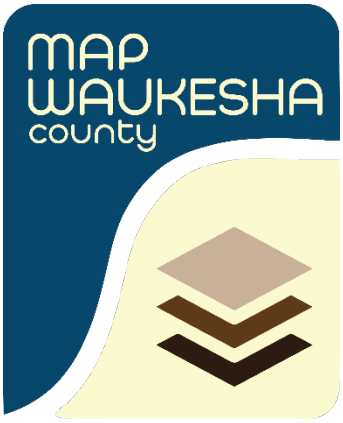


Waukesha County Land Information Plan

2025-2027

Waukesha County Land Information Office
515 W Moreland Blvd, Rm AC170
Waukesha, WI 53188
(262) 548-7816
https://www.waukeshacounty.gov/landandparks/land-information-system/

Version: 2024-1.2
Approved/Adopted by Land Information Council on: 2024-10-29

CONTENTS

EXECUTIVE SUMMARY

About this Document. This document is a land information plan for Waukesha County prepared by the land information officer (LIO) and the Waukesha County Land Information Council. Under state statute 59.72(3)(b), a "**countywide plan for land records modernization**" is required for participation in the Wisconsin Land Information Program (WLIP). The purpose of this document is twofold: 1) to meet WLIP funding eligibility requirements necessary for receiving grants and retaining fees for land information, and 2) to plan for county land records modernization in order to improve the efficiency of government and provide improved government services to businesses and county residents.

WLIP Background. The WLIP, administered by the Wisconsin Department of Administration, is funded by document recording fees collected by register of deeds at the county-level. In 2023, Waukesha County was awarded $71,000 in WLIP grants and retained a total of $373,784 in local register of deeds document recording fees for land information. However, with a strong dip in retained fees in the last few years, this has dropped to $11,000 in WLIP grants and $213,800 in retained fees through July of 2024.

This plan lays out how funds from grants and retained fees will be prioritized. (Note that this funding covers about half of the Land Information Office's current budget.) However, as county budgets are determined on an annual basis with county board approval, this plan provides estimated figures that are subject to change and are designed to serve planning purposes only.

Land Information in Waukesha County. Land information is central to county operations, as many essential services rely on accurate and up-to-date geospatial data and land records. A countywide land information system supports economic development, public safety and disaster planning, environmental education, transparent permitting activities, and a host of other citizen services. It also helps save tax payer money by helping departments track location-based workflows to find greater efficiencies. The Waukesha County land information system integrates with other systems to enable efficient access to information that describes the physical characteristics of land, as well as the property boundaries and rights attributable to landowners.

Mission of the Land Information Office. In the next three years, Waukesha County's Land Information Office will streamline data services to internal and external customers to delivery timely and accurate data, explore ways to rebrand the program as a county-wide Enterprise System with stakeholder buy-in, and increase self-service opportunities for all customers.

Land Information Office Projects. To realize this mission, in the next three years, the county land information office will focus on the following projects:

Waukesha County Land Information Projects: 2025-2027	
Project #1	**Acquire 2025 LiDAR data and increase use of the investment**
Project #2	**Conversion of WebAppBuilder and Geocortex applications to updated platforms**
Project #3	**Implement 2023 Wisconsin Act 235 (Judicial Privacy Law)**
Project #4	**Acquire 2026 Orthophotography**
Project #5	**Preliminary exploration of effort to convert to new datums and coordinate system**
Project #6	**Maintain NG911 Data to support 5 PSAP area**
Project #7	**Create a County GIS Data Governance Framework**
Project #8	**Increase integration with other County systems**
Project #9	**Explore funding options for restarting an intern program**
Project #10	**PLSS Monument NAD83 Coordinate Densification**
Project #11	**Update to Countywide Hazard Mitigation Plan**

The remainder of this document provides more details on Waukesha County and the WLIP, summarizes current and future land information projects, and reviews the county's status in completion and maintenance of the map data layers known as Foundational Elements.

1 INTRODUCTION

In 1989, a public funding mechanism was created whereby a portion of county register of deeds document recording fees collected from real estate transactions would be devoted to land information through a new program called the Wisconsin Land Information Program (WLIP). The purpose of the land information plan is to meet WLIP requirements and aid in county planning for land records modernization.

The WLIP and the Land Information Plan Requirement

In order to participate in the WLIP, counties must meet certain requirements:

- Update the county's land information plan at least every three years
- Meet with the county land information council to review expenditures, policies, and priorities of the land information office at least once per year
- Report on expenditure activities each year
- Submit detailed applications for WLIP grants
- Complete the annual WLIP survey
- Subscribe to DOA's land information listserv
- Coordinate the sharing of parcel/tax roll data with the Department of Administration in a searchable format determined by DOA under s. 59.72(2)(a)

LAND INFORMATION

Any physical, legal, economic or environmental information or characteristics concerning land, water, groundwater, subsurface resources or air in this state.

'Land information' includes information relating to topography, soil, soil erosion, geology, minerals, vegetation, land cover, wildlife, associated natural resources, land ownership, land use, land use controls and restrictions, jurisdictional boundaries, tax assessment, land value, land survey records and references, geodetic control networks, aerial photographs, maps, planimetric data, remote sensing data, historic and prehistoric sites and economic projections.

– Wis. Stats. section 59.72(1)(a)

Any grants received and fees retained for land information through the WLIP must be spent consistent with the county land information plan.

The Statewide Parcel Map Initiative

For Strategic Initiative grant eligibility, counties are required to apply WLIP funding toward achieving certain statewide objectives, specified in the form of "benchmarks." Benchmarks for parcel data—standards or achievement levels on data quality or completeness—were determined through a participatory planning process. Current benchmarks are detailed in the WLIP grant application, as will be future benchmarks.

WLIP Benchmarks

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

More information on how Waukesha County is meeting these benchmarks appears in the Foundational Elements section of this plan document.

County Land Information System History and Context

Waukesha County initiated a Public Land Survey System (PLSS) remonumentation program in 1981 under the direction of the Southeastern Wisconsin Regional Planning Commission, which not only reestablished the survey control system, but created new base maps.

In 2000, Waukesha County launched the first public facing land records web mapping site.

In 2004, the first phase II E-911 call was successfully responded to when a call came into the combined dispatch center from a person who did not know her location, but the caller location was able to be geolocated with a dot appearing on the dispatcher's console map.

By 2006, it was determined that Waukesha County had completed all the foundational elements as identified by the WLIP.

In 2016, Waukesha County, in a contract with SEWRPC, set forth to transform their data from an antiquated datum, (NAD27/NGVD29) to a modern datum, (NAD83/NAVD88) to enable more seamless data transfer with both the surveying community and state and local government and the private sector. Going forward, the County will continue work to maintain and distribute its data free of charge using its open data portal.

The Waukesha County Land Information Office started with a land records focus and it remains a large part of its activities today. However as GIS technology increases its capabilities and its capacity for integrating with other systems, we've branched out significantly to areas such as public health, emergency management, economic development, and more.

The WLIP identified a set of Foundational Elements that were to serve as the basis for a complete County Land Information System. The primary custodian of the WLIP-defined Foundational Elements in Waukesha County is the Department of Parks and Land Use, Land Resources Division (LRD) where the Land Information Office is currently housed. Within the Land Information Office, the LIS Supervisor is assigned the duties of County Land Information Officer (LIO).

County Land Information Plan Process

Counties must submit their plans to DOA for approval every three years. The 2025-2027 plan is to be completed at the end of 2024.

County Land Information Plan Timeline

- DOA release of finalized instructions by March 31, 2024.
- **April-September 2024:** Counties work on land info plans.
- **Complete draft plans due to DOA by September 30, 2024** (but sooner is advised).
- **Final plans with county land info council approval due by December 31st, 2024.**

Plan Participants and Contact Information

Another requirement for participation in the WLIP is the county land information council, established by legislation in 2010. The council is tasked with reviewing the priorities, needs, policies, and expenditures of a land information office and advising the county on matters affecting that office.

According to s. 59.72(3m), Wis. Stats., the county land information council is to include:

- Register of Deeds
- Treasurer
- Real Property Lister or designee
- Member of the county board
- Representative of the land information office
- A realtor or member of the Realtors Association employed within the county
- A public safety or emergency communications representative employed within the county
- County surveyor or a registered professional land surveyor employed within the county
- Other members of the board or public that the board designates

The land information council must have a role in the development of the county land information plan, and DOA requires county land information councils to approve final plans.

This plan was prepared by the County LIO, the Waukesha County Land Information Council, and other stakeholders.

Badger County Land Information Council and Plan Workgroup				
Name	**Title**	**Affiliation**	**Email**	**Phone**
+ **James Behrend**	Register of Deeds	Waukesha County Register of Deeds Office	jbehrend@waukeshacounty.gov	262-548-7586
+ **Pamela Reeves**	County Treasurer	Waukesha County Treasurer's Office	preeves@waukeshacounty.gov	262-548-7033
+ **Candace White**	Real Property Lister	County Dept. of Administration Tax Listing Div.	clwhite@waukeshacounty.gov	262-548-7597
+ **Stephen Styza**	County Board Member	Waukesha County Board of Supervisors	sstyza@waukeshacounty.gov	414-573-1414
+ **Kimberly Meinert**	Land Information Office Representative	County Dept of Parks and Land Use – Land Resources Div, LIO	kmeinert@waukeshacounty.gov	262-548-7816
+ **Liz Tobolt**	Realtor	Realtor Association Representative	ltobolt@firstweber.com	
+ **Gary Bell**	Director of Dept. of Emergency Preparedness	Public Safety/Emergency Representative	gbell@waukeshacounty.gov	262-446-5075
+ **Robert Merry**	County Surveyor	Appointed County Surveyor (SEWRPC)	rmerry@sewrpc.org	262-547-6721

+ Land Information Council Members designated by the plus symbol

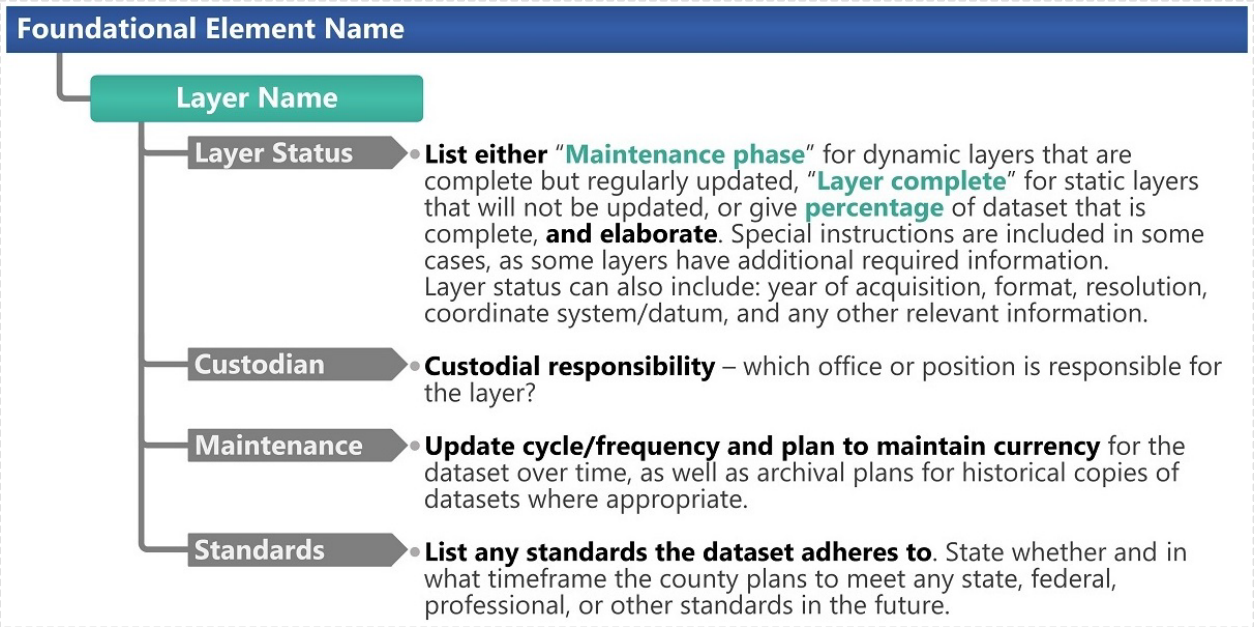
2 FOUNDATIONAL ELEMENTS

Counties must have a land information plan that addresses development of specific datasets or map layer groupings historically referred to as the WLIP Foundational Elements. Foundational Elements incorporate nationally recognized "Framework Data" elements, the major map data themes that serve as the backbone required to conduct most mapping and geospatial analysis.

