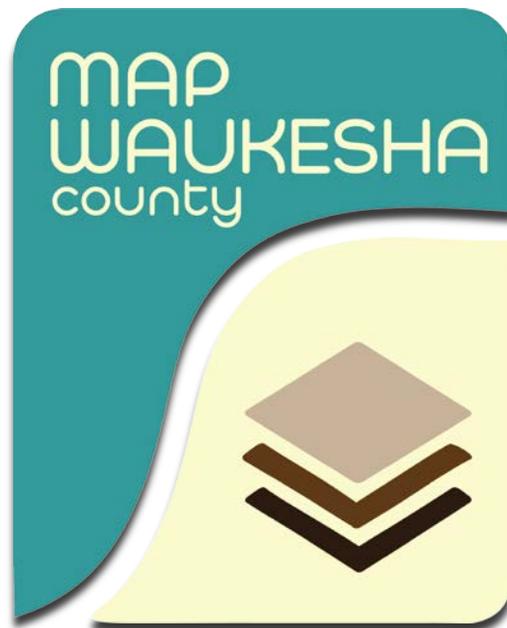


Waukesha County Land Information Plan 2019-2021



Department of Parks and Land Use
Land Resources Division – Land Information Office
515 W. Moreland Blvd.
Waukesha, WI 53188
262-548-7946
www.waukeshacounty.gov/lis

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Approved/Adopted by Land Information Council on: 2018-11-20

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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 2017, Waukesha County was awarded \$51,000 in WLIP grants and retained a total of \$506,280 in local Register of Deeds document recording fees for land information.

This plan lays out how funds from grants and retained fees will be prioritized. 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 a wide array of programs and citizen services such as economic development, emergency planning and response, land use planning, resources management, engineering, real estate, and surveying. The Waukesha County land information system integrates and enables 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 continue to maintain its core datasets and enable the integration and use of geographic and land record information into the core processes and business functions of the County and its citizens.

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: 2019-2021	
Project #1	Acquire Year 2020 Orthophotography
Project #2	Transform ESRI Parcel fabric data from NAD27 to NAD83 (modern map datum)
Project #3	Continued Support of AWS Cloud Computing
Project #4	PLSS Monument NAD83 Coordinate Densification
Project #5	PLSS Surveyor Data Upload Application
Project #6	Continuous Improvement Projects
Project #7	Lakefront Zoning Enforcement Data/App
Project #8	Next Gen 911 Data Compliance Project
Project #9	Enable Plats of Survey For Direct GIS Access

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.

Act 20 and the Statewide Parcel Map Initiative

A major development for the WLIP occurred in 2013 through the state budget bill, known as Act 20. It directed the Department of Administration (DOA) to create a statewide digital parcel map in coordination with counties.

Act 20 also provided more revenue for WLIP grants, specifically for the improvement of local parcel datasets. The WLIP is dedicated to helping counties meet the goals of Act 20 and has made funding available to counties in the form of Strategic Initiative grants to be prioritized for the purposes of parcel/tax roll dataset improvement.

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 (For 2016-2018 Grant Years)

- 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.

More recently, 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 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

County land information plans were initially updated every five years. However, as a result of Act 20, counties must update and submit their plans to DOA for approval every three years. The 2019-2021 plan, completed at the end of 2018, is the second post-Act 20 required update.

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 others as listed below.

Waukesha County Land Information Council and Plan Workgroup				
Name	Title	Affiliation	Email	Phone
+ James Behrend	Register of Deeds	Register of Deeds	jbehrend@waukeshacounty.gov	262-548-7586
+ Pamela Reeves	County Treasurer	County Treasurer	preeves@waukeshacounty.gov	262-548-7033
+ Candace White	Real Property Lister	County Dept. of Administration Tax Listing	cwhite@waukeshacounty.gov	262-548-7597
+ Paul Decker	County Board Member	Waukesha County Board	pdecker@waukeshacounty.gov	262-548-7002
+ James Landwehr	Land Information Office Representative	Land Information Officer	jlandwehr@waukeshacounty.gov	262-548-7946
+ Laura Kruschka	Realtor	Realtor Association Representative	laurakruschkarealtor@gmail.com	414-807-4684
+ 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.

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.

FOUNDATIONAL ELEMENTS

- PLSS
- Parcel Mapping
- LiDAR and Other Elevation Data
- Orthoimagery
- Address Points and Street Centerlines
- Land Use
- Zoning
- Administrative Boundaries
- Other 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	<ul style="list-style-type: none"> 1,985 (2,902 if one would include center of section, closing corners on quarter-section lines, and meander corners on quarter-section lines which are not part of the original government survey)
Number and percent of PLSS corners capable of being remonumented in your county that have been remonumented	<ul style="list-style-type: none"> 1,985, 100%
Number and percent of remonumented PLSS corners with survey grade coordinates (see below for definition) <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 1,985, 100% 2,902, 100% of all monumented corners original or not, all have established survey grade coordinates.
Number and percent of survey grade PLSS corners integrated into county digital parcel layer	<ul style="list-style-type: none"> 2,902, 100%
Number and percent of non-survey grade PLSS corners integrated into county digital parcel layer	<ul style="list-style-type: none"> 0, 0%
Tie sheets available online?	<ul style="list-style-type: none"> Yes, NAD83/2011 (planned delivery 7/31/18) with also NAD27 - https://maps.sco.wisc.edu/surveycontrolfinder/#7/44.730/-90.143/NGS,county,USGS,CORS/terrain Yes, NAD27 only - http://maps.sewrpc.org/regionallandinfo/survey.shtm
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)?	<ul style="list-style-type: none"> Corner identification is as follows: <ul style="list-style-type: none"> XXYYZZZ0 XX – Township YY – Range ZZZ0 – There are a possible 169 corners within a typical township with the Northeast corner of Section 1 being 0010 with the SW of 31 which could be again be 0010 (NE of Section 1) or if outside of the Region the number be 1690. The forth 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 found from adjacent Townships would number from the north line of the southern Township.
Does the county contain any non-PLSS areas (e.g., river frontage long lots, French land claims, private claims, farm	No

lots, French long lots, etc.) or any special situations regarding PLSS data for tribal lands?	
Total number of PLSS corners along each bordering county	<ul style="list-style-type: none"> • Milwaukee – 49; Washington – 72; Walworth – 50; and counties outside Region; Dodge – 19; Jefferson – 52; Racine - 46
Number and percent of PLSS corners remonumented along each county boundary	<ul style="list-style-type: none"> • Milwaukee – 49, 100%; Washington – 72, 100%; Walworth – 50, 100%; and counties outside Region; Dodge – 19, 100%; Jefferson – 52, 100%; Racine - 46 100%
Number and percent of remonumented PLSS corners along each county boundary with survey grade coordinates	<ul style="list-style-type: none"> • Milwaukee – 49, 100%; Washington – 72, 100%; Walworth – 50, 100%; and counties outside Region; Dodge – 19, 100%; Jefferson – 52, 100%; Racine – 46, 100%
In what ways does your county collaborate with or plan to collaborate with neighboring counties for PLSS updates on shared county borders?	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

- SEWRPC (in role as County Surveyor)

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 insuring 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

- Statutory Standards for PLSS Corner Remonumentation
 - Waukesha County’s practices are consistent with s. 59.74, Wis. Stats. Perpetuation of section corners, landmarks.
 - Waukesha County’s practices are consistent with s. 60.84, Wis. Stats. Monuments.
 - Waukesha County’s practices are consistent with ch. A-E 7.08, Wis. Admin. Code, U.S. public land survey monument record.
 - Waukesha County’s practices are consistent with ch. A-E 7.06, Wis. Admin. Code, Measurements.
 - Waukesha County’s practices are consistent with s. 236.15, Wis. Stats. Surveying requirement.
- 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
- Waukesha County’s PLSS corner coordinates were collected using methods consistent with a
- 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 1927 and vertically the National Geodetic Vertical Datum of 1929. In cooperation with the rest of the SEWRPC region, the county is currently undergoing a migration to modernize the system in the North American Datum of 1983 with the national readjustment of 2011 (NAD83/2011) and the North American Vertical Datum of 1988 (2012).

