WASHINGTON COUNTY
WISCONSIN

Land Information Plan

2018 Update

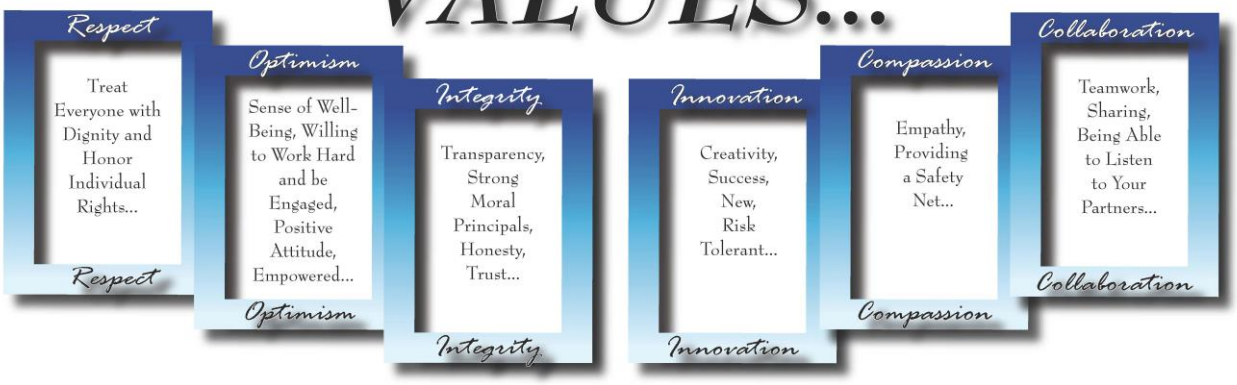
Our VISION...

As trusted stewards of Washington County's future, we provide innovative and cost effective core public services.

Our MISSION...

Washington County is a collaborative leader in providing efficient and effective public services for the well-being of our citizens.

VALUES...



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Approved/Adopted by Land Information Council on: 2018-11-13

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EXECUTIVE SUMMARY

About this Document. This document is a land information plan for Washington County prepared by the land information officer (LIO) and the 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, Washington County was awarded $51,000 in WLIP grants and retained a total of $179,280 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 Washington 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, emergency planning and response, and a host of other citizen services. The Washington 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. The Washington County Land Information Office will create and maintain a countywide framework of shared geographic information that conforms to standards enabling data sharing and collaborative decision making.

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

Washington County Land Information Projects: 2019-2021	
Project #1	**Public Land Survey System Monument Maintenance**
Project #2	**Land Use Sanitation/Zoning Modernization**
Project #3	**Floodplain Mapping**
Project #4	**Historic Tax Roll Scanning**
Project #5	**Major Hardware Acquisitions**
Project #6	**County Surveyor Modernization Projects**
Project #7	**2020 Orthophotography Acquisition**
Project #8	**Land Conservation Program Upgrades**
Project #9	**Ongoing Costs Not Associated with a Specific Project**
Amendment #1	**City of West Bend Tax Roll Data Integration**

The remainder of this document provides more details on Washington 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.

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 Washington County is meeting these benchmarks appears in the Foundational Elements section of this plan document.

County Land Information System History and Context

The original Land Information Plan for Washington County, completed in March 1992, identified two basic goals.

Goal 1: To Implement in Washington County, over time, a multipurpose, multi-user, parcel-based, automated mapping and land information system consisting of the following five basic elements:

a) Geodetic reference framework.
b) Large-scale planimetric and topographic base maps.
c) Overlays, including cadastral boundaries and boundaries of various cultural and natural resources.
d) Identifiers, including parcel numbers and codes associated with various cultural and natural areas.
e) Non-spatial land information files, including cadastral parcel records and various cultural and natural resource data.

Goal 2: To reach agreement among Washington County, the local units of government in Washington County, and the various public and private utilities operating in Washington County on the design of a common automated mapping and land information systems so as to ensure economy of efficiency in the development and use of that system and so as to ensure the ready entry, retrieval, and exchange of data by and between the various users of the system.

As framework layers were completed, additional goals were developed and included in plan updates. Slowly, goals focused less on data creation and more on the vertical and horizontal integration of land information.