FOUNDATIONAL ELEMENTS

PLSS
Parcel Mapping
LiDAR and Other Elevation Data
Orthoimagery
Address Points and Street Centerlines
Land Use
Zoning
Administrative Boundaries
Other Layers

In the past, Foundational Elements were selected by the former Wisconsin Land Information Board under the guiding idea that program success is dependent upon a focus for program activities. Thus, this plan places priority on certain elements, which must be addressed in order for a county land information plan to be approved. Beyond the county's use for planning purposes, Foundational Element information is of value to state agencies and the WLIP to understand progress in completion and maintenance of these key map data layers.



PLSS

Public Land Survey System Monuments

Layer Status

PLSS Layer Status

	Status/Comments
Number of PLSS corners (selection, ¼, meander) **set in original government survey** that can be remonumented in your county	• 1,925 (2,909 if one would include center of section, closing corners on quarter- section lines, extension corners, witness corners, and meander corners on quarter-section lines which are not part of the original government survey)
Number of PLSS corners capable of being remonumented in your county that **have been remonumented**	• 1,925
Number of remonumented PLSS corners with survey grade coordinates (see below for definition) • **SURVEY GRADE** – coordinates collected under the direction of a Professional Land Surveyor, in a coordinate system allowed by 236.18(2), and obtained by means, methods and equipment capable of repeatable 2 centimeter or better precision • **SUB-METER** – point precision of 1 meter or better • **APPROXIMATE** – point precision within 5 meters or coordinates derived from public records or other relevant information	• 1,925 • 2,909, 100% of all monumented corners original or not have established survey grade coordinates.
Number of survey grade PLSS corner coordinates **integrated** into county digital parcel layer (see definition of PLSS integration on page 37)	• 2,909
Number of non-survey grade PLSS corner coordinates integrated into county digital parcel layer	• 0
Tie sheets available online?	• Yes, see below for link to access both NAD83/2011 and NAD27 coordinates for all USPLSS corners • USPLSS Tie Sheets
Percentage of remonumented PLSS corners that have **tie sheets available online** (whether or not they have corresponding coordinate values)	• 100%
Percentage of remonumented PLSS corners that have tie sheets available online (whether or not they have corresponding coordinate values) **and a corresponding URL path/hyperlink value** in the PLSS geodatabase	• 100%
PLSS corners believed to be remonumented based on filed tie-sheets or surveys, but do not have coordinate values	• 0
Approximate number of PLSS corners believed to be lost or obliterated	• 0
Which system(s) for **corner point identification/ numbering** does the county employ (e.g., the Romportl point numbering system known as Wisconsin Corner Point Identification System, the BLM Point ID Standard, or other corner point ID system)?	County employs SEWRPC numbering system as follows: • Each corner is assigned a corner ID - XXYYZZZ0 • XX – Township • YY – Range • ZZZ0 – There are a possible 169 corners within a given township with the Northeast corner of Section 1 being 0010 with the SW of 31 which could again be 0010 (NE of Section 1) or if outside of the Region the number be 1690. The fourth digit "0" would allocate if there are witness/meander corners. If there are witness/meander corners the value of 1 would be for the witness/meander corner that is to the north of the actual corner location, 2 would be to the east, 3 would to the south, and 4 to the west. • USPLSS corners from adjacent range lines would number from the east line of the western Township. If common corners from the adjacent
Does the county contain any **non-PLSS areas** (e.g., river frontage long lots, French land claims, private claims, farm lots, French long lots, etc.) or any special situations regarding PLSS data for tribal lands?	• No
Total number of PLSS corners along each bordering county	• Milwaukee – 49; Washington – 72; Walworth – 50; and counties outside Region; Dodge – 19; Jefferson – 52; Racine - 46

Number of PLSS corners remonumented along each county boundary	• Milwaukee – 49; Washington – 72; Walworth – 50; and counties outside Region; Dodge – 19; Jefferson – 52; Racine - 46
Number of remonumented PLSS corners along each county boundary with survey grade coordinates	• All USPLSS corners in the SE Region (Kenosha, Milwaukee, Ozaukee, Walworth, Washington, and Waukesha) are shared and supported from one site. The neighboring counties of Dodge and Jefferson share corner location evidence to assist with the corner perpetuation, however, the corner coordinates are based on differing datums.

Custodian

- Southeast Wisconsin Regional Planning Commission (SEWRPC)

Maintenance

- Waukesha County contracts with the SEWRPC to provide yearly maintenance to the geodetic survey control system. This includes identifying monuments that may be disturbed during upcoming construction and ensuring that all survey ties are correct and current. In addition, SEWRPC responds to notification from other surveyors regarding missing or damaged monuments which are then researched and replaced.

Standards

- Waukesha County's practices are consistent with following Statutory Standards for PLSS Corner Remonumentation:
  - s. 59.74, Wis. Stats. Perpetuation of section corners, landmarks.
  - s. 60.84, Wis. Stats. Monuments.
  - ch. A-E 7.08, Wis. Admin. Code, U.S. public land survey monument record.
  - ch. A-E 7.06, Wis. Admin. Code, Measurements.
  - s. 236.15, Wis. Stats. Surveying requirement.
- North American Datum of 1983, with National Readjustment of 2011 (NAD83/2011)
- **Survey grade** standard from Wisconsin County Surveyor's Association:
  - **Survey grade** – coordinates collected under the direction of a Professional Land Surveyor, in a coordinate system allowed by 236.18(2), and obtained by means, methods and equipment capable of repeatable 2 centimeter or better precision
  - **Sub-meter** – point precision of 1 meter or better
  - **Approximate** – point precision within 5 meters or coordinates derived from public records or other relevant information
- Esri ArcGIS Pro Parcel Fabric Data Model
- Waukesha County's PLSS corner coordinates were established using the guidelines and specifications from the National Geodetic Survey for Third Order Class I accuracy. The county uses the State Plane Coordinate System (SPCS) Wisconsin South Zone and the datum referenced is the North American Datum of 1983 and vertically, the North American Vertical Datum of 1988 (2012).

Other Geodetic Control and Control Networks

e.g., HARN, Height Mod., etc.

Layer Status

Waukesha County does not have or maintain any other Geodetic or Control Networks

NAD83/2011 and NAD27 - Sample Dossier Sheet

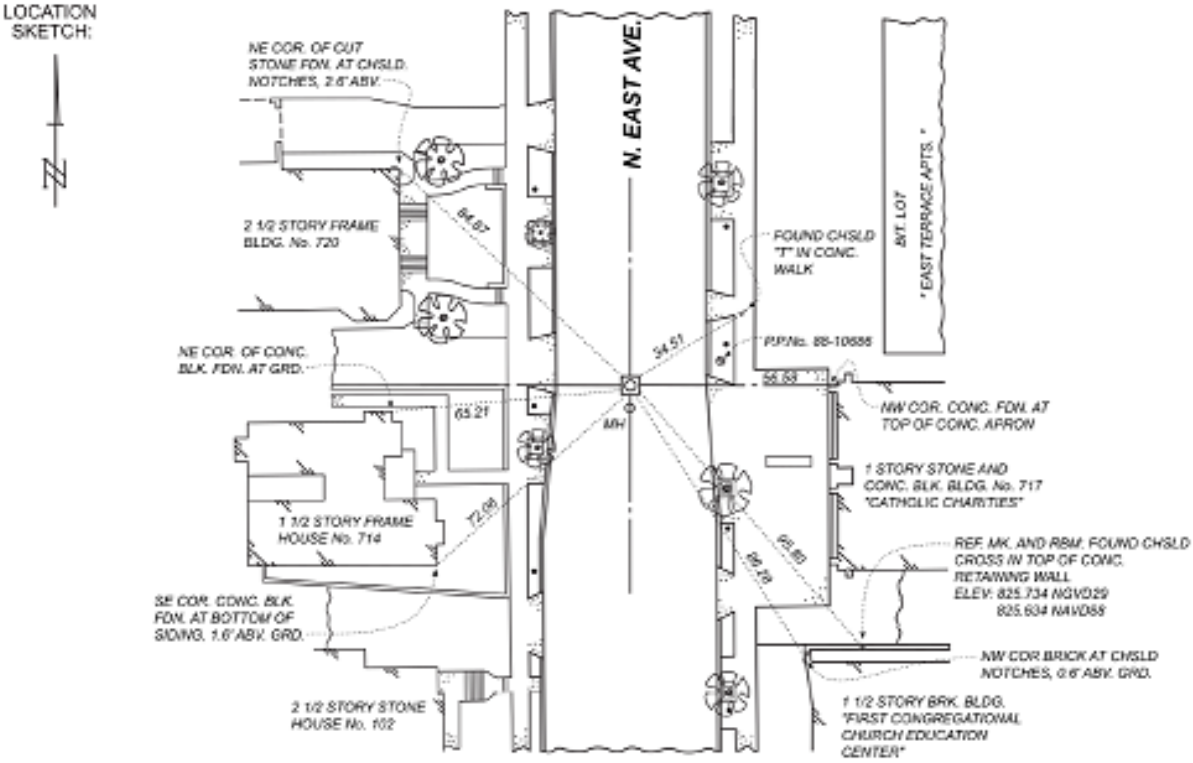
RECORD OF U.S. PUBLIC LAND SURVEY CONTROL STATION

