Final Report
Version 7 Statewide Parcel Map Database Project
December 2, 2021 | *Appendix B Updated: December 2, 2021

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OVERVIEW

The **Version 7 Statewide Parcel Map Database Project** (V7 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 V7 Project, which ran from January 2021 to December 2021 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 V7 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 29, 2021. The V7 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 V7 Project was another phase in the incremental approach of the Parcel Initiative—improving the statewide parcel map with each annual iteration. The V7 Project builds upon the experience of the LinkWISCONSIN and V1-V6 Projects. V7 was the sixth 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

V7 Statewide Parcel Layer - 2021
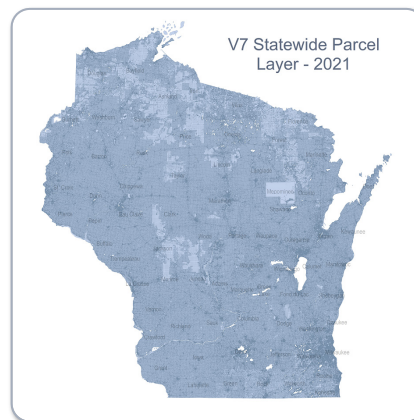
mapping application. The web app allows someone without GIS software to view and search the statewide parcel map.

BENCHMARK PROGRESS ASSESSMENT

The final V7 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. Notes from assessment and analysis of county data were communicated to counties through individualized documents called V7 Observation Reports, which describe what must still be done for a county to meet the Searchable Format. The majority of counties came close to meeting the Searchable Format in

their V7 data submissions. Very few met the Searchable Format exactly, with only 12.5%, or 9 of 72 counties, submitting data that did not require additional processing to meet all Searchable Format requirements. The remaining 87.5% 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 V7, **514** new county data layers were cataloged, archived, and made available through the data portal GeoData@Wisconsin.

RECOMMENDATIONS

Recommendations to improve and achieve better efficiency, accuracy, and final products include making the call for data earlier, updating the validation tool with a plan for a new *Validation Tool Concept*, and actively encouraging counties to integrate PLSS coordinates into the parcel fabric.

Recommendations for the V8 project do not include changing the schema in a way that would alter county workflows, although there are some recommendations for schema clarification. 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 7 Statewide Parcel Map Database Project** (V7 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, 2021 and December 31, 2021.

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. V7 is the sixth round of requesting that counties submit local data in the Searchable Format.

The V7 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), and the Version 6 (V6) Project (2020).[1]

The V7 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 V7 Project Goals

As part of the implementation planning for the statewide digital parcel map, the goals of the V7 Project were established in a memorandum of understanding (MOU) between DOA and SCO.

- **Tracking progress.** The statewide parcel layer is built in an iterative fashion. V7 will continue to track the progress made with investments to local governments, specifically on benchmarks for parcel dataset development instituted with the 2016 WLIP grant application and continued in the 2017, 2018, 2019, 2020, and 2021 grant applications.

- **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. 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 become more efficient with time, facilitating other improvements and/or opportunities for value-added products.

- **Authoritative Automated Asynchronous Aggregation.** A long-term goal is to achieve the "Four A's" so county data stewards can submit datasets at any time or interval by automatically merging local data with the most current statewide database. The 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.

- **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 V7 Project should seek to create and realize efficiencies in general, eliminate waste, and integrate or collaborate with other state GIS services where possible.

- **Responsiveness to public needs and economic development goals.** Evaluate parcel layer user suggestions and implement improvements where feasible.

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[1] See 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

V7 Statewide Parcel Map Database Project Milestones	
Date	**Version 7 Project Milestone**
01/01/2021	V7 Project start
01/15/2021	V7 data validation and geoprocessing tools finalized
01/29/2021	Call for data
02/01/2021	Begin county data preparation assistance/outreach
02/26/2021	V7 workflow documentation draft
03/31/2021	V7 data submissions due
06/01/2021	Benchmarking data ready for sharing with counties
06/10/2021	Draft V7 database for purposes of QA/QC
06/28/2021	Any V7 parcel map web app updates complete
06/30/2021	V7 parcel map available online
09/17/2021	Final E3 PLSS database
09/30/2021	E3 PLSS end user documentation
10/29/2021	V7 final report
11/12/2021	E3 PLSS final report and E3 database publication
12/03/2021	V8 data validation tool finalized
12/17/2021	V8 call for data ready

1.1.3 Project Team

V7 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
Jin Du	Wisconsin State Cartographer's Office (student)
Ethan Lucas	Wisconsin State Cartographer's Office (student)
Marie Overing	Wisconsin State Cartographer's Office (student)
Davita Veselenak	Wisconsin Department of Administration

1.1.4 Outreach

V7 Conference Presentations and Outreach To-Date	
72nd Wisconsin Society of Land Surveyors (WSLS) Annual Institute January 2021; Virtual	Wisconsin County Surveyors Association (WCSA) Annual Membership Meeting, Q&A
Wisconsin Land Information Association (WLIA) Annual Conference February 2021; Virtual	Land Information Officers Network Annual Meeting, DOA and SCO updates
Wisconsin Land Information Council (WLIC) February 2021; Virtual	WLIP program updates
V7 County Assistance/Outreach Sessions March 2021; Virtual	Assistance offered to all counties via call for data, some individualized meetings were held

Note. Some outreach scheduled for 2021 did not take place or occurred virtually due to the COVID-19 pandemic.
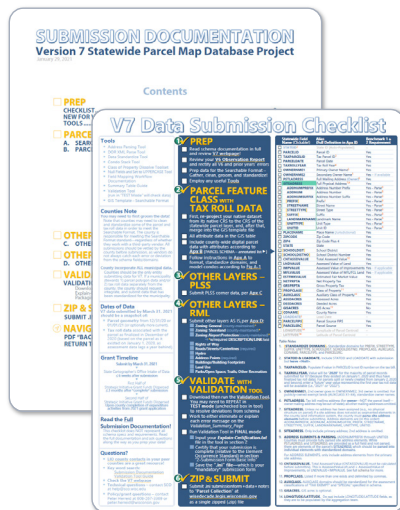
1.2 Documentation and Communication of Standards

The Submission Documentation set forth the required data submission standards for the V7 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. V7 Submission Documentation and Data Submission Checklist

1.2.1 New for V7

All attribute names, definitions, domains, and other schema requirements remained the same (for V7) 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.

  A minor but noteworthy change to the tool is an updated certification section, where the submitter attests to the completeness of the submission using a new summary statistic called the **ERROR SUM**. The tool asks, of the number of unresolvable flags present in the final run of the tool, for how many are explanations provided via the *Explain-Certification.txt* file. Not all flags in the tool represent "errors" or mistakes in the data—some occur for legitimate reasons or exceptional situations in which deviations from the schema are permissible. However, 100% of the number of flags represented by the ERROR SUM on the last and final run of the tool should have explanations (which can be generalized/grouped together for duplicate error messages). See Validation Tool Guide for details.

- **Take Notes As You Go! Help Us Help You!** A new optional activity encouraged for those who prepare the local data is to take contemporaneous notes on the data prep, grooming, and submittal process. We are interested in issues you may encounter—particularly issues that DOA may be able to help with, such as the schema, documentation, and tools. If you encounter any problems, please describe them in detail, so that we have actionable information to fix the problems on our end where possible. Notes can be submitted in any file format zipped up in the submission package (e.g., BADGER_COUNTY_NOTES.docx).

- **Added Flexibility for Data Cut Date.** The option to submit data as cut on December 31st is being added to allow counties greater flexibility. Records from calendar year 2020 are required (spanning two TAXROLLYEARs) but any records in existence as of January 1, 2021 can optionally be included when preparing the V7 data.

- **Submit PLSS Corner Data.** PLSS corner data is being collected to be shared with SCO for the application Survey Control Finder and for a sub-project to create a statewide PLSS database. If the county has the PLSS attributes listed in Appendix C in a digital tabular format, they must be provided. They may exactly match the attributes listed—for which a new PLSS template is included in the Searchable Format GIS template. If it is not possible to submit standardized attribute names, all attribute names must unambiguously correspond to the PLSS attribute names listed in Appendix C.

- **Submit Other Layers.** DOA is continuing to combine the V7 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 V7, counties only need to submit three layers of county-maintained zoning data: 1) General, 2) Shoreland, and 3) Airport Protection. 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 2021 WLIP Strategic Initiative Grant and receive the first grant payment. In some cases in which a county does not meet the Searchable Format requirements with their V7 submission or fails to rectify errors from prior years' Observation Reports, the county may need to re-submit data and/or alter its 2021 grant agreement to address deficiencies in its parcel layer or native data.

- **Clarified Documentation.** The V7 documentation has been revised. Discard any old documentation and links. Replace with this updated Submission Documentation and V7 links. In the V7 schema, a few attribute definitions have been made more clear or has examples added—particularly STREETNAME, STREETTYPE, and on page 8. To avoid excessive 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 documentation before preparing data submissions.

1.3 Call for Data

The official V7 data request was sent to each county land information officer on January 29, 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 7.

All counties must submit parcel/tax roll data in the Searchable Format standard no later than March 31, 2021. 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 2021 Strategic Initiative Grant agreement and receive the first payment.

SUBMISSION DOCUMENTATION & V7 WEBPAGE
The V7 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 from V6, a page titled New for V7 summarizes what's new.

You will want to read the Submission Documentation in full, in order to understand the details of the V7 request. In addition, the V7 webpage contains all the necessary submission information and links to several tools to help you format your data.

NEW THIS YEAR – TAKE NOTES!
Help us help you by taking notes! A new optional activity encouraged for those who prepare the local data is to take contemporaneous notes on the data prep, grooming, and submittal process. We are interested in issues you may encounter—particularly issues that DOA may be able to help with, such as the schema, documentation, and tools. If you encounter any problems, please describe them in detail, so that we have actionable information to fix the problems on our end where possible.

