure 6. V8 Data Page

The custom webpage for data distribution was built and hosted by SCO, with the aim of flexibility. The site supports desktop, mobile, and tablet devices.

2.3.2 Web Application

Development of the web application for V8 followed suit with the technology used in developing the previous web applications—Web AppBuilder, the ArcGIS API for JavaScript, and feature services hosted by Wisconsin's LTSB. The V8 app design reflected the elements of the previous year's app with the addition of some enhancements added through custom code to target functionality not supported through Web AppBuilder.

As a GIS layer and application covering the entire state of Wisconsin, functionality for displaying and querying parcel data at statewide and regional levels—in addition to county and neighborhood levels—was important. The sheer amount of data in the parcel layer requires a unique strategy be employed to provide users with a fluid and seamless experience at all scale levels.

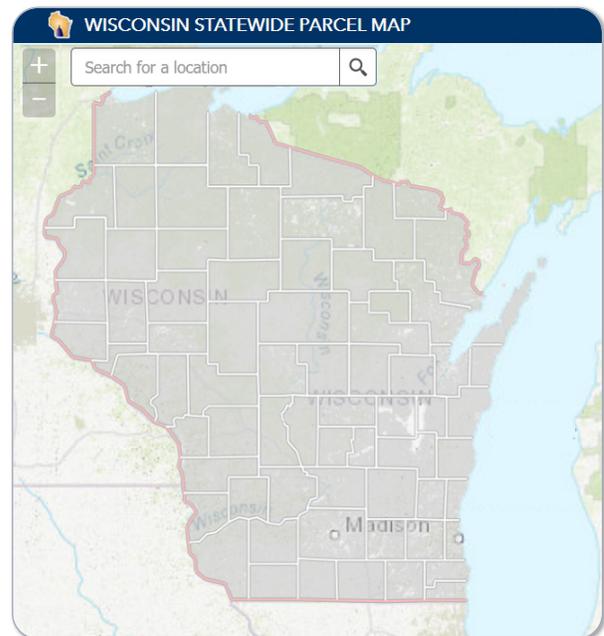


Figure 7. V8 Web App

Improvements to the V8 Web App

- Inclusion of the V8-V7 parcel data feature layers.** At the time of the release of the V8 statewide layer, only the impending V8 and V7 feature layers were included in the app at maps.sco.wisc.edu/Parcels. However, users can still download a historic copy of the V1-V7 data at sco.wisc.edu/parcels/data and from the Robinson Map Library.
- Updates to supporting text/links and user feedback form.** All of the supporting text and links associated with the parcel application including, the Statewide Parcel Map splash screen, *About* section, *Search Tips*, and data download links were updated. Updates were also made to the user feedback form (shown in Figure 8) and land information county contacts page, which directs users to Wisconsin’s county-maintained land information websites.
- Standardized site address field for searching.** By way of the LTSB feature service, the V8 parcel application includes a field called "**STAND_SITEADD**," which facilitates a simplified, more streamlined search of parcels by site address.
 - In the file geodatabase for the statewide layer, the site address field—SITEADDRESS—appears "as is," with the physical street address of the parcel appearing exactly as it is provided by the county.
 - As a result of the differences in formatting for site address data at the county level, an end-user might need to perform multiple iterations of a search in order to find one desired address.
 - Particularly for the PREFIX and STREETTYPE fields, variations in spelling and abbreviations can be found in the SITEADDRESS field.
 - The standardized site address field, STAND_SITEADD, is created by:
 - Concatenating the elements that make up SITEADDRESS**, which counties are to submit as individual address elements:

ADDNUMPREFIX	ADDNUM	ADDNUMSUFFIX	PREFIX	STREETNAME	STREETTYPE	SUFFIX	UNITTYPE	UNITID
 - Further refining the PREFIX field**, so that it is standardized to a select number of domains:

CTH	STH	USH	INTERSTATE
N CTH	N STH	N USH	
E CTH	E STH	E USH	
S CTH	S STH	S USH	
W CTH	W STH	W USH	

Figure 8. V8 User Feedback Form

- Improvements to End User Schema Documentation.** The V8 end user schema (*V8_Wisconsin_Statewide_Parcels_Schema_Documentation*) was also updated for V8. The documentation contains several notes for end users including links to some of Wisconsin’s assessment/tax data resources, *Locating Property Information and Tax Assessment Data in Wisconsin*.

2.3.3 Data Access and Download Statistics

Across the various formats that are offered, the statewide parcel database has received large numbers of downloads and access via web mapping services.

V7 received a total of 11,266 downloads and 11,424,840 hits on web services in the year following the V7 release date. Download and web app statistics from V1-V7 appear on the following page.

Statewide Parcel Layer Download and Access Statistics

	Downloads	Hits on Services or App Views/Requests
V1 V1 Parcels		
V1 Parcels (during V1 year)	3,625 Total	unknown
V2 V2 Parcels		
V1 Parcels (during V2 year)	131	451,374
V2 Parcels (during V2 year; all formats)	859	1,341,401
V2 Individual County Parcels, all 72 counties combined (all formats)	3,248	NA
	4,238 Total	1,792,775 Total
V3 V3 Parcels		
V3 Parcels (during year after release; all formats)	868	unknown
V3 Individual County Parcels, all 72 counties combined (all formats)	2,203	unknown
	3,071 Total	
V4 V4 Parcels		
V4 Parcels (during year after release; all formats)	1,142	4,453,517
V4 Individual County Parcels, all 72 counties combined (all formats)	4,204	NA
	5,346 Total	4,453,517 Total
V5 V5 Parcels		
V5 Parcels (during year after release; all formats)	1,715	10,090,958
V5 Individual County Parcels, all 72 counties combined (all formats)	5,637	NA
	7,352 Total	10,090,958 Total
V6 V6 Parcels		
V6 Parcels (during year after release; all formats)	1,755	unknown
V6 Individual County Parcels, all 72 counties combined (all formats)	6,771	NA
	8,526 Total	
V7 V7 Parcels		
V7 Parcels (during year after release; all formats)	2,461	11,424,840
V7 Individual County Parcels, all 72 counties combined (all formats)	8,805	NA
	11,266 Total	11,424,840 Total

Note.

- Data that is not available is denoted with "unknown."
- The source download data is Google Analytic events, as well as Box access statistics. Numbers are approximate.
- The source for hits figures is LTSB. Figures for hits are approximate.
- V6 hits figures for Hits on Services or App Views/Requests were unavailable due to an LTSB server migration that occurred during V6.
- "Hits" numbers are subject to variation in definition. Here, hits may be "transactions." For ArcGIS server, a transaction is defined as any time the server or services is hit or pinged. Therefore, the number of hits is not an indicator of the number of unique users. A transaction is counted each time that a user makes a request to the service and data is returned.
 - For example, each of these actions within the parcel web app would be counted as a transaction:
 - a) searching the web app on owner name, parcel ID or site address;
 - b) panning the map to an uncashed area when viewing the map at neighborhood level (large scale); and
 - c) clicking on the map to procure the parcel attribute information of an area.

Statewide Parcel Layer Web Mapping Application Statistics

	Sessions	Users	Pageviews
V1 App (July 31, 2015 – Oct 16, 2016)	Data not available	Data not available	Data not available
V2 App (Oct 17, 2016 – September 6, 2017)	9,788	4,271	16,402
V3 App (Sep 7, 2017 – July 30, 2018)	31,013	15,602	56,423
V4 App (July 31, 2018 – June 30, 2019)	75,815	42,258	117,338
V5 App (June 30, 2019 – June 30, 2020)	121,326	65,239	164,188
V6 App (June 30, 2020 – June 2021)	156,517	78,837	196,033
V7 App (June 30, 2021 – June 2022)	142,430	72,405	170,670

Note.

- The first date in the date range represents the public release date for the web app.
- Data source is SCO's implementation of Google Analytics.

Zoning Data Download Stats

Zoning Download Statistics

V1 V1 Zoning	Downloads	Hits on Services or App Views/Requests
NA – No statewide zoning data was produced as part of V1	NA	NA

V2 V2 Zoning (Aggregated for V2)

Wisconsin_Zoning_2016 - All 5 zoning layers in one database	128-174	NA
Airport	19-36	3,524
Farmland	39-56	3,837
Floodplain	26-44	4,448
General	61-80	8,138
Shoreland	27-47	4,469
	300-437 Total	24,416 Total

V3 V3 Zoning (Aggregated for V3)

Wisconsin_Zoning_2017 - All 5 zoning layers in one database	127	unknown
Airport	17	unknown
Farmland	37	unknown
Floodplain	27	unknown
General	65	unknown
Shoreland	28	unknown
	301 Total	

V4 V4 Zoning

SCO Data Page – All Zoning (all zoning types combined; from January 2017–Dec 2018)	113-194	NA
GeoData@Wisconsin - “2018” year data (GeoData stats not available)	NA	NA
GeoData@Wisconsin - Any year zoning data (GeoData stats; January 2017–Dec 2018)	89	NA
	202-283 Total	

V5 V5 Zoning

SCO Data Page - Zoning (all zoning types combined; from January 2019–Dec 2019)	196	NA
GeoData@Wisconsin - “2019” year data (GeoData stats not available, except Q4 [20])	20	NA
GeoData@Wisconsin - Any year zoning data (2019 sans September 2019)	227	NA
	443 Total	

V6 V6 Zoning

SCO Data Page - Zoning (all zoning types combined; from January 2020–Dec 2020)	**	NA
GeoData@Wisconsin - “2020” year zoning data (from January 2020–Dec 2020)	91	NA
GeoData@Wisconsin - Any year zoning data (from January 2020–Dec 2020)	456	NA
	547 Total	

V7 V7 Zoning

SCO Data Page - Zoning (all zoning types combined; from January 2021–June 2022)	**	NA
GeoData@Wisconsin - “2021” year zoning data (from January 2021–June 2022)	310	NA
GeoData@Wisconsin - Any year zoning data (from January 2021–June 22)	1,371	NA
	1,681 Total	

Note.

- V2 zoning figures appear as a range (e.g., 128-174) due to differences in Google Analytics versus Box access statistics.
- “All zoning” means any and all zoning types—aggregated statewide layers (produced for V2/V3), individual county layers, and statewide layers produced by DATCP for farmland preservation zoning.
- Statewide GIS data for farmland and floodplain zoning may be available either from GeoData@Wisconsin and/or the following:
 - **Zoning – Farmland:** See Wisconsin DATCP for statewide farmland zoning data
 - **Zoning – Floodplain:** See FEMA for statewide floodplain zoning data

3 BENCHMARK PROGRESS ASSESSMENT

3.1 Benchmark 1-4 Progress Assessment

In the years 2016-2021, the notes from the Statewide Parcel Map Database Project intake process and assessment were formerly communicated to counties through documents called the *Observation Reports*. The reports were individualized for each county, and contained observations related to the data submitted, with focus on how local data compared to the statewide schema.