U.S. PUBLIC LAND SURVEY CORNER 3|2 / 3|2 T 06 N, R 19 E, WAUKESHA COUNTY, WISCONSIN

HORIZONTAL: NORTH AMERICAN DATUM OF 1927			HORIZONTAL: NORTH AMERICAN DATUM OF 1983/2011		
VERTICAL: NATIONAL GEODETIC VERTICAL DATUM OF 1929			VERTICAL: NORTH AMERICAN VERTICAL DATUM OF 1988 (12)		
HOR. CONTROL:	SEWRPC	2023	HOR. CONTROL:	SEWRPC	2023
VER. CONTROL:	SEWRPC	2023	VER. CONTROL:	SEWRPC	2023
NORTHING:	373,261.89 USFT		NORTHING:	373,271.51 USFT	
EASTING:	2,474,323.20 USFT		EASTING:	2,442,785.60 USFT	
ELEVATION:	824.31 FT		ELEVATION:	824.21 FT	GPS: 824.24 FT
HOR. ACCURACY:	3rd ORDER, CLASS I		HOR. ACCURACY:	3rd ORDER, CLASS I (OBSERVED)	
VERT. ACCURACY:	2nd ORDER, CLASS II		VERT. ACCURACY:	2nd ORDER, CLASS II (COMPUTED)	

RBM ELEV. IN SKETCH BELOW TIED TO NGVD29 DATUM. CONVERSION FROM NGVD29 -0.10 FT DERIVES NAVD88 HEIGHT

LOCATION SKETCH:



SURVEYOR'S AFFIDAVIT:
STATE OF WISCONSIN) SS
WAUKESHA COUNTY)

WISCONSIN
ROBERT W. MERRY
2412
SHEBOYGAN
WI
LAND SURVEYOR

As Waukesha County Surveyor, I hereby certify that following street resurfacing, I found a concrete monument with SEWRPC brass cap marking the location of this corner; said concrete monument having been set to mark the location of this corner in August 1968 by Richard P. Jahnke, S-318; Mr. Jahnke having established the location of this corner using monumentation for and information shown on the 1841 plat of Prairieville Village; that I have referenced the same as shown hereon; and that this record is correct and complete to the best of my knowledge and belief.

DATE OF SURVEY: 20 NOVEMBER 2023 _____ S - 2412
REGISTERED LAND SURVEYOR

PREPARED BY SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION (SEWRPC) 06190220

CERTIFICATION APPLIES ONLY TO THE LOCATION SKETCH AND SURVEYOR AFFIDAVIT

CSSD Date Published: 11/20/2023 Historic Dossier

Parcel Mapping

Parcel Geometries

Layer Status

- **Progress toward completion/maintenance phase:** In Waukesha County, 100% of the county's parcels are available in the Esri Geodatabase format. New parcels are added using Coordinate Geometry (COGO) techniques into the Esri Parcel fabric.
- **Projection and coordinate system:** Parcels were created based on the County adopted horizontal geodetic control system which is defined as having survey control accuracy of Third Order, Class I, referencing the North American Datum of 1983/2011, Wisconsin State Plane Coordinate System, South Zone.
- **Integration of tax data with parcel polygons:** The county does not have a parcel polygon model that directly integrates tax/assessment data as parcel attributes. The parcels are combined with tax assessment data as part of a geoprocessing task done monthly (or more) for public consumption.
- **Online Parcel Viewer Software/App and Vendor name:** Waukesha County self-hosts and maintains internally an application built on the VertiGIS GeoCortex platform and will be moving this application to its newest VertiGIS platform shortly with similar functionality.
- **Unique URL path for each parcel record:**
  https://prd.waukcogeo.com/HTML5Viewer/?viewer=parcelviewer&run=TaxParcelSearch&id=WAKC1000982
  Yes, this URL is stable.
  No, the URL cannot be used to export the parcel record or geometry, however the application allows for selection of groups of parcels for exporting to an Excel .xlsx file. (Export of geometries can be performed on the Waukesha County Open Data Portal.)

Custodian

- Waukesha County Land Information Office

Maintenance

- **Update Frequency/Cycle:** Parcel polygons are updated to the publicly shared service at least monthly with an ongoing effort to keep parcels current to no more than 30 days from when documents are filed. There are currently three municipalities (Brookfield, New Berlin and Waukesha) that do their own parcel mapping in the County's Parcel Fabric via a REST endpoint accessible in ArcPro in their own offices. The county also has been collecting retired parcels since 2004, namely those parcels that are superseded by newer land divisions or assigned new tax key numbers due to splits/combinations.

Standards

- **Data Dictionary:** FGDC compliant Metadata has been created for the digital parcel data that identifies most codes used in the file. However, as part of a future project referenced elsewhere in this plan, we will ensure that this metadata is updated with any new fields or features, and replicated and accessible throughout all the means we provide to access parcel data, including on Portal services and our open data portal.
- The county migrated its parcels to the ESRI Parcel Fabric data model in 2017 to facilitate easier data exchange and maintenance. Further migration into ArcGIS Pro Parcel took place in 2021 as part of a Strategic Initiative Grant project and has greatly streamlined our parcel editing and sharing efforts due to its service-based architecture.

Parcels Without Land Value

Layer Status

- **Number of parcels without a land value recorded to-date:**
  One polygon as of 8/7/24.
- **County geolocates/maps parcels for improvements only and without a land value by:**
  Waukesha County and the three municipalities that also provide parcel mapping work all create polygons that stack on top of the tax parcel polygon layer by mapping the legal description in a separate feature class that looks similar to the schema of the tax parcels. Work is underway to

display these and join to our tax data warehouse to display similar information along with the geometry.

Assessment/Tax Roll Data

Layer Status

- **Progress toward completion/maintenance phase:** NA
- **Tax Roll Software/App and Vendor name:** EZ Access from vendor Hamer Enterprises, LLC
- **Municipal Notes:** The Cities of Brookfield and Waukesha do their own tax listing and create their own tax bills. They do not submit the tax roll information to DOR independent of the county.

Custodian

- The Waukesha County Dept of Administration - Tax Listing Division is the custodian for the data in municipalities for which they provide tax listing services.

Maintenance

- **Maintenance of the Searchable Format standard:** To better facilitate parcel and tax data to fit the Searchable Format standard, the county has developed a monthly automated tax assessment export process for each of the 37 communities within the county directly into the GIS Production Esri SDE Database, which is then joined to the parcel geometries and published for public use.
- **Searchable Format Workflow:** This monthly tax data export closely matches the Statewide Parcel schema with some localized differences that are rectified during the yearly upload to the statewide parcel layer. During that time, the county also does further extensive work to a "year end" cut of this data to cleanse, reformat and quality check prior to provision to the State Department of Administration, largely to rectify differences in address formatting and standards, and to rectify errors made in the assessment and listing process that the GIS staff has no control over throughout the prior year.

Standards

- Waukesha County meets and complies with Wisconsin Department of Revenue Property Assessment Manual and attendant DOR standards
- Waukesha County meets and complies with DOR XML format standard requested by DOR for assessment/tax roll data.

Non-Assessment/Tax Information Tied to Parcels

e.g., Permits, Easements, Non-Metallic Mining, Brownfields, Restrictive Covenants

Layer Status

Waukesha County ties many datasets back to a tax key or parcel geometry, including the following:

- POWTS, Private Onsite Wastewater Treatment Systems for use with the Transcendent Technologies application in the Waukesha County Parks and Land Use Environmental Division.
- Images in the Register of Deeds are being indexed with a tax key to link to a variety of document types for easy access via the GIS application.
- Permitting, economic development, and violations in the Planning Division
- Non-Metallic Mining sites in the Land Resources Division
- Farm Operations and Program administration in Land Resources and Planning

Custodian

- Parks and Land Use – Environmental Health Division
- County Register of Deeds
- Parks and Land Use – Planning Division
- Parks and Land Use – Land Resources

Maintenance

- Daily

Standards

- Mapping tied to parcels would follow the specifications of the parcel layer itself.

ROD Real Estate Document Indexing and Imaging

Layer Status

- **Grantor/Grantee Index:** Grantor/Grantee Indexes are available as computer searchable back to 1994. Manual, hardcopy searches are required for documents prior to 1994.
- **Tract Index:** Tract Indexes are available as computer searchable back to 1994. Manual, hardcopy searches are required for documents prior to 1994. Tract index search is based on Public Land Survey System one-quarter section searches for unplatted parcels. All documents identified in State Statute are indexed in Grantor/Grantee and Tract Index systems. Tract index images are linked to GIS layers for Subdivisions, CSM and Condominium areas.
- **Imaging:** All documents identified in State Statute are imaged and accessible for viewing through the computerized indexing system. All Plats of Survey on file with the Register of Deeds have been imaged and indexed in the Tract Index. All map documents including, Subdivision Plats, Condominium Plats and Certified Survey Maps filed with the Register of Deeds office have been imaged and indexed in the Tract Index. All images are now available for viewing (with watermark) by the public or for purchase online using a credit card.

  A previous Strategic Initiative Grant Project in 2020 allowed Waukesha County to hire US Imaging to index a large portion of Plats of Survey by Tax Key for input into the imaging system. In addition, the Register of Deeds has since begun to index every land related document with a tax key. After 1/1/24, a tax key is required by ordinance on any conveyances but was strongly suggested since June of 2019. This work allows the public to click on a parcel on our main GIS Application and click through to the Register of Deeds imaging application to find all related documents to that tax key instead of having to have knowledge of the tract index system.
- **ROD Software/App and Vendor Name:** Aumentum Reporter – from vendor Thomson Reuter

Custodian

- Waukesha County Register of Deeds

Maintenance

- Daily

Standards

- s. 59.43, Wis. Stats. Register of deeds; duties, fees, deputies.
- ch. 706, Wis. Stats. Conveyances of real property; Recording; Titles.

LiDAR and Other Elevation Data

LiDAR

Layer Status

- **Most recent acquisition year:** 2015
- **Accuracy:** The RMSEz was computed to be 0.041 meters (0.135 feet) and AccuracyZ to be 0.080 meters (0.264 feet). RMSEz has been tested to 0.5 feet or better per the task order specifications. AccuracyZ has been tested to meet 18.13 cm Fundamental Vertical Accuracy at 95 Percent confidence level using RMSE(z) x 1.9600 as defined by the National Standards for Spatial Data Accuracy (NSSDA); assessed and reported using National Digital Elevation Program (NDEP)/ASRPS Guidelines.
- **Post spacing:** USGS QL2 Specifications – 0.71 meter and greater than or equal to 2 points per meter square.
- **Contractor's standard, etc.:** United State Geological Survey (USGS) – LiDAR Base Specifications, Version1.2
- **Next planned acquisition year:** 2025
- **QL0/QL1/QL2 acquisition plans:** Waukesha County is working with SEWRPC to achieve a 30

points per square meter acquisition in the spring of 2025. This classified high density data set will be delivered in LAS, v1.4 and meet USGS Base LiDAR specifications. The high density solution will be a vast improvement to the previously acquired data set. In addition, the Land Information Office is currently working with the County Administrator to secure additional funds that would substantially enhance the hydro features going from the USGS standard of 100' or wider river breaklines to 20' or wider for the 2025 data set.

Custodian

- Waukesha County Land Information Office

Maintenance

- Once shared and made accessible, none.

Standards

- U.S. Geological Survey Quality Level 2 (QL2) specifications.