NAD27 - Sample Dossier Sheet

RECORD OF U. S. PUBLIC LAND SURVEY CONTROL STATION

U. S. PUBLIC LAND SURVEY CORNER	28/28 33/33	T <u>7</u> N, R <u>19</u> E, <u>WAUKESHA</u> COUNTY, WISCONSIN	
HORIZONTAL CONTROL SURVEY BY:	<u>OWEN AYRES & ASSOCIATES, INC.</u>	YEAR: <u>1992</u>	
VERTICAL CONTROL SURVEY BY:	<u>SEWRPC</u>	YEAR: <u>2017</u>	
STATE PLANE COORDINATES OF:	<u>QUARTER SECTION CORNER</u>	<u>NORTH WIT. CORNER</u>	<u>EAST WIT. CORNER</u>
NORTH	<u>381,044.96</u>	<u>381,092.81</u>	<u>381,046.95</u>
EAST	<u>2,466,310.69</u>	<u>2,466,309.79</u>	<u>2,466,364.13</u>
ELEVATION OF STATION	<u>951.516 (W NOTCH)</u>	<u>950.699</u>	<u>950.771</u>

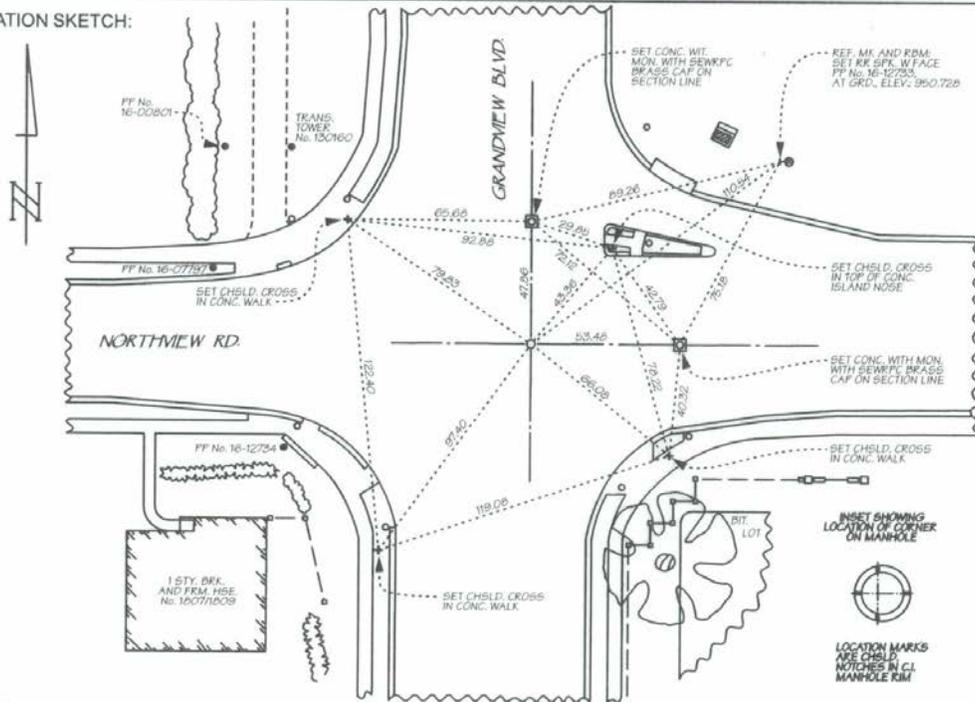
HORIZONTAL DATUM: WISCONSIN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE
NORTH AMERICAN DATUM OF 1927

VERTICAL DATUM: NATIONAL GEODETIC VERTICAL DATUM OF 1929

CONTROL ACCURACY: HORIZONTAL: THIRD ORDER, CLASS I THETA ANGLE: +1-11-55

VERTICAL: SECOND ORDER, CLASS II

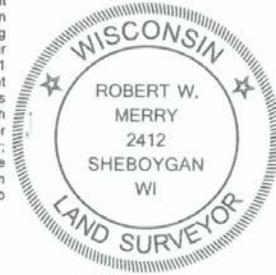
LOCATION SKETCH:



SURVEYOR'S AFFIDAVIT:

STATE OF WISCONSIN)
WAUKESHA COUNTY)

SS
As Waukesha County Surveyor, I hereby certify that following road reconstruction I set a concrete witness monument with SEWRPC brass cap on the one-quarter section line 47.86-foot north of the location of this corner, and a concrete witness monument with SEWRPC brass cap on the one-quarter section line 53.48-foot east of the location of this corner, said location falling on sanitary sewer manhole cover; replacing a concrete witness monument with SEWRPC brass cap on the quarter-section line 47.86-foot north of the location of this corner as set to witness this corner on August 21, 2002 by Kurt W. Bauer, S-157, former Waukesha County Surveyor; replacing a broken concrete witness monument; said witness monument with SEWRPC brass cap having been set to witness this corner 47.86-foot north of the location of this corner on June 22, 1991, also by Mr. Bauer; the easterly witness monument also set in 1991 having been found in-place and in good condition in 2002; on August 21, 1991 Mr. Bauer set the above mentioned witness monument 47.86-foot north of the corner location and a concrete witness monument with SEWRPC brass cap 53.48-foot east of the location of this corner, both monuments being on the quarter-section lines; replacing two broken witness monuments; said witness monuments with SEWRPC brass caps having been set to witness the location of this corner on the quarter-section line 47.86-foot north of the corner location, and 53.48-foot east of the corner location in June 1983 by Claude C. Johnson, Jr., S-765, former Waukesha County Surveyor; the location of this corner having been determined by Mr. Johnson using a punch hole found in the then existing sanitary sewer manhole cover; said punch hole having been previously found, referenced and accepted as marking the location of this corner by the Wisconsin Department of Transportation and the office of the City of Waukesha Engineer, and said punch mark having been set using ties to reference marks maintained by the office of the Waukesha County Surveyor dating back prior to 1946; said sanitary manhole having been installed in 1957; 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: 28 JUNE 2017


REGISTERED LAND SURVEYOR

S - 2412

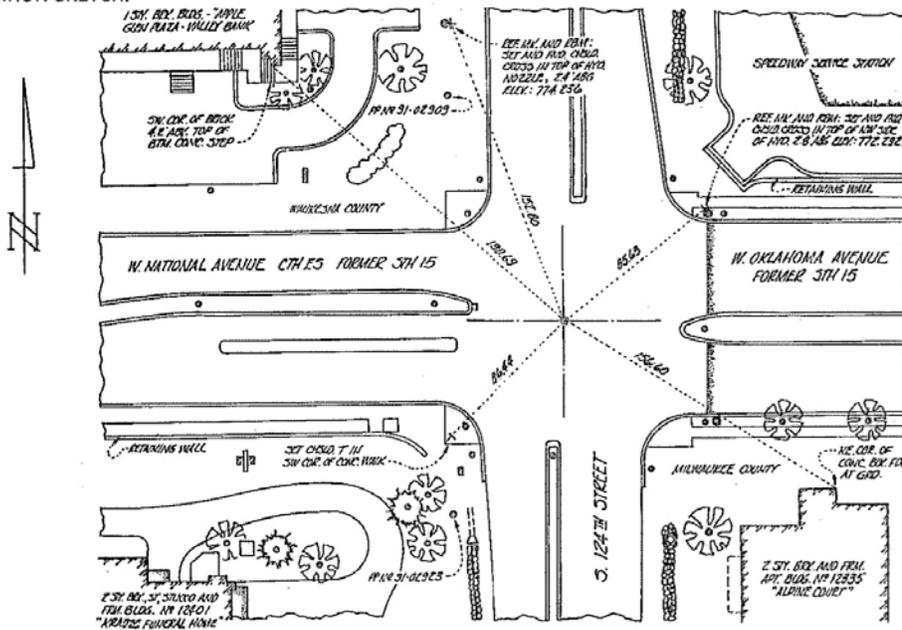
FORM PREPARED BY SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