The V7 Observation Reports showed precisely how local data compared to the benchmarks for parcel data laid out in the *WLIP grant application* and the *Submission Documentation*, evaluating how close counties came to the Searchable Format for submission of parcel data.

Project staff documented what must be done yet to achieve the Searchable Format and thus meet Benchmarks 1 and 2. The intention was that the action items from the Observation Report be used as a checklist to help develop and groom the county’s data to meet the Searchable Format in the future, and, where applicable, to call attention to reoccurring errors for those counties who submitted data with the same deficiencies or errors that had been pointed out to them in the past as issues to remedy.

Observation Reports were omitted from V8. After several years of creating and sharing the Observation Reports with counties, the incremental gains achieved going through the exercise again for V8 were projected to be marginal at best. Given that it required a significant amount of staff time to complete the Observation Reports, it was decided that staff time could be more productively directed to other areas of the V8 Project, such as improving the Validation Tool for V9. The end result or projected end result of omitting the Observation Reports will be most evident at the time of the V9 data submittal intake process.

The new for V8 "Validation Tool Concept" that serves as prep for V9 will seek to provide data submitter feedback. The V9 updated tool will continue to focus on strengthening the data quality and record specific contextual checks. Doing so will assist in identifying potential deviations from the schema requirements prior to submission, thus reducing the amount of manual staff time required for assessing the data. In addition, catching these issues prior to submission will also reduce the amount of back-and-forth correspondence between the project team and data submitters often required to resolve the issue. The V8 iteration of the tool’s *Validation Summary Page* utilizes a text format to display major increases or decreases in the presence of specific attribute values. The new tool will focus on providing this information in a more graphic or visually focused manner. The best method for achieving this will be determined in preparation for V9 in fall of 2022, with a goal of providing useful feedback for data submitters.

3.1.1 OWNERNME1 – Redaction of Owner Names

V8 Owner Name Redaction		
County	Scope	Percent Redacted
Kenosha	Entire county dataset	100.00
Barron	Partial	0.56
Brown	Partial	0.12
Columbia	Partial	0.27
Dane	Partial	9.22
Jackson	Partial	0.67
Manitowoc	Partial	0.19
Sauk	Partial	0.10
Sheboygan	Partial	0.19
Vilas	Partial	0.29
Waupaca	Partial	0.21

For the owner name attribute, some counties redacted owner names. Partial owner name redaction was conducted by 11 counties for V8, although some counties redacted only a very small number of records. An additional county—Kenosha—withheld all owner names, consistent with a local county board resolution.

Over time, this represents an improvement compared to the V1 database, in which 22 counties did not permit owner name display in the V1 statewide layer.

3.1.2 Benchmark 1 & 2 Progress Assessment

Benchmarks 1-4 were initially defined in detail within the V1 Interim Report:

- Benchmark 1 – Parcel and Zoning Data Submission
- Benchmark 2 – Extended Parcel Attribute Set Submission
- Benchmark 3 – Completion of County Parcel Fabric
- Benchmark 4 – Completion and Integration of PLSS

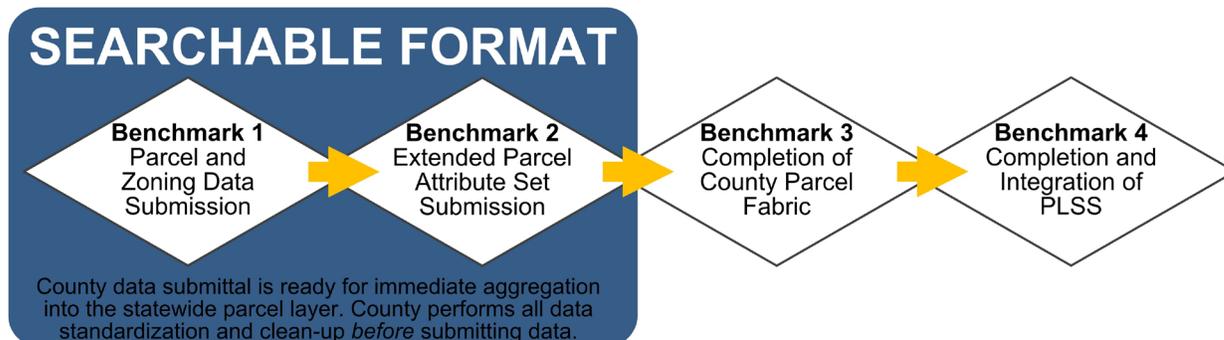


Figure 9. Searchable Format with Benchmarks

Benchmark 1 and 2 are explored below for the purpose of assessing progress between V2 and V8. For both of these benchmarks, progress between the successive projects can be captured in comparing the individual V2 Observation Reports, V3 Observation Reports, V4 Observation Reports, V5 Observation Reports, V6 Observation Reports, and V7 Observation Reports.

Benchmark 1 & 2 – Parcel/Zoning Data Submission & Extended Parcel Attribute Set Submission

Benchmark 1 and 2 were satisfied by submitting parcel, tax roll, and relevant zoning information using the required standards detailed in the Submission Documentation. Because Benchmark 1 and 2 are closely related and go hand-in-hand, they are often discussed together. The main distinction is that for Benchmark 2, counties must submit parsed address components with their parcel data.

For parcel and tax roll data submitted for V1, V2, and V3, there were two submission format options—the "Export Format" and the "Searchable Format." For V4 and beyond, the Searchable Format was the only submission option.

The Searchable Format is a format that directly meets the data model requirements of the final statewide parcel layer. This format is not expected to change in the foreseeable future and is intended that only essential modifications be made for future iterations of the statewide parcel database. The Searchable Format is the format that all counties will be expected to use for future versions of the project.

The "Export Format" was a format for data exchange. Data received in this format—from 2016-2017—was processed by the parcel aggregation team to meet the data model requirements of the final statewide parcel layer. This format was acceptable for counties to use for submitting parcel and tax roll data for the V1, V2, and V3 projects, but the Export Format was phased out for the V4 Project, when it was no longer accepted. The Export format is not compatible with the desirable asynchronous update model and is a major obstacle to achieving the objective of automation and efficiency in statewide parcel aggregation. It was originally devised to accommodate variations in local data and allow counties time to gradually adjust to the submission requirements of the Searchable Format.

Parcel Data Evaluated Against Benchmark 1 & 2

Assessing progress in county achievement of the Searchable Format—equivalent to attaining Benchmark 1 and 2—can be performed by referencing the V2, V3, V4, V5, V6, and V7 Observation Reports. The Observation Reports track all substantial manipulation that needed to be performed on each county parcel data submission, on a per attribute basis. The table in the V7 Report on page 21 summarizes the progress between V2 and V7. Assessing progress in county achievement of the Searchable Format took a different shape with V8, residing in team discussions, internal team notes (e.g., OneNote), and evaluation against county grant applications.

The majority of counties came close to meeting the Searchable Format in their initial V8 parcel data submissions. Given the complexity and size of the local data, not all counties submit "perfect" Searchable Format submissions on their first attempt. Few counties met the standard for parcel data exactly with their initial data submission.

- Met Searchable Format for V8 parcel data submission on initial data submission: ~16 counties (22%)
Barron, Bayfield, Calumet, Dunn, Fond du Lac, Green, Iowa, Jackson, Kenosha, Manitowoc, Pepin, Polk, Richland, Taylor, Washburn, and Wood.

3.1.3 Benchmark 3 and Benchmark 4 Progress Assessment

Data for Benchmark 3, Completion of County Parcel Fabric—collected via the 2022 WLIP grant application (at the end of calendar year 2021)—is summarized below, as well as data for Benchmark 4, Completion and Integration of PLSS. These are the four counties who have yet to complete county-wide digital parcel mapping and **39 of 72 counties** have PLSS remonumentation work remaining.

Benchmark 3 Progress		
As of 2021	Counties with Incomplete Parcel Fabric	Estimated Year of Parcel Fabric Completion
	Buffalo	2027
	Burnett	2024
	Crawford	2023

Benchmark 4 Progress		
As of 2021	Counties with Incomplete PLSS (Self-Reported; 39 of 72 counties)	Estimated Year of PLSS Network Completion
	Ashland	2035
	Bayfield	2039
	Buffalo	2027
	Burnett	2025
	Chippewa	2024
	Clark	2030
	Columbia	2028
	Crawford	2024
	Dane	2024
	Douglas	2030
	Dunn	2030
	Eau Claire	2028
	Florence	2035
	Forest	2035
	Grant	2059
	Green	2030
	Green Lake	2025
	Iowa	2022
	Iron	2030
	Jackson	2030
	Lafayette	2030
	Langlade	2028
	Lincoln	2022
	Marinette	2050
	Marquette	2025
	Monroe	2024
	Oconto	2031
	Oneida	2030
	Portage	2024
	Price	2030
	Richland	2024
	Rock	2023
	Rusk	2030
	Sauk	2030
	Sawyer	2035
	Taylor	2024
	Vilas	2030
	Waupaca	2024
	Waushara	2030

3.3 E4 PLSS Sub-Project

As part of V5-V8, a full statewide Public Land Survey System (PLSS) layer, Edition 1, Edition 2, Edition 3, and Edition 4 were created and will be reported on separately.

E4 statewide PLSS data can be downloaded from www.sco.wisc.edu/parcels/data.

For background information on PLSS in Wisconsin, see the State Cartographer’s Office webpage on Land Surveying and PLSS Topics.

4 RECOMMENDATIONS

The collaborative exercise of DOA and SCO producing final reporting on each year's parcel aggregation project, complete with recommendations, is a requirement of the project MOU. The recommendations contained within each year's final report and documentation of lessons learned are essential elements of the WLIP's regular program planning activities and serve as tools to help to evaluate the project and lay out a course for the future.

The methodology for composing the recommendations in the final project report for each year's parcel database were described in detail on page 24 of the V6 Final Report.

Recommendations below cover several areas, such as technology, tools, data request details, project workflow, and sustainability. Importantly, they take into account state-level needs at the same time as those of other end users and the local governments that produce the data that makes up the statewide parcel layer.

Recommendations for V9 and Beyond

1. Web app: Establish new hosting mechanism for parcel data

- Land information officers are asked to submit data to the Legislative Technology Services Bureau (LTSB) of the Wisconsin State Legislature, through their WISE-Decade platform. WISE-Decade is LTSB's suite of mapping tools designed to assist counties and municipalities with legislative and legal requirements as required by state statute.
- For several years, LTSB has hosted the feature service at mapservices.legis.wisconsin.gov/arcgis/rest/services/WLIP.
- LTSB has communicated an inability to continue hosting after V8 ceases. Therefore, there is a need to establish a new hosting mechanism for parcel data, since LTSB can no longer do it.
 - ▶ **Action Item:** Plan for V9 feature service hosting options and budget, building time and explicit deliverable(s) into the V9 MOU for the research needed to achieve independent hosting and/or third-party state agency collaborations.