LiDAR Derivatives

e.g., Bare-Earth Digital Terrain Model (DTM), Bare-Earth Elevation Contours, Bare-Earth Digital Elevation Model (DEM), Digital Surface Model (DSM), Hydro-Enforced DEMs, etc.

Layer Status

- Horizontal Datum: NAD83/2011, Wisconsin State Plane Coordinates, South Zone, US Survey Feet; Vetical Datum: NAVD88, US Survey Feet
- Classified LAS Tiles: 10,000ft x 10,000ft tiles - See USGS LiDAR Base Specifications for technical approach for LAS version, file headers, and classification schema.
- Breaklines: One geodatabase containing all breaklines supporting USGS LiDAR Base Specifications (100ft or wider for river/streams and 2acres or greater for lakes and ponds)
- Digital Terrain Model DTM and hydro-enforced breaklines were used to generate contour lines of vertical interval of one-foot. Every fifth contour is noted as an index contour. DTM and contour vector files were delivered using an ESRI File Geodatabase format.
- Bare-Earth Surface (Raster Digital Elevation Model): 2ft hydro-flattened DEM using the same tiling scheme as above.
- FGDC Compliant metadata files for each of the derivative services.
- County staff also used the DTM data to derive a county-wide Digital Elevation Model with a 5' cell size.

Custodian

- Waukesha County Land Information Office

Maintenance

- Once shared and made accessible, none.

Standards

- United State Geological Survey (USGS) – LiDAR Base Specifications, Version1.2.

Other Types of Elevation Data

Layer Status

- In addition to the above, Waukesha County has contour lines and elevations at a 1 foot interval. They were derived from 2015 hydro-flattened digital terrain model built from the LiDAR data.

Custodian

- Waukesha County Land Information Office

Maintenance

- Once shared and made accessible, none.

Standards

- Vertical accuracy Root Mean Square Error (RMSEz) +/- .5'. Horizontal accuracy +/- .5' NAD83 (2011) State Plane Wisconsin South Zone, US survey feet; NAVD88, US survey feet.

Orthoimagery

Orthoimagery

Layer Status

- **Most recent acquisition year:** 2022
- **Resolution:** 3″
- **Contractor's standard:** Spring acquisition, leaf-off.
- **Next planned acquisition year:** 2024 (Flown March 2024, processing in progress as of this writing.) 2026 photos are planned after that.

Custodian

- Waukesha County Land Information Office

Maintenance

- Once shared and made accessible, none.

Standards

- Orthophotos were compiled to meet National Map Accuracy Standards for 1:50 scale.

Historic Orthoimagery

Layer Status

- 2020; 3″ pixel resolution; color; Orthorectified, compiled at 1:50 scale
- 2015; 6″ pixel resolution; color; Orthorectified, compiled at 1:1200 scale
- 2010; 6″ pixel resolution; color; Orthorectified, compiled at 1:1200 scale
- 2007; 1′ pixel resolution; color; Orthorectified, compiled at 1:2400 scale
- 2005; 6″ pixel resolution; color; Orthorectified, compiled at 1:1200 scale
- 2000; 1′ pixel resolution; black and white; Orthorectified, Part of the county compiled at 1:2400 with 1′ pixel resolution and Part of the County compiled at 1:4800 scale with 2′ pixel resolution
- 1995; 2′ pixel resolution; black and white; Orthorectified, 1:4800 scale
- 1990; 1′ pixel resolution; black and white; Not Orthorectified, 1″=1667′ scale
- 1980; 1′ pixel resolution; black and white; Not Orthorectified, 1″=1667′ scale
- 1970; 1′ pixel resolution; black and white; Not Orthorectified, 1″=1667′ scale
- 1963; 1′ pixel resolution; black and white; Not Orthorectified, 1″=1667′ scale
- 1950; 1′ pixel resolution; black and white; Not Orthorectified, 1″=1667′ scale
- 1941; 1′ pixel resolution; black and white; Not Orthorectified, 1″=1667′ scale

Custodian

- Waukesha County Land Information Office

Maintenance

- Once shared and made accessible, none.

Standards

- National Map Accuracy Standards for 1:50 for flight years of 2020
- National Map Accuracy Standards for 1:1200 for flight years of 2015, 2010 and 2005.
- National Map Accuracy Standards for 1:1200 for flight years of 2010 and 2005.
- National Map Accuracy Standards for 1:2400 for flight years of 2007 & portions of year 2000.
- National Map Accuracy Standards for 1:4800 for flight years of, 1995 and portions of 2000.
- Historic imagery for 1990, 1980, 1970, 1963, 1950 and 1941 have standards that are undefined. This imagery was flown at a 1"=1667' negative scale. The negatives were acquired from SEWRPC and the National Archives (1950, 1941), then scanned and georeferenced to an approximate horizontal accuracy of +/- 40′.

  For more details see related metadata at:
  http://prd.waukcogeo.com/Images/Metadata83/AerialPhotography

Other Types of Imagery

e.g., Oblique Imagery, Satellite Imagery, Infra-red, etc.

Layer Status

- Waukesha County flies smaller projects with a drone for various tracking or promotional purposes.
- 2017 Oblique, non-georeferenced color aerial photos of perimeter of selected lakes
- 1996 Oblique, non-georeferenced color aerial photos of perimeter of selected lakes

Custodian

- Waukesha County Land Information Office (drone images)
- Waukesha County Department of Parks and Land Use – Planning Division (obliques)

Maintenance

- Once shared and made accessible, none.

Standards

- Drone imagery - Varies by project
- 2017 obliques – High Resolution JPEG files with accompanying Index map of approximate location.
- 1996 obliques – High Resolution PCD proprietary format files.

Address Points and Street Centerlines

Address Point Data

Layer Status

Address points are:

- maintained for each address in the entire County.
- linked to a related tax parcel and a related street centerline segment
- tied to a normalized street name table
- linked to the Environmental Health Premise scanned files.
- provided to the Waukesha County Emergency Preparedness Department for use in the shared dispatch system.
- used as the main input into the LUCA program in cooperation with the US Census
- converted to the Wisconsin GIS NG9-1-1 Data Standard

Custodian

- Waukesha County Land Information Office

Maintenance

- Site address points are maintained by the Waukesha County Land Information System Division staff. New addresses or incorrect address notifications are sent by municipal addressing authorities via the County's online Address Maintenance System (AMS) or other means. These notifications are then entered by the Land Resources Division and sent to the Tax Listing department for verification. Work is currently underway under the 2024 NG911 GIS Grant program from the WI Dept of Military Affairs to compare the address points to the five sets of MSAG/ALI files in the county that correspond to the PSAPs currently under operation within the county boundary. Once complete they will be used as a part of Phase 2 NG911 implementation for all 5 PSAPs within the county.

Standards

- Wisconsin GIS NG9-1-1 Data Standard (Site/Structure Address Point)
- United States Postal Service standards

Building Footprints

Layer Status

- Building footprints were obtained from Microsoft Bing from approximately 2009, to replace outdated buildings captured as part of planimetric mapping from SEWRPC from 1985-2000.

Custodian

- Waukesha County Land Information Office

Maintenance

- Some maintenance is done at the municipal level using building permits, but none are maintained as part of county processes. The footprints are strictly used for reference with all

caveats noted regarding their accuracy and currency.

Standards

- None

Other Types of Address Information

e.g., Address Ranges

Layer Status

- See Street Centerlines

Custodian

- Waukesha County Land Information Office

Maintenance

- See Street Centerlines

Standards

- Wisconsin GIS NG9-1-1 Data Standard (Road Centerline)

Street Centerlines

Layer Status

- Left/Right, Low/High address ranges are attributed on street centerlines for the entire county and some outlying areas in surrounding counties that have shared assistance agreements with fire departments within the Waukesha County Communications Center. This layer is complete for the County.
- Centerlines contain attribute for jurisdiction and are linked to a normalized street name table as well as an alias table to track all possible names.
- Attributes account for Waukesha County's unique coordinate addressing in rural areas.
- Data has been converted to the Wisconsin GIS NG9-1-1 Data Standard.

Custodian

- Waukesha County Land Information Office

Maintenance

- Centerlines are maintained by the Waukesha County Land Information System Division staff.
- Centerlines are added using preliminary plats georeferenced to existing parcel framework as well as the most current orthophotography available.
- New addresses or incorrect address notifications are sent by municipal addressing authorities via the County's online Address Maintenance System (AMS) or other means. These notifications are then entered by the Land Resources Division and sent to the Tax Listing department for verification. Work is currently underway under the 2024 NG911 GIS Grant program from the WI Dept of Military Affairs to compare the address points to the five sets of MSAG/ALI files in the county that correspond to the PSAPs currently under operation within the county boundary. Once complete they will be used as a part of Phase 2 NG911 implementation for all 5 PSAPs within the county.

Standards

- Wisconsin GIS NG9-1-1 Data Standard (Road Centerline)
- United States Postal Service standards

Rights of Way

Layer Status

- Rights of Way are complete for the County
- **How maintained:** Rights of Way are maintained as part of the parcel fabric. They have attributes for Municipality and Type (Dedicated, reserved, etc.) The four municipalities that maintain their own parcel maps are tasked with maintaining their ROWs and providing them to the County.

Custodian

- Waukesha County Department of Parks and Land Use – Land Resources Division

Maintenance

- New rights of way are added during the parcel update process. Changes or vacations to existing rights of way are flagged by Tax Listing department and also made during this update process.

Standards

- Mapped to the same standards that the overall parcel dataset is mapped at.

Trails

e.g., Recreational Trails, Snowmobile Trails

Layer Status

- County-maintained trails are complete. Snowmobile trails are maintained for use by the local snowmobile clubs. During Park and Open Space plan updates, we ask for updates to non-county trails (state and local) for reference but we do not maintain the layer throughout the time between unless specifically needed.

Custodian

- Waukesha County Department of Parks and Land Use – Parks Division

Maintenance

- Waukesha County Department of Parks and Land Use – Parks Division

Standards

- None

Land Use

Current Land Use

Layer Status

- 2020

Custodian

- Southeast WI Regional Planning Commission (SEWRPC)

Maintenance

- SEWRPC. Updates are provided on a 5-year cycle.

Standards

- SEWRPC land use mapping standard.

Future Land Use

Layer Status

- 2035 Development Plan is complete for the county. Updates are conducted in collaboration with local municipalities

Custodian

- Waukesha County Department of Parks and Land Use – Planning and Zoning Division

Maintenance

- Planning and Zoning Division of the Parks and Land Use Department perform an annual review and complete an official amendment process.

Standards

- s. 66.1001, Wis. Stats. Comprehensive planning
- Completed according to requirements for Comprehensive Planning set forth in State Statutes.

Zoning

County General Zoning

Layer Status

- The County does maintain a GIS representation of county general zoning boundaries for the Towns of Oconomowoc and Ottawa.

Custodian

- Parks and Land Use Department – Planning and Zoning Division

Maintenance

- Completed on a monthly basis by Planning and Zoning Division staff. Rezoned information is updated upon occurrence.