Some of the significant achievements made at Washington County include:

- 100% of PLSS corners are remonumented with horizontal and vertical control (100 PPM coordinate accuracy).
- 100% of parcels are digitized using coordinated geometry and referenced to the PLSS network.
- Countywide historic aerial imagery from 1941, 1950, 1963, 1970, 1980, 1985, and 1990 that is scanned, edge matched and georeferenced.
- Countywide digital orthophotography from 1995, 2000, 2005, 2010, and 2015.
- Countywide oblique and ortho imagery from 2013 and 2017.
- Countywide LiDAR data from 2006 (1.0 m point spacing) and 2015 (0.7 m point spacing) as well as older photogrammetric contours for select areas of the county.
- Countywide site addresses and road centerlines that are used for a variety of county applications including emergency response.
- Surface water and shoreland/wetland/floodplain zoning features are digitized.
- A large number of planning layers used for comprehensive and other planning efforts.
- All real estate documents recorded in the register of deeds are scanned and available on-line.
- Register of Deeds pioneered e-recording in Wisconsin.
- All surveys filed with the county surveyor are scanned and available on-line.
- An on-line mapping application that receives over 5,000 visits per month.
- Access to POWTS and zoning records that are tied to parcels and available on-line with the ability to electronically submit pumping maintenance reports.
- A growing suite of on-line applications providing simplified access to property sales, parks, supervisory districts, addressing, etc…
- Data is available for free public download.

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.**

** *Other members of the Washington County Land Information Council named in County Ordinance 2.32 include: Deputy Administrator (Planning and Parks Department), County Conservationist and 2 additional members.*

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 Land Information Officer and the Land Information Council.

Washington County Land Information Council

Name	Title	Affiliation	Email	Phone
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+ **Brian Braithwaite**	Real Property Lister/LIC Vice-Chair	Register of Deeds Department	Brian.Braithwaite@co.washington.wi.us.us	262-335-4370
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+ **Katrina Hanson**	Broker/Realtor	Hanson & Co. Real Estate	khanson@hansoncompanyhomes.com	262-353-1800
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+ Land Information Council Members designated by the plus symbol

Approved by the Land Information Council: 11/13/2018
Approved by the Land Use and Planning Committee: 11/29/2018

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. The list of WLIP's Foundational Elements has evolved with each update of the county land information plan instructions.

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	2065
Number and percent of PLSS corners capable of being remonumented in your county that **have been remonumented**	2065 (100%)
Number and percent 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	Coordinate values on 100% of the monuments in Washington County were collected under the direction of a professional land surveyor. The network maintains a Third Order Class I accuracy. The coordinate system is the North American Datum of 1927/National Geodetic Vertical Datum of 1929. Washington County is nearing completion of a multi-year project to reoccupy all monuments to establish "Survey Grade" coordinates in the North American Datum of 1983 (2011)/North American Vertical Datum 1988(2012).
Number and percent of survey grade PLSS corners integrated into county digital parcel layer	0 (0%)
Number and percent of non-survey grade PLSS corners integrated into county digital parcel layer	2065 (100%)
Tie sheets available online?	Yes - 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)	2065 (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	2065 (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)?	SEWRPC Standard
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	Dodge County – 52 monuments Fond du Lac County– 46 monuments Ozaukee County – 55 monuments Sheboygan County – 25 monuments Waukesha County – 73 monuments
Number and percent of PLSS corners remonumented along each county boundary	251 (100%)
Number and percent of remonumented PLSS corners along each county boundary with survey grade coordinates	0
In what ways does your county collaborate with or plan to collaborate with neighboring counties for PLSS updates on shared county borders?	We share updated tie sheets with neighboring county surveyor offices on an annual basis. We inform neighboring county surveyor offices when we find discrepancies with PLSS data on shared county borders. We plan and share field work responsibilities with neighboring county surveyors when required to preserve and maintain the PLSS corners on our borders.

Custodian

- Washington County Surveyor

Maintenance

- Washington County has a monument maintenance program where approximately 1/12 of all PLSS corners, including ties and reference benchmarks, are inspected annually. Any deficiencies found are repaired and brought to current county standards
- Every year the county reaches out to local governments and paving contractors requesting information about road projects that could damage monuments. Response has been very good and through this outreach monuments are prepped prior to construction and, if necessary, replaced after construction.
- Each year the county repairs or replaces monuments reported by surveyors and other professionals reliant on the monuments.

Standards

- Statutory Standards for PLSS Corner remonumentation
  - Washington County meets s. 59.74, Wis. Stats. Perpetuation of section corners, landmarks.
  - Washington County meets s. 60.84, Wis. Stats. Monuments.
  - Washington County meets ch. A-E 7.08, Wis. Admin. Code, U.S. public land survey monument record.
  - Washington County meets ch. A-E 7.06, Wis. Admin. Code, Measurements.
  - Washington County meets 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

  All monument coordinates were collected under the direction of a professional land surveyor and have third order class I accuracy. Washington County is nearing completion of a multi-year project to reoccupy all monuments to establish "Survey Grade" coordinates in the North American Datum of 1983 (2011)/North American Vertical Datum 1988(2012).