2. Web app: Update application

- The current web application was built in 2016 and thus may be close to breaking beyond repair.
- Development of the V2 web application—updated each year through V8—followed suit with the technology used in developing the V1 web application—Web AppBuilder for ArcGIS. In contrast to the V1 app, however, the V2-V8 app design reflected both functional and cosmetic updates implemented via Web AppBuilder, with added value through custom coding.
- For V9, a goal is to update the application via ArcGIS Web AppBuilder.
- With a rebuild, there is the potential to explore additional features for the V9 data release or V10, such as: a measuring tool, select and export by area (clip, zip and ship), and perhaps others.
 - ▶ **Action Item:** Include V9 app update project planning into V9 MOU milestone timeline.
 - ▶ **Action Item:** Research hosting options and costs, including credit usage.
 - ▶ **Action Item:** Leading up to the V9 release in June of 2023, pull down app and host for SCO customization.

3. Web app: Highlight parcel app features

- Often end users submit comments about the inability to do things in the parcel app that can, in fact, be done.
- One way to address this might be to more prominently highlight the most commonly requested features higher up in the *About* section of the app.
 - Switch to stroke only so basemap is not obscured ("Show outline only" or outline view)
 - Use app on mobile phone and use phone GPS to zoom to user's current location
 - Clip, zip and ship
 - Explore making other export types available (e.g., CAD formats), or call attention to schema page 2 which specifies that other formats may be available upon request
- Another option is to add video or GIF clips to the app that help show app features.
 - ▶ **Action Item:** Plan for V9 app updates in V9 MOU milestone timeline.

4. Validation Tool: Strengthen Validation Tool checks

- Regular updates and audits of the Validation Tool functions and checks allows for providing consistent and accurate alerts to data submitters during the validation process. Updates and modifications are made to the Validation Tool on an annual basis in the interest of providing quality feedback for the data preparation process.
- Make edits to the revamped V9 Validation Tool to accommodate the most common flags explained in the county *Explain-Certification.txt* portion of the submission form.
- Refine tool logic, so that counties do not need to explain as much for common flags.
- Additional logic will be added to expand the current validation checks, including but not limited to:

- General address component logic verification (SITEADDRESS is <Null> but any of the address components are populated, et cetera).
- Flag when expected fields are 100% empty
- ESTFMKVALUE > 0 when appropriate PROPCLASS values present
- Reevaluate NETPRPTA/GROSS threshold for legit values of "0"
- The Validation Tool should be as clear as possible that like or common error explanations can be grouped together, instead of individually explained.

▶ **Action Item:** Make changes to tool logic, for draft V9 tool due on October 31st, to be finalized by November 15th.

5. Validation Tool: V9 Validation Tool Concept implementation

- The new concept for the Validation Tool was laid out in draft form in March of 2022, and in a final plan.
- In addition to any aesthetic or ease-of-use updates, some priorities for a revamped tool include:
 - ▶ Seek to build in an efficient mechanism for entering the "Explain-Certification.txt Must-Haves":
 - NOTICE OF NEW STREET NAMES
 - NOTICE OF NEW NON-PARCEL FEATURE PARCELIDs
 - NOTICE OF MISSING DATA/OMISSIONS
 - ERROR SUM ERRORS THAT ARE UNRESOLVABLE
 - ▶ Consider whether there is an accountability or enforcement mechanism so that counties rectify/pay heed to the results of the Validation Summary Page.
 - ▶ Consider the need for counties to manually enter legitimate errors and/or have the project team reassess them anew each year—i.e., "standard exceptions."
- ▶ **Action Item:** Implement new Validation Tool Concept with attention to priorities where feasible.

6. Make no changes to parcel schema for V9

- Changes to the parcel schema, other than potentially reducing requirements for data submittal (e.g., deleting attributes or making them optional), would be disruptive to data submitters. This disruption would likely not be worth the small, incremental benefits that any changes would garner.
- An external change may be needed before a drastically different approach to statewide parcel aggregation is viable. For example, county-wide assessment, a legislative change, all local governments achieve DOR's XML standard or DMA's Wisconsin NG9-1-1 GIS Data Standard & Best Practices. These or other developments at the state or federal level would warrant a reexamination of the parcel schema and data aggregation process, as would any leaps in technology.
 - ▶ **Action Item:** Stay abreast of other state and national standards and their enforcement and levels of compliance at the local level, as data is available.
 - ▶ **Action Item:** Strive to maintain consistency with other enforced standards, while also taking into account local conditions and the diversity in local government land information systems that may stand in the way of a statewide "multi-purpose" standard for any one relevant GIS data layer (other than parcels that have geometry with tax roll attributes called for by statute 59.72(2)(a)).

7. DOA explore option of requiring counties to link to Statewide Parcel Map page

- According to s. 59.72(2), a county shall post parcel data in the Searchable Format on the internet. Instead of each county posting parcel data directly on the internet, counties provide parcel data in the Searchable Format (or close to this standard) to DOA, which contracts with SCO to aggregate all 72 county parcel datasets into the statewide digital parcel map database. This statewide database is made publicly available at the SCO data download webpage: www.sco.wisc.edu/parcels/data, which is also linked from GeoData@Wisconsin, a site curated by the UW-Madison Robinson Map Library.
- In order to more directly meet the statutory requirements for counties to post parcel data online in the Searchable Format and increase awareness and discoverability of the statewide parcel database, potentially require that counties provide a link to www.sco.wisc.edu/parcels/data and GeoData@Wisconsin somewhere on their website
- Counties would have discretion where to place the weblink and with what accompanying text, so as not to disrupt the structure of county websites.
- SCO and/or RML could implement small webpage or metadata tweaks in order to maximize search engine optimization.
 - ▶ **Action Item:** DOA evaluate effectiveness of first asking counties to voluntarily add two links.
 - ▶ **Action Item:** DOA consider making links a requirement for 2023 or 2024 grants.
 - ▶ **Action Item:** SCO explore further tweaking webpage or metadata for search engine optimization.
 - ▶ **Action Item:** RML explore further tweaking webpage or metadata for search engine optimization.
 - ▶ **Action Item:** In the V9 Submission Documentation, mention the topic of link(s) to statewide parcel map download page, as a way to demonstrate in the program materials it is part of the required Act 20 Searchable Format to post links.

8. DOA/SCO explore option of statewide parcel data download page integrations with GeoData@Wisconsin

- Currently, there is a "two-stop shop" for parcel data, as users can acquire data from either the SCO parcel data download page, or from RML's geospatial data portal, GeoData@Wisconsin.
- As of July 2022, the SCO parcel data page does hyperlink to GeoData.

- The SCO parcels page, sometimes referred to as the "mini-site," utilizes Box download link URLs.
- The mini site could *at some point* be subsumed or integrated into GeoData. For example, the mini-site page contents could be pasted into a new page or "collection" housed inside the GeoData platform. This would require download URLs to be those associated with the GeoData catalog, and other labor as well.
- In short, there are opportunities for further integration of the SCO data page with GeoData which can be considered for V9 MOU or V10 scope of work.
- **Action Item:** Consider GeoData/mini-site integrations for the V9 or V10 MOU scope of work.

9. New LIO/data preparer's workshop or meeting

- To aid in county data preparation, one outreach option is to reach out individually to new LIOs or those preparing data for the first time immediately after the V9 call for data request.
- The team could address some of the biggest issues, problems, et cetera that have occurred in the past.
- Walk them through all the tools available, what needs to be done before running the Validation Tool, and so forth.
- Such tips could also be added to the [county workflow example diagram](#) for data submission prep.
 - ▶ **Action Item:** Plan for and set target date for an SCO data preparer's meeting to be held in early 2023.

10. Gather additional county data relevant to tools and parcel submittals

- Some additional county data or metadata may be relevant to the Validation Tool and parcel submittals.
 - Version of ArcGIS
 - Plans to switch to ArcGIS Pro
 - Availability of a county parcel feature service, and if so, the included fields
- ▶ **Action Item:** DOA gather ArcGIS software and feature service information from the county land information plans submitted in late 2021.

11. Parcel assessment workflow improvements

- Workflow documentation has several benefits, including that it helps document the workflow process with an eye toward replicability of the project, provides information to be considered in planning efforts for future iterations of the statewide database, including helping to identify efficiencies and improvements to be gained and steps that might move the Parcel Initiative closer to the Four A's (Authoritative Automated Asynchronous Aggregation), and helps DOA understand the technical process better, such as what is QA/QC'ed and what is not.
- As such, the workflow documentation should be a living document that is scrutinized, refined, and added to throughout the development of each statewide parcel database.
- At time of V8 release, one county was discovered to have a small number of owner names utilizing "UNKNOWN" to designate them, perhaps instead of "NOT AVAILABLE" as the schema calls for in the case of redacted records.
- The V8 workflow documentation reads,

Get count of 'NOT AVAILABLE' records if owner name redaction policy exists.

- ▶ **Action Item:** Adding step to workflow, to check if counties who redact uniformly employ "NOT AVAILABLE."
- ▶ **Action Item:** Make any other changes to the V8 workflow for V9.

12. V9 Call for data prep to occur in October/November of 2022

- According to the V8 MOU, the V9 call for data should be ready by November 30, 2022, which is more than a month earlier than previous years. Similarly, the V9 data Validation Tool is to be finalized much earlier, by November 15, 2022.
- For V9, there could be a benefit to maintaining a schema tweak log. It would be an authoritative list of V9 changes, V9 schema changes, and V9 documentation changes. This list is necessary for composing the V9 end user schema, for metadata in the file geodatabase, et cetera.
- There could be a benefit to updating metadata and the end-user schema immediately after a tweak occurs with the Submission Documentation.
 - ▶ **Action Item:** Hold team planning meetings in October and November 2022 for the November deliverables of the V9 Submission Documentation and revamped Validation Tool.
 - ▶ **Action Item:** Maintain a schema tweak log for V9. Keep one authoritative list of V9 changes/V9 schema changes/V9 documentation changes. Update metadata and user schema immediately after tweak occurs.
 - ▶ **Action Item:** For the V9 call for data, plan to print the V9 Submission Documentation and mail it via postal mail, particularly for new LIOs.
 - ▶ **Action Item:** As part of the V9 Submission Documentation update process, draft the PLSS call for data. Include any E5 PLSS call for data changes in the draft V9 call for data that are consistent with recommendations from previous year's PLSS report.