Standards

- Waukesha County Zoning Ordinance

Shoreland Zoning

Layer Status

- The County does maintain a GIS representation of shoreland zoning boundaries for the Towns of Brookfield, Delafield, Eagle, Genesee, Merton, and Mukwonago. All other Towns, Cities, and Villages have the authority to administer their own shoreland zoning code and therefore this data is not maintained at the County level.

Custodian

- Parks and Land Use Department – Planning and Zoning Division

Maintenance

- Monthly or more, as re-zones occur, navigability determinations are made, or floodplain information becomes available.

Standards

- County Shoreland and Floodplain Protection Ordinance

Farmland Preservation Zoning

Layer Status

- The County does maintain a GIS representation of county farmland preservation zoning boundaries, which at present, is applicable in four towns, Oconomowoc, Ottawa, Eagle and Merton.
- This layer is 100% complete for the county.
- **Year of certification:** 2023

Custodian

- Plan is created and maintained by a joint effort between the Land Resources and Planning & Zoning Divisions, Dept of Parks and Land Use

Maintenance

- Zoning changes mapped as needed by Planning and Zoning Division staff.

Standards

- DATCP, Wisconsin Statutes Ch. 91

Floodplain Zoning

Layer Status

- The County does maintain a GIS representation of floodplain zoning boundaries
- The county's floodplain zoning GIS data is not identical to the FEMA map. Dam failure floodplains and other approximated floodplains are represented in addition to FEMA boundaries.
- Flood storage boundaries are also provided to the County by the DNR and incorporated into the floodplain zoning area.

Custodian

- Federal Emergency Management Agency (FEMA)
- Waukesha County Parks and Land Use – Planning and Zoning Division
- Wisconsin Department of Natural Resources

Maintenance

- Completed on a monthly basis by Planning and Zoning Division staff. Rezone information or new floodplain boundaries are incorporated upon occurrence or adoption of new floodplain studies.

Standards

- Federal Emergency Management Agency floodplain standards
- NR 116 Wisconsin Floodplain Management standards

Airport Protection

Layer Status

- The County does maintain a GIS representation of airport protection zoning boundaries for the Waukesha County Airport (Crites Field). The layer is 100% complete.
- Airport protection zoning map depicts: Height limitation restrictions, airport avigation easements and runway protection zones.

Custodian

- Parks and Land Use Department – Planning and Zoning Division

Maintenance

- Parks and Land Use Department – Planning and Zoning Division. Information is updated upon new information.

Standards

- No formal standards.

Municipal Zoning Information Maintained by the County

e.g., Town, City and Village, Shoreland, Floodplain, Airport Protection, Extra-Territorial, Temporary Zoning for Annexed Territory, and/or Zoning Pursuant to a Cooperative Plan

Layer Status

- Five towns, Brookfield, Eagle, Genesee, Merton and Mukwonago, and three villages, Lisbon, Vernon and Waukesha - contract with the County to perform zoning map creation and maintenance to support each of their local Zoning Ordinances.

Custodian

- Parks and Land Use Department – Planning and Zoning Division

Maintenance

- Monthly or more frequently, as re-zones occur, or as floodplain or navigability information becomes available.

Standards

- Standards vary with the type of zoning area it is – those based on parcels generally follow those standards, and those based on floodplain, wetlands, or environmental corridors follow those.

Administrative Boundaries

Civil Division Boundaries

e.g., Towns, City, Villages, etc.

Layer Status

- Civil Division boundaries are complete for 100% of the County.

Custodian

- Waukesha County Land Information Office

Maintenance

- Updated as parcels are annexed as part of ongoing parcel maintenance efforts.

Standards

- No formal standards.

School Districts

Layer Status

- Progress toward completion/maintenance phase: 100% complete for County.
- Relation to parcels: Parcels contain a school district code.
- Attributes linked to parcels: SCHOOLDISTNO for School District Name, plus HIGHSCHOOLDIST for those areas that also have a separate unified high school district.

Custodian

- Waukesha County Tax Listing

Maintenance

- Tax Listing maintains school district codes in tax system. LIS maintains map layer, incorporating changes from Tax Listing to give a more visual representation of the boundary.
- Periodic checks are done to ensure synchronicity between parcels and the district polygon layer.

Standards

- No formal standards

Election Boundaries

e.g., Voting Districts, Precincts, Wards, Polling Places, etc.

Layer Status

- Municipal election wards exist for 100% of the county. These are used to build the County Supervisory Districts we maintain every ten years.

Custodian

- Waukesha County Land Information Office
- Waukesha County Clerk's office
- Municipal Clerks within Waukesha County

Maintenance

- The Land Information Office maintains the election ward layer by monitoring annexations received at the County. Some annexations are filed with the County Clerk, some with the Register of Deeds, and some with both offices. Updated data is uploaded as part of the BAS/Ward Collection process hosted by the WI Legislative Technology Services Bureau.
- Wards were redrawn in early 2024 to reflect the effects of the recent WI Supreme Court decision.

Standards

- Meets standards for submission to LTSB to fulfill Wisconsin State Statute 5.15(4)(br)1

Utility Districts

e.g., Water, Sanitary, Electric, etc.

Layer Status

- Waukesha County does not have utility district layers. (We do display Sewer District codes in the parcel data that we receive from tax listing but they are not a separate GIS layer.)

Custodian

- None

Maintenance

- None

Standards

- None

Emergency Service Boundary – Law/Fire/EMS

Layer Status

- Law Enforcement: 100% complete for the county and uploaded into ESINet

- Fire: 100% complete for the county
- EMS is served by the Fire Agencies in the county in all cases, so this is considered to be the same as the Fire boundary.

Custodian

- Waukesha County Land Information Office

Maintenance

- Updated as per the request of fire and law agencies based on changing operational and response needs.

Standards

- Wisconsin GIS NG9-1-1 Data Standard (Law/Fire/EMS)

Public Safety Answering Points (PSAP) Boundary

Layer Status

- 100% complete for all 5 PSAP areas within Waukesha County and uploaded into ESINet

Custodian

- Waukesha County Land Information Office

Maintenance

- Updated as per the request of the Waukesha County Communications Center or if an annexation would occur between PSAP boundaries.

Standards

- Wisconsin GIS NG9-1-1 Data Standard (Law/Fire/EMS)

Provisioning Boundary

Layer Status

- 100% complete and uploaded into ESINet

Custodian

- Waukesha County Land Information Office

Maintenance

- Since this boundary must edge match each other county surrounding, most changes are requests from neighboring communities.

Standards

- Wisconsin GIS NG9-1-1 Data Standard (Provisioning Boundary)

Other Public Safety

e.g., Healthcare Facilities

Layer Status

- School Buildings, Churches, Fire Stations, Police Stations, Hospitals, Daycares and Nursing Homes are 100% complete.

Custodian

- Waukesha County Land Information Office

Maintenance

- Maintenance of day cares and nursing homes relies on extracts of state lists from WI DHS and are checked on a yearly basis as part of an Emergency Management workflow as well as throughout the year as the county is notified about all of the above layers from our dispatch team.

Standards

- None

Lake Districts

Layer Status

- The Tax Listing database has Lake District codes for several districts in the County. These codes are 100% complete for the districts the County administers. Recently we have worked with Tax

Listing to create geographical boundaries from these attributes as a check of accuracy. Eleven out of 22 districts are digitized. Once all are complete, this will be published as a GIS layer.

Custodian

- Waukesha County Tax Listing department

Maintenance

- Files are maintained on a monthly cycle. Currently lake districts are being checked and compared using the tax codes to insure they match the geography for the lakes.

Standards

- None

Native American/Tribal Lands

Layer Status

- We do not maintain anything related to this topic as of yet. However, with the purchase of the Indian Mound Boy Scout property by the Forest County Potawatomi Community, this may change in the future.

Other Administrative Districts

e.g., County Forest Land, Parks/Open Space, etc.

Layer Status

- The County maintains a file containing 100% of the Park and Open Space Lands.

Custodian

- Waukesha County Department of Parks and Land Use – Parks Division

Maintenance

- County-owned lands are maintained as needed. State, Local, private, etc lands are updated as part of the five year update cycle.

Standards

- None

Other Layers

Hydrography Maintained by County or Value-Added

e.g., Hydrography maintained separately from DNR or value-added, such as adjusted to orthos; Elevation-Derived Hydrography

Layer Status

- The hydrography layer is 100% complete for the county. Hydrography lines were captured from planimetric methods as part of the aerial photography collection in 2000. The 2025 LiDAR dataset may be investigated for potential elevation derived hydrography in the future.

Custodian

- Waukesha County Land Information Office

Maintenance

- Static data unless a major stream relocation occurs.

Standards

- USGS Elevation-Derived Hydrography Specifications

Cell Phone Towers

Layer Status

- A new Cell Phone Tower GIS layer is currently scheduled for creation late 2024 via the FCC's data download website.

Custodian

- Waukesha County Land Information Office

Maintenance

- Will work towards a yearly download of the FCC data to check against existing layer.

Standards

- None

Bridges and Culverts

Layer Status

- There are two culvert datasets of any quality at the County level. The Department of Public Works tracks all culverts on county highways. In the summer of 2024, the County Parks department started collecting the culverts inside of county parks and along county bike trails.
- The county does not have bridges mapped to any recent currency as of this writing. These are tracked through WISDOT's HSIS system.

Custodian

- Waukesha County Dept of Public Works – Engineering Division
- Waukesha County Department of Parks and Land Use – Parks Division

Maintenance

- DPW maintains their culvert files during their cyclical inspections or via new construction projects. Parks is in collection mode and will likely have a similar workflow.

Standards

- DPW has some attributes that they maintain as part of WI Dept of Transportation reporting.

Other/Miscellaneous

e.g., Pipelines, Railroads, Non-Metallic Mining, Sinkholes, Manure Storage Facilities, etc.

Layer Status

- Railroads are mapped with basic information for Dispatch and basemap purposes.
- Non-Metallic Mining operations are tracked as part of permitting workflows.
- Stormwater BMPs are mapped to aid in tracking and linked to a separate permitting/tracking/document image database.
- Agricultural Waste Storage sites
- There has been large effort to map assets in DPW and Parks such as signage, street markings, small structures, airport lighting, invasive/native species within county parks, etc. There are too many types to list here, but it is becoming a larger focus. Some of these things link to an asset management system (Brightly).

Custodian

- Waukesha County Land Information Office
- Waukesha County Department of Parks and Land Use – Land Resources Division
- Waukesha County Department of Parks and Land Use – Parks Division
- Waukesha County Department of Public Works

Maintenance

- As needed

Standards

- Varies per layer, most are mapped at the same standard as our parcel or orthophotography layer, others have been collected via GPS at varying standards.

3 LAND INFORMATION SYSTEM

The WLIP seeks to enable land information systems that are both modernized and integrated. Integration entails the coordination of land records to ensure that land information can be shared, distributed, and used within and between government at all levels, the private sector, and citizens.

One integration requirement is listed under s. 16.967(7)(a)(1), Wis. Stats., which states that counties may apply for grants for:

> The design, development, and implementation of a land information system that contains and integrates, at a minimum, property and ownership records with boundary information, including a parcel identifier referenced to the U.S. public land survey; tax and assessment information; soil surveys, if available; wetlands identified by the department of natural resources; a modern geodetic reference system; current zoning restrictions; and restrictive covenants.