SUBMIT PLSS + OTHER LAYERS
Again for V7, 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 submit your data by **March 31, 2021**.

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@sco.wisc.edu or call 608-262-3065. Feel free to contact me with general questions as well.

We realize that a considerable amount of work goes in to this annual data submittal. WLIP Strategic Initiative grants were designed to aid in this task. We sincerely appreciate your efforts to help make another year's statewide parcel layer successful.

Thank you,

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

Figure 2. V7 Call for Data

1.4 V7 Assistance/Outreach & V7 Notes Submitted

1.4.1 V7 Assistance/Outreach

For V7, a new outreach element was added to the project:

County data preparation assistance/outreach. Conduct outreach with and offer assistance to counties that have in the past experienced problems preparing or submitting 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.

Although site visits were not possible at the time of the V7 call for data due to restrictions relating to the COVID-19 pandemic, some assistance and outreach efforts occurred virtually. All counties were encouraged to ask for assistance, if they so choose, in the call for data. The process began with an email targeting 13 specific counties. Only 3 counties took up the offer—Dunn, Lafayette, and Crawford, although there was substantial emailing with other counties about the V7 call for data.

A notable aspect of the assistance was that it allowed communication between DOA/SCO and one of Wisconsin's common tax parcel software vendors, GCS. It became clear from prior year's Observation Reports that a problem with some counties submissions was the addition of false cardinal directions. This communication with GCS and the county resulted in a GCS update to their customer parcel module, may have reduced address parsing errors in the V7 data that was submitted.

A communication with GCS and Dunn County uncovered that some GCS counties were submitting work roll attributes for the new year, instead the finalized tax roll attributes from the previous year. GCS will make sure to submit finalized tax roll information for future data submittals.

More V7 outreach in preparation for V8 may be conducted by SCO. The V8 MOU includes a similar provision for assistance/outreach.

1.4.2 V7 Notes

For V7, a new request was added to the call for data asking counties to voluntarily submit any contemporaneous notes on their data prep workflow.

My V7 Notes
- Must get data from the munis who maintain data independently
- Remember to add note of new street names in Explain-Certification.txt
- Keep jotting down notes!

Take Notes As You Go! Help Us Help You! A new optional activity encouraged for those who prepare the local data is to take contemporaneous notes on the data prep, grooming, and submittal process. We are interested in issues you may encounter—particularly issues that DOA may be able to help with, such as the schema, documentation, and tools. If you encounter any problems, please describe them in detail, so that we have actionable information to fix the problems on our end where possible. Notes can be submitted in any file format zipped up in the submission package (e.g., BADGER_COUNTY_NOTES.docx).
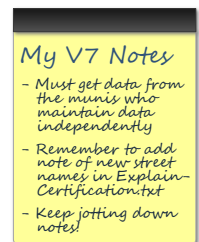
Brown, Dodge, Jefferson, and Waushara Counties submitted notes, while Richland had provided their internal workflow notes prior to the call for data. Here is a summary of what the notes revealed:
- Data gathered prior to start of submittal process and submittal process details.
- One county was explaining all new street name changes, when it could have summarized these changes. We pointed this out for future submissions.
- Exposed frustrations with a vendor data export tool and potential tweaks to make it work better.

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 V7 final deliverable and statewide parcel map.

2.1 Tool Development

2.1.1 Updated Validation Tool

V7 featured an updated 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 ".ini" Submission Form, a required part of the submission package.

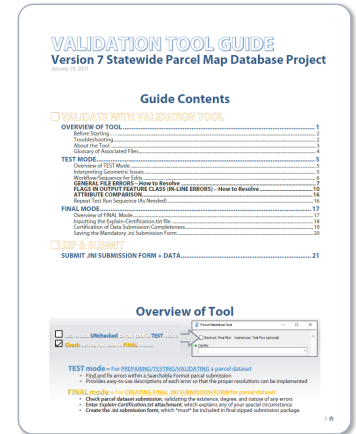For more details or to download the tool, see the Validation Tool Guide.

Figure 3. Validation Tool Guide

Validation Summary Page

The Validation Tool was updated for V7. It displays validation test results in a browser-displayed page called the "Validation Summary Page." The Validation Summary page is a an 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.

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.
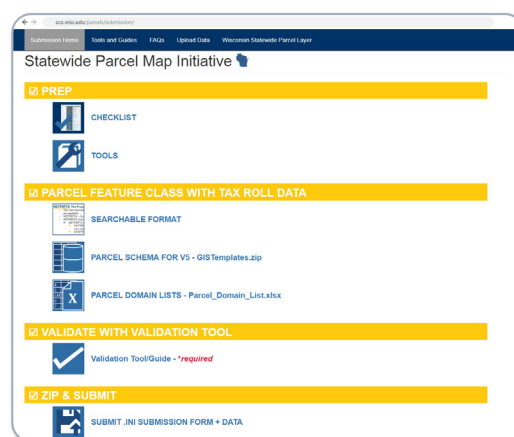

Figure 5. V7 Data Submission Webpage with Links to Schema and Tools

- **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 SITEADRESS 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 PROPCLASS 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.

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)
Validation Tool	Not applicable	Not applicable	108	118	84	117	112
Address Parsing Tool	Not available	Not available	48	46	36	27	37
DOR XML Parse Tool	Not available	Not available	24	36	17	34	24
Data Standardize Tool	Not available	Not available	28	27	22	40	39
Condo Stack Tool	Not available	Not available	21	19	9	16	15
Class of Property Dissolve Toolset	Not available	Not available	20	19	13	20	22
Null Fields and Set to UPPERCASE Tool	Not available	Not available	51	59	52	34	57
Field Mapping Workflow Documentation	Not available	Not available	36	34	21	19	18
Summary Table Guide	Not available	Not available	13	11	11	22	13

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 V7, **514 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 made 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 V6 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. Roughly 26 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 39 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.

V7 Versus Previous Re-Submits and Clarifications						
	V3 (2017)	**V4** (2018)	**V5** (2019)	**V6** (2020)	**V7** (2021)	**Change**
# of counties that had to be re-approached	29 counties (40%)	38 counties (53%)	19 counties (26%)	26 counties (36%)	**27** counties (38%)	⬈ **+ 1** more counties
# of emails sent to resolve issues	83 emails	60 emails	24 emails	34 emails	**39** emails	⬈ **+ 5** more emails

In a semi-automated process added for V7, any intake issues that required county follow-up were entered into an online form to be sent to DOA so that a follow-up email could be sent—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 V7 statewide parcel layer and the **3 counties yet to complete county-wide digital parcel mapping** are summarized in the table below.

V7 Gaps Summary		
County	**Number of Munis with Gaps**	**Municipalities with Gaps in Parcel Coverage**
Buffalo	7	Part of: Alma (C), Buffalo(C), Fountain City (C), Glencoe (T), Milton (T), Nelson (T); Waumandee (T); plus several small parcel gaps in various townships
Burnett	5	Part of: Swiss (T), Union (T), West Marshland (T), Grantsburg (T), Anderson (T)
Crawford	5	Part of: Mount Sterling (V), Gays Mills (V), Seneca (T), Wauzeka (T), Wauzeka (V)

For V7, 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

V7 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.

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 in the ParcelValidationTool 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. 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, etc. 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 was 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

The final parcel layer totaled 3.507 million parcels shown in Map 1 on the following page.

Geometric Coverage

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

V7 Spatial Coverage Versus Previous Years									
	V1	V2	V3	V4	V5	V6	V7	Additional Coverage in V7	Percent Additional Coverage in V7
Number of features	3,434,149	3,466,359	3,486,200	3,491,037	3,504,785	3,507,127	3,520,942	**13,815 features**	**0.39%**
Coverage (in square miles)	53,656	55,280	56,060	56,193	56,403	56,410	56,389	-21 square miles	**-0.04%**

Note. The coverage in square miles calculation does <u>not</u> 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 unparcelized areas are geometrically represented or omitted.