13. Edits to Submission Documentation that are non-substantiative

- **Typos.** For V9 Submission Documentation, fix typos in MFLVALUE, AUXCLASS, LONGITUDE/LATITUDE.
- **Many-to-One for Condos.** Submission Documentation condo graphic edits.
 - Edit condo graphic, which has "TAXROLL ATTRIBUTE" as one word, instead of "TAX ROLL ATTRIBUTE" or "valuation-related (assessor-assigned) attributes."

- In the case of the Type #1 scenario, under normal circumstances (as shown in the image) with a ParcelID such as 'COMMON AREA' this would be within the “pinskips” list, so the Validation Tool would just pass over it.
- Documentation could say 'COMMON AREA can have AWO in AUXCLASS.'
- In the instance of Type #4, it may be appropriate to place the “PARCELID 100 should have AWO in AUXCLASS'.
- A scenario as presented by Sheboygan County does not exactly fit under either of these scenarios. The proposed edits could provide appropriate direction to others.

▶ **Action Item:** SCO determine if the Sheboygan County scenario is covered by existing diagram.

▶ **Action Item:** Edit V9 Submission Documentation draft if edits are needed.

14. Communicate to counties that they do not need to null out ESTFMKVALUE

- The V8 schema definition for ESTFMKVALUE (Estimated Fair Market Value) states that ESTFMKVALUE should not be populated for parcels that contain PROPCLASS 4, 5, or 5M or have an AUXCLASS designation.
- Because counties need to null ESTFMKVALUE for these parcels specifically for the DOA call for data, it is an extra awkward step and hassle for many counties or their vendors. It was decided that this was not necessary at the county level and the redaction could be completed at the state level during the statewide processing stage.
- This was already communicated to Transcendent Technologies, a common county tax roll software vendor, on February 8, 2021.

▶ **Action Item:** In V9 call for data, communicate to counties that they can leave ESTFMKVALUE populated for parcels that contain PROPCLASS 4,5, or 5M or have an AUXCLASS designation, but it is also okay if they null out these values according to the V9 schema definition.

▶ **Action Item:** DOA author a draft of “New for V9” text based on language from previous year’s “New” page(s) that explicitly asked counties to null certain PROPCLASS 4,5, or 5M data.

▶ **Action Item:** Edit out or remove the Validation Tool flags relating to ESTFMKVALUE needing to be null for records containing PROPCLASS 4/5/5M and/or any AUXCLASS value.

15. Encourage counties to integrate PLSS points and/or require counties to prioritize integration

- Parcel Benchmark 4, Completion and Integration of PLSS, requires counties to complete their PLSS and integrate PLSS coordinates into a digital parcel layer. According to PLSS status tables in land information plans finalized at the end of 2021, about 14 counties have a significant backlog of PLSS points to be integrated.
- In 2022 a definition for “integration” was created with feedback from county land information offices. This definition is to be included in the 2023 WLIP grant application and is defined as such:

***Integration** means the optimization of the geospatial accuracy of the digital parcel layer which improves the accuracy of where parcel boundary lines are represented on the digital parcel map. In cases where the result would be a materially significant improvement to the geospatial accuracy of the digital parcel layer, parcels have been tied to and, if necessary, adjusted geometrically to the inputted PLSS coordinates. This definition does not imply a restriction on a county’s options for integration, whether it is snapping parcel boundary lines to PLSS corner coordinates one corner at a time, entirely redrawing parcel boundaries one survey township at a time, or another chosen approach. (For example, “rubber sheeting” is not required.)*

- It is likely that only a few counties will need to adjust their timelines for achieving Benchmark 4 in light of the new definition.
- ▶ **Action Item:** With 2023 Grant Application announcement, highlight the addition of “integration” definition and encourage counties with a backlog to catch up.
- ▶ **Action Item:** By March 2024, request and analyze data on PLSS integration counties that reported a significant backlog at the end of 2021.
- ▶ **Action Item:** Consider modifying 2025 Strategic Initiative grant application so that Benchmark 4 prioritizes integration if there is a significant backlog of survey grade PLSS corner coordinates to integrate.
- ▶ **Action Item:** Gather feedback from stakeholders on any proposed change to Benchmark 4 in a 2025 WLIP grant application.

16. Evaluate progress on AUXCLASS/OWNERNAME1 for public lands

- The V8 MOU requires benchmarking data for each county with checks on values for all attributes called for by s. 59.72(2)(a) and the Searchable Format. According to the schema, for publicly owned parcels (AUXCLASS = X1-X4), the same owner should be designated the same way if they own multiple parcels.
- It should continue to be recognized that standardizing owner names for public parcels has constraints—such as local government policies that require parcel data to match what appears in a deed or other recording documents.
- For V7 and V8, a county-level check for standardized owner names for public parcels was conducted (but *not* to the point that outside research was required nor that judgements be made about complexities like trusts, easements, et cetera). The basis for this was a mini-pilot project for V6, encouraging Milwaukee County to standardize its owner names for government-owned public lands by way of their V6 Observation Report. The effort appears to have been successful, as Milwaukee County was *not* on the list of V7 submitters who were observed to have variation in owner name for government-owned public lands.

- The following comment appeared on the V7 Observation Reports:
 - AUXCLASS - Public Lands:** Per schema specs, for publicly owned parcels (AUXCLASS = X1-X4), the same owner should be designated the same way if they own multiple parcels (e.g., not "DEPT OF NATURAL RESOURCE," "TAX EXEMPT DEPT OF NATURAL RESOURCE," which both occur in the county dataset). In other words, standardize owner names for public parcels to the extent possible/permmissible by recording document policy.
- There were 32 counties who were observed to exhibit variation across the same owner name for public lands (Adams Buffalo, Clark, Columbia, Crawford, Dane, Douglas, Dunn, Florence, Fond du Lac, Forest, Grant, Jackson, La Crosse, Manitowoc, Menominee, Monroe, Oconto, Outagamie, Ozaukee, Pierce, Racine, Richland, Shawano, Sheboygan, St. Croix, Vernon, Walworth, Washington, Waushara, Winnebago, and Wood).
- There is evidence that there are business use cases for future improvements to AUXCLASS for government-owned public lands.
- In one example, the State of Wisconsin conducts a regular inventory of state-owned buildings. The "X2" AUXCLASS data can be used to map the known state-owned parcels against the state building inventory file. If counties, municipalities, or assessors were to comply with the DOR standards for *Standard Exemption Codes* and *Common Class Codes* from the WPAM (www.revenue.wi.gov/documents/wpam21.pdf#page=164), this data for more detailed exempt property codes could, in theory, be utilized in future iterations of the statewide parcel schema.
- In a second example of the business cases for expanded standardized AUXCLASS values, for V7, a Wisconsin non-profit organization stated a business use case for adding additional granularity for tax exempt properties—beyond just FEDERAL/STATE/COUNTY/OTHER—in order to more clearly identify municipally-held parcels.
- For V8, a user affiliated with a UW-Madison and the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) reported using parcel data to find public lands on which to perform ecological survey work. The user suggested that parcels owned by different state entities could be more standardized for querying purposes.
 - ▶ **Action Item:** Consider asking DOR to contact DOA regarding any pending WPAM changes that impact the characteristics of the parcel records' requirements for assessment and tax rolls in the future.
 - ▶ **Action Item:** For V8, evaluate results of basic check on AUXCLASS X1-X4 owner names and evaluate how many counties did submit standardized public lands owner names for V8, out of the 37 counties who did not for V7.
 - ▶ **Action Item:** For V8, check for "X5" values, especially in Douglas and Ozaukee Counties. Follow-up with the counties if necessary.

17. Focus on obstacles to the Four A's

- Great strides have been made since the passage of Act 20 of 2013 and the first version of the statewide parcel database. However, given the state of parcel data submissions, where only about 20%-22% of counties are meeting all submission requirements on their first attempt at submitting data, focus should be more intent on obstacles to automation of local GIS data to the state level. This has been more apparent with each year, as can be followed in successive years' project final reports.
- The 2019 WLIP Report elaborated specific obstacles to automation and areas for improvement in aggregation of local GIS data to the state level:
 - Obstacles to Automation for Aggregation of Local GIS Data**
 - GIS gaps to fill yet.
 - Geospatial accuracy work and adjustments are ongoing. 65% of counties still working on PLSS.
 - Only 20% of counties meet all Searchable Format standard requirements on first attempt
 - Data collection time is about 5 months.
 - Data validation and error reporting require several passes.
 - Local government capabilities are vastly different.
 - Unique local data situations can create exceptions to a standard data model.
 - Independent municipal data stewards present challenges.
 - Automated server-side aggregation may be a long way off.
- The obstacles to automation (the Four A's) are enormously important. They stand in the way of further progress in streamlining and modernizing the process of aggregating local GIS data to the state level. One action taken to address this was to stipulate that since V6, the project included specific attention to documenting obstacles to automation. For example, in the V8 MOU, the workflow called for documentation of "obstacles in local data conditions that could hinder future efforts at automation."
- The Parcel Initiative has taken the approach that counties do not have to change their native workflow/databases, but the annual submission requirements from DOA require the native data be re-formatted for export in to meet the submission requirements. The formatting of native data to meet the requirements must happen each year. Otherwise, counties would have to maintain the data in the structure of the statewide parcel data model.
- At a broad level, for the WLIP, strategic goals post-Act 20 include the administration of county grants and standards, and the continuation of progress on the Statewide Parcel Map Initiative.
- The **policies and practices surrounding property assessment in Wisconsin**, where local government control often takes precedence over matters of statewide concern, have over the years been a limiting factor in the continuation of progress on the Statewide Parcel Map Initiative.
- It should be recognized that on the state end, an external change may be needed before a drastically different approach is viable (e.g., county-wide assessment, a legislative change, DOR XML standard achieved by all counties

and independent municipalities, developments facilitated by another state or federal agency or by way of stakeholder/constituent action).

- In other words, the obstacles to automation may involve issues that occur at the local level or are outside of the scope of what DOA/SCO can control—thus making understanding of obstacles to progress one area that stakeholders can contribute understanding and possibly solutions that might facilitate forward progress.
- ▶ **Action Item:** Maintain mindfulness of documenting any obstacles to progress as a strategic priority.