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**New Dossier with both
NAD83/2011 and NAD27 - Sample Dossier Sheet**

RECORD OF U.S. PUBLIC LAND SURVEY CONTROL STATION			
U.S. PUBLIC LAND SURVEY CORNER	12 7 13 18	T 06 N, R 20 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:	ALSTER & ASSOCIATES, INC. 1966	HOR. CONTROL:	SEWRPC 2017
VERT. CONTROL:	AERO-METRIC ENGINEERING, INC. 2001	VERT. CONTROL:	
NORTHING:	366,157.00 USFT	NORTHING:	366,167.52 USFT
EASTING:	2,516,834.52 USFT	EASTING:	2,485,297.07 USFT
ELEVATION:	772.057 FT	ELEVATION:	FT
HOR. ACCURACY:	3rd ORDER, CLASS I	HOR. ACCURACY:	3rd ORDER, CLASS I (COMPUTED)
VERT. ACCURACY:	2nd ORDER, CLASS II	VERT. ACCURACY:	
RBM ELEV. IN SKETCH BELOW TIED TO NGVD29 DATUM. CONVERSION FROM NGVD29 _____ FT DERIVES NAVD88 HEIGHT			

LOCATION SKETCH:



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

As County Surveyor for Waukesha and Milwaukee Counties, I hereby certify that I found a concrete monument with SEWRPC brass cap as set to mark this corner in November 1991 by Gregory A. Kunz, S-1346, Consultant to the Waukesha County Department of Transportation, following highway reconstruction; replacing a concrete monument with SEWRPC brass cap set to mark this corner in March 1988 by Claude C. Johnson, Jr. S-765, Waukesha County Surveyor; replacing a broken concrete monument with City of New Berlin brass cap having been set to mark this corner in the summer of 1965 by Donald R. Polzin, S-624; replacing a cast iron plug with cross set in the then existing concrete pavement to mark this corner in 1957 by Donald J. Dlugopolski, State Highway Commission of Wisconsin Project Engineer, following highway reconstruction; replacing a cast iron plug with cross set in the then existing concrete pavement to mark this corner in 1931 by a Milwaukee County Highway Department project engineer following highway reconstruction; replacing an iron rod set in the then existing concrete pavement to mark this corner in 1913 by a Milwaukee County Highway Department project engineer following highway reconstruction; replacing an old cut limestone monument set to mark this corner in 1876 by Jonathan C. Crouse, Surveyor, in the conduct of the remonumentation of the U.S. Public Land Survey System in the Town of New Berlin; replacing in turn a wood post set to mark this corner in January 1836 by John Mullett, Deputy United States Surveyor, in the conduct of the original United States Public Land Survey; that I 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: 17 September 1993
REVISED: 8 June 2001

Kurt Bauer
REGISTERED LAND SURVEYOR



S - 157

FORM PREPARED BY SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION (SEWRPC)
CERTIFICATION APPLIES ONLY TO THE LOCATION SKETCH AND SURVEYOR AFFIDAVIT

06200530

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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

Parcel Mapping

Parcel Geometries

Layer Status

- **Progress toward completion/maintenance phase:** In Waukesha County, 100% of the county's parcels are available in a commonly-used digital GIS format. (ESRI Geodatabase). New parcels are added using Coordinate Geometry (COGO) techniques.
- **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 1927, Wisconsin State Plane coordinate System, South Zone.
- **Integration of tax data with parcel polygons:** The County does have a parcel polygon model that directly integrates tax/assessment data as parcel attributes using a common tax key number to link to tax assessment data as well as many other data sets.
- **Esri Parcel Fabric/LGIM Data Model:** The county does use or plans to implement the Esri Parcel Fabric Data Model, and/or ESRI's Local Government Information Model. The county migrated to the ESRI Parcel Fabric in 2017 and has been maintaining them in that form ever since.
- **Online Parcel Viewer Software/App and Vendor name:** Geocortex Essentials was used by internal staff to develop Waukesha County's cloud hosted (AWS) application.
- **Unique URL path for each parcel record:**
<https://prd1.waukocgeo.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.

Custodian

- Waukesha County Parks and Land Use, Land Information System Division

Maintenance

- **Update Frequency/Cycle.** Parcel polygons are updated monthly at the moment with an ongoing effort to keep parcels current to no more than 30 days from when documents are filed. There are currently four municipalities (Brookfield, Muskego, New Berlin and Waukesha) that do their own parcel mapping. The parcels from those communities are merged into the county's parcel fabric when they are provided. 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 all codes used in the file. The county migrated its parcels to the ESRI Parcel Fabric data model in 2017 in an attempt to facilitate easier data exchange and maintenance.

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, New Berlin 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 Tax Listing Division is 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 an automated tax assessment .XML export process for each of the 37 communities within the county. These files are then ingested into the Statewide Parcel toolset to create a single .xml file. This file is joined to the parcel and then manual processes are used to cleanse, reformat and quality check the data prior to provision to the State Department of Administration.
- **Searchable Format Workflow:** The County maintains parcel/tax roll data in such a way that **requires significant formatting every year**—whether by in-house county staff, or a third-party contractor/vendor. To clarify, despite now having the data exported to a DOA compatible .xml format, there is still significant manual effort to fill missing values and/or meet the extensive needs of the searchable format. Some of this is due to inconsistencies between the four communities that do their own tax listing. However, if the searchable format was not a fluid and evolving standard subject to change from year to year, it would be easier to automate more of the processes to meet the state requirements.

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

- POWTS, Private Onsite Wastewater Treatment Systems are linked to parcels by Tax Key number for use with the Transcendent Technologies application in the Waukesha County Parks and Land Use Environmental Division.

Custodian

- Parks and Land Use – Environmental Health Division

Maintenance

- The Environmental Health division staff enter new permits as they are received and the parcels are automatically linked via a join to the parcel polygons.

Standards

- POWTS data and information is compliant with all county ordinances and state statutes.

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.

- **ROD Software/App and Vendor Name:** Aumentum Reporter – from vendor Thomson Reuter

Custodian

- County Register of Deeds
County Register of Deeds also serves as Deputy County Surveyor to enable acceptance of Plats of Survey.

Maintenance

- County Register of Deeds

Standards

- Waukesha County meets and complies with s. 59.43, Wis. Stats. Register of Deeds; duties, fees, deputies.
- Waukesha County meets and complies with 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 $RMSE(z) \times 1.9600$ 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, Version 1.2
- **Next planned acquisition year:** 2025

Custodian

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

Maintenance

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

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), etc.**

Layer Status

- Horizontal Datum: NAD83/2011, Wisconsin State Plane Coordinates, South Zone, US Survey Feet; Vertical 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 Department of Parks and Land Use – Land Resources Division

Maintenance

- None required as the LiDAR data set is static. Due to significant costs, the county will look to acquire new LiDAR every ten years or more frequently as budget allows. The next planned acquisition is 2025.

Standards

- United State Geological Survey (USGS) – LiDAR Base Specifications, Version 1.2.