V7 Statewide Parcel Layer - 2021
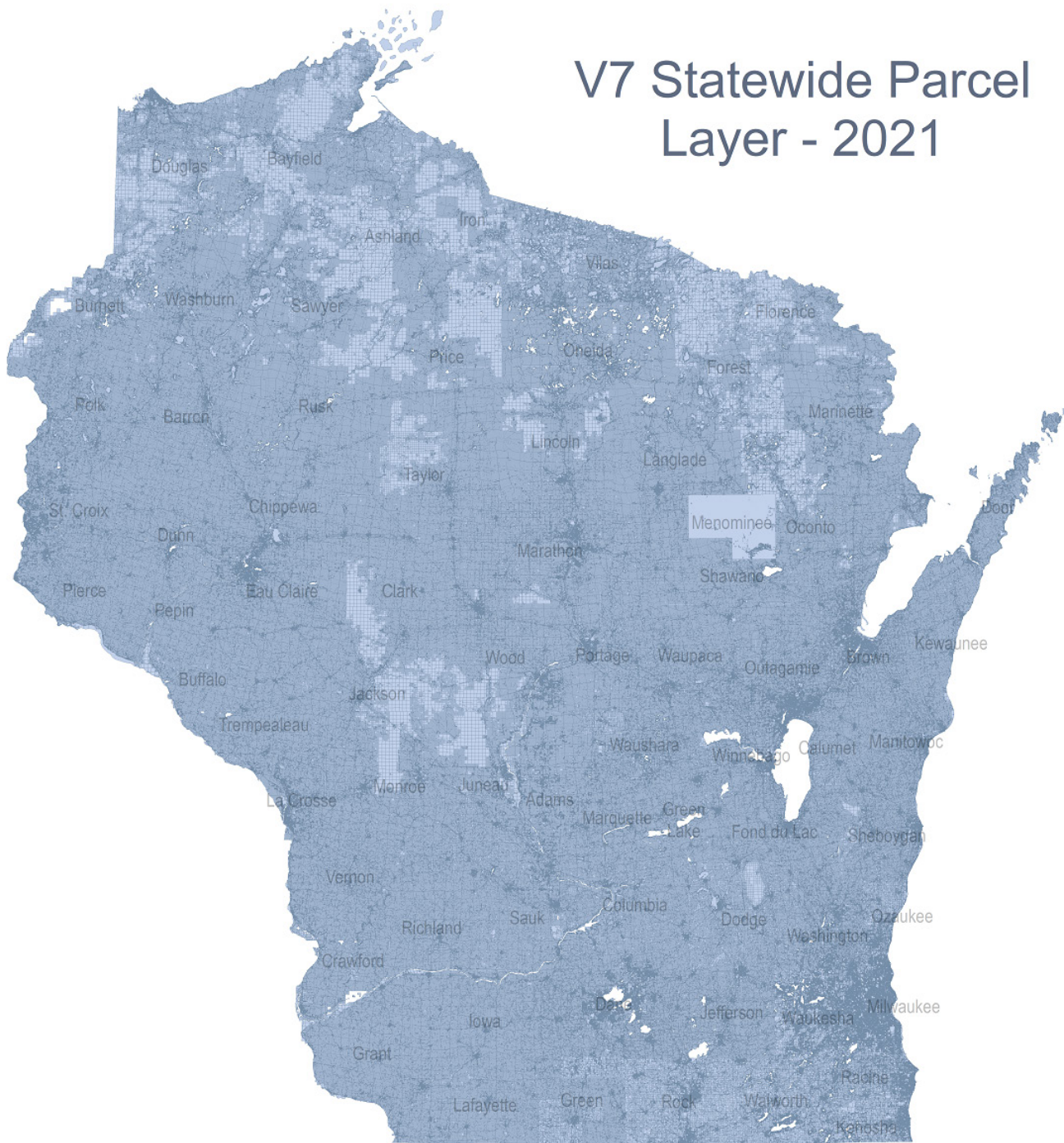
Map 1. Version 7 Statewide Parcel Layer Completed in June 2021

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-V7 in 2018-2021.

However, three zoning types were collected for V7—county **general zoning**, **shoreland**, and **airport protection**.

The Searchable Format for V7 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 V7.

V7 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)
County General Zoning	14 / 49	21 / 56	7 / 54	4 / 53	6 / 50	8 / **55**
Farmland Preservation	16 / 29	12 / 38	not collected	not collected	not collected	not collected
Shoreland Zoning	16 / 33	18 / 45	4 / 24	0 / 27	3 / 31	2 / **27**
Floodplain	15 / 29	17 / 41	not collected	not collected	not collected	not collected
Airport Protection Zoning	9 / 16	5 / 23	1 / 12	0 / 13	1 / 12	2 / **12**
Total errors/TOTAL SUBMITTED	(45%) 70 /**156**	(36%) 73 /**203**	(13%) 12 /**90**	(4%) 4 /**93**	(11%) 10 /**93**	(13%) 12 /**94**

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 V7_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.

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.

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 V7 database was formally released to the general public on June 29, 2021, through the DOA land information email listserv and the data page at www.sco.wisc.edu/parcels/data.
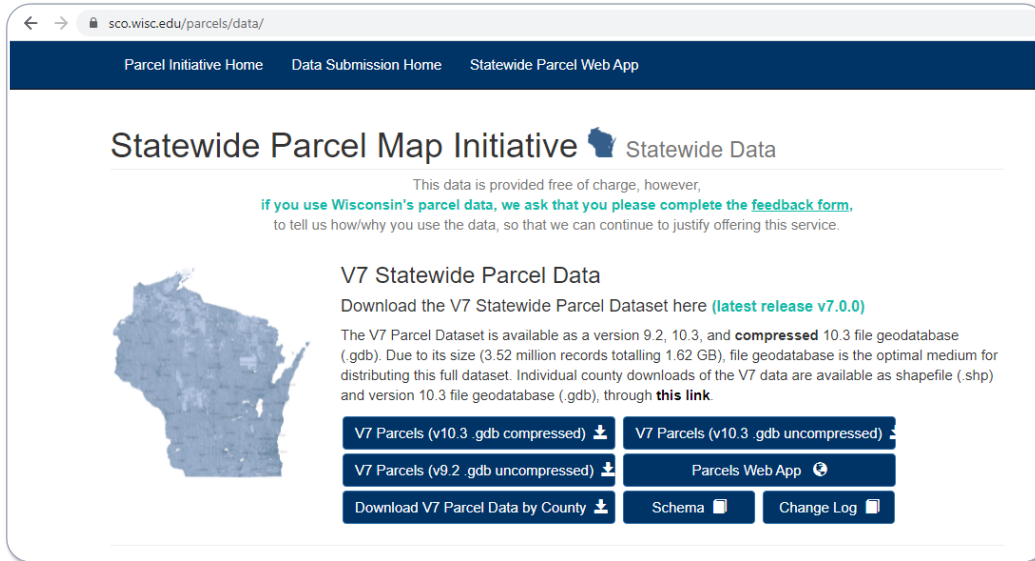

Figure 6. V7 Data Page

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 V7 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 V7 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.
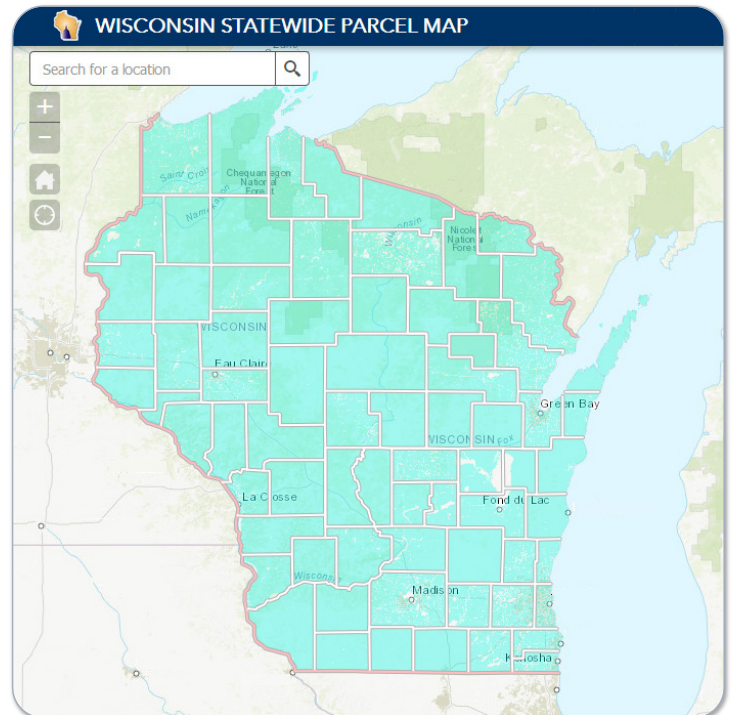

Figure 7. V7 Web App

Improvements to the V7 Web App

- **Inclusion of the V7-V6 parcel data feature layers.** At the time of the release of the V7 statewide layer, only the impending V7 and V6 feature layers were included in the app at maps.sco.wisc.edu/Parcels. However, users can still download a historic copy of the V1-V5 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 V7 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—SITEADRESS—appears "as is," with the physical street address of the parcel appearing exactly as it is provided by the county.

Figure 8. V7 User Feedback Form

  ▪ 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 SITEADRESS field.
  ▪ The standardized site address field, STAND_SITEADD, is created by:
    ❶ **Concatenating the elements that make up SITEADRESS**, which counties are to submit as individual address elements:

ADDNUMPREFIX	ADDNUM	ADDNUMSUFFIX	PREFIX	STREETNAME	STREETTYPE	SUFFIX	UNITTYPE	UNITID

    ❷ **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	

- **Improvements to End User Schema Documentation.** The V7 end user schema (V7_Wisconsin_Statewide_Parcels_Schema_Documentation) was also updated for V7. 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.

V2 received a total of over 4,000 downloads and nearly 1.8 million hits on web services in the year following the V2 release date. V3 received a total of over 3,070 downloads and nearly 2.6 million hits on web services in the year following its release date. V4 received a total of ~5,346 downloads and nearly 4.5 million hits on web services. V5 received a total of 7,352 downloads and 10 million hits on web services. V6 received a total of 8,526 downloads. Download and web app statistics 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 (~three months after release; all formats)	602	1,892,036
	V7 Individual County Parcels, all 72 counties combined (all formats)	2,070	NA
		2,672 Total	**1,892,036** 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 – October 2021; ~3 months only)	43,733	23,465	55,340

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–Sept 2021)	**	NA
GeoData@Wisconsin - "**2021**" year zoning data (from January 2021–Sept 2021)	149	NA
GeoData@Wisconsin - Any year zoning data (from January 2021–Sept 2021)	435	NA
	584 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 Observation Reports

The notes from the V7 Statewide Parcel Map Database Project intake process and assessment were communicated to counties through documents called the V7 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.

SCO staff documented what must be done yet to achieve the Searchable Format and thus meet Benchmarks 1 and 2. The intention is that the action items from the V7 Observation Report be used as a checklist to help develop and groom the county's data to meet the Searchable Format in the future.

A special symbol appears in some cases, to prominently 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 requiring attention to remedy.

Figure 9 shows an example of a V7 Observation Report.

Figure 9. V7 Observation Report (Example)

3.1.1 OWNERNME1 – Redaction of Owner Names

For the owner name attribute, some counties redacted owner names. Partial owner name redaction was conducted by nine counties for V7, 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.