18. Investigate potential uses of additional aggregated assessment data

- In Wisconsin, detailed property information for taxable parcels is collected by municipal-level assessors in records called *property record cards*, but that municipal-level data is not fully aggregated up to the county level. To create the statewide parcel map, DOA aggregates county-level parcel datasets that contain fewer property attribute fields than what municipal assessors hold.
- While some data resources do exist for locating detailed property data attributes beyond those contained in the statewide parcel layer—included on page 4 of the *V8 Attribute Schema documentation*—they are not standardized or aggregated to the statewide level or even county level in a way comparable with the V8 Statewide Parcel Map Database.
- Several stakeholders, such as the real estate industry and Department of Revenue, have expressed a desire for more **aggregated assessment data beyond attributes specifically listed by State Statute 59.72(2)(a)**.
- The Department of Revenue in the past has proposed via the governor's budget the creation of county-wide assessment (e.g., the 2015 Executive Budget proposal). The legislature's Joint Committee on Finance stripped out the initiative both times.
- Notes from the *Ashland County Building Inventory Data Project* include a list of potential stakeholder uses for such assessment data:
 - Zoning and permit enforcement
 - Equitable taxation
 - Social services (building condition, residential building or not)
 - Disaster response (damage estimates)
 - Emergency management planning (disaster mitigation, social vulnerability)
 - First responder response
 - Baseline data for social-economic analyses and grant proposals (e.g., HUD housing grants)
 - Insurance underwriting
- The Ashland County Building Inventory project explicitly noted that local assessment was a challenge, including accessing local assessment data from official data stewards.
- A starting point could be a research effort to understand and document any problems, and, depending on the scope of the problem(s) identified, to begin to explore the parameters of potential solutions.
- The Wisconsin Land Information Association's (WLIA) 2009 *Parcel Data Model Task Force Report* and WLIP program materials in the pre- and immediately post-Act 20 time period could serve as an example, as could reports from different states.
- As part of a possible research effort, a summary document, report, or project final report sub-section could be produced.
- A **research effort** could have the following purpose/goals:
 - (a) Document any **need for aggregated assessment data** beyond the attributes specifically listed by State Statute 59.72(2)(a), including current business use cases, with attention to relevant data consumption practices of end users and any financial expenses associated with their current acquisition or use of data.
 - (b) Document any **obstacles or barriers** to the aggregation of assessment data beyond the attributes specifically listed by State Statute 59.72(2)(a), with focus on problems surrounding the lack of aggregated assessment data (by which is meant data generated by municipal property assessors under DOR guidance and, for manufacturing properties, created by DOR assessors). Move beyond the *Obstacles to Automation for Aggregation of Local GIS Data* basic bulleted list generated in 2019, that was centered exclusively on *GIS* data aggregation. As part of the documentation of obstacles, include description of relevant history and context. Draw upon, analyze, and reference any existing materials relevant to the topic (e.g., materials which have built the case for a reform of local government assessment policies and practices in Wisconsin, such as white papers and fiscal impact statements for past proposals on county-wide assessment).
 - (c) Document any **possible solutions**, with potential sites for change and their corresponding regulatory/governing bodies, with attention to needs for coordination between different Wisconsin state agencies, county and minor civil division units of government, and stakeholder organizations.
 - (d) Document any **foreseeable costs** associated with the aggregation of assessment data beyond the attributes specifically listed by State Statute 59.72(2)(a).
- ▶ **Action Item:** Within the constraints of what is realistic given scarce staff resources, explore the option of a research effort, bounded by a feasible scope of work and timeline, which aims at producing a summary document or report on aggregated assessment data.

19. Update DOA inventory of land use regulations restricting the use and division of parcels

- The third edition 2011 Wisconsin Local Land use Regulations and Comprehensive Planning Status Report inventoried common land use regulations exercised in Wisconsin by local governments.
- According to s. 66.1001, changes to these land use regulations must be consistent with a comprehensive plan:
 - Official mapping ordinances enacted or amended under s. 62.23(6)
 - Local subdivision ordinances enacted or amended under s. 236.45 or 236.46
 - County zoning ordinances enacted or amended under s. 59.69
 - City or village zoning ordinances enacted or amended under s. 62.23(7)
 - Town zoning ordinances enacted or amended under s. 60.61 or 60.62
 - Shorelands or wetlands in shorelands zoning ordinances enacted or amended under s. 59.692, 61.53, or 62.231
- The burden of land use regulations and their negative effects on **housing affordability** have been topical concerns at local, state, and federal levels. Accurate information on which land use regulations are exercised is pertinent information to the discussion about how to reduce the cost of housing in Wisconsin.
- This inventory can be used to reference whether a certain type of land use regulation governs any specific parcel in Wisconsin. Persons who serve as informational resources on land use law and comprehensive planning, such as UW Professor Brian Ohm, author of *Wisconsin Land Use & Planning Law*, frequently reference the inventory of land use regulations.
- The WLIP grant administrator also often references the inventory when answering questions about land use regulations and comprehensive planning from local government officials or the public.
- Other likely users include members of the legislature, the Wisconsin Towns Association, state agency staff, local government officials, academic researchers, and other unidentified users.
- The 2011 inventory could serve as a base level of information, from which knowledgeable agencies could confirm or correct the information. The steps of contact would likely be:
 1. Regional planning commissions
 2. County code administrators
 3. Municipalities: Many municipal ordinances are available on the Municode platform
- In previous iterations of the land use inventory, official mapping ordinances were the most difficult to inventory, because of a general lack of understanding or confusion about the definition of an “official map.” Because official mapping is less employed than zoning and subdivision regulations, while being the most time consuming to accurately inventory, official mapping could potentially be left out of the next land use regulations inventory update.
- **Potential partners:** UW Professor Brian Ohm, who will be retiring June 30, 2023, has indicated an interest in contributing to the update of the land use regulation inventory, and there are other possible collaborators employed at UW and DOA.
 - ▶ **Action Item:** Within the constraints of what is realistic given scarce staff resources, explore the option of a research effort, bounded by a feasible scope of work and timeline, to update the spreadsheet inventory of land use regulations as well as an update to the 2011 Wisconsin Local Land use Regulations and Comprehensive Planning Status Report.
 - ▶ **Action Item:** Obtain web analytics on use of “Table of Results” 2011 Wisconsin Local Land Use Regulations and Comprehensive Planning Status Report.
 - ▶ **Action Item:** Recruit potential project partners beyond the Professor Ohm and the WLIP grant administrator, whose position description includes updating land use regulations inventory, if time and resources allow.
 - ▶ **Action Item:** If project is completed, consider linking a 2022-updated “Table of Results” to the SCO parcels page or include the data generated as state-populated attributes in the statewide parcel map attribute table, linked by PLACENAME or CONAME.
 - ▶ **Action Item:** Explore possibility of mapping extraterritorial plat review area of cities and villages, by buffering 3 miles from the municipal boundary of a 1st, 2nd, or 3rd-class city and 1.5 miles for a 4th-class city or village. Extraterritorial plat review area applies to cities and villages that have enacted local subdivision or official mapping ordinances.

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Appendix

A. V8 MOU Excerpt

Specific V8 Project deliverables:²

Data Request Materials

- **Data request with submission instructions.** Provide technical and GIS-specific elements of call for data and the submission instructions that counties are to follow in order to prepare and submit data.
- **Validation of county data submissions and tools.** For V8, offer a tool that validates county data submissions for fitness to submission requirements and data model, as well as provides directives on how to rectify errors. For those essential data preparation and standardization functions that cannot be built into the data Validation Tool, supply up-to-date geoprocessing tools and tool documentation. If information is available indicating a significant number of counties have moved or will be moving to the platform *ArcGIS Pro*, convert tools for compatibility.
- **Future-oriented Validation Tool concept.** In preparation for the V9 data submission, research and explore options for a revamped tool for data validation. Provide a written overview of the tool concept which takes into account the content and format of any reports outputted by the tool. In collaboration with DOA, arrive at an agreed-upon approach and include a plan for the tool as part of the final project report. For V9, provide an automated tool for validation that is aligned to the plan for the tool concept, while still within the scope of SCO capabilities and project timeline.
- **Data collection.** Assist in the collection of county data submissions. In addition to parcel data collection, this also entails collection and delivery of ancillary data layers to the UW-Madison Arthur H. Robinson Map Library, including county-maintained zoning layers that are not collected and/or aggregated by another government entity.
- **County data preparation assistance/outreach.** Conduct outreach with and offer assistance to counties that have in the past experienced problems preparing data. Focus should be on a small subset of counties that have encountered recurring problems with data submissions, those that are characteristic of specific types of problems that occur across multiple counties, and those that are representative of the most common tax parcel software vendors in the state. The goal is to better understand what challenges counties face preparing and submitting parcel and tax roll data, provide solutions where possible, and document roadblocks so that they may be targeted in the future.

Data Assessment Materials

- **Intake assessment data.** Conduct assessment of incoming data submissions and communicate to DOA the receipt of each adequate county submission. For those submissions that are incomplete or appear to fall short of Searchable Format requirements, provide comments to DOA in a uniform fashion in order to facilitate follow-up with the county. As part of intake, record contemporaneous notes on observations evaluating counties against data submission requirements. For each county, during intake, include checks on values for all attributes called for by s. 59.72(2)(a) and the Searchable Format.
- **Workflow documentation.** Document the data intake and processing workflow in human-readable format in as few files as possible, with attention to differentiating aspects of workflow that are/are not and can/cannot be automated, any conditions in local government data that comprise legitimate data model exceptions (e.g., from prior years' notes, intake notes, county submission form content, qualifying language/examples in submission documentation, data Validation Tool programming, et cetera), and other obstacles in local data conditions that could hinder future efforts at automation. Employ cross-references and hyperlinks to other databases and files as appropriate. Provide both draft and final versions.

Statewide Parcel Map Database

- **A draft V8 statewide parcel database and map layer** aggregated from existing county and municipal parcel datasets for purposes of internal quality assurance/quality control.
- **A statewide parcel database and map layer** aggregated from existing county and municipal parcel datasets in both GIS and CSV formats, using a documented update process that, at a minimum, includes the parcel attributes required by s. 59.72(2)(a), those listed in the parcel schema and Searchable Format standard detailed by the *V8 Submission Documentation* and recommended in the *V7 Final Report*, is aligned as closely as feasible with the property tax bill content prescribed by state statute and the Wisconsin Department of Revenue, and, if statewide benefits clearly outweigh the costs of implementation, enhanced with additional data fields.
- **Database documentation for users.** Make available basic metadata for end-users of the statewide database, as well as schema documentation that includes explanatory notes that aid end user understanding of the dataset.
- **Hosting and display of V8 parcel layers.** Employ a hosting solution for the statewide parcel database and map layer (with the potential for a third-party hosting solution), and publicly display the database and map layer and end user schema documentation, with delivery through platform(s) that provide a mechanism for linking to publicly available county land information websites, land information officer contact information, and other publicly available county GIS data layers and web mapping services. Incorporate modern software tools if a web app is deployed. Offer download/export of data and data subset capabilities, as well as individual county downloads.