Other Types of Elevation Data

Layer Status

- Waukesha County does not have other types of elevation data.

Orthoimagery

Orthoimagery

Layer Status

- **Most recent acquisition year:** 2015
- **Resolution:** 6 inch pixel resolution
- **Contractor's standard:** Spring acquisition leaf-off.
- **Next planned acquisition year:** 2020. The county has historically compiled orthophotography on a five year cycle, though significant interest has been generated in recent years toward obtaining aerial photography on a more frequent basis. Beyond 2020 the County will be investigating costs/ROI on an interim product, perhaps in 2023.
- **WROC participation in 2020:** Confirmed participating via a region-wide project administered by SEWRPC to obtain 3-inch pixel resolution

Custodian

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

Maintenance

- Land Information System Division, however no maintenance activities are anticipated.

Standards

- Orthophotos were compiled to meet National Map Accuracy Standards for 1:1200 scale.

Historic Orthoimagery

Layer Status

- 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 Department of Parks and Land Use – Land Resources Division

Maintenance

- Land Information System Division, however no maintenance activities are anticipated.

Standards

- 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, then scanned and georeferenced to an approximate horizontal accuracy of +/- 40'. For more details see related metadata at:
<http://prd1.waukcogeo.com/Images/Online%20Help/metadata/Orthophotography.htm>

Other Types of Imagery

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

Layer Status

- 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 Department of Parks and Land Use – Planning Division

Maintenance

- None

Standards

- 2017 – High Resolution JPEG files with accompanying Index map of approximate location.
- 1996 – High Resolution PCD proprietary format files.

Address Points and Street Centerlines

Address Point Data

Layer Status

- Address points are complete for the county.
- Address Points are maintained for each address in the County.
- Address Points are linked to a related tax parcel and a related street centerline segment
- Address Points are tied to a normalized street name table
- Address Points are linked to the Environmental Health Premise scanned files.
- Address Points are provided to the Waukesha County Emergency Preparedness Department for use in the shared dispatch system.
- Address Points are provided to the Wisconsin Government Accountability Board for use in the Statewide Voter Registration System (SVRS).
- All new Address Points are shared with Tax Listing Division

Custodian

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

Maintenance

- Site address points and centerlines 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). These notifications are then entered by the Land Information System Division and sent to the Tax Listing department for verification.

Standards

- Addresses are maintained according to USPS standards
- Addresses are formatted to comply with the ESRI Local Government Address Data Model

Building Footprints

Layer Status

- Building footprints were generated for all Townships with the exception of Eagle and Ottawa as a product of several SEWRPC planimetric mapping projects from the mid-1980's to 2000. This layer is not complete for the County. (Eagle and Ottawa townships missing)

Custodian

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

Maintenance

- As building codes and permits are administered at the local levels, the building outlines are not maintained by Waukesha County and, as a result, are significantly out of date.
- There is no objective in the current plan to update building footprints.

Standards

- None

Other Types of Address Information

e.g., Address Ranges

Layer Status

- Addresses are attributed on street centerlines for the entire county and some outlying areas in surrounding counties that have shared assistance agreements with County Dispatch. This layer is complete for the County.
- Centerlines contain attribute for jurisdiction
- Link to normalized street name table
- Assigned local name and linked to street name alias table for alternate names and other designations
- Contain attributes for address range formatted as Left/Right, Low/High
- Attributes account for Waukesha County's unique coordinate addressing in rural areas.

Custodian

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

Maintenance

- Completed by Land Information Office staff concurrent with updating the address point data file.

Standards

- None

Street Centerlines

Layer Status

- Street centerlines are maintained county wide for use in County Dispatch/E911 operations. This layer is complete for the County.

Custodian

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

Maintenance

- Centerlines are added using preliminary plats georeferenced to existing parcel framework.

Standards

- None

Rights of Way

Layer Status

- Rights of Way are complete for 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

- None

Trails

e.g., Recreational Trails

Layer Status

- County maintained trails are complete for the county.

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

- 2010 Existing Land Use. (Currently awaiting a 2015 update.)

Custodian

- 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.

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/Jurisdiction layers for all unincorporated areas, in addition to floodplain study boundaries above and beyond FEMA's mapped boundaries.
- The layer is 100% complete for the unincorporated areas of the county.

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.
- This layer is 100% complete for the county.
- **Year of certification:** 2015. Data has been updated to 6/2018.

Custodian

- DATCP

Maintenance

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

Standards

- DATCP

- s. 66.1001, Wis. Stats. Comprehensive planning.

Floodplain Zoning

Layer Status

- The County does maintain a GIS representation of floodplain zoning boundaries
- The county's floodplain zoning GIS data is the same as/identical to the FEMA map.
- 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 DNR

Maintenance

- Federal Emergency Management Agency (FEMA)
- Wisconsin Department of Natural Resources

Standards

- Federal Emergency Management Agency floodplain standards

Airport Protection

Layer Status

- The County does maintain a GIS representation of airport protection zoning boundaries. The layer is 100% complete.
- **Airport protection zoning map depicts:** Height limitation restrictions, airport aviation 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 occurrence.

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

- Eight towns, Brookfield, Eagle, Genesee, Lisbon, Merton, Waukesha, Mukwonago and Vernon - contract with the County to perform zoning map creation and maintenance to support each Town Zoning Ordinance.

Custodian

- Parks and Land Use Department – Planning and Zoning Division

Maintenance

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

Standards

- Town Zoning ordinances for, Brookfield, Eagle, Genesee, Lisbon, Merton, Waukesha, Mukwonago and Vernon.

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 Department of Parks and Land Use – Land Resources Division

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:**
 - **Attributes linked to parcels:** Parcels contain a school district code. The parcels were dissolved by district code to create a polygon overlay boundary. Work is underway to better integrate/update and display the school district polygons so attribute changes are reflected immediately and can be symbolized accordingly.

Custodian

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

Maintenance

- Tax Listing maintains school district codes in tax system. LIS maintains map layer, incorporating changes from Tax Listing.
- Work is underway to better integrate/update and display the school district polygons so attribute changes are reflected immediately and can be symbolized accordingly.

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.

Custodian

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

Maintenance

- Land Information System Division 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. The Land Information System Division works with both Departments to get complete information. Work is underway with Tax Listing and County Clerk to insure more complete and timely recording and mapping of annexations and resultant wards.

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.

Public Safety

e.g., Fire/Police Districts, Emergency Service Districts, 911 Call Center Service Areas, Public Safety Answering Points, Healthcare Facilities

Layer Status

- The following layers are 100% complete for the county:
 - ESN
 - PSAP
 - Fire ESZ
 - Law ESZ
 - Emergency Facilities (Shelters)
 - Fire/EMS Stations
 - Hospitals
 - Nursing Homes
 - Law Enforcement Stations

Custodian

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

Maintenance

- Updated as new facilities are reported.

Standards

- None

Lake Districts

Layer Status

- The Tax Listing database has Lake District codes for several districts in the County, however those codes are not included in the .xml export used to create ownership parcels. These codes are 100% complete for the districts the County administers.

Custodian

- Waukesha County Tax Listing department

Maintenance

- Files are maintained on a monthly cycle.

Standards

- None

Native American Lands

Layer Status

- Waukesha County does not have a Native American Lands layer.

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

- Annually or as plan evolves.

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

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.

Custodian

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

Maintenance

- Static data.

Standards

- None

Cell Phone Towers

Layer Status

- Waukesha County does not have a cell phone towers layer.

Bridges and Culverts

Layer Status

- Bridges and County-owned culverts are 100% complete for the county. Bridges are coded with links to photos and as built documents.

Custodian

- Waukesha County Department of Public Works

Maintenance

- Updated as needed.