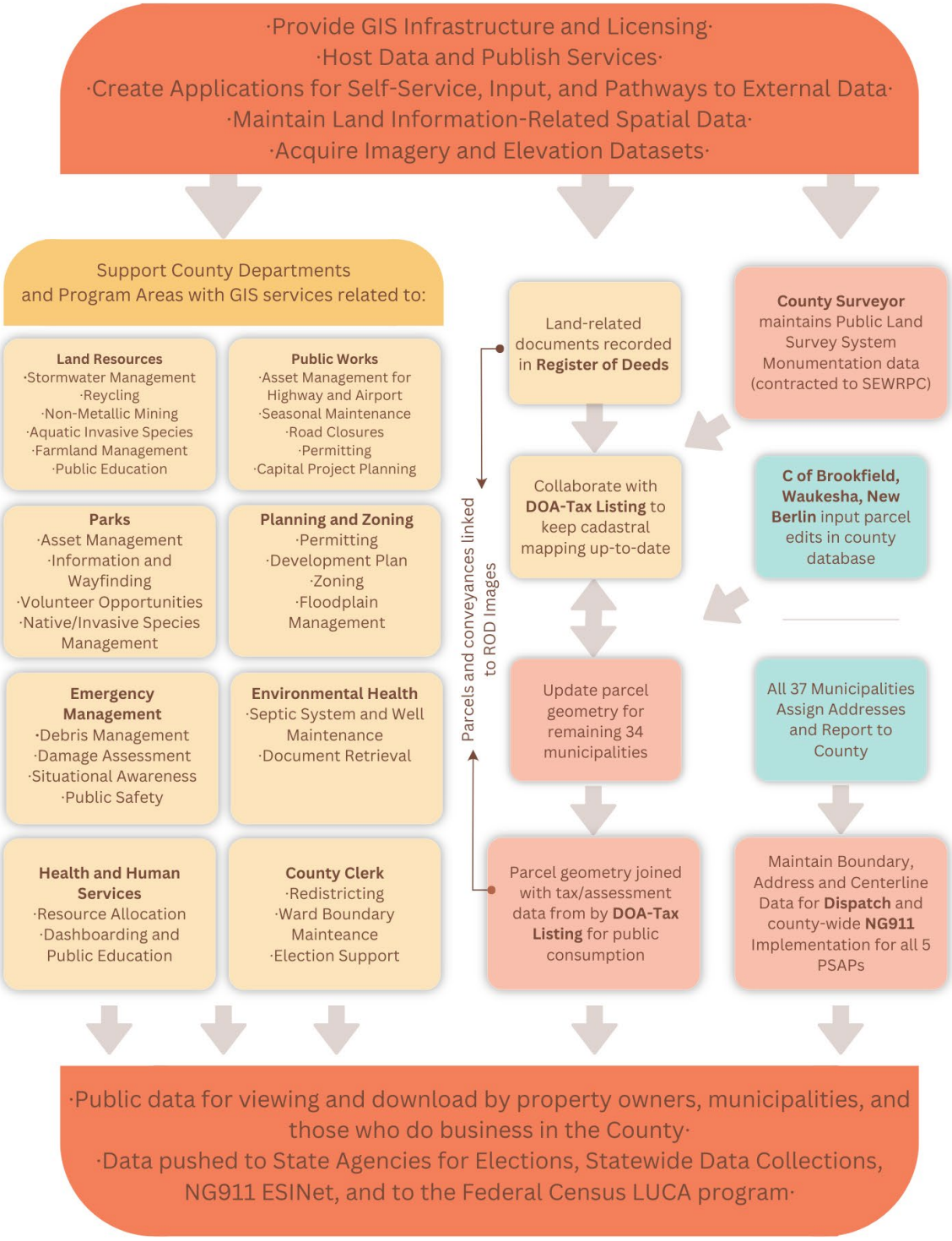
This chapter describes the design of the county land information system, with focus on how data related to land features and data describing land rights are integrated and made publicly available.

Current Land Information System

Diagram of County Land Information System

The diagram on the next page illustrates overall responsibilities of the Waukesha County Land Information Office, what it provides the county and broader public, and how data flows between departments, organizations, and stakeholders. It is meant to be a broad representation of the kinds of areas are supported and is not exhaustive. Areas in pink are those services the Land Information Office provides directly and is wholly responsible for. Areas in yellow may involve a varying degree of support and input from the Office. Areas in blue are where other stakeholders outside of the County may provide important inputs to the system.

Waukesha County Land Information Office



County Parcel Data Workflow Diagram

Technology Architecture and Database Design

This section refers to the hardware, software, and systems that the county uses to develop and operate computer systems and communication networks for the transmission of land information data.

Hardware

- As of this writing, Waukesha County is currently engaged in a migration project to move the

enterprise GIS system from AWS back to county-hosted VMware environment by the end of 2024 to leverage cheaper infrastructure and enhanced IT service for maintenance and security. Seven production servers are deployed to distribute load and function, and an eighth functions as a file server. A development environment will mimic this configuration as well for testing and development of upgrades and applications. For the meantime, Waukesha County will continue to utilize AWS S3 buckets to distribute large datasets such as LiDAR and orthophotography.

- The Land Information Office utilizes a DJI Phantom 4 RTK drone.

Software

- Waukesha County is currently licensed for the software products below, either by the Land Information Office directly, or by departments with a strong tie to land records/GIS.

Company	Product	Purpose
Esri	ArcGIS Enterprise (inc a mix of Contributor, Mobile Worker, Parcel Fabric term licenses)	Hosting Web services and supporting data
Esri	Image Server	Specialized server software that hosts imagery data
Esri	ArcGIS Desktop (Basic/Standard/Advanced)	Data editing, cartography, and analysis
Esri	3D Analyst	Special purpose analytics
Esri	ArcOnline (inc a mix of Contributor and Mobile Worker term licenses)	Esri-hosted data/application site
Esri	ArcGIS Hub Premium	Centralized location for all internal and external apps as well as focused initiatives and our Open Data Portal
Esri	Drone to Map	Drone data collection, flight planning, etc.
VertiGIS	Geocortex Essentials/VertiGIS	Web map application creation and maintenance
Microsoft	SQL Server	Database storage and retrieval
Thomson Reuters	Aumentum Reporter	Register of Deeds Document Imaging and Indexing system
Hamer Enterprises	EZ Tax	Tax Listing and Billing
FME Form	Safe Software	Enhanced data conversion software for 911 dispatch support and other workflows
Aloft	Aloft	Drone Fleet/Airspace Management
WebHarvy	WebHarvy	Screen scraping application used for Temporary 980 residence location.
Brightly	Asset Essentials	Asset Management for Parks, Facilities, and Airport

- **County currently uses ArcGIS Pro:** Yes. We no longer install any version of ArcMap on any new machine.

Website Development/Hosting

- Public access to land information is provided via a general public facing website using Geocortex Essentials by VertiGIS (to be recreated in their VertiGIS product as detailed

elsewhere in this plan). The current URL for the site is:

https://prd.waukcogeo.com/HTML5Viewer/?viewer=html_viewer_ext

Access to parcels, addresses, school districts, supervisory districts, floodplains, zoning (where administered by the County), land use, public lands, soils, PLSS, elevation, hydrography, historic aerial photography, and more is provided via this single site. In addition to this public site the county also hosts a variety of focused applications for internal staff or public use. Waukesha County will continue to provide additional public access to data through the development of specialized web mapping applications that will be hosted in ArcOnline and ArcGIS Portal. In addition, we strive to make as much data as possible accessible through our Open Data Portal.

Metadata and Data Dictionary Practices

Metadata Creation

- **Metadata creation and maintenance process:** Commonly used public layers have FGDC compliant metadata linked to a series of HTML pages via our Geocortex site, either self-created, or inherited from acquired data from third parties such as SEWRPC or imagery services. In addition, Esri software is utilized to keep similar metadata in SDE feature classes, ArcGIS Online, and ArcGIS Portal items.

Metadata Software

- **Metadata software:** Esri ArcCatalog/ArcPro generates metadata consistent with the FGDC Content Standard for Digital Geospatial Metadata, and ISO geographic metadata standard 19115.
- **Metadata fields manually populated:** As needed.

Metadata Policy

- **Metadata Policy:** We do not have a formal policy. However, we would like to formulate one in the future as detailed elsewhere in this plan.

Municipal Data Integration Process

- Waukesha County has had a longstanding relationship with three municipalities that conduct their own parcel maintenance activities, namely the cities of Brookfield, Waukesha and New Berlin. With the County's move to the ArcPro Parcel Fabric, the County has provided Parcel Fabric Editor licenses for editing via services in the County database and direct connections for efficient download of data to support local workflows.
- The County Tax Listing Division also receives tax roll information from Brookfield and Waukesha for incorporation into the County Tax File. This county-wide file is then used to create a monthly export to our SDE database for the purposes of joining to the parcel geometry.
- Waukesha County consumes the address point services from the Cities of Waukesha and Muskego to replace the need to report addresses via our AMS website. A periodic check for new addresses is performed as part of daily maintenance of the address layer by the County. This direct data sharing eliminates unnecessary steps to keep the county-wide address layer up-to-date.

Public Access and Website Information

Public Access and Website Information (URLs)

Public Access and Website Information

GIS Webmapping Application(s) Link - URL	GIS Download Link – URL	Real Property Lister Link - URL	Register of Deeds Link - URL
https://prd.waukcogeo.com/HTML5Viewer/?viewer=html_viewer_ext	https://data-waukeshacounty.opendata.arcgis.com/	https://tax.waukeshacounty.gov/Default.aspx	https://landrecordspublicaccess.waukeshacounty.gov/

Single Landing Page/Portal for All Land Records Data

URL

https://land-information-waukeshacounty.hub.arcgis.com/

Web Services/REST End Points

URL

https://gis2.waukcogeo.com/server/rest/services

County Webpage with Link to Statewide Parcel Map (www.sco.wisc.edu/parcels/data)

URL

https://www.waukeshacounty.gov/landandparks/land-information-system/

Municipal Website Information

Municipal Website	Municipal Website URL
City of Waukesha GIS Landing Page	https://www.waukesha-wi.gov/government/public_records/gis.php
City of Pewaukee GIS Hub	https://pewaukee.maps.arcgis.com/home/index.html
City of Brookfield GIS Web Map	https://citybrookfieldwi.maps.arcgis.com/apps/webappviewer/index.html?id=67a4c07670714cd59c30195cfec802b2
City of New Berlin GIS Landing Page	https://www.newberlinwi.gov/100/GIS-LIS-Mapping
City of Muskego GIS Landing Page	https://www.muskego.wi.gov/departments/information_technology/geographic_information_systems/interactive_maps.php
Village of Hartland GIS Web Map	https://maps.ags.ruekert-mielke.com/Html5Viewer/Index.html?viewer=hartland
Village of Sussex GIS Web Map	https://maps.ags.ruekert-mielke.com/Html5Viewer/Index.html?viewer=sussex
Village of Mukwonago GIS Web Map	https://maps.ags.ruekert-mielke.com/Html5Viewer/Index.html?viewer=mukwonago
Village of Nashotah GIS Web Map	https://nashotah-wi.maps.arcgis.com/apps/webappviewer/index.html?id=e7c4d2db00ad473393ac389777105061

*All the websites above use some degree of shared county resources via our REST endpoints.