V7 Owner Name Redaction		
County	**Scope**	**Percent Redacted**
Kenosha	**Entire county dataset**	**100.00**
Barron	Partial	0.62
Brown	Partial	0.11
Columbia	Partial	0.25
Dane	Partial	8.89
Manitowoc	Partial	0.24
Sauk	Partial	0.11
Sheboygan	Partial	0.18
Vilas	Partial	0.25
Waupaca	Partial	0.21

3.2 Benchmark Progress Assessment

3.2.1 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
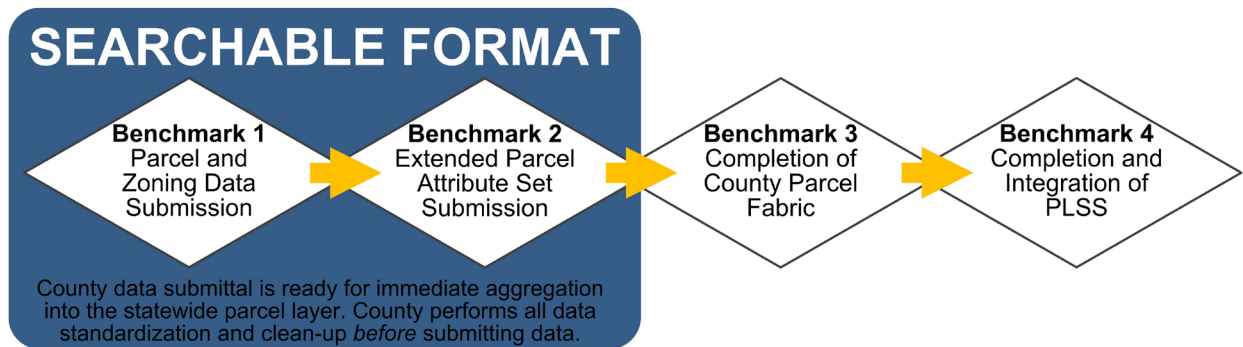
Figure 10. Searchable Format with Benchmarks

Benchmark 1 and 2 are explored below for the purpose of assessing progress between V2 and V7. For both of these benchmarks, progress between the successive projects is captured in comparing the individual V2 Observation Reports, V3 Observation Reports, V4 Observation Reports, and V5 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 intended 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 reports track all substantial manipulation that needed to be performed on each county parcel data submission, on a per attribute basis. The table below summarizes the progress between V2 and V7.

Benchmark 1 and 2 Progress Assessment						
Attributes	**V2** Attribute Errors	**V3** Attribute Errors	**V4** Attribute Errors	**V5** Attribute Errors	**V6** Attribute Errors	**V7** Attribute Errors
PARCELID	3	0	4	4	1	12
TAXPARCELID	1	30	4	2	1	0
PARCELDATE	40	8	4	4	4	5
TAXROLLYEAR	7	1	2	5	7	15
OWNERNME1	1	1	1	0	1	1
OWNERNME2	0	6	6	0	0	5
PSTLADRESS	31	42	30	24	21	18
SITEADRESS	19	3	1	2	3	3
ADDNUMPREFIX	12	4	5	0	5	1
ADDNUM	35	8	8	11	7	6
ADDNUMSUFFIX	17	10	8	12	10	11
PREFIX	19	5	11	15	24	12
STREETNAME	34	21	32	17	15	6
STREETTYPE	37	5	5	7	5	3
SUFFIX	15	3	2	1	2	2
LANDMARKNAME	8	0	0	0	0	0
UNITTYPE	16	1	1	3	4	3
UNITID	22	4	2	6	3	1
PLACENAME	11	1	0	1	0	0
ZIPCODE	59	1	3	2	0	0
ZIP4	8	1	1	0	1	1
STATE	11	1	1	0	0	0
SCHOOLDIST	8	11	4	3	5	1
SCHOOLDISTNO	19	1	2	1	2	1
IMPROVED	18	0	3	0	NA	NA
CNTASSDVALUE	7	0	4	3	2	4
LNDVALUE	3	0	2	0	0	0
IMPVALUE	3	0	2	0	0	0
FOREST/MFLVALUE	4	0	0	0	3	0
ESTFMKVALUE	7	2	50	0	33	1
NETPRPTA	7	2	2	1	3	11
GRSPRPTA	6	1	1	0	0	1
PROPCLASS	4	4	6	8	4	9
AUXCLASS	20	3	6	11	7	5
ASSDACRES	2	0	2	2	0	1
DEEDACRES	2	0	0	0	0	0
GISACRES	1	1	1	0	0	2
CONAME	7	2	2	0	1	0
PARCELFIPS	6	3	2	0	0	0
PARCELSRC	7	3	2	0	0	0
PROJECTION	19	5	2	0	0	0
NET TOTAL	**556**	↘**194**	↗**218**	↘**141**	↗**174**	↘**141**

Some informational comments not representing errors appeared in the V7 Observation Reports that are not included in the above totals—specifically for PARCELDATE (29 counties); and OWNERNME1/AUXCLASS (34 counties).

The majority of counties came close to meeting the Searchable Format in their initial V7 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 V7 parcel data submission on initial data submission: ~**9** counties (12.5%)
  Green; Iron; Jackson; Jefferson; Kenosha; LaCrosse; Sauk; Waushara; Wood.

3.2.2 Benchmark 3 and Benchmark 4 Progress Assessment

Data for Benchmark 3 – Completion of County Parcel Fabric—collected via the 2021 WLIP grant application (at the end of calendar year 2020) 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 44 of 72 have PLSS remonumentation work remaining.

Benchmark 3 Progress		
As of 2020	**Counties with Incomplete Parcel Fabric**	**Estimated Year of Parcel Fabric Completion**
	Buffalo	2022
	Burnett	2022
	Crawford	2022

Benchmark 4 Progress	
As of 2020	**Counties with Incomplete PLSS** (Self-Reported; 44 of 72 counties)	**Estimated Year of PLSS Network Completion**
Adams	2021
Ashland	2099
Bayfield	2039
Brown	2022
Buffalo	2027
Burnett	2022
Chippewa	2022
Clark	2023
Columbia	2022
Crawford	2022
Dane	2024
Douglas	2030
Dunn	2030
Eau Claire	2028
Florence	2035
Forest	2035
Grant	2050
Green	2030
Green Lake	2025
Iowa	2021
Iron	2030
Jackson	2029
Lafayette	2030
Langlade	2028
Lincoln	2021
Marathon	2021
Marinette	2050
Marquette	2025
Menominee	2023
Monroe	2024
Oconto	2031
Oneida	2030
Portage	2023
Price	2030
Richland	2024
Rock	2025
Rusk	2030
Sauk	2030
Sawyer	2035
StCroix	2022
Taylor	2024
Vilas	2030
Waupaca	2023
Waushara	2030

3.3 E3 PLSS Sub-Project

As part of V5-V7, a full statewide Public Land Survey System (PLSS) layer, Edition 1, Edition 2, and Edition 3 were created and will be reported on separately.

E3 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 V8 and Beyond

1. **Suggest reuse of parsed SITEADRESS elements**
   - One of the most time consuming processes involved with parcel data preparation process is the parsing and standardization of the SITEADRESS elements. It could be suggested in the Submission Documentation that one potential method to help reduce the amount of time and effort involved with this process would be to obtain the SITEADRESS values, all of their parsed elements from the previous year (e.g., V7), as well as the PARCELID values, in a table. This data could then be joined to the current year parcels and the already parsed elements could then be copied over. The only parcels that would then require a full address parse would be those that did not get joined to the previous year's address element data (i.e., new parcels or parcels that have a new structure for which an address was recently assigned).
     ▶ **Action Item:** Add to the Submission Documentation a suggestion for SITEADRESS that can help reduce the amount of time and effort needed for parsing addresses each year.

2. **Strengthen Validation Tool requirements for .ini creation**
   - During the validation tool 2.0 development process, thought should be given to additional validation checks that can be applied to ensure data meets the requirements. If those requirements are not met, the .INI file creation process should be paused and directives on how to repair the data should be provided to the data submitter. Care should be taken to prevent false flags and account for valid deviations or "standard exceptions" from the submission requirements. This will ensure that counties are not burdened with searching for errors or issues that are not actually present within their submission.
     ▶ **Action Item:** Keep this concept in mind during the planning and design meetings for validation tool 2.0.

3. **Consider additional publicizing of use and positive feedback received in regards to the Statewide Parcel Layer**
   - The data download statistics, feature service hits and additional metrics related to the statewide parcel layer are always included within the project final report. Consideration of additional methods for highlighting and emphasizing the amount of usage and public benefits of the layer could be explored. This would not only provide additional tangible evidence to the counties of the value they are providing with the extensive effort they put into data preparation, but also draw further public attention to the layer and the immense value it can provide.
     ▶ **Action Item:** Discuss possible options internally among project team. Identify possible benefits and how information could be best presented.

4. **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 should be made to the validation tool on an annual basis in the interest of providing quality feedback for the data preparation process.
     ▶ **Action Item: Total Assessed Value Check.** Ensure that function checking CNTASSDVALUE values of <Null>, 0 or 0.00 when propclass is populated are functioning as expected
     ▶ **Action Item: Update PSTLADRESS Dictionary.** Add "NULL BLVD" and "CANULL" to acceptable PSTLADRESS dictionary to prevent erroneous flags on valid values.
     ▶ **Action Item: Taxroll Value Check Modification.** Update the function that checks various taxroll values when propclass field is populated and auxclass field is populated with AW or AWO. Ensure that erroneous flags are not being generated and modify function as necessary.

- ▶ Action Item: **NETPRPTA/GRSPRPTA.** Check if NETPRPTA/GRSPRPTA with a PROPCLASS designation 1-7 are 0.00 or <Null>; especially if it is a majority of records.
- ▶ Action Item: **STREETNAME.** SCO project team to verify apostrophe ("**'s**") within the STREETNAME attribute field are not throwing erroneous error flags and ensure that the bad characters check does not flag for the presence of apostrophes.
- ▶ Action Item: **PSTLADRESS.** SCO project team to verify that this check and validation tool exit are functioning as expected and generating false flags or unnecessary tool exits.