Standards

- None

Other

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

Layer Status

- The following layers are 100% complete for the County.
- Railroads
- Non-Metallic Mining sites
- Agricultural Waste Storage sites

Custodian

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

Maintenance

- Updated as needed.

Standards

- None

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:

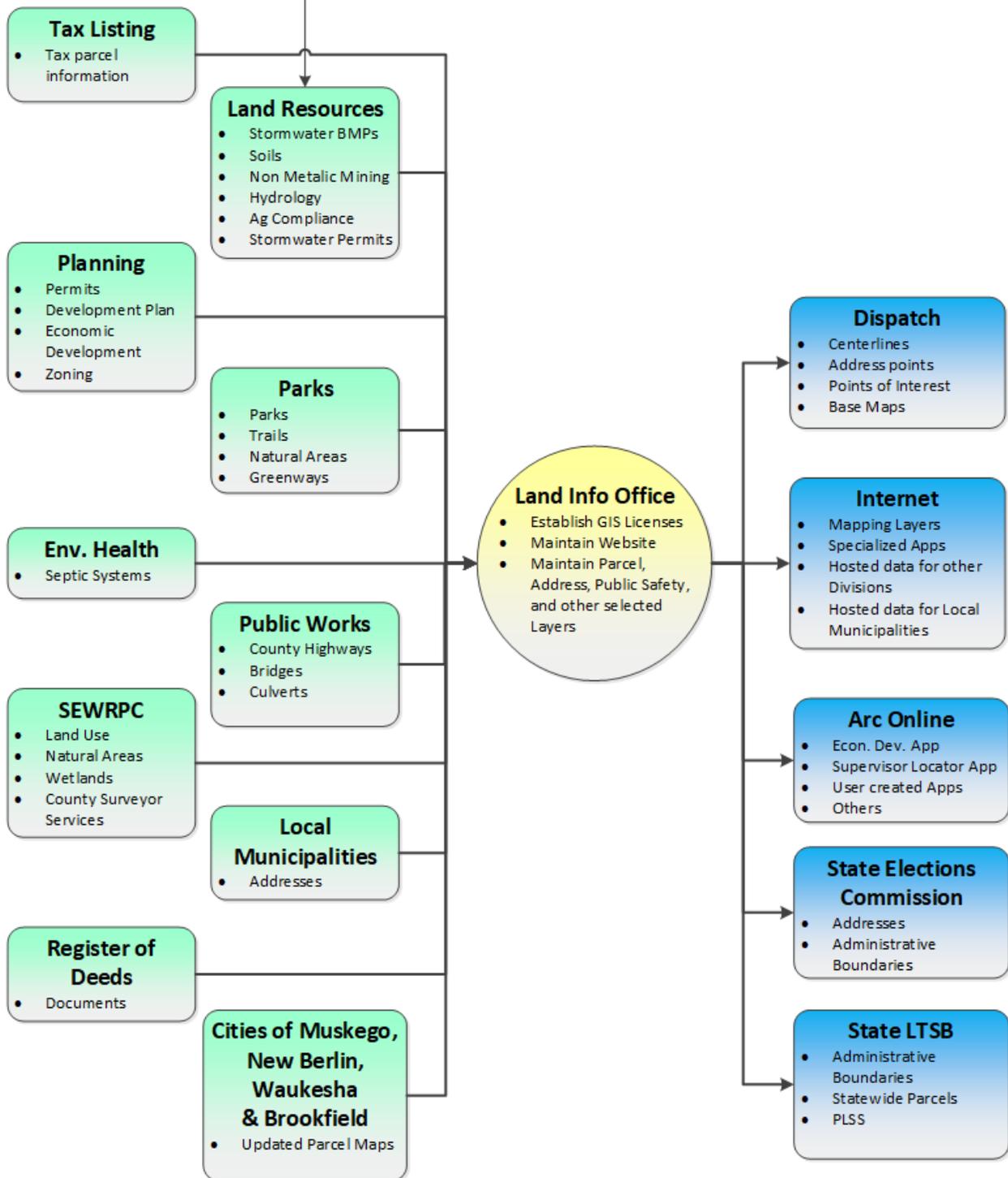
- The design, development, and implementation of a land information system that contains and integrates, at a minimum, property and ownership records with boundary information, including a parcel identifier referenced to the U.S. public land survey; tax and assessment information; soil surveys, if available; 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

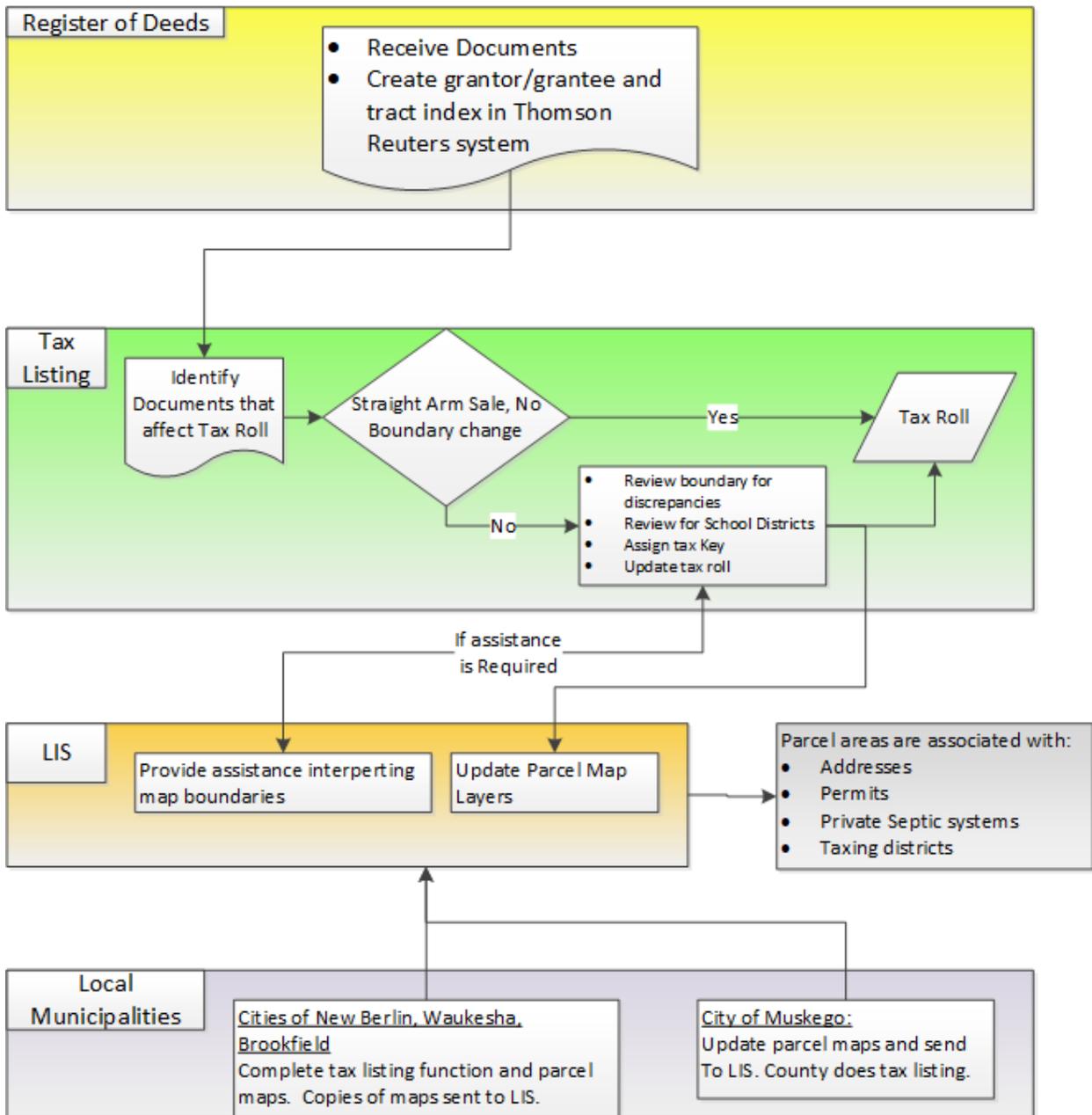
Diagram of County Land Information System

Waukesha County Land Information System Components and Relationships



County Parcel Data Workflow Diagram

Waukesha 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

- In 2015, Waukesha County moved all software and data related to the Land Information System to computer servers hosted by Amazon Web Services. The County is currently running 5 instances (servers) as part of the GIS technology stack.