Other Geodetic Control and Control Networks

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

Layer Status

- Washington County does not maintain any other geodetic control or control networks

Parcel Mapping

Parcel Geometries

Layer Status

- **Progress toward completion/maintenance phase:** 100% of parcels in Washington County are mapped, referenced to the PLSS network and entered using coordinate geometry. Updates are completed as documents are recorded or surveys filed.
- **Projection and coordinate system:** Data is in State Plane 1927 – Wisconsin South Zone
- **Integration of tax data with parcel polygons:** Washington County has a parcel polygon model that directly integrates tax/assessment data as parcel attributes. The parcel feature incudes the tax key as an attribute. Using the tax key, the parcel polygons can be joined to tax/assessment data, POWTS, or any other database that is also associated with a tax key. An automated routine runs nightly to extract the most commonly used tax roll attributes from the tax program, joins those attributes to the parcel polygons and publishes the joined data as a new service.
- **Esri Parcel Fabric/LGIM Data Model:** Parcels are maintained using the Esri Parcel Fabric Data Model. Although the county does not currently use Esri's Local Government Information Model, tools exist that would convert the data stored in the parcel fabric to the local government information model. The native data format is in a Microsoft SQL Server/Esri enterprise database. From this format the data can be converted to many commonly used GIS formats.
- **Online Parcel Viewer Software/App and Vendor name:** Internally hosted and developed using Esri's Web AppBuilder for ArcGIS Developer edition. http://gisweb.co.washington.wi.us/Apps/washcogis/ Note: The subdomain may change due to a server configuration project scheduled for late 2018/early 2019.
- **Unique URL path for each parcel record:**
  - **Tax Listing Application:**
    - Sample URL for parcel T4-066600B: http://landrecords.co.washington.wi.us/LandRecords/PropertyListing/RealEstateTaxParcel/DetailByMuniCodeParcelNumber?municipalCode=T4&parcelNumber=066600B
    - Accessible information includes ownership, physical address, mailing address, short legal description, assessment classes and values, taxing districts, tax and payment history, parcel lineage and links to scanned tax bills.
    - This link is expected to be stable
    - The link is easily calculated using the municipality and parcel ID attributes.
    - The unique URL launches an application with data shown for the selected parcel, but can't directly be used to export the parcel specific data. Washington County provides other options for obtaining tabular and geographic land records data.
  - **POWTS/Land Use Zoning Application:**
    - Sample URL for T4-066600B: http://landrecords.co.washington.wi.us/LandRecords/PropertyListing/RealEstateTaxParcel/PermitDetail?muni=T4&parcelNumber=066600B
    - Accessible information includes POWTS and shoreland zoning permits, POWTS maintenance history and links to scanned permit files. This link is expected to be stable
    - The link is easily calculated using the municipality and parcel ID attributes.
    - The unique URL launches an application with data shown for the selected parcel, but can't directly be used to export the parcel specific data. Washington County provides other options for obtaining tabular and geographic land records data.
  - **GIS Mapping Application**
    - Sample URL for T4-066600B: http://gisweb.co.washington.wi.us/Apps/washcogis/index.html?query=Current%20parcel,TaxKey,T4_066600B

- Accessible information includes current and historic orthophotography, address and road centerlines, landmarks, districts, soils, topography, shoreland/floodplain/wetland zoning, environmental features, etc…
- The subdomain in this link may change due to a server configuration project scheduled for late 2018/early 2019.
- The unique URL launches an application with a map zoomed to the selected parcel, but can't directly be used to export the parcel specific data. Washington County provides other options for obtaining tabular and geographic land records data.

Custodian

- IT Department – GIS Division

Maintenance

- **Update Frequency/Cycle**. Parcel polygons are actively updated throughout the year as documents are recorded or surveys filed.
- Parcels that are retired are maintained in a history file.

Standards

- **Data Dictionary**: Washington County maintains FGDC compliant metadata as well as separate cadastral data model diagram that includes all domain values.

Assessment/Tax Roll Data

Layer Status

- **Progress toward completion/maintenance phase:** Complete
- **Tax Roll Software/App and Vendor name:** Ascent Land Records Suite, Transcendent Technologies.
- **Municipal Notes:**
  - The City of West Bend Assessor's office maintains the West Bend tax roll using the Devnet software platform. Regular updates are provided to the county to make the county's database whole.
  - Assessment data is maintained by local assessors. Washington County has limited access to the detailed assessment information that is not included in the tax roll.