Reporting Requirements

- **A final project report**, on the V8 statewide parcel database project, written in collaboration with DOA. At a minimum, the report shall address:
 - [Project Background](#)
 - [Technical Approach](#)
 - [Summary-Level Workflow Documentation](#)
 - [Benchmark Progress Assessment](#)
 - [Recommendations for V9](#) – Recommendations for V9, not limited to but addressing parcel project recommendations, outcomes of V9 county outreach, and any obstacles to automation encountered for V9. Recommendations should include those for a hypothetical subsequent year's parcel aggregation project and data request as well as whether to continue any potential future statewide PLS aggregation efforts as part of the Parcel Initiative. Provide reasoning and evidence for basis to support funding any future statewide efforts.

² From V8 MOU (2021 September). Retrieved from https://doa.wi.gov/DIR/V8_Parcel_Project_MOU.pdf

Appendix

B. V8 User Feedback

ABOUT USER FEEDBACK

This V8 Final Report appendix is a compilation of comments provided by users of the **V8** Wisconsin statewide parcel layer, received via email and by way of the V8 online user feedback form. This data has been cleaned. Questions and comments dealing with technical subject matter have been omitted. Some comments have been omitted due to lack of content, or combined, in the case of multiple comments from the same user.

To view user feedback from previous years, see the V7 Final Report, V6 Final Report, V5 Final Report, V4 Final Report, and V3 Final Report (for V1-V3).

Legend

Organge text indicates Organization/Affiliation
User responses are broken down into the following sub-groups:

- STATE GOVERNMENT
- FEDERAL GOVERNMENT
- LOCAL GOVERNMENT
- PRIVATE SECTOR
- NON-PROFIT ORGANIZATIONS
- EDUCATIONAL INSTITUTIONS
- PRIVATE CITIZENS

Total number of V8 responses that appear below: **207**
Date of last update: **July 12, 2023**

STATE GOVERNMENT USERS

- **Wisconsin Elections Commission**
USES • Address Location, School District Reference, Annexations and voter locating.
BENEFITS • This is an essential service to help properly locate voters and addresses in our system.

- **Wisconsin Department of Natural Resources**
USES • -- To help delineate recreational and preservation lands
-- To help update the Public Access Lands Atlas
-- To evaluate wetland compensatory mitigation options for the wetland permit applicants.
-- To oversee the cleanup of contaminated properties.
-- Identify responsible or affected neighboring parties, is useful when seeking permission to inspections on private property, or when enforcement actions are involved.
-- In discerning land ownership and ownership of manure storage structures associated with large fish kill events.
-- To help track the locations of rare species and natural communities and to carry out land and species management practices.
-- To digitize Taxlaw parcels
-- To generate a vector tile service for offline mapping
-- To generate mailing lists by a geographic area
BENEFITS • By not having to contact each county separately for this data
By having a regular, reliable source of this information

- **WI Historical Society/State Historical Preservation Office/Compliance**
USES • Planning, land ownership.
BENEFITS • Contacting land owners, determining property lines.

- **WI Dept of Administration, Division of Intergovernmental Relations; Municipal Services Payments (MSP) Program**
USES • I would like to use this tool to search/identify tax-exempt parcels that are State-owned and use the map's aerial imagery to identify which of those parcels have building improvements/structures on them. If this map tool could serve as a substitute for searches on the 72 individual county websites' online maps, that would be a bonus.

- **WI Department of Agriculture, Trade and Consumer Protection**
 USES • I am looking for an address associated with produce-growing acreage to contact for inspection per the Produce Safety Rule.

- **Wisconsin Department of Transportation, Bureau of Aeronautics**
 USES • I perform desktop review of projects, some of which includes determining the property boundaries of the project area and what type of use is associated with the parcels.
 BENEFITS • I perform desktop review of projects, some of which includes determining the property boundaries of the project area and what type of use is associated with the parcels.

- **Wisconsin Department of Health, Bureau of Communicable Diseases**
 USES • I made a disease prevalence map using R with the .shp file.
 BENEFITS • It would have been impossible and take much too long to make my own map for use in R. Your map was readily downloadable in the files that I needed.

- **Wisconsin Department of Natural Resources - Environmental Management - Water Resources**
 USES • Landowner contact information, landowner history of ownership, double checking existing WDNR resources such as surface water data viewer.
 BENEFITS • Centralized hub for gaining information on private parcels that otherwise is difficult to obtain.

- **[Anonymous]**
 USES • Field inquiries from citizens looking to access waters—needing to access landowner parcel tax address data for citizens to request access permissions from landowner.

FEDERAL GOVERNMENT USERS

- **U.S. Fish and Wildlife Service**
 USES • Assist private landowners to restore habitat on their property.
 BENEFITS • Accurate up to date information about property boundaries for project design and implementation.

- **Ho-Chunk Nation - Administration Department - Real Estate Division - GIS Office**
 USES • Internal GIS Application & Property Acquisitions information & checking our own parcels information.
 BENEFITS • Displayed in our GIS Application and gives us the ability to easily find parcels and their information if the Nation is looking at purchasing properties.

- **[Anonymous]**
 USES • Land use planning.

- **[Anonymous]**
 USES • Overlay the parcel data on my data in GIS to see how owners/parcels intersect in my areas of interest. Area of interest covers multiple counties making inconvenient to use individual County sites. Also allows to keep a file rather than uploading every time on individual County sites.
 BENEFITS • This allows multiple data downloads in one location saving time and money. Not all Counties provide option to download parcel data so may not be available.
 May have encouraged some Counties to complete parcel mapping quicker.
 Not a static data set. Potential for use of outdated data if updating discontinued.

- **USDA Farm Service Agency (FSA)**
 USES • Create zip files to correctly map out land parcels for farming use.
 BENEFITS • Makes sure we have the correct boundaries!

LOCAL GOVERNMENT USERS

- **Village of Pepin Zoning Administrator**
 USES • Create village maps.
 BENEFITS • We are able to create custom maps without having to get time from the busy county staff.

- **City of Menasha Health Department**
 USES • Verifying resident's jurisdiction.
 BENEFITS • We can accurately verify jurisdiction of residents.

PRIVATE SECTOR USERS

- **Engineering Resource Associates**
USES • Making GIS exhibits for clients and residents in Wisconsin.
BENEFITS • This combined with LiDAR/DTM data helps us determine the location of the property quickly and better convey the situation to the client prior to survey saving a great deal of time. It's also a great resource for students I tutor that desire to do projects.

- **Black Knight [Real estate]**
USES • Validating parcel data.

- **Great Ecology**
USES • Used to conduct an economic market analysis.
BENEFITS • We will be using Wisconsin parcel data for an environmental litigation to understand market responses to contamination.

- **AECOM/PMO/Environmental/GIS Specialist**
USES • Primary use is for FEMA Open Space project for Region 5.
BENEFITS • As noted from the FEMA Open Space project, this comprehensive statewide parcel layer has made my process more efficient providing a "one stop" shop for parcel data. The alternative is for me use various county viewers assuming the county I'm working in is.

- **Medxcel Real Estate**
USES • Search of legal entity property ownership over multiple Wisconsin counties.

- **MetroNet**
USES • Creating permits for Fiber in correct location per Wisconsin's permitting regulations.
BENEFITS • Correct location of Parcels/ROW for drawing our fiber in the correct location.

- **Abei Energy**
USES • Determine zoning information and use parcel boundaries to assist in the development of statewide renewable energy projects (solar and wind).

- **National consulting firms - Partner Engineering and Science, Inc., AEI Consultants, and others**
USES • I am an environmental assessor (I complete Phase I Environmental Site Assessments), and this data helps me write my reports and gather data about potential environmental impacts to soil and groundwater at properties around the State.
BENEFITS • Some rural sites have very limited data & online resources, so this is especially helpful for properties not located in large municipalities.

- **FBS- Creators of FlexMLS**
USES • MLS – to visualize property boundaries on a map and determine property location via parcel number and centroid.

- **[Anonymous]**
USES • Utilizing the gis to see site lines for future architecture development projects.
BENEFITS • We utilize the gis when our Wisconsin clients hire us to work for them. This provides valuable information for us to start designing according to the correct city setbacks.

- **[Anonymous]**
USES • I plan to utilize this to help track down all real estate that a client may own in Wisconsin. This will be a helpful tool to encompass all of a client's real estate so that we aren't missing any parcels.
BENEFITS • I foresee this benefiting our firm in identifying exactly what real estate a client owns so that we can find everywhere they have real estate to encompass it all in their estate planning.

- **[Anonymous]**
USES • Land survey search points.

- **Commonwealth Heritage Group, Inc.**
USES • Identifying landowners for archaeological field survey.
BENEFITS • We conduct archaeological survey on behalf of various private, public, state, and federal entities and use the parcel layer to identify landowners impacted by our work.

- **Fitzpatrick Select Services**
USES • Property lookup function for customers to order real estate title searches.
BENEFITS • Helps us compete with larger organizations by improving customer experience.

- **Geographic Techniques LLC**
USES • UAV (drone) planning; land conservation maps; hiking trail maps.
BENEFITS • Knowing particular land ownership for hiking trail maps, conservation easements, and planning UAV mapping routes (who to contact/avoid while flying). The statewide parcel data has been a fantastic asset for our mapping needs!

- **Forster Electrical Engineering**
USES • We use the parcel data when mapping electrical distribution facilities for our Municipal Utility clients.
BENEFITS • Reduces the time required to add landbase data to our maps.

- **Halberg Engineering LLC**
USES • Verify building owner municipality for proper documentation of building project locations submitted to the DSPS (where the building design is reviewed and the local municipality is notified of the building design application).
BENEFITS • Often building owner's and builders associate their project with the nearest "village" or "city" because their mail comes to that Zip Code, but they are often located in a civil town ("township") nearby. Also, some villages and cities spill over from one.

- **Assessment Technologies / Market Drive CAMA / Support**
USES • Our product, Market Drive CAMA, is used by about 1600 municipalities throughout the state. I'm the Support Specialist that assists users. We have functions to output assessment data in various formats. I use a SQL database output to connect assessment data to your mapping. I can obtain mapping from each county, but I find that because I work with many assessors throughout the state, it is very convenient to have one map for the entire state.
BENEFITS • I have assisted our users with producing thematic maps. I have created maps showing topical data for analysis purposes (when combined with assessment data).

- **Green County Mutual Insurance Co**
USES • Find out who owns the parcel and mailing address of owner.
BENEFITS • We are an insurance company and this helps us to know we have all owners of the property insured correctly. Lots of time people forget to tell us about trusts and LLCs.

- **[Anonymous]**
USES • Trying to see where the R/W is through abutting parcel lines.

- **[Anonymous]**
USES • Use it for our maps.
BENEFITS • Absolutely. I'm not sure how else we'd show Right of Way or Parcel Lines on our prints.