5. Modify statewide logic processing to look for duplicate names.
- Duplicate names have been observed in OWNERNME1 and OWNERNME2 fields. It is unlikely any substantial number of duplicate names is legitimate.
  - ▶ Action Item: Add check for significant number of duplicate names (e.g., more than 10) to workflow process during intake and/or statewide logic process.

6. Make no changes to parcel schema for V8
- 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).

7. Do not implement suggested schema changes from end-users for V8 but keep in mind business uses
- The V8 schema recommendation does not recommend changes to the V8 data model, but end-users sometimes request features that might be more feasible to implement down the road, should external factors or a need prompted by external factors set in motion or made possible by a significant data model restructuring.
- It is advisable to retain records for suggested schema changes that have documented business cases that are not implemented in V8.
- One example is SCHOOLDIST. On SCHOOLDIST, staff from DPI Alexander Roberson and Shelley Witte suggested a change to the schema for SCHOOLDIST to accommodate the school districts with both elementary and secondary/union high school district information.
  - ▶ Action Item: Proactively alert the counties who populated SCHOOLDIST inconsistently or incorrectly for V7 (e.g., Kenosha, according to DPI, as well as Milwaukee County) so that they can address the situation for V8. Add intake assessment workflow checks on known offenders (Kenosha and Milwaukee), albeit checks that do not require comparison to outside data sources. Consult with someone at DPI to look at these counties prior to statewide aggregation if available.
  - ▶ Action Item: Maintain a record of suggested schema changes from end-users for viable changes that are not able to be implemented with V8.

8. Plan for Validation Tool replacement and updated Validation Tool for V9
- The V8 MOU lays the groundwork for a revamped validation tool for V9 and likely V10. A written overview of V9 validation tool concept is due on March 15, 2022:

  > **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.*

- The updated validation tool concept is to lay out the vision and implementation options for an updated tool. Ideally, this tool would function to serve the same purpose as the Observation Reports, containing benchmarking data feedback for the Searchable Format, and would give specific instructions on what steps counties need to take yet in order to meet the Searchable Format for V9.
- The V7 Observation Reports are envisioned to be the last data benchmark feedback report in the PDF format. The V8 MOU also inaugurates changes to the benchmark feedback reporting process and tools, which relate to benchmarking data and mean that the PDF format Observation Reports may be discontinued beginning with V8.

  > **Standards development and benchmarking data.** *Identification of specific standards to improve the efficiency of data integration, data submission standards, timetables, and benchmarks for counties. SCO to generate benchmark data by county and document benchmark progress.*

- As the V8 MOU also calls for a "written overview of V9 validation tool concept" by March 15, 2022, this provides an opportunity to sketch out ideas for Observation Report replacements as part of the tool concept.
- The written overview of V9 validation tool concept should take into account the methods, functions or thinking behind the Observation Reports, or a general way of reporting to counties where and what their errors are when checked against the Searchable Format—with allowance for documented "standard exceptions."
  - ▸ **Action Item:** To the extent possible, use the V8 call for data and V8 validation tool to facilitate whatever will replace the V8 Observation Reports.
  - ▸ **Action Item:** SCO project team will maintain spreadsheet that collects the number of errors per attribute field per county to allow for continued analysis for county data submission improvements and allows for analysis at the statewide level.
  - ▸ **Action Item:** Ensure all relevant and errors are in V8 Validation Tool Guide, such as the error for "0" in tax roll fields such as CNTASSDVALUE and any other explanatory error flag documentation.
  - ▸ **Action Item:** For V9, contact LTSB on validation tool schema matching options for new validation tool Concept

9. V8 Call for data prep to occur in November/December of 2021
- According to the V7 MOU, the V8 call for data should be ready by December 17, 2021, which is more than a month earlier than previous years. Similarly, the V8 data validation tool is to be finalized much earlier, by December 3, 2021.
  - ▸ **Action Item:** Hold team planning meetings in November and December 2021 for December deliverables of Submission Documentation and Validation Tool.

10. For PARCELDATE, ask counties to populate with date if available or null field if it is a uniform date
- The V7 parcel schema allowed counties to populate the PARCELDATE field with "the parcel dataset's last known geometric editing date."
- As opposed to the last geometric edit date for an *individual* parcel, utilizing the last known date for the entire dataset makes the information in the this field less useful. It could also potentially be misleading if a user is looking at data for an individual parcel and assumes that the date in the PARCELDATE field is the last modification date for the given individual parcel geometry.
- On the V7 Observation Reports, counties who utilized either a uniform PARCELDATE or a null parcel date were notified of their usage of the field, although it was recognized that the schema allows for these usages, so it was not "incorrect" to submit uniform or null values. A total of 24 counties saw one of two informational comments:

  Uniform PARCELDATE: All records submitted had a uniform parcel date (dd/mm/yyyy). This is not an error—a uniform parcel date is acceptable under the V7 schema. According to the Element Occurrence Standard, if a value for the date of a 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 for future data submissions.
  Adams, Clark, Juneau, Marinette, Menominee, Oconto **(6 counties)**

  Null PARCELDATE: All records submitted lacked a date value in PARCELDATE. This is not an error—a null parcel date is acceptable under the V7 schema. According to the Element Occurrence Standard, if a value for the date of a 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 for future data submissions.
  Barron, Chippewa, Dodge, Florence, Grant, Jefferson, Kenosha, Kewaunee, Marathon, Monroe, Ozaukee, Pepin, Richland, Rock, Rusk, Sheboygan, St. Croix, Taylor, Waukesha **(19 counties)**

- The V8 Parcel Schema should therefore delete the existing sentence permitting use of dataset geometric editing date, and replace it with a modification to the attribute definition to include a revised sentence:

  In lieu of individual parcel date records, the parcel dataset's last known geometric editing date can be used.

  *Do not populate with the "cut date," the date the data was extracted/exported for V7 submission, **NOR the parcel dataset's last known geometric editing date.***

  - ▸ **Action Item:** Incorporate change into validation tool to check for additional invalid values/patterns in PARCELDATE than the V7 tool checked for.
  - ▸ **Action Item:** Modify PARCELDATE definition in Submission Documentation. Data submitters should be alerted to a clarification on PARCELDATE in a "New for V8" section.
  - ▸ **Action Item:** Confirm with a sampling of counties that a uniform PARCELDATE has no legitimate reason to exist at the county level, before finalizing the decision to encourage nulling of uniform PARCELDATE.
  - ▸ **Action Item:** Explore why 19 counties submitted null values for V7 to better understand why it must be true that such data exists nowhere in the county land information system.
  - ▸ **Action Item:** At state processing level, null out PARCELDATE if there is a uniform date for all parcel records submitted from a given county.
  - ▸ **Action Item:** Include information in Validation Summary page the highlights incidents of greater than 97% of all records containing the same PARCELDATE value. As needed, dates that do not adhere to the schema definition for this field will be set to <Null>.

11. Specify that parcel data request is for finalized tax roll valuation data and most current data for the rest
- The parcel data submitted for V8 should be the finalized 2021 tax roll data determined during the 2021 assessment process for parcels as they existed January 1, 2021. There are several tax roll values in the parcel schema that should only contain values that appeared in the *finalized* tax roll.

    ***Tax Roll Valuation-Related Attributes*:**

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

- Any different valuation-related values generated after December 2021 would be tentative, not-yet-finalized values and yet to have completed the assessment process.
- Parcel geometry for polygons *must* be most current in the land information system when the are exported for submission (polygons are allowed to be cut on December 31st or after).
- The parcel geometry and other attributes, namely OWNERNME1, may be more current— meaning that historic owner name is not required. There is no requirement that owner name match the name that appeared on the tax bill.
- The values assigned by assessors for tax roll valuation-related attributes are not finalized until the end of the year. For V8, the most recent values would be from December 2021.
    - ▶ **Action Item:** Add to the Submission Documentation clear statement for counties to submit only the most current, finalized data for all attribute fields as it exists in the county land information system on the date of export.
    - ▶ **Action Item:** Add new clarification to Submission Documentation that OWNERNME1 and other attributes not assigned by assessor may be more current (page 2, 3, 11).
    - ▶ **Action Item:** Evaluate the drawbacks or benefits of depicting currency per attribute, with edit (perhaps to page 8) to highlight which fields may *optionally* be more current than those fields requiring only finalized tax roll year.

12. New parcels/splits must also have AUXCLASS <Null>
- According to the 2021 Wisconsin Property Assessment Manual (WPAM), the municipal assessor assigns the equivalent of the AUXCLASS value for **EXEMPT** codes (X1-X4) or confirms it with DNR for **SPECIAL** codes (W1-W9).
- Therefore, any new parcels or splits should have the AUXCLASS code assigned through the regular assessment process.
- New parcels/splits should have null values for AUXCLASS, because the assessor enters the AUXCLASS code during the assessment process that is not completed until year's end. The ***Common Class Codes/ Standard Exemption Codes*** would be not-yet-finalized.
- A requirement for counties to null AUXCLASS X1-X5 if a new/spilt parcel occurs would likely affect very few parcels as publicly owned parcels are not often created or split.
    - ▶ **Action Item:** SCO project team to ensure the validation tool generates a flag if condition occurs for records with **X4** and **W1-W9** AUXCLASS values.
    - ▶ **Action Item:** Edit Submission Documentation of TAXROLLYEAR to specify that AUXCLASS should be nulled for new parcels/splits, as well as the table on page 8 to add the following qualifying clause for AUXCLASS:

        Must be null if a split/merge occurred in the last year.