Custodian

- Washington County Real Property Lister maintains the tax roll data for all municipalities except the City of West Bend.
- The City of West Bend Assessor maintains the tax roll for the City
- The Washington County Treasurer maintains tax billing and receipting data through a coordinated effort with the local treasurers.

Maintenance

- **Maintenance of the Searchable Format standard:** To maintain the Searchable Format standard, the county pays an annual maintenance fee for a program that exports data from the tax listing software to the searchable format. The exported data is then joined to the parcel geometries and subjected to additional automated and manual validation and clean-up processes before being submitted to the Wisconsin Department of Administration.
- **Searchable Format Workflow:** If the searchable format would remain static from year to year, the program from our tax listing software coupled with implemented changes in how Washington County enters data, **minimal human labor** would be required to meet the annual parcel/tax roll submission requirements. *Note:* ***Significant human labor*** *would be required on an annual basis to reformat data imported from Devnet to exactly match the searchable format. The maintenance of this data and how it is entered and provided by the City is outside of the county's control.*

Standards

- Wisconsin Department of Revenue Property Assessment Manual and attendant DOR standards – Washington County complies with these standards
- DOR XML format standard requested by DOR for assessment/tax roll data – Washington County complies with these standards.
- s. 73.03(2a), Wis. Stats. Department of Revenue (DOR) – Powers and duties defined.
- Department of Revenue Property Assessment Manual – Chapter 5 and DOR format standard requested by DOR for assessment/tax roll data – Washington County complies with these standards
- s. 59.72(2)(a), Wis. Stats. Presence of all nine "Act 20" attributes: The only zoning information maintained by Washington County is shoreland/floodplain/wetland zoning in the unincorporated areas of the county. That information is available as an overlay. The other 8 "Act 20" attributes are present.
- s. 70.09, Wis. Stats. Real Property Lister – Washington County complies with these standards.

Non-Assessment/Tax Information Tied to Parcels - POWTS

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

Layer Status

- Private On-Site Wastewater Treatment Systems (POWTS) permit and maintenance history is tied to the parcel and maintained in the Transcendent Technologies suite of products.

Custodian

- Planning and Parks Department

Maintenance

- The data is actively maintained by department staff when permits are issued.
- Maintenance information is entered by pumpers through an on-line portal or by department staff.
- The software is tightly integrated with the tax system. This ensures the integrity of the links between POWTS, tax information and parcel geometries are maintained.

Standards

- Consistent with all state statutes and county ordinances.

Non-Assessment/Tax Information Tied to Parcels – Zoning Records

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

Layer Status

- Shoreland/Wetland/Floodplain zoning is tied to the parcel and maintained in the Transcendent Technologies suite of products. *Note: Washington County does not administer any general zoning and only administers shoreland/floodplain/wetland zoning in the unincorporated areas of the county.*
- Specific Best Management Practices (BMP) typically installed on private lands through federal, state or local programs.
- Inventory of sites that have been permitted and comply with the County's Erosion Control and Stormwater Management (ECSM) Ordinance. Permanent storm water practices are identified for future inspections and maintenance requirements as identified in County Ordinance.
- Inventory of nonmetallic mines that are permitted through the County's Nonmetallic Mining Reclamation Ordinance

Custodian

- Planning and Parks Department – Land Use Division
- Planning and Parks Department – Land Conservation Division
- Planning and Parks Department – Land Conservation Division
- Planning and Parks department – Land Conservation Division

Maintenance

- Zoning data is actively maintained by department staff when permits are issued. The software is tightly integrated with the tax system. This ensures the integrity of the links between zoning, tax information and parcel geometries are maintained.
- BMPs are kept current as applicants receive project funding.
- ECSM sites are identified and mapped during the permitting process.
- Approved reclamation plans are on file in the Planning and Parks Department.

Standards

- Consistent with all state statutes and county ordinances.

ROD Real Estate Document Indexing and Imaging

Layer Status

- **Grantor/Grantee Index:** Washington County has a digital, searchable grantor/grantee index from 1/1/1945 to the present.
- **Tract Index:** Washington County has a digital, searchable tract index from 7/1/1996 to the present. Tract books from 1830 through 12/31/1996 are scanned. The tract index is based on the PLSS (1/16 section) except for subdivisions and condominiums where the tract index is based on Subdivision/Condominium lot and block. All real estate documents recorded in the Register of Deeds are included in the tract index.
- **Imaging:** All real estate documents recorded in the register of deeds are scanned and stored in IMS21 software.
- **ROD Software/App and Vendor Name:** Landshark, Trimin. Although registration is required for access, no fees are charged other than the statutory fees assessed when downloading and printing scanned documents.