- **Resource Environmental Solutions**
USES • Use for project boundaries for projects that are parcel based. ID landowners to know which parcels are part of a project.

- **SolEnergy**
USES • We are a contractor that submits a lot of permits to municipalities and tickets to Digger's Hotline, this is a very quick and easy way to see which municipality a customer's address falls under.
BENEFITS • It has saved us TONS of time and has made my job extremely easy.

- **Sink to Septic Plumbing**
USES • For working on Wisconsin water wells and location information.

- **RFY Inc**
USES • Permit application for highway entrance.

- **[Anonymous]**
USES • We use the parcel lines in our pre-planning for site developments.
BENEFITS • We benefit by saving an immense amount of time not have to georeference PDFs and trying to scale into drawings. Having the owner information right in the shapefile lines helps us greatly as well.

- **Info-Pro Lender Services**
USES • We research properties for mortgage lenders to check if property taxes are paid. We need to have the ability to search by an owner in Jefferson County, as their treasurer site does not have this option.
BENEFITS • We do not need to contact the county to do owner searches for us. We can use the database for this.

- **Ayres Associates**
USES • I use the parcel lines in autocad as a background to engineering design topo, or as a starting point to determine boundaries and ROW's for survey projects.
BENEFITS • It's a wonderful resource. It saves so much research time to create a basemap in cad for what we use it for.

- **Cardno (now Stantec)**
 USES • I work as a GIS Analyst for an environmental consulting company. We use parcel data in a wide variety of our GIS deliverables, mainly to show ownership and delineate project boundaries.
 BENEFITS • It is very easy and convenient to be able to download statewide parcels versus tracking down parcels by county or municipality as needed.

- **McKnight Excavating LLC**
 USES • I work with an excavation company and before I call in to diggers or submit municipality permits, I always check here and verify that the address and parcel information is accurate.
 BENEFITS • What sometimes out-of-state contractors have listed as the project site is actually correct with the city records. I have found incorrect lot numbers and also wrong parcel numbers attached with to jobsite addresses by architects.

- **Vanselow Law Offices, LLC**
 USES • Verifying parcel information for legal documents.
 BENEFITS • More quickly confirming parcel information.

- **Redevelopment Resources, Chief Research Officer and Development Specialist**
 USES • Private sector consultant working with local and regional units of government to assess workforce and housing needs.
 BENEFITS • It helps our clients receive accurate, relevant information and facilitates data-driven decision making in a more timely manner. Having experience with working in other states where this data is not readily available, this is a huge benefit to WI communities.

- **[Anonymous]**
 USES • For Map Export we will use the data.

- **[Anonymous]**
 USES • Quickly used to find property boundary/ parcel info for several Wisconsin taxpayers.
 BENEFITS • I can sort out the parcels base on various criteria. Such as tax parcel ID, Owner name, County, etc.

- **[Anonymous]**
 USES • Professional planning and design consulting services in support of mountain bike trails & associated infrastructure. Basically we plan parks. We use parcel data for cartographic and planning purposes to depict/identify the land where trails can go.
 BENEFITS • Our planning projects have turned into construction projects, which are both profit centers and involve onsite work. We have used the maps in the field and in desktop format.

- **Schug Consulting LLC**
 USES • Shapefile - I use Land & Improvement assessment values to analyze commercial property value changes year to year.
 BENEFITS • Annual source of some of my income.

- **Franzen Appraisal Services LLC**
 USES • Used for county parcel data and GIS maps for appraisals.

- **Ark Wireless, Inc. dba RFAlytic**
 USES • Assist with potential locations for fixed wireless site performance/feasibility prediction - provide broadband access.
 BENEFITS • I primarily rely on US census and other public databases, but the Census data is not accurate to the census block level (by design) making it difficult to asses small populations for capital investment. I am a single person consulting company with expertise in radio systems. This data allow better model creation.

- **Spectrum, Field Engineering, Wisconsin**
 USES • Basic plat research for various issues/concerns.
 BENEFITS • Much easier interface than other plat map avenues.

- **[Anonymous]**
 USES • To see if Wisconsin is good to invest in, suitable for our purposes.
 BENEFITS • Checking lands against their local qualities.

- **Edgewater Resources**
 USES • We use the information to complete necessary information for obtaining construction permits.
 BENEFITS • We get access to information necessary to apply for construction permits.

- **Wisconsin Department of Agriculture, Trade and Consumer Protection; DFRS, BFRB, Produce**
 USES • I work for the state produce safety program at DATCP and find this map valuable for locating farms not listed online.
 BENEFITS • We have been able to make a more efficient farm verification by locating a contact address for a piece of land on which we have observed produce production in order to connect with the operators to meet our requirement for FSMA in verifying all produce farms in the state.

- **[Anonymous]**
 USES • Identify ownership of property adjacent land for sale, for potential purchase. I'd like to find some property for a recreational getaway.

- **Securitel, LLC**
 USES • Determining municipality and county by entering an address. Municipality is needed for fire alarm inspection compliance; county is needed for charging proper sales tax.
 BENEFITS • We can go to one website and find municipality and county by entering an address.

- **[Anonymous]**
 USES • Creating site maps for DNR requirements.
 BENEFITS • All parcels are in 1 database which saves time from navigating each county or municipality's GIS site.

- **Medxcel Real Estate**
 USES • Confirm current list of owned assets against county detail.

- **Emmons & Olivier Resources, Inc.**
 USES • Environmental planning and permitting, water resources management.
 BENEFITS • Saves time having to navigate each county's individual parcel offerings, which are in a variety of formats / retrieval mechanisms, if they are even available.

- **Linked Living Homes**
 USES • Legal property data for obtaining building permits.
 BENEFITS •

- **[Anonymous]**
 USES • Forestry.
 BENEFITS • All county parcel info in one place, I don't have to search each county, or pay some of them for their GIS data.

- **Lobolnc.**
 USES • Affirming land disputes.

NON-PROFIT USERS

- **Gathering Waters**
 USES • Gathering Waters—a nonprofit organization that serves and is comprised of the state's nonprofit land trusts - uses the Statewide Parcel Database to map the lands that have been protected by its members. In addition, I assist individual land trusts with varied land protection projects, relying on the statewide database both to delineate active projects and to research opportunities.
 BENEFITS • The statewide geodatabase of protected lands is possible only through the statewide parcel layer. I can not overstate the value of this service, nor my gratitude at being able to draw upon it. At the local level of individual land protection projects, I'm similarly indebted to the technical team that manages this layer and to the governmental department or departments whose funding makes it possible.

- **Ice Age Trail Alliance**
 USES • We use the statewide parcel data to check property ownership in the vicinity of the Ice Age Trail.
 BENEFITS • The statewide parcel data layer has helped us identify landowners that have changed along the Ice Age Trail. It also helps us in planning the route of the Trail. Using one statewide layer is much more efficient than working with data from multiple counties. (If we have questions about an area or want to verify we have the most recent information, we do follow up by going to the county's website.)

- **Doty Island Development Council**
 USES • We had read some Menasha City Council Minutes from July 1886 in which the city obtained property from a couple citizens. Since the streets weren't named, I had to figure out where Block A, Lot #51 & #52 were. I found old maps, but I needed to cross the 1887 Menasha Lot Map with GIS.

- **Affiliated with UW-Madison and Great Lakes Indian Fish & Wildlife Commission**
 USES • Finding public lands on which to perform ecological survey work.
 BENEFITS • I am able to find accessible parcels efficiently while minimizing the risk of unintentional trespass.

- **League of Women Voters - St. Croix Valley**
 USES • League of Women Voters St. Croix Valley (St. Croix, Polk, and Burnett counties). We use shapefiles for our VOTE411 voter info application to help voters see exactly what is on the ballot for a specific address.
 BENEFITS • We (and most other local leagues) update the VOTE411 system for each election. The State and National Leagues use this data for statewide and national elections in our mission to provide information to voters.

- **BlueBonnet Data / Data Fellow**
 USES • I will be making a map of population density of younger residents in Milwaukee county.

- **Woodland Dunes Nature Center and Preserve, Inc. - Land Management Coordinator**
 USES • To show our property boundaries to the public and neighbors as we manage for habitat.
 BENEFITS • It makes it easier to tell the story of our property when applying for grants to continue land management activities.

- **Des Moines Showing Up for Racial Justice (SURJ) and Iowa Citizens for Community Improvement**
 USES • Genealogical research.

- **[Anonymous]**
 USES • RCPC residency verification for school district.

- **Northern Grace Youth Camp**
 USES • Checking the parcel #s we own and those of our neighbors.

- **Jehovah's Witness**
 USES • Identify property owner and if it is a rental property.
 BENEFITS • More accurate information.

EDUCATIONAL INSTITUTION USERS

- **Downtown Montessori Academy - Admissions**
 USES • To verify a student's resident/school district.
 BENEFITS • Helps us during membership audits.

- **Stevens Point Christian Academy**
 USES • I use the Wisconsin statewide parcel map for verifying residency for our school's participation in the Wisconsin Parental Choice Program and the Special Needs Scholarship Program.
 BENEFITS • This service provides us the documentation we need to provide the DPI in order to participate in the above programs.

- **University of Wisconsin Platteville Civil and Environmental Engineering Department**
 USES • I used this to get parcel lines for a site design project I am working on as part of a capstone senior design project at UW-Platteville.
 BENEFITS • It provides an easy way to get shape files to import into Autodesk Civil 3D to use for design.

- **[Anonymous]**
 USES • Used to verify addresses for DPI programs.
 BENEFITS • Verifiable information for a family's current residence.

- **Plum City School District**
 USES • Our school uses this website to find Open Enrolled students.
 BENEFITS • This data is essential for finding what tax addresses belong to which school district.

PRIVATE CITIZEN USERS

- **Private Citizen**
 USES • Personal project to map parcels in native ecotype restoration, land stewardship etc in SW Dane County.
 BENEFITS • I've use SPL in earlier personal mapping projects of very limited scope.

- **Private Citizen**
 USES • Hobby mapping.

- **Private Citizen**
USES • Look at own parcel for dimensions.

- **Private Citizen**
USES • Researching land owners for archaeological research.
BENEFITS • We have used this information to successfully contact land owners to conduct archeological surveys/documentation!

- **Private Citizen**
USES • Hobby.

- **Private Citizen**
USES • I am looking at purchasing this property.

- **Private Citizen**
USES • Viewing land.

- **Private Citizen**
USES • Ownership.

- **Private Citizen**
USES • Understanding boundaries for hunting.

- **Private Citizen**
USES • Reference for home buying.
BENEFITS • Easy to use and see property lines and owners.

- **Private Citizen**
USES • Camping and hunting without trespassing.
BENEFITS • Not trespassing.