13. Add check for CNTASSDVALUE for Manufacturing PROPCLASS 3 to intake assessment workflow
- For V7, some parcel datasets were submitted with all or almost all values for PROPCLASS = 3 (Manufacturing) zero/null, because the county submitted a 2021 "work roll" or "assessment role" values for valuation fields instead of the requested finalized 2020 tax roll values.
- This was discovered in noticing that parcels with PROPCLASS = 3 had zero/null in the CNTASSDVALUE field, because DOR assessors determine the values later in the annual assessment process. For V7, counties (and their tax parcel software vendor) were alerted to this problem early in the V7 data collection cycle. There are hopes that this communication will precent it from happening again in V8.
- However, there may need to be more specific direction or outreach on this issue.
    - ▶ **Action Item:** Add attribute check for CNTASSDVALUE for PROPCLASS = 3 (Manufacturing) to intake assessment workflow.

14. Checks on AUXCLASS/OWNERNME1 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, a new county-level check for standardized owner names for public parcels was conducted for the first time (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/permissible 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 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 commented on the issues of levels of government for tax exempt AUXCLASS properties and "X5" AUXCLASS domains in the statewide parcel map, stating 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. It was explained that, on the X5 records, there is not one standardized domain definition for X5 across various local governments, due to different ways that tax exempt properties are classified in different places. DOA/SCO has been working at getting the counties to standardize the non-standard AUXCLASS values in the data they submit for the statewide parcel map but can check the records that show up as X5 (~2,000 for V7, especially in Douglas and Ozaukee counties).
  - ▶ **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, continue basic check on AUXCLASS X1-X4 owner names and evaluate how many counties 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 for clarification, and ensure no X5 values are in final statewide database.

15. Contact counties not submitting using AW/AWO for "assessed with" parcels
- For V7, a couple of counties had numerous schema validation errors that were presumably due to the lack of "AW/AWO" tags for assessed with parcels.
- This can create error flags in the validation tool, such as a flag for "$0 assessment error."
  - ▶ **Action Item:** Email the known affected counties (e.g., Calumet, Vilas, and Dane) to remind them that they should populate with AW or AWO code for relevant parcels.

16. Encourage county websites to link to the statewide parcel data
- People in search of parcel data may visit individual county websites without realizing that there is a "one-stop shop" for parcel data in Wisconsin at www.sco.wisc.edu/parcels/data.
- Perhaps the SCO website can be optimized to appear in searches results for individual county parcel datasets (e.g., search engine optimized to be tagged for "Adams County parcel data").
- Counties could also be encouraged to link to the SCO parcel data webpage, as well as geodata.wisc.edu to find other county layers throughout Wisconsin. A requirement could potentially be imposed on counties to post a link to the statewide parcel data. This authority seems to exist in 59.72(2) and could be implemented as a grant application/agreement requirement, in which the county has to list the county URL where the link to statewide parcel data page exists.
  - ▶ **Action Item:** If it is not already optimized, optimize the parcel data download website for users to find the statewide parcel database and individual county parcel data files to download.
  - ▶ **Action Item:** Sample counties to see how many put link to statewide parcel database on county website.
  - ▶ **Action Item:** Gauge stakeholder sentiment on the idea of enforcement of redirecting end users from the most current and authoritative source for local data to the less current and sometime less detailed aggregated statewide data.

17. Encourage PARCELID or TAXPARCELID usefulness to access more info on county websites
- Parcel ID formats vary across the state. Some are a continuous line of numerical digits and others have letters, dashes, spaces, forward or backslashes, and/or periods. Ideally, a statewide parcel database user should be able to enter the PARCELID or TAXPARCELID in a county property search tool to access more current and comprehensive information about the parcel, such as a copy of the tax bill.
- During a test of all 72 county websites in July 2019, on four county websites the property search tool could not be located or did not function with the PARCELID or TAXPARCELID used. Three remained for V7: Menominee County does not have an interactive map or property search tool; LaCrosse County takes out the 3,4,7,8th digits of its Tax Parcel ID; and for Door County, Parcel ID worked in the interactive map search to zoom in on the parcel, but the links to assessment and tax bills timed out before displaying anything.

▸ **Action Item:** Provide email augmenting the V7 Observation Report to LaCrosse stating the issue with the inability to use TAXPARCELID to access more info on the county website, and to Door for their timeout issue.
▸ **Action Item:** In V8 Submission Documentation, encourage fewer <Null> values in PARCELID, where the county holds in its land information system labels for non-parcel features that are more useful than null values.

18. 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 drafted in 2021, some counties have a significant backlog of PLSS points to be integrated. In some cases, this is on account of a methodology of completely remapping one township at a time.
- Encouragement to integrate PLSS points could come in the form of an email to relevant applicable counties after all draft land info plans have been submitted.
- Benchmark #4 could also be tweaked to require prioritization of integration over new PLSS remonumentation and coordinate capture. Integration of PLSS corner coordinate points is assumed to mean that the geospatial accuracy of the digital parcel has been optimized according to the most accurate PLSS coordinates obtained by the county. Integration is not explicitly defined in the 2022 WLIP grant application or 2021 instructions for land information plans.
  ▸ **Action Item:** Analyze data from PLSS status tables in 2021 county land information plans.
  ▸ **Action Item:** Contact counties with more than 300 PLSS corners, in order to discuss integration into digital parcel layer and ask why there is a backlog.
  ▸ **Action Item:** Consider modifying 2023 Strategic Initiative grant application so that Benchmark #4 prioritizes integration if there is a significant backlog of survey grade PLSS corner coordinates to integrate. If integration prioritization will be required, more robustly define integration in the grant application.
  ▸ **Action Item:** Gather feedback from stakeholders on any proposed change to Benchmark #4.

19. Consider "Beyond The Tax Bill" section for county workflow example

- Although all counties were encouraged to submit notes on their V7 workflow, only four counties submitted notes.
- Vernon County did submit a note by way of their land information plain containing suggestions for their tax parcel software vendor, LandNav/GCS, to consider the following process improvements to make the parcel data submission more efficient. However, these suggestions may be based on an analysis of an older version of the tool and some of the issues may have since been addressed.

  LandNav/GCS could update several things on their end that would make the parcel data submission more efficient. Some examples include: export the property address zip code in their Generic Data Dump; improve their WLIP data export tool to output all of the tax and assessment parcel attributes in the Searchable Format; allow for Street Type fields to hold values that meet the full text Searchable Format requirements instead of just the abbreviations; etc.

- One way to assist counties who may not have detailed records with a previous year's workflow—particularly those who might experience staff turnover is to provide a basic overview of the processing steps that are involved in preparing the annual data submission.
- Since counties have a different land records system designs, focus could be on what needs to be done to transform data that appears on the tax bill into the Searchable Format at a very general level.
- This could be added to the Submission Documentation, and/or the county workflow example (www.sco.wisc.edu/parcels/FAQ/CountyWorkflowExample.pdf). The workflow example is posted online, but not linked to prominently anywhere in the Submission Documentation. Workflow steps, at a very general level, might include those on the current Submission Documentation checklist, as well as others, like:

  Export current tax parcel polygons; parse the XML tax roll files; join resulting table to the parcel polygons; project the data into the appropriate coordinate system; parse site addresses; populate the state schema (match up fields); standardize domain values, capitalization, null values, etc.; calculate some attributes (YEAR, COUNTY NAME, etc.); document errors/omissions and other metadata; package Other Layers feature classes.

  ▸ **Action Item:** Consider adding "Beyond the Tax Bill" or "Additional Processing" section to the county workflow example document or other appropriate location.

Additional Tax Roll/DOR XML/Tax Bill Data Processing Considerations for County *Workflow*

- **PARCEL GEOMETRY** – Parcel geometry is not required by DOR. Parcel polygon geometry with geometric-derived attributes, such as PARCELID and GISACRES, is required in the DOA submittal.

- **PARCELID** – PARCELID and, if different, TAXPARCELID are required in the DOA submittal. Joining data from various sources can mean that PINs or parcel identification numbers in some cases may require attention to formatting differences, such as the inclusion or exclusion of special characters like dashes.

- **GEOMETRY POST-JANUARY 1ST** – Parcel polygon geometry for new parcels/splits occurring *after* the January 1st tax roll valuation date. These new records must lack tax roll data, which entails nulling of these tax-roll fields: CNTASSDVALUE, LNDVALUE, MFLVALUE, ESTFMKVALUE, NETPRPTA, GRSPRPTA, PROPCLASS, AUXCLASS [W1-W9; AUXCLASS combined with PROPCLASS], and ASSDACRES).

- **OWNER NAME POST-JANUARY 1ST** – Owner name may optionally be more current than January 1st.

- **CONDOS** – Modeling of condos or collective ownerships may require attention to SITEADRESS, stacking or collapsing geometric records by owner name.

- **SITEADRESS** with individual parsed address components is required for the DOA submittal (site address elements are: ADDNUMPREFIX, ADDNUM, ADDNUMSUFFIX, PREFIX, STREETNAME, STREETTYPE, SUFFIX, LANDMARKNAME, UNITTYPE, UNITID).

- **STREETTYPE** for parcel site address must be fully spelled-out rather than abbreviated in the pacel schema STREETYPE field.

- **ESTFMKVALUE** must be populated for all municipalities; estimated fair market value is not optional.

- **PROPCLASS** for property class values with "G" in front of numeric ID, this "G" should be omitted ("3" not "G3").

- **AUXCLASS** records must be included for tax-exempt parcels, for both government-owned "*Exempt*" records, and "*Special*" classes as well. There should be standardization of OWNERNME1 to the extent to the extent possible/permissible by recording document policy for government-owned tax exempt lands (AUXCLASS X1-X4).

- **SCHOOLDISTNO** – DOR XML utilizes a 6-digit code; exclude the first two digits in the DOA submittal.