Custodian

- Register of Deeds

Maintenance

- The Register of Deeds continually adds and updates records as documents are recorded

Standards

- s. 59.43, Wis. Stats. Register of deeds; duties, fees, deputies. – Washington County meets this standard.
- ch. 706, Wis. Stats. Conveyances of real property; Recording; Titles. – Washington County meets this standard.

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:** 0.7m
  - **Coordinate System:** Point cloud data was delivered in both NAD 27/NGVD 29 and NAD 83/NAVD 88
- **Next planned acquisition year:** Tentatively planned for 2025
- **Historic:** Dec 2006. The post spacing is approximately 1m. Per NSSDA/FEMA guidelines: RMSEz x 1.960 = 95% confidence level; 0.29 x 1.9600 = 0.57 ft. Per NDEP/ASPRS guidelines: 95th percentile (CVA) = 95% confidence level = 0.64 ft

Custodian

- IT Department – GIS Division

Maintenance

- There is little maintenance with LiDAR data. The data and its derivative products are made available in a variety of formats.
- There is not a specific update schedule for LiDAR data. The county will look to acquire an updated LiDAR dataset when the benefits of an updated surface outweigh the costs. The next flight is tentatively planned for 2025.

Standards

- The 2015 flight was designed to meet USGS LiDAR Base Specifications QL2.

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

- The 2015 deliverable included a countywide DTM and 1' contour file. Washington County developed a countywide 5' DEM. Other derivative products are created on a site specific basis as needed.

Custodian

- IT Department – GIS Division

Maintenance

- There is not a specific update schedule for LiDAR data. The county will look to acquire an updated LiDAR dataset when the benefits of an updated surface outweigh the costs. The next flight is tentatively planned for 2025.

Standards

- The 2015 flight was designed to meet USGS LiDAR Base Specifications QL2.

Other Types of Elevation Data

Layer Status

- 1994 photogrammetric project covering 12 sections around and including the Village of Kewaskum. The deliverable included topographic features consisting of geodetic and

geographic reference elements, hydrographic elements, planimetric elements, and hypsometric elements.

- 1995 photogrammetric project covering the 36 sections that make up the Town of Erin. The deliverable included topographic features consisting of geodetic and geographic reference elements, hydrographic elements, planimetric elements, hypsometric elements and a DTM.
- 1997 photogrammetric project covering 14 sections around and including the Village of Slinger. The deliverable included topographic features consisting of geodetic and geographic reference elements, hydrographic elements, planimetric elements, hypsometric elements and a DTM.
- 2003 photogrammetric project covering 18 sections in the Oconomowoc River sub-watershed. The deliverable included topographic features consisting of geodetic and geographic reference elements, hydrographic elements, planimetric elements, hypsometric elements and a DTM.
- 2005 photogrammetric project covering 111 sections in various Washington County communities. The deliverable included 2' contours and a DTM.

Custodian

- IT Department – GIS Division

Maintenance

- This dataset is made available in a variety of formats, but is not actively maintained.
- The photogrammetric elevation data has been updated by 2 countywide LiDAR projects

Standards

- National Map Accuracy Standards for 1:2400 scale mapping

Orthoimagery

Orthoimagery

Layer Status

- **Most recent acquisition year:** 2015
- **Resolution:** 6″
- **Contractor's standard:** Leaf-off, true color
- **Next planned acquisition year:** 2020
- **WROC participation in 2020:** Confirmed participating in WROC 2020 through a regional consortium managed by SEWRPC.

Custodian

- IT Department – GIS Division

Maintenance

- For many years Washington County has acquired orthophotography as part of a consortium organized and facilitated by the Southeastern Wisconsin Regional Planning Commission. That consortium has a history of acquiring imagery every 5 years and that update schedule is anticipated to continue in 2020.
- In 2013 Washington County initiated a program with Pictometry to acquire imagery between the regional projects. A Pictometry data capture was repeated in 2017. The specific Pictometry product purchased is referenced with less ground control and the tone balancing less complete. When the regional and local projects are combined, orthogonal imagery is available for Washington County every 2 or 3 years.

Standards

- National Map Accuracy Standards for 1:1200 scale mapping

Historic Orthoimagery