- **Private Citizen**
USES • To start to determine property lines.

- **Private Citizen**
USES • Locate owners of land parcels for requesting hunting access.
BENEFITS • Land tracts are difficult to determine ownership and are seldom owner occupied, as such this data base provides access to lands that are given CRP and other program dollars for wildlife damage appropriated from hunting fees.

- **Private Citizen**
USES • Hunting permissions.

- **Private Citizen**
USES • Locating property lines.

- **Private Citizen**
USES • To correct the owners name of a parcel.

- **Private Citizen**
USES • To see a map of land I bought.

- **Private Citizen**
USES • Needed to verify my parcel number from an easement agreement.
BENEFITS • Easy search by name, address or parcel number.

- **Private Citizen**
USES • Plotting.

- **Private Citizen**
USES • Search information on parcels near mine.
BENEFITS • Located information that is useful.

- **Private Citizen**
USES • Land ownership.
BENEFITS • Found owner and land values.

- **Private Citizen**
 USES • Identify property owned by Grandfather.
 BENEFITS • Adding information to the personal history of [name].

- **Private Citizen**
 USES • Setting up for a tabletop role playing game and need inspiration for the world.

- **Private Citizen**
 USES • Locating historical property information.

- **Private Citizen**
 USES • Considerations for property development, purchase.
 BENEFITS • I dont even know how anyone would ever spend money investing in real estate or developing real estate in WI without this resource.

- **Private Citizen**
 USES • Helped with finding land to purchase by knowing land owners.
 BENEFITS • Helps to ensure pieces of land are being taxed assessed correctly.

- **Private Citizen**
 USES • Property lines for hunting parcels.

- **Private Citizen**
 USES • Curiosity.
 BENEFITS • No longer curious.

- **Private Citizen**
 USES • Planing ski trails.
 BENEFITS • Look for city owned land.

- **Private Citizen**
 USES • I volunteer with several projects for cemeteries. I use this for land owner info. VERY IMPORTANT FOR ME AND TO BE FREE.
 BENEFITS • Land owner info, cemetery acres, if church is included, surveys done, plats, plss land description.

- **Private Citizen**
 USES • Agricultural land contracts, and Realty information.

- **Private Citizen**
 USES • Metal detecting
 BENEFITS • Find out the land owner and obtain permission to metal detect.

- **Private Citizen**
 USES • Hunting and fishing permission.

- **Private Citizen**
 USES • Personal curiosity.

- **Private Citizen**
 USES • To know neighbors.
 BENEFITS • I know my neighbors for safety and security of the neighborhood.

- **Private Citizen**
 USES • Researching my property lines.
 BENEFITS • Gave me a good idea on where my property line should be.

- **Private Citizen**
 USES • Survey.

- **Private Citizen**
 USES • Buying property.
 BENEFITS • Plat books are expensive especially for a 1 time look up.

- **Private Citizen**
 USES • Just viewing my land.

- **Private Citizen**
 USES • To ensure I am not trespassing when out overlanding / exploring with my 4x4, especially up north in Nicolet forest.
 BENEFITS • Plan trips knowing I won't be trespassing.

- **Private Citizen**
 USES • Property lines.

- **Private Citizen**
 USES • Fishing spots.

- **Private Citizen**
 USES • Find out who owns a parcel of land near me.
 BENEFITS • I don't have to call around or go anywhere to retrieve public information.

- **Private Citizen**
 USES • Wondering if you could put or have historical data too.

- **Private Citizen**
 USES • To research the history of our home and to help find the original build date.

- **Private Citizen**
 USES • Delineate property lines.

- **Private Citizen**
 USES • Checking it out to potentially use as a primary source for an undergrad research paper about architecture!
 BENEFITS • YES I used it last year for a geography project. 10/10 great source.

- **Private Citizen**
 USES • Assessing Real estate for purchase.

- **Private Citizen**
 USES • For mapping our mine boundary mine for the county.
 BENEFITS • This is our first time using it, it's been very helpful.

- **Private Citizen**
 USES • Who owns land , and who to ask about hunting.

- **Private Citizen**
 USES • Property lines.

- **Private Citizen**
 USES • Places to move.

- **Private Citizen**
 USES • Identify parcel owner.

- **Private Citizen**
 USES • Interested in looking at boundaries for purpose of respecting them.

- **Private Citizen**
 USES • Platbook.

- **Private Citizen**
 USES • I use the map to find my personal property lines and property lines on public land.
 BENEFITS • This map is great. It is super easy to use and there is so much information for the user! And its free!

- **Private Citizen**
 USES • Identifying property owners for broadband and telecommunications project rights of way.
 BENEFITS • Able to download a shape file of the County Parcels and ID Numbers to get vesting documents from the respective counties.

- **Private Citizen**
 USES • Hunting.

- **Private Citizen**
 USES • Look up who owns land.

- **Private Citizen**
 USES • Determine landowner.

- **Private Citizen**
 USES • Curious as to who owns land near me.
 Bicycling and hunting purposes.

- **Private Citizen**
 USES • Clarifying my lot lines.

- **Private Citizen**
 USES • Purchase home.

- **Private Citizen**
 USES • Looking at land up north.

- **Private Citizen**
 USES • Location of parcels for signage placement.

- **Private Citizen**
 USES • Land surveyor.

- **Private Citizen**
 USES • Was hoping to get information on parcel size (dimensions) for use in possible future improvements.

- **Private Citizen**
 USES • Used to investigate locations for the purposes of a telecom provider exploring the area as a potential place to deploy fiber- need to understand how many locations there are, where they're located, and how far they are from the road.
 BENEFITS • Helps validate other data sources (example: FCC data), especially the addresses, the lat/long, and the provided SHP files.

- **Private Citizen**
 USES • I use to monitor neighboring properties owner changes around the properties that I own.
 BENEFITS • Yes, the ability to view adjacent properties in another county has been very helpful.

- **Private Citizen**
 USES • Checking on parcel numbers of my property, my deceased fathers property and daughters property for insurance and our records.
 BENEFITS • I would be able to figure out acres, parcel numbers etc on my own property and that of our properties that we would rent in the future.

- **Private Citizen**
 USES • Check who owns lots for possible purchase.

- **Private Citizen**
 USES • Hunting information.
 BENEFITS • Hunting information.

- **Private Citizen**
 USES • To avoid trespassing.

- **Private Citizen**
 USES • Local land owner.

- **Private Citizen**
 USES • General.

- **Private Citizen**
 USES • Hunting.

- **Private Citizen**
 USES • Potential property purchase.

- **Private Citizen**
 USES • Determining property ownership.
 BENEFITS • Knowledge of property ownership.

- **Private Citizen**
 USES • Research for personal history project.
 BENEFITS • Easier accessed information.

- **Private Citizen**
 USES • Just want look up 2004 RE tax bill.

- **Private Citizen**
 USES • Values on my property.

- **Private Citizen**
 USES • Taxe record.

- **Private Citizen**
 USES • Finding our neighbors names.

- **Private Citizen**
 USES • Looking at properties in the surrounding area.

- **Private Citizen**
 USES • General curiosity. Possible relocation.

- **Private Citizen**
 USES • Property values.

- **Private Citizen**
 USES • Parcel sales.

- **Private Citizen**
 USES • Real estate appraisal.
 BENEFITS • Conducting research for real estate appraisals, which we are paid to prepare

- **Private Citizen**
 USES • To understand what land is public versus private in my county and surrounding counties.

- **Private Citizen**
 USES • Property owners while hunting.

- **Private Citizen**
 USES • Curious.

- **Private Citizen**
 USES • Looking into rural property out of curiosity. I'll want to buy some land in the future to have a hobby farm.

- **Private Citizen**
 USES • Land description and zoning.

- **Private Citizen**
 USES • Comparison.

- **Private Citizen**
 USES • Homebuyer looking at property owner information and lot lines.
 BENEFITS • It has helped me see if there are easements and to see if whatâ€™s on the real estate websites is correct.

- **Private Citizen**
 USES • Look up landowner.

- **Private Citizen**
 USES • View boundary with neighbor.

- **Private Citizen**
USES • To assess previous land use for land I will own or currently own. to determine confines of my property. to understand owner history and use, for history's sake.

- **Private Citizen**
USES • Personal.

- **Private Citizen**
USES • Research regarding conservation easements.

- **Private Citizen**
USES • I am looking for information on my lot in Outagame County.

- **Private Citizen**
USES • Getting rough idea of actual property lines of my home.

- **Private Citizen**
USES • To look at location of parcel I co-own.

- **Private Citizen**
USES • Property line dispute. Neighbor cut down one of my trees.

- **Private Citizen**
USES • I really appreciate it for asking property owners permission to hunt/fish or cross there private property.

- **Private Citizen**
USES • Urban archeology (property lines).
BENEFITS • Knowing approx. location/names of parcel owners.

- **Private Citizen**
USES • Understand and locate public property in order to not trespass on to private property when observing flora and fauna.
BENEFITS • Avoid trouble with its private citizens.

- **Private Citizen**
USES • Personal.

- **Private Citizen**
USES • Family property details.

- **Private Citizen**
USES • See who owns land around me and how big the parcel is.
BENEFITS • Showed me exactly who owns what next to my land and the size of it. Thank you.

- **Private Citizen**
USES • I was trying to see our property lines for a possible addition of a fence on the side of our yard.

- **Private Citizen**
USES • Check if my neighbor is building on my property.

- **Private Citizen**
USES • Look at where property lines are to find easement.

- **Private Citizen**
USES • Looking for my buddies phone number.
BENEFITS • I get to talk s* and say hi to my old friend.

- **Private Citizen**
USES • See who owns things and state taxes to determine vales.
BENEFITS • Learn about the area around me.

- **Private Citizen**
USES • Hunting.

- **Private Citizen**
USES • Many different purposes such as
 - 1) finding where my parcel is located within the larger plat,
 - 2) mapping current use and planning for future use of my properties,
 - 3) finding tax parcel information,
 - 4) finding property tax information,
 - 5) finding property boundary information,
 - 6) finding terrain information,
 - 7) finding a mailing address for a property owner out in the country where there is no house or residence, and other very helpful uses.

- **Private Citizen**
USES • Hunting.
BENEFITS • Predator control.

- **Private Citizen**
USES • Land purchase.

- **Private Citizen**
USES • Identify my lot lines.

- **Private Citizen**
USES • Land lines.

- **Private Citizen**
USES • New to area and used it to find names of all our neighbors.

- **Private Citizen**
USES • Looking for property lines of my property.

- **Private Citizen**
USES • Find property discription.

- **Private Citizen**
USES • I use this to help hold government officials accountable in what they say about their personal finances/real estate information.
BENEFITS • This has been an immense resource for transparency and base mapping.