- **MFLVALUE** – No one single field exists in the DOR XML schema to represent the statewide parcel schema field MFLVALUE (Assessed Value of MFL/FCL Land). MFLVALUE can be calculated by adding specific XML fields:

  PFCRegularClass1<Value> + **PFCRegularClass2**<Value> + **PFCSpecialClass**<Value> +**MFLBefore2005Open**<Value> +**MFLBefore2005Closed**<Value> + **MFLAfter2004Open**<Value> + **MFLAfter2004Closed**<Value> +**MFLFerrousMining**<Value>

- **NULLING OF CERTAIN VALUES** – The parcel schema requires some additional nulling requirements, that may have appeared on the tax bill:

  - **IN THE CASE OF SPLITS/MERGES:** Null all tax roll attributes (CNTASSDVALUE, LNDVALUE, IMPVALUE, MFLVALUE, ESTFMKVALUE, NETPRPTA, GRSPRPTA, PROPCLASS, AUXCLASS, ASSDACRES).

  - **ESTFMKVALUE:** Null for parcels not assessed at full market value [PROPCLASS = 4, 5, or 5M; AUXCLASS = X1-X4; AUXCLASS W1-W9.

  - **CNTASSDVALUE & LANDVALUE:** Null for entirely MFL/FCL parcels or tax-exempt parcels.

  - **IMPVALUE:** Null for tax exempt parcels (designated by AUXCLASS field), non-parcel features as labeled in PARCELID, and parcels yet to be assessed (e.g., a new parcel/split)

  - **NETPRPTA/GRSPRPTA:** For tax exempt properties, enter <Null>.

- **CONAME/PARCELFIPS/PARCELSRC** – Populate for all records for the DOA submittal; may be calculated.

- **SELECTIVE OWNERNAME REDACTION** – If applicable and there is a policy in place, selective owner name redaction.

Appendix
A. V7 MOU Excerpt

Specific V7 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.
- **Automated validation of county data submissions and tools.** Create an automated mechanism for evaluating county data submissions for fitness to submission requirements and data model while accounting for individual county differences, along with a report of possible deviations from the schema and 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. If information is available indicating a significant number of counties have moved or will be moving to the platform *ArcGIS Pro*, convert tools to Python 3 for compatibility.
- **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 or submitting 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 fashion consistent with benchmarking evaluation in order to facilitate follow-up with the county.
- **Benchmarking data.** Provide data evaluating counties against current benchmarks, with parcel benchmark data as uniform as possible, generated contemporaneously as part of data intake process and ready to be provided to counties within six weeks after successful data submission date. For each county, 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 V7 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 *V7 Submission Documentation* and recommended in the *V6 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 V7 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, including a download by filter or download subset function, as well as individual county downloads.

Reporting Requirements

- **A final project report,** on the V7 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 – Assessment of where each county is at in terms of meeting the four benchmarks listed by the *V1 Interim Report* and the requirements for counties to achieve by the V8 call for data deadline in 2022.
  - County Data Preparation Assistance Overview and Outcomes
  - Recommendations for V8 – Recommendations for V8, not limited to but addressing the Four A's. Recommendations should include those for a hypothetical subsequent year's parcel aggregation project and data request.

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[2] From V7 MOU (2020 August). Retrieved from https://doa.wi.gov/DIR/V7_Parcel_Project_MOU.pdf

Appendix
B. V7 User Feedback

ABOUT V7 USER FEEDBACK

This appendix is a compilation of comments provided by users of the **V7** Wisconsin statewide parcel layer, received via email and by way of the V7 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 V6 Final Report (for V6), the V5 Final Report (for V5), the V4 Final Report (for V4), and the V3 Final Report (for V1-V3).

> **Legend**
>
> Aqua 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 V7 responses that appear below: **90**
> Date of last update: **December 2, 2021**

STATE GOVERNMENT USERS

- WisDOT/Division of Transportation System Development/Innovation Section
  USES • Use for real estate needs within WisDOT.
  BENEFITS • Able to sync up right-of-way and other assets with the parcel layer.

- Wisconsin Department of Public Instruction
  USES • Extremely valuable for looking up property owners, values, and particularly the school district to which each parcel assigned, for residency and voting purposes.

- Wisconsin Department of Public Instruction
  USES • We use this parcel map to identify to which districts students are zoned based on address.

- Wisconsin Department of Transportation, Division of Transportation System Development, Bureau of Highway Maintenance
  USES • Using parcel data to calculate right of way widths.

- Wisconsin Department of Revenue – Equalization, Milwaukee Bureau
  USES • It will be useful in our field review process when we are looking for property/owner info on or near county borders. It may prove useful in other processes as well for a regional map that can be accessed via the web.

- Public Service Commission of Wisconsin – Wisconsin Broadband Office
  USES • Census and broadband access analysis.

- Wisconsin Department of Public Instruction
  USES • Monitoring changes in school district boundaries.
  BENEFITS • Verifying reorganization (boundary change) orders.

- Public Service Commission of Wisconsin
  USES • Review of utility construction projects and customer service inquiries.
  BENEFITS • Being able to identify affected properties and their proximities to proposed projects.

- [Anonymous]
  USES • Delineation of public and private land for various regions.

FEDERAL GOVERNMENT USERS

- **U.S. Army Corps of Engineers – St. Paul District GIS Section**
  USES • We use Wisconsin parcel GIS data as a reference for U.S. Army Corps of Engineers Projects, as well as a check of federal versus private or other public property.
  BENEFITS • It is a valuable resource to not have to go each county to request updated data. This is way easier to have a compilation that is available and updated. We are very thankful for this dataset.

- **National Park Service**
  USES • I am using this layer in Ashland, Bayfield, and Iron counties to summarize landscape scale disturbances around Apostle Islands National Lakeshore.
  BENEFITS • It is extremely beneficial to have this ownership information. For myself, it is not necessary to see individuals names, but knowing the difference between private, private industrial, county, state, and federal ownership is useful.

- **[Anonymous]**
  USES • Allows us to put together map exhibits for rights-of-entries to test for harmful substances.
  BENEFITS • Allows us to do our work with a short suspense.

LOCAL GOVERNMENT USERS

- **[Anonymous]**
  USES • I use the statewide parcel viewer to obtain information and complete records for my position at our police department.
  BENEFITS • I have been able to update our records and acquire information that assist in investigations.

- **West Central Wisconsin Regional Planning Commission**
  USES • We use this database daily for regional planning purposes such as land use, transportation, recreation, housing, economic development, water quality, farmland preservation, etc.
  BENEFITS • Yes, we take advantage of every release and have done so since it was first provided for nearly all of our planning projects, grant applications, local and regional community support, and more.

- **Lockly Valuation Services**
  USES • Building GIS applications.

- **Bone Lake Management District**
  USES • Understand town boundaries around lake areas, parcels, and land ownership within town and lake district. Relate parcels to property tax information.

PRIVATE SECTOR USERS

- **Thomas Wyse Forestry**
  USES • Managed Forest Law plan map creation and timber sales.
  BENEFITS • More accurate MFL plan maps and reduced confusion about property lines.

- **Westwood Infrastructure, Inc. (Appleton Office / environmental)**
  USES • Displaying parcel lines, parcel numbers and/or ownership information on maps for WisDOT figures, WDNR submittals, and environmental projects for municipalities.
  BENEFITS • It saves large amounts of time compared to tracking down parcel mapping from individual counties/municipalities. It also provides seamless mapping across county/municipal boundaries, as well as a consistent schema.

- **[Anonymous]**
  USES • Review property lines and find information.
  BENEFITS • As a contractor, I've used the map to verify names and addresses. I also used the map to review property lines while house/land shopping.

- **OnX/GeoContent/CoreContent**
  USES • OnXmaps, Inc. (onX) processes and compiles county parcel data into a statewide layer for display along with public lands, trails, hunting units, and recreation points-of-interest. Hunters, outdoor recreators, and government resource managers use our value-added maps accessible via GPS units, smartphones, and web map servicess to determine public and private land boundaries.
  BENEFITS • We've used this as a private parcel source for WI the last few years.

- **[Anonymous]**
  USES • For GIS analysis and addresses needed for existing and proposed projects.
  BENEFITS • We use the data to create landowner lists on project areas. For any landowners that live near the project site, we send a letter to them notifying them of future work in the area.

- **Sunset Forestry LLC**
  USES • I enter privately owned lands into the Managed Forest Law Program. I use this parcel layer in GIS software to map every clients property.
  BENEFITS • Using this parcel layer has been critical to accuracy on acreages being enrolled into MFL. This data has also saved me ~1/2 hour per client.

- **[Anonymous]**
  USES • We will use the parcel data for engineering projects for Marshfield Utilities. We work with various municipalities and districts within Wisconsin.

- **[Anonymous]**
  USES • Needed to show property lines in a site plan.
  BENEFITS • We were able to easily obtain parcel data that was not found on the county website.

- **Snyder & Associates**
  USES • Very beneficial for preliminary design and planning in Civil 3D (CAD).

- **Mid-America Real Estate**
  USES • Highly valuable data that we use for general research.
  BENEFITS • Greatly reduces the time needed to find general parcel boundaries and parcel information throughout Wisconsin.

- **[Anonymous]**
  USES • Parcel boundaries for due diligence for a potential project in Rock County.

- **Hiawatha Broadband Communications Inc., Winona MN**
  USES • We use this data for planning of both wired and wireless broadband infrastructure.
  BENEFITS • We have benefited greatly by having a standardized statewide parcel layer. Our service area covers several counties in Wisconsin and having the data in a standardized and simplified format makes the data so much easier to work with as compared to other areas where every county's data is in different format and schema. The regular updates are a benefit as well. And I like to option of downloading individual counties as well.