Software

- Waukesha County is currently licensed for the software products below.

Company	Product	Purpose
ESRI	ArcGIS Enterprise	Hosting Web services and supporting data
ESRI	ArcGIS for Desktop	Data editing and analysis
ESRI	ArcGIS Pro	Data editing and analysis
ESRI	3d Analyst, Spatial Analyst, Data Interoperability, Image Server	Special purpose analytics
ESRI	ArcOnline account	Online data application site
ESRI	ArcCatalog	FGDC compliant metadata on all foundational element datasets
Latitude Geographics	Geocortex Essentials	Web map application creation and maintenance
Safe Software	FME	Data format conversion and ETLs
Thomson Reuters	Aumentum Reporter	Register of Deeds Document Imaging and Indexing system
Hamer Enterprises	EZ Tax	Tax Listing and Billing

Website Development/Hosting

- Public access to land information is provided via 1 general public facing website. The url for the site is: https://prd1.waukcogeo.com/HTML5Viewer/?viewer=html_viewer_ext Access to parcels, tax, addresses, school districts, supervisory districts, floodplains, zoning (where administered by the County), land use, public lands, soils, PLSS, elevation, hydrography, and historic aerial photography is provided via this single site. In addition to this public site the county also hosts twelve other websites for internal use. These sites allow viewing, querying and editing functions for planning and Land Resources staff as well as collaborative work with field staff and municipal partners. Waukesha County will continue to provide additional public access to data through the development of specialized web mapping applications that will be hosted in the ArcOnline and ArcGIS Portal.

Metadata and Data Dictionary Practices

Metadata Creation

- **Metadata creation and maintenance process:** Waukesha County maintains FGDC metadata for all of its core foundational elements. This metadata is then provided as a clickable link on the GIS website. For all new data acquired from vendors, FGDC standard metadata is a required deliverable.

Metadata Software

- **Metadata software:** ESRI ArcGIS Catalog

- The software does generate metadata consistent with the FGDC Content Standard for Digital Geospatial Metadata, and ISO geographic metadata standard 19115.
- **Metadata fields manually populated:** None

Metadata Policy

- **Metadata Policy:** No formal policy.

Municipal Data Integration Process

- Waukesha County has had a longstanding relationship with four municipalities that conduct their own parcel maintenance activities, namely the cities of Brookfield, Muskego, Waukesha and New Berlin. With the County's move to the parcel fabric, the County now provides Amazon workspaces (virtual desktops) to the municipalities to better facilitate updates to the fabric and export back to the County. Once the County receives the municipal parcel data it merges those into the overall County fabric. The County tax listing department also receives tax roll information from Brookfield, New Berlin and Waukesha for incorporation into the County Tax File. There is now a DOR compliant .xml export routine that can be run to create a series of xmls for each municipality. Those are merged to make a single .xml for the County for joining an embedding into the countywide parcel set.

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://prd1.waukcogeo.com/HTML5Viewer/?viewer=html_viewer_ext	https://data-waukeshacounty.opendata.arcgis.com/	http://tax.waukeshacounty.gov/Default.aspx	https://landrecordspublicaccess.waukeshacounty.gov/

Single Landing Page/Portal for All Land Records Data

URL

<http://waukeshacounty.maps.arcgis.com/home/gallery.html?view=grid&sortOrder=desc&sortField=modified#c=organization&o=numviews>

Municipal Website Information

Municipal Website

Municipal Website URL

City of Brookfield GIS Web Map	https://webgis.ci.brookfield.wi.us/BrookfieldWebMap/
Village of Hartland GIS Web Map	https://maps.ags.ruekert-mielke.com/Html5Viewer/Index.html?viewer=hartland
City of Waukesha GIS Web Map	http://gis.ci.waukesha.wi.us/Html5Viewer/?viewer=property
City of Muskego GIS Web Map	http://www.mapmuskego.com/mapPUBLIC/
City of Mukwonago GIS Web Map	https://maps.ags.ruekert-mielke.com/Html5Viewer/Index.html?viewer=Mukwonago

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 cost through the ROD's online document purchasing application.

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

Training and Education

- Waukesha County Land Information staff members are always encouraged to attend conferences and seminars to stay current on technology and trends.
- Conferences typically attended include the ESRI Users Conference, WLIA Annual Conference and Regional Meetings, ESRI Wisconsin Users Group, and GIS Day.
- The LIS Supervisor coordinates a Southeastern Wisconsin ESRI Technical Users Group meeting biannually.
- More recently, select County staff has taken online training for Amazon Web Services administration, as well as attending AWS Summits.
- In house efforts include a Waukesha GIS Technical Users group to focus on training and collaboration with county departments and divisions.

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.