Data Sharing

Data Availability to Public

Data Sharing Policy

- Many of Waukesha County's core data sets and foundational layers are available on the County's open data portal for download free of charge. Documents that are part of the Register of Deeds Tract Index are available for a small cost through the ROD's online document purchasing application.
- The privacy statement adopted by the Waukesha County Board is found at the bottom of https://www.waukeshacounty.gov/landandparks/land-information-system/ page.

Open Records Compliance

- Any data sets that are not available on the County open data portal are typically provided free of charge via upload to a cloud storage site.

Data Sharing Restrictions and Government-to-Government Data Sharing

Data Sharing Restrictions

- None

Government-to-Government Data Sharing

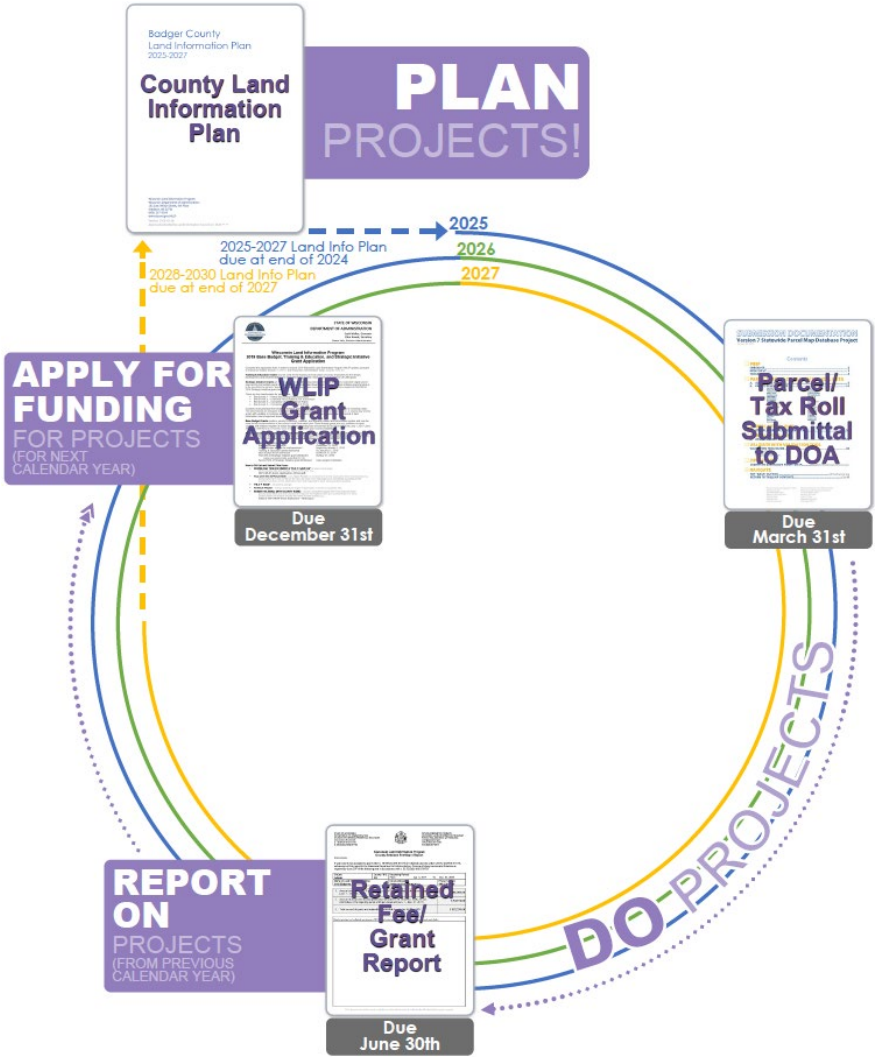
- The Waukesha County Municipal GIS Users meets biannually for project updates, collaboration and networking. Data sharing is encouraged and promoted within the group.
- See Parcel feature section for more information on how some municipalities collaborate to map parcels.

Training and Education

- Waukesha County Land Information staff members are always encouraged to attend conferences and seminars to stay current on technology and trends as our budget allows.
- Conferences typically attended include the ESRI Users Conference, WLIA Annual Conference and Regional Meetings and EWUG.
- The LIS Supervisor coordinates a Southeastern Wisconsin ESRI Technical Users Group (SEWETUG) meeting bi-annually.
- LIS staff have taken ad hoc online training via vendor presentations on-line or through WLIA.
- In-house efforts include a Waukesha GIS Technical Users group to focus on training and collaboration with county departments and divisions. More recently, we instituted a monthly training series touching on a different aspect of Esri technology available to them at each session.

4 CURRENT & FUTURE PROJECTS

This chapter lists the current and future land information projects the county is currently undertaking or intends to pursue over its planning horizon. A project is defined as a temporary effort that is carefully planned to achieve a particular aim. Projects can be thought of as the means to achieving the county's mission for its land information system.



Project #1: Acquire 2025 LiDAR data and increase use of the investment

Project Description

- Acquire 2025 30 ppm LiDAR data and upgraded 20' hydro as part of the SEWRPC region collection. Once received, ensure data is widely available and derivative products are useful to stakeholders. Explore what kinds of data can be further extracted to fully utilize the investment.
- Land Info Spending Category: Lidar

Business Drivers

- Acquisition of dense, high-quality elevation data will be a vast improvement over the outdated and less dense 2015 data.
- Region wide project will ensure planning and design can extend over county borders as hydrologic features enter and exit our county boundary.
- Ensuring widespread use of the data once acquired may increase stakeholder participation in the next round of acquisition.
- High quality data can drive accurate decision making and faster permitting workflows.

Objectives/Measure of Success

- Delivered data meets industry and federal accuracy standards.
- Data widely available via download from Open Data Portal and services for commercial use and sharing with other governmental or non-profit agencies.
- Increased use of the data or its derivatives in Public Works, Land Resources, Environmental Health, Planning, Parks, and Emergency Management.

Project Timeframes

- Initial acquisition is projected to be delivered by the fourth quarter of 2025.
- Data for download and viewing complete by first quarter of 2026.
- Possible derivatives could be produced as soon as the second half of 2026 and beyond depending on the time needed for research and development, as well as processing time.

Responsible Parties

- SEWRPC will manage and QC the project pre-delivery
- Waukesha County Land Information Office will host the resulting data and produce any derivatives.

Estimated Budget Information

- See table at the end of this chapter. Note that the project will be paid for with combined Strategic Initiative Grants pooled from 2023 to 2025 in combination with the 2024 Orthophoto project completed during the last plan cycle.

Project #2: Conversion of WebAppBuilder and Geocortex applications to updated platforms

Project Description

- 2025 brings the retirement of Esri's WebAppBuilder and VertiGIS's Geocortex platforms. These are the two main vehicles the Land Information Office uses for self-service geographical data viewing by staff and the general public, simple data editing by non LIO staff, and information sharing to stakeholders in general. Between the two platforms there are approximately 30 applications of varying complexity that need to be re-built on Experience Builder or the VertiGIS Studio platform.
- Land Info Spending Category: Website Development/Hosting Services

Business Drivers

- Upgrading the applications will bring new functionality and better support.

Objectives/Measure of Success

- Increased efficiency in department workflows using GIS
- More self-service opportunities for internal and external stakeholders

Project Timeframes

- 2025

Responsible Parties

- Waukesha County Land Information Office

Estimated Budget Information

- See table at the end of this chapter.

Project #3: Implement 2023 Wisconsin Act 235 (Judicial Privacy Law)

Project Description

- Act 235 directs governmental bodies to withhold certain categories of private information from publicly accessible online records on request by judicial officers. The Land Information Office will work with Register of Deeds, DOA-Tax Listing, County Corporation Counsel, County IT staff, municipal partners, and any county department where this law applies to conform to the requirements stated in this legislation and any future updates to it. The general consensus is that this law will expand to cover more categories of occupations that can request this shielding, therefore it is imperative that the process is accurate and timely to handle the number of requests that may come in the future. It is anticipated that we will closely follow the guidelines set forth by the WLIA Judicial Privacy Task Force/Pria Local.
- Land Info Spending Category: Administrative Activities and Management

Business Drivers

- Statutory requirement with penalties if not enforced

Objectives/Measure of Success

- Those wishing to remove their private information find the process easy and results timely.
- The process as executed at the county complies with the law with a minimal amount of extra effort on the part of staff.
- The responsibilities of each data holder are clearly defined and potential sharing agreements yet to be defined are entered into when needed.

Project Timeframes

- Waukesha County will meet the statutory requirement of April 2025

Responsible Parties

- Waukesha County Land Information Office
- Waukesha County Register of Deeds
- Waukesha County Dept of Administration-Tax Listing
- Other state, county, and local government offices that may hold property owner records as part of their business needs.

Estimated Budget Information

- See table at the end of this chapter.

Project #4: Acquire 2026 Orthophotography

Project Description

- Continue the modern standard of acquiring leaf-off orthophotography every two years, Waukesha County will enter into a similar agreement as in 2024 with SEWRPC to produce 3" region-wide coverage.
- Land Info Spending Category: Orthoimagery

Business Drivers

- Because of rapid changes in our urban areas, having more frequent orthophotography helps stakeholders make better decisions and increases efficiencies.
- Recent photography aids Emergency Management and Public Safety to have up-to-date tools for situational awareness.

Objectives/Measure of Success

- SEWRPC has had success in getting imagery products at a very good price point to the counties that participate, so the lowest cost possible for the highest quality dataset is the objective once again.
- Waukesha County will host the resulting dataset before the end of 2026 pending delivery date of

the leaf-off, snow and ice free spring flight.

Project Timeframes

- 2026

Responsible Parties

- SEWRPC will manage and QC the project pre-delivery
- Waukesha County Land Information Office will host the resulting data and produce any derivatives.

Estimated Budget Information

- See table at the end of this chapter. We are estimating a possible 3% increase over 2024 at this writing.

Project #5: Preliminary exploration of effort to convert to new datums and coordinate system

Project Description

- While there are not imminent plans to convert our data to the new horizontal system of North American Terrestrial Reference Frame of 2022 (NATRF2022) and vertical system of North American-Pacific Geopotential Datum of 2022 (NAPGD2022) that is nearing completion at the federal level, Waukesha County expects that an exploratory discussion with SEWRPC as our County Surveyor and the municipalities who have their own GIS offices/contractors to begin during this plan cycle. Pros and cons of moving to this system should be discussed as well as creating estimates on the amount of effort that will be required and resources that may need to be budgeted for. It would also be advantageous to get the perspective of private surveyors who work in this county.
- Land Info Spending Category: PLSS

Business Drivers

- Those who do survey work or other related industries in our county may appreciate the option of using this more accurate coordinate system.

Objectives/Measure of Success

- An actionable plan for migration of monumentation and GIS data.

Project Timeframes

- 2025-2027

Responsible Parties

- Waukesha County Land Information Office
- SEWRPC
- Municipal partners
- Private sector surveyors

Estimated Budget Information

- See table at the end of this chapter.

Project #6: Maintain NG911 Data to support 5 PSAP area

Project Description

- Waukesha County has 5 PSAPs operating within the county boundaries plus the remainder of the Village of Mukwonago that exists in Walworth County. In addition to simply maintaining the data itself and doing regular updates to EsiNET via GeoComm's statewide portal, it is our goal to further streamline the address update process from the addressing authorities at the municipal level to all of the departments at the County who need that information and back again. Because each PSAP still maintains their own MSAG/ALI, it will be imperative that new addresses are communicated back and forth quickly and accurately so that each subsequent update to EsiNET can meet the 98% accuracy standard against the MSAG/ALI files that each PSAP maintains. In addition, Waukesha County will continue to add quality control measures to ensure that data does not fail upon upload if possible.
- Land Info Spending Category: Address Points/Street Centerlines

Business Drivers

- Next Gen 911 data requirements dictate the quality and speed of data updates.
- Increasing reliance on GIS data for police, fire and emergency management activities.
- Increased expectation from developers, USPS, and utility providers on timely updates for new address on our GIS access points.

Objectives/Measure of Success

- 100% success rate when uploading to ESInet (no critical errors, 98% or greater accuracy rate)
- Increased traffic to the Address Maintenance System by local addressing authorities.
- Increased satisfaction regarding the speed of updates to publicly available datasets.
- Agility as technology and federal standards evolve.

Project Timeframes

- On-going

Responsible Parties

- Waukesha County Land Information Office, Waukesha County Communications Center

Estimated Budget Information

- See table at the end of this chapter.

Project #7: Create a County GIS Data Governance Framework

Project Description

- As GIS use grew in different County departments over the last two decades and as more requests for GIS assistance occurred, a large amount of data and applications were produced. In addition, the IT Dept in Waukesha County is also starting a broader data governance initiative. In our mature enterprise state, it is past time to create a GIS Data Governance Framework to ensure that GIS Data is:
  - Accessible by those who need it
  - Protected from those who shouldn't
  - Discoverable via good metadata
  - Maintained by clearly defined data stewards
- Land Info Spending Category: Administrative Activities and Management

Business Drivers

- Increased reliance on quality data to make timely and informed decisions
- Staff turnover
- Increased staff time to manage the enterprise system
- Greater emphasis on security and redundancy

Objectives/Measure of Success

- Every data layer has a clearly defined person or position documented who is responsible for maintaining GIS data in their business area.
- Documented metadata standards are followed for both existing and new GIS layers to make data discoverable and appropriate uses for data clearly defined.
- Clearly defined processes for creating a new dataset or application to streamline development and maintenance.

Project Timeframes

- Development of a Data Governance document – 2025-2026
- Implementation of the outcome – late 2026

Responsible Parties

- Waukesha County Land Information Office and various stakeholders who use GIS data.
- Waukesha County Information Technology Dept

Estimated Budget Information

- See table at the end of this chapter.

Project #8: Increased integration with other County systems

Project Description

- In recent years, throughout the County, there has been an interest in upgrading to more modern systems for tracking, permitting, asset management, and other workflows. In addition, there has been an increase in scanning historical records that need to be easily retrieved from Sharepoint and other document storage solutions. We expect this trend to continue and efforts will be made to connect geographical data to many of these new workflows and systems. Things like geographically linking soil test results to their locations for the POWTS program, adding additional mapped assets in the Parks and Airport divisions to their asset management system, and increased document tracking in the planning and zoning process related to a parcel is already under discussion.
- Land Info Spending Category: Website Development/Hosting Services

Business Drivers

- Shrinking budgets means "doing more with less" to make self-service and efficient workflows a priority.
- Increased desire for more timely updates to data and milestone communication within projects to speed up development and permitting.
- Access to data that can inform better decisions to save money and time.

Objectives/Measure of Success

- Processes are clearly defined and information easily obtained by the public.
- Updates to publicly viewable data are within a week of the change.
- Each data steward understands their part in keeping data fresh.

Project Timeframes

- On-going

Responsible Parties

- Waukesha County Land Information Office
- Other responsible parties will depend on which system is being integrated with

Estimated Budget Information

- See table at the end of this chapter.

Project #9: Explore funding options for restarting an intern program

Project Description

- Previously, the Land Information Office would host summer interns for the purpose of digitizing GIS data above and beyond the core parcel dataset. In recent years, funding and time for this type of program has been lacking. We believe the County has many unique learning opportunities for students interested in learning about enterprise GIS, field work, data creation and quality assurance, and many other topics not always experienced in a university setting to jumpstart tomorrow's GIS professional. It would also help move the GIS program forward in getting projects completed that we wouldn't otherwise have time to do ourselves. The Land Information Office would like to explore a more permanent program with clear funding sources or partnerships with other county departments and a clear framework for identifying and managing projects including scope, hours needed, and responsibilities of the Land Information Office versus the program area needing the work done. Outreach would occur to attract both high-value projects internally, and high-achieving applicants externally.
- Land Info Spending Category: Training and Education

Business Drivers

- A clearly defined intern program with timelines, guidelines, and secured funding would make each year's intern hiring process and project identification easier and more efficient. This will ensure the program doesn't lapse as it has previously.
- Keeping GIS data up-to-date year over year is sometimes a struggle for program areas. Having extra help could ensure that data governance goals are maintained.

Objectives/Measure of Success

- First intern(s) hired by summer of 2027 based on the new framework to complete at least one GIS project.

Project Timeframes

- Preliminary funding and documentation work – 2026
- First round of GIS project(s) completed in summer of 2027.

Responsible Parties

- Waukesha County Land Information Office
- Other responsible parties will depend on which program area is being assisted

Estimated Budget Information

- See table at the end of this chapter.

Project #10: PLSS Monument NAD83 Coordinate Densification

Project Description

- This initiative would continue to fund SEWRPC serving as county surveyor, to occupy monuments in urban areas and update/correct horizontal coordinates previously calculated by least squares adjustment for incorporation into dossier sheets.
- Land Info Spending Category: PLSS

Business Drivers

- Because the Waukesha County PLSS system was converted to NAD83 using a selective sampling of points and a least squares adjustment algorithm, many of the monuments do not have field-occupied coordinate values.

Objectives/Measure of Success

- Increased NAD83/2011 accuracy for the PLSS network.
- Additional monuments occupied and location/condition verified to augment annual monument maintenance.

Project Timeframes

- 2026-2027

Responsible Parties

- SEWRPC
- Waukesha County Land Information Office

Estimated Budget Information

- See table at the end of this chapter.

Project #11: Update to Countywide Hazard Mitigation Plan

Project Description

- Emergency Management will be preparing a 5-year update to the Countywide Hazard Mitigation Plan starting in 2025. The process of updating the plan can take over a year as it requires an assessment of hazards, data collection, project identification and input from communities. The county LIS office may be asked to provide data sets to assist the contractor in their information gathering phase. Data of interest include, but is not limited to location of critical infrastructure, demographic information, environmental data, transportation routes, flood plains, and other data related to natural hazard impacts in Waukesha County. A need may arise where the county LIS office will be asked to prepare maps to display data in relation to the plan specifications. The details of LIS needs will be identified in the scoping of the project with the hired contractor.

Business Drivers

- The current plan is due to expire in August of 2027.

Objectives/Measure of Success

- The draft plan must go through a review and approval process with Wisconsin Emergency Management and FEMA.

Project Timeframes

- 2025-2026. The Emergency Management office anticipates starting the work of updating the plan

with the assistance of contractor starting late 2025 if awarded a BRIC grant.

Responsible Parties

- Waukesha County Emergency Management
- Waukesha County Land Information Office

Estimated Budget Information

- See table at the end of this chapter.

Completed Projects

Completed projects since the last update include but are not limited to:

- 2022 3" Orthophotography
- Phase 1 NG911 Data uploaded into ESInet (Phase 2 data in process as of this writing, data is now in NG911 schema and going through QC/edge matching processes)
- 2024 3" Orthophotography (pending Sept delivery as of this writing)
- Drone acquisition and implementation
- Plats of Survey Image Link/direct link to tax key indexed documents of all types
- Signed agreement to acquire 2025 LiDAR data
- Integration with the Brightly Asset Essentials asset management system

Estimated Budget Information (All Projects) for Planning Period 2025-2027

Estimated Budget Information

Project Title	Item	Unit Cost/Cost	Land Info Plan Citations Page # or section ref.	Project Total
1) Acquire 2025 LiDAR data and create better access points for its use	Initial Acquisition costs (Ayres Associates via shared SEWRPC agreement)	$32,982	P. 34	–
	Upgraded 20' Hydo (Ayres Associates via shared SEWRPC agreement)	$24,100		–
	1 LIS Analyst positions to manage data and create derivatives	10% of 125,400 X approx. 2 years = $25,080		–
				$82,465
2) Conversion of WebAppBuilder and Geocortex applications to updated platforms	1 LIS Supervisor	10% of $134,400 = $13,440	P. 34	–
	2 LIS Analysts	20% of $246,600 = $49,320		–
				$62,760
3) Implement 2023 Wisconsin Act 235 (Judicial Privacy Law)	1 LIS Supervisor	5% of $134,400 = $6,720	P. 35	–
				$6,720
4) Acquire 2026 Orthophotography	Initial Acquisition costs (via shared SEWRPC agreement)	$49,500	P. 35	–
	1 LIS Analyst to manage incoming data	1% of $125,400 = $1,254		–
				$50,754
5) Preliminary exploration of effort to convert to new datums and coordinate system	1 LIS Supervisor	2% of $134,400 = $2,688	P. 36	–
				$2,688
6) Maintain NG911 Data to support 5 PSAP area	1 LIS Supervisor	10% of $134,400 x 3 years = $40,320	P. 36	–
	1 Mapping Tech	25% of $100,600 x 3 years = $75,450		–
				$115,770
7) Create a County GIS Data Governance Framework	1 LIS Supervisor	5% of $134,400 x 2 years = $13,440	P. 37	–
	2 LIS Analysts	5% of $246,600 x 2 years = $24,660		–
				$38,100
8) Increased integration with other County systems	1 LIS Supervisor	10% of $134,400 x 3 years = $40,320	P. 37	–
	2 LIS Analysts	20% of $246,600 x 3 years = $147,960		–
				$188,280
9) Explore funding options for restarting an intern program	1 LIS Supervisor	5% of $134,400 = $6,720	P. 38	–
				$6,720
10) PLSS Monument NAD83 Coordinate Densification	County Surveyor team	$50,000	P. 39	–
				$50,000
11) Update to Countywide Hazard Mitigation Plan	1 LIS Supervisor	5% of $134,400 = $6,720	P. 39	–
				$6,720
			GRAND TOTAL	**$610,967**

Note. These estimates are provided for planning purposes only. Budget and staff effort listed is subject to change. Estimates of staff costs based on 2023 salary + benefits with a conservative 5% increase.