- **Builders First Source - Menomonie, Wi**
  USES • I use it to determine what county a certain address is in and whether or not it is in the city limits in order to provide the information to our credit department when setting up jobs for our builders.
  BENEFITS • I can easily type in an address and see where it is located and what county it is in.

- **Resource Environmental Solutions, LLC**
  USES • ID appropriate property boundaries for projects, verify landowner name(s) and parcel address, determine parcels within a study area.
  BENEFITS • Having free access to the geodatabase tremendously streamlines our processes in which we use the data in the aforementioned "Uses" section. Makes the lives of us Geospatial Analysts so much easier.

- **Law Office of Rollie R. Hanson, S.C.**
  USES • To identify Parcel ID/Tax ID numbers for processing of Transfer on Death Deeds (and the like); Determine ownership, for same; FMV for probate estate assessments; Acreage to complete eRETRs.
  BENEFITS • Able to complete our work in a timely and efficient manner. The information is reliable. Oftentimes we are able to locate something in your database that we cannot find in the local/county databases.

- **Spectrum construction department**
  USES • This is a great tool to have working in Wisconsin.
  BENEFITS • When working in the road right-a-ways, we can find out landonwers' information.

- **Redd Summit Advisors**
  USES • Mapping ranch boundaries for clients for PRF Insurance.
  BENEFITS • When we have a client interested in PRF Insurance, we can more easily map the land they ranch on and give them a quote very quickly.

- **United Real Estate Corp**
  USES • Appraisal services (find parcel sizes and look at the aerial view).
  BENEFITS • When we can't get in touch with the local government or the assessor, it is nice to have this info online.

- **Adler Forestry, LLC**
  USES • Use for forest management operations / planning.
  BENEFITS • This is a convenient and consistent source of parcel data, since each county has varied data available.

- **American Transmission Company - IT - GIS**
  USES • Base data info, mailer & contact data source
  BENEFITS • One stop location instead of contacting multiple counties, good for work in 'new' areas.

- **Conservation Strategies Group**
  USES • Siting potential locations for solar energy sites, and wetland or stream restoration.
  BENEFITS • Knowing when adjacent parcels may be in common ownership helps any assessment that's otherwise based only on geographic features.

NON-PROFIT USERS

- **Ice Age Trail Alliance**
  USES • We use the parcel layer to identify properties within the approved IAT corridor. This information is then matched up with other layers to confirm contact info.
  BENEFITS • It is a quick way to identify properties and land owners.

- **[Anonymous]**
  USES • We use this information to verify school district for given addresses.

- **Gathering Waters**
  USES • Our organization has used and will continue to utilize the Statewide Parcel Database to accurately and comprehensively map those lands protected by the state's 53 land trusts and nature centers through both ownership and via easement.
  BENEFITS • The statewide parcel layer is literally at the center of our continuing mapping project. It would not be possible without the invaluable work of the team that assembles, maintains, and updates this database.

- **Ice Age Trail Alliance**
  USES • The Ice Age Trail Alliance uses the statewide parcel layer to check property boundaries and also ownership information. The parcels may be ones that the Trail crosses, or others we may be interested in acquiring for protection of the Ice Age Trail.
  BENEFITS • The statewide parcel layer benefits us in that it's a single layer of parcel data for the entire state. In the past, we needed to visit or download parcel data from 30 different counties in Wisconsin. It also helps us more easily update ownership informormation in areas where we have easements or handshake agreements for the trail to cross a property.

- **IndependenceFirst**
  USES • We do home accessibility assessments for people with disabilities, and sometimes need this type of information to help make decisions about home modification recommendations.
  BENEFITS • We were able to get the information we needed to make accurate decisions about modification options. Specifically, we needed to know where the property lines were in relation to the house.

EDUCATIONAL INSTITUTION USERS

- **Salem State University**
  USES • Hi! I'm using this data in GIS to study changing traffic patterns and changing commercial activity in Wausau and the surrounding bedroom communities for a school project.
  BENEFITS • Having these files easily available as shapefiles has helped me quickly understand how the Wausau region is changing.

- **University of Wisconsin-Green Bay**
  USES • I am providing this feedback as a volunteer consultant for UW-GB, specifically related to their effort to propose a new National Estuarine Research Reserve in the area. The statewide parcel map is a key resource in understanding which lands are to consider for the "boundaries" for the proposed reserve.
  BENEFITS • It is helping filter out lands which are not eligible for consideration. It is also making it much easier for the involved experts to see where lands are and how they fit into the context of other criteria, e.g., terrain, existing protected status, etc.

Graduate School of Economics Kobe University Japan & Dept of Economics, University of Wisconsin-Eau Claire
USES • Used to write academic article: "Convergent Validity of Satellite and Secchi Disk Measures of Water Clarity in Hedonic Models" by David Wolf and Thomas Kemp. For this article, each housing transaction was georeferenced using parcel shapefiles collected from the Wisconsin Statewide Parcel Map Initiative.

University of North Carolina at Asheville's National Environmental Modeling and Analysis Center
USES • Using to map the Great Lakes coastal environment for UNC Asheville's National Environmental Modeling and Analysis Center. Our geographic information systems (maps) will help others decide where to direct environmental relief funds.

[Anonymous]
USES • Verify school district for address.

Waterloo School District - I T Department
USES • To create a map of the Waterloo School District School Board boundaries across three counties. The layers provided the parcels to subdivide the county specific zones.

PRIVATE CITIZEN USERS

Private Citizen
USES • Property lines.

Private Citizen
USES • The deeds on my home have been altered .deeds have been switched and the park rd park st is actually my easement that has been hidden due to.the deeds being switched.

Private Citizen
USES • Looking to see who owns parcels adjoining our farm.

Private Citizen
USES • Personal use.

Private Citizen
USES • Personal.

Private Citizen
USES • Realty searching.
BENEFITS • Love access to parcel info.

Private Citizen
USES • Trying to find hunting land/property owner.

Private Citizen
USES • 1) When camping in state and national parks/forests to be sure we stay on government lands (avoid trespassing). 2) To see the terrain, helping to determining accessible areas, and confirm the route to desired destination (as well as determine the destination).
BENEFITS • Being confident we are staying on public land helps us have a more enjoyable time.

Private Citizen
USES • More descriptive idea on the land boundry, visual idea.
BENEFITS • Same way it helped me in the past get a visual clarifcation of land I want to purchase.

Private Citizen
USES • Checking my property.

Private Citizen
USES • Using it to see who owns what property. I am looking to purchase and build homes in areas around Wisconsin. I would like to know who to contact to buy portions their land.
BENEFITS • Find contact informations for land owners.

Private Citizen
USES • Just to see my new land on the map.

Private Citizen
USES • Was looking at land for sale and it gave a parcel number so i wanted to look it up to see where it was at but the number was only part of it cause a lot of parcels came up from just the numbers that was given.

Private Citizen
USES • To fill out durable power of attorney for finances.

Private Citizen
USES • We are buying a house and I' trying to see where property tax lines are.

Private Citizen
USES • For property values on land for sale. For owner information on buying property. General curiosity on parcels.
BENEFITS • I find the information I need or was curious about.

Private Citizen
USES • Identify land owners. Submitted an application to NRCS and used the information from the map to identify the parcel.

Private Citizen
USES • Pondering business possibilities, building sizes.

Private Citizen
USES • Looking for a house, property.

Private Citizen
USES • Looking up who owns land near current family property.
BENEFITS • Quick lookup, able to save a lot of time.

Private Citizen
USES • Finding out names of land-owners around our property to report and offer assistance with trees down.

Private Citizen
USES • Helped us in buying a home to know what the land/property value was so we could make a reasonable offer, as well as understand what our property taxes would be when we did acquire the property.
BENEFITS • We could accurately estimate our property taxes from the previous year and create a much more accurate budget for our finances.

Private Citizen
USES • Bought a cabin and curious about lot lines.

Private Citizen
USES • Locating exact property lines.

Private Citizen
USES • Real estate research. Learning proper owners.
BENEFITS • Made house shopping easier and better informed.

Private Citizen
USES • Review for hunting land.

Private Citizen
USES • See size of land and tax data.

Private Citizen
USES • Give location to our land without a fire number.
BENEFITS • Provides important info with user friendly platform and quick results.

Private Citizen
USES • Knowing where to hike and hunt- Confirming private areas.
BENEFITS • Not trespassing on private land and knowing landowners contact info. Geo info helpful, as well as topo.

Private Citizen
USES • Interested in purchasing land and would like to know neighboring parcels.

■ Private Citizen
USES • OMG! Best map, EVER! I used it to:
 1) Identify neighboring land ownership and boundaries
 2) Determine my land value
 3) Search for land owned by others (e.g. state owned lands)

■ Private Citizen
USES • Use the parcels as part of day-to-day genealogy research. By comparing the parcels to old county plat maps, I am able to find the present day locations of old family farms, etc. and create custom genealogy-related maps using ArcGIS.

■ Private Citizen
USES • To review property boundaries.

■ Private Citizen
USES • Hunting.

■ Private Citizen
USES • Seeking land boundary info, Lat / Lon coordinates of parcel corners.

■ Private Citizen
USES • To gain information about homes I am trying to purchase in order to understand zoning issues, look up records with county offices, etc.

■ Private Citizen
USES • Don't know yet. Just found site and have general interest in GIS.

■ Private Citizen
USES • View various parcels of land and assessments in our area, find owners of land. Information for value and purchase.

■ Private Citizen
USES • Public land use for inland trout fishing.

■ Private Citizen
USES • Checking boundaries of my property - seeing neighbors and understanding who owns adjacent land.
BENEFITS • Very valuable service! Nice tool and very much appreciated. I am grateful for access to this and very pleased that this has been provided free of charge. Thank you!!!

■ Private Citizen
USES • Was trying to find easements.

■ Private Citizen
USES • Gravel road/ATV trail bike route planning/exploration.

■   ■   ■