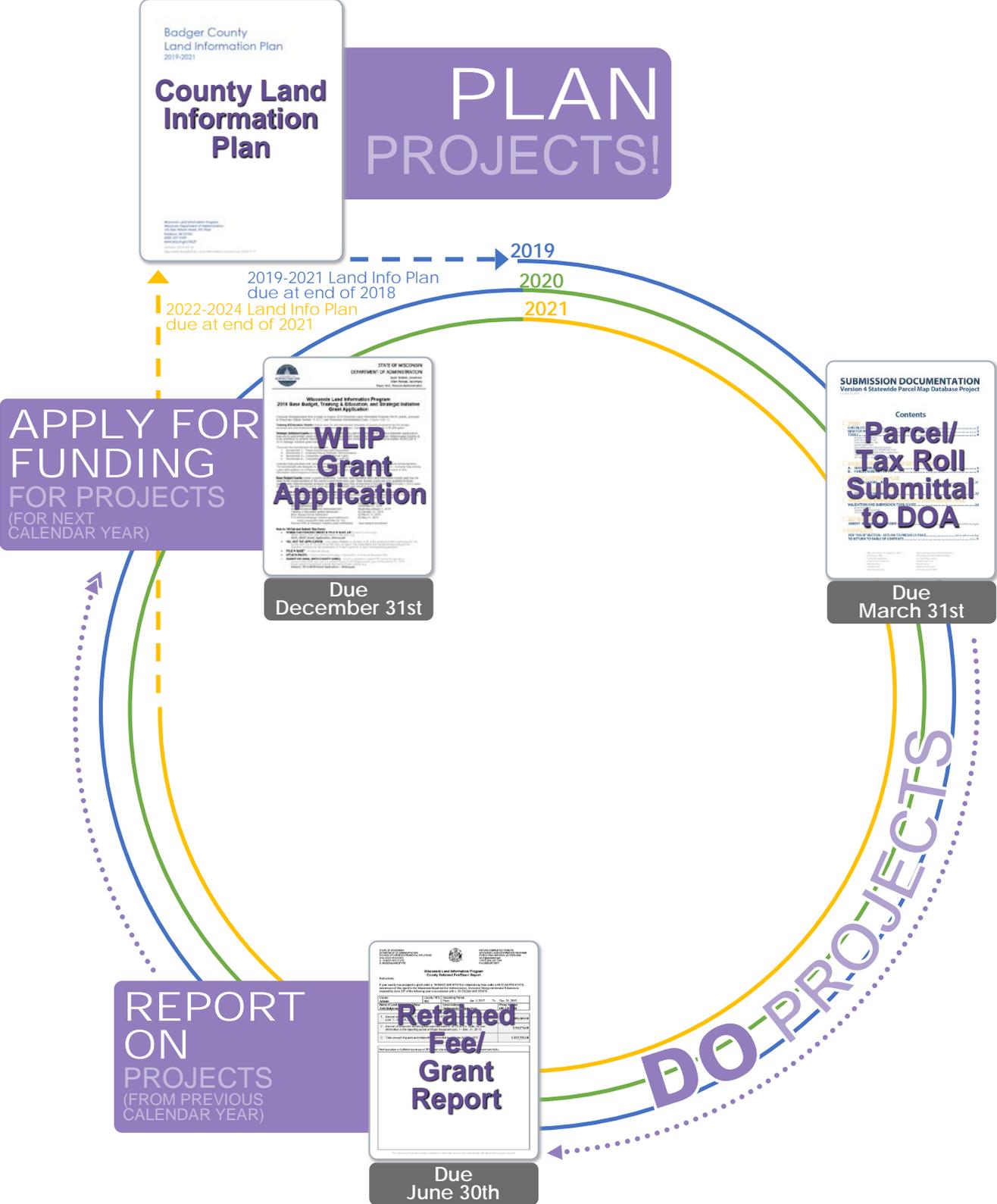


Figure 1. The WLIP Land Information Plan/Grant Project Cycle

Project Plan to Maintain Searchable Format (Benchmarks 1 & 2)

Project Description/Goal

How Searchable Format Will Be Maintained

- In 2018, the Waukesha County Tax Listing office, in coordination with the Land Information Office, County Information Technology and Hamer Technologies, enabled the export of a DOA compliant .xml export process/application. These exported files will expedite the creation of the parcels for the statewide parcel submission including the fields and attributes necessary for the searchable format.

Business Drivers

- The Project Plan to Maintain Searchable Format for Benchmarks 1 & 2 is a requirement for those counties who utilize Strategic Initiative funds for parcel/tax roll formatting to prepare the data submission to Wisconsin Department of Administration.
- The Wisconsin Department of Administration compliant .xml file can also be used to provide a monthly export for joining to parcels to display ownership and assessment information on the GIS website.

Objectives/Measure of Success

- The objective is to continue to meet the Searchable Format for Benchmarks 1 & 2 (Parcel and Zoning Data Submission, Extended Parcel Attribute Set Submission).
- **

Project Timeframes

Timeline – Project Plan to Maintain Searchable Format		
Milestone	Duration	Date
Provide parcels to DOA	–	3/31 Annually

Responsible Parties

- Waukesha County Tax Listing
- Waukesha County Land Information Office
- Waukesha County Information Systems
- Hamer Technologies

Estimated Budget Information

- \$1123 – 3 days LIS Analyst hourly salary (\$46.78 X 24 hours)

Project Plan for PLSS (Benchmark 4)

Project Title: Project Plan for PLSS (Benchmark 4)

Project Description/Goal

Planned Approach

- By Year End, 2018, 100% of the survey monument corner coordinates will reflect the NAD83(2011)/NAVD88(2012) values from their previous NAD27/NGVD29 values. This transformation project was conducted by SEWRPC using GPS and modern surveying methods and was funded in part from the 2015-2018 Strategic Initiative Grant monies. The new coordinate values will persist the Third Order Class I accuracy.

Current Status

- **Tally of the total number of corners:** 2902
- **Remonumentation status:** Complete
- **Coordinate status (accuracy class) if known:** Third Order Class I (100%).

Goals

- **Number of corners to be remonumented and/or rediscovered:** 0
- **Number to have new coordinates established:** 2902 - most corners will have a Least Squares Adjusted value.
- **Accuracy class for these new coordinates:** Third Order Class I (100%).
- **Way in which these points will be integrated into the parcel fabric:** As part of the parcel fabric transformation to NAD83(2011), it is anticipated that these new corners will be imported with a designator referencing their values as NAD83(2011). It is also anticipated that the existing NAD27 coordinates will be designated as "historic" or "NAD27" so they can continue to be referenced for historical documents tied to them.

Missing Corner Notes

- **Documentation for any missing corner data:** NA

County Boundary Collaboration

- SEWRPC hosts all Dossier and Control Survey Summary Diagram sheets related to Waukesha County's outermost boundaries. These are accessible to the surveying community at the following link.
 - <http://maps.sewrpc.org/regionallandinfo/survey.shtm>

Business Drivers

- The Project Plan for PLSS is a requirement for those counties who utilize Strategic Initiative funds for work related to PLSS completion and integration.
- **

Objectives/Measure of Success

- The objective is to meet Benchmark 4 (Completion and Integration of PLSS) by **date.

Project Timeframes

Timeline – Project Plan for PLSS		
Milestone	Duration	Date
Project start	-	January 1, 2018
Horizontal control point collection begins	3 months	July 1-Oct. 1st 2018
Coordinate transformation processing	2 months	Oct. 1 st – Nov. 30th
Delivery of Horizontal Control	-	December 31, 2018
Delivery of Vertical Control	-	February 2019

Responsible Parties

- SEWRPC (In role as County Surveyor)

Estimated Budget Information

- \$153,250.00 funded largely by 2016–2018 Strategic Initiative Grant Monies.

Project #1: Acquire Year 2020 Orthophotography

Project Description/Goal

- Acquire 3" pixel resolution color leaf-off aerial photography for Waukesha County in the spring of 2020.
- **Land Info Spending Category:** Orthoimagery

Business Drivers

- Orthophotography is a critical and highly used GIS layer within the County's land information system.
- Orthophotos are used for zoning enforcement, hardcopy map displays for development, planning activities, address/structure verification, etc.
- Planning has determined that 5 years between aerial photo acquisition is a minimum. In the next strategic grant cycle, a 2023 acquisition may be included to insure our aerial photography data is not more than 3 years old.
- Improved resolution to 3" pixels will allow for improved feature identification, especially decks, impervious surfaces and assets.

Objectives/Measure of Success

- Delivery and acceptance of orthophoto product within time frame outlined in contract.

Project Timeframes

Timeline – Project #1 Title		
Milestone	Duration	Date
Planning & vendor selection	-	Fall/Winter 2018
Aerial Photography Missions	-	April, 2020
Product delivery	-	12/2020

Responsible Parties

- SEWRPC – Contract draft and oversight, QC, liaison/coordinator for regional partners.
- Aerial Photography Vendor – Flight, data collection, ground control, data processing.
- Waukesha County Land Information Systems Division – Leverage data and make available.

Estimated Budget Information

\$70,000

Project #2: Transform ESRI Parcel data from NAD27 to NAD83

Project Description/Goal

- Transform ESRI parcel fabric to NAD83/2011 from NAD27.
- Land Info Spending Category:** Digital Parcel Mapping

Business Drivers

- Waukesha County migrated parcels to the ESRI parcel fabric in 2017. After all other county data is transformed to NAD83/2011 in 2018, parcels will need to be migrated to the new datum as well. The process for this migration is unknown and will potentially require vendor assistance.
- The migration to NAD83 will insure vertical integration with other County GIS layers that have previously been migrated.
- The migration will include importing the NAD83/2011 PLSS monument coordinate values into the parcel fabric while maintaining the existing NAD27 monument values.

Objectives/Measure of Success

- Vertical integration and integrity with other GIS layers.
- Easier data sharing between state and local agencies already on NAD83/2011 datum.

Project Timeframes

- 2019

Responsible Parties

- Waukesha County Parks and Land Use – Land Information System Division
- Contracted Services Vendor, TBD

Estimated Budget Information

- \$3,000

Project #3: Continued Support of AWS Cloud Computing

Project Description/Goal

- Continued support of AWS cloud computing
- **Land Info Spending Category:** Hardware

Business Drivers

- Flexibility and scalability for providing infrastructure and tools offered by Amazon Web Services.
- Waukesha County is currently undergoing a countywide assessment of potential cloud computing opportunities, with GIS being the forerunner.
- Ongoing cost savings from former IT cross charges for in-house hardware/network.

Objectives/Measure of Success

- System uptime, scalability and performance optimization.

Project Timeframes

- 2019-2021

Responsible Parties

- Waukesha County Parks and Land Use – Land Information System Division
- Contract with Amazon Web Services

Estimated Budget Information

- \$144,000 (\$48,000/annually X 3)

Project #4: PLSS Monument NAD83 Coordinate Densification

Project Description/Goal

- This initiative would fund SEWRPC to occupy monuments and gather horizontal coordinates for monuments 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

- 2020-2021

Responsible Parties

- SEWRPC or contracted services vendor
- Waukesha County Parks and Land Use – Land Information System Division

Estimated Budget Information

- \$80,000 (\$40,000/annually X 2)

Project #5: PLSS Surveyor Data Upload Application

Project Description/Goal

- Enable surveyors in the field or office to upload field verified NAD83/2011 monument coordinates and/or documents to SEWRPC for verification and inclusion into PLSS dossier sheets.
- **Land Info Spending Category:** PLSS

Business Drivers

- Continued maintenance of PLSS network
- Increased accuracy of PLSS network.
- Automated and centralized data collection of field documents.

Objectives/Measure of Success

- Upload application becomes the standard for survey data storage.
- Historical references to monuments visited by surveyors becomes part of public record.

Project Timeframes

- 2020-2021

Responsible Parties

- SEWRPC or contracted services vendor
- Waukesha County Parks and Land Use – Land Information System Division

Estimated Budget Information

- Application Development - \$30,000

Project #6: Continuous Improvement Projects

Project Description/Goal

- Continue to provide a high level of service for data access and public record information to public as well as county staff via web applications, open data portal, and imaging system.
- **Land Info Spending Category:** Hardware, Software, Website Development/Hosting Services.

Business Drivers

- Increased demand for data access and acquisition by public and internal departments.
- The Parks and Land Use LIS System Plan developed in 2018 includes working toward a more distributed, enterprise approach which requires additional software, licenses and applications.

Objectives/Measure of Success

- Faster, easier and more reliable access to GIS data through desktop applications and portals as well as mobile-friendly applications and data collection.

Project Timeframes

- 2020-2021

Responsible Parties

- Waukesha County Parks and Land Use – Land Information System Division

Estimated Budget Information

- \$15,000 GIS Server Software
- \$5,000 Web Hosting Software
- \$5,000-\$10,000 ESRI Level II ArcOnline or On-Premise Portal licenses

Project #7: Waterfront Zoning Enforcement Data/Application

Project Description/Goal

- Provide applications and support data acquisition to facilitate zoning regulations around lakes and waterways especially with regards to impervious surfaces and drainage.
- **Land Info Spending Category:** Other Parcel Work

Business Drivers

- Waterway protection
- Increasing reliance on GIS data for informed decision making and planning efforts.

Objectives/Measure of Success

- One stop access for lake and water protection, regulation and zoning data
- GIS data integration with SharePoint imaging system, georeferenced oblique aerials, etc.

Project Timeframes

- 2020-2021

Responsible Parties

- Waukesha County Parks and Land Use – Planning and Zoning Division
- Waukesha County Parks and Land Use – Land Resources Division

Estimated Budget Information

- \$10,000 Application development
- \$12,000 Data Collection (Oblique Aerial Photos or other sources.)

Project #8: Next Gen 911 Data Compliance Project

Project Description/Goal

- Insure that County E911 point, centerline and zone information is compliant with Next Gen 911 (NG911) specifications
- **Land Info Spending Category:** Address Points, Street Centerlines

Business Drivers

- Next Gen 911 data requirements
- Increasing reliance on GIS data for police, fire and emergency management activities.

Objectives/Measure of Success

- 100% compliance with data standards set forth and guided by Statewide NG911 Plan.
- Full GIS integration with County Dispatch and Emergency Management

Project Timeframes

- 2020-2021

Responsible Parties

- Waukesha County Communications
- Waukesha County Parks and Land Use – Land Resources Division

Estimated Budget Information

- \$50,000 Data compilation including, turn lanes, one ways, dual carriageways, speed limits, impediments, road closures, point/centerline association, field mapping etc.

Project #9: Enable Plats of Survey for Direct GIS Access

Project Description/Goal

- Index Plats of Survey recorded in the Register of Deeds office to make them accessible to the public via a link to tax key or document number
- **Land Info Spending Category:** Digital Parcel Mapping

Business Drivers

- Ongoing phone requests for existing Plats of Survey
- Reduce Register of Deeds office traffic/inquiries

Objectives/Measure of Success

- 100% of all plats are searchable within the GIS application using tax key, retired tax key or document number

Project Timeframes

- 2020-2021

Responsible Parties

- Waukesha County Register of Deeds
- Waukesha County Parks and Land Use – Land Resources Division

Estimated Budget Information

- \$80,000 Consultant or in-house staff retrieving plat of survey, appending tax key or retired tax key to existing index.



5 APPENDIX

Waukesha County *Department of Parks and Land Use*

Waukesha County Land Information Council Meeting

Waukesha County Administration Center, Room AC170

11/20/2018 10:00 AM

Present: Jim Landwehr, Robert Merry, Laura Kruschka, Jim Behrend, Pam Reeves, Candace White, Mark Mader, (representing Paul Decker)

Absent: Gary Bell

1. Introductions were made. Jim Landwehr gave an overview of the structure and purpose of the committee as well as a brief discussion about the realignment of the GIS/LIS staff and division.
2. Discussion of Draft 3 Year Land Information Plan. Jim Landwehr went through the plan discussing the Executive Overview, the Foundational Layers, Act 20 statewide requirements and the eight projects in the current draft. Comments were offered from Mark Mader and Laura Kruschka regarding making Plats of Survey more accessible to the public using GIS. Jim Landwehr responded by offering a ninth project he had prepared before the meeting for discussion on the topic of making plats of survey indexed to tax keys, and thus more accessible. The idea spurred conversation across the group regarding the potential benefits and difficulties of attempting to link metes and bounds parcels to plats of survey. In the end it was agreed upon that it would be a project with wide-reaching benefits and thus should be included in the plan.
3. A vote was taken on adopting the Waukesha County Draft Land Information Plan with the provision for adding a ninth project of "Enable Plats of Survey for Direct GIS Access" as presented at the meeting. Vote was unanimous to accept the plan with the ninth project added.
4. 2019 Strategic Initiative Grant Overview. Jim Landwehr presented the 2019 grant project draft which includes earmarking grant dollars for 2020 aerial photography as well as a parcel fabric conversion to NAD83. He also gave a reminder that the 2015-2018 grant projects were used for converting the PLSS from the antiquated NAD27 datum to the more modern NAD83 datum.
5. NAD27 to NAD83 datum conversion update. This topic was covered in the discussion of the plan as well as the 2015-2018 grant projects so required no further detail.
6. Other Items. There were no other items requiring discussion. It was asked that the next Land Information Council meeting be scheduled in the early part of November, 2019.
7. Meeting Adjourned at 11:15 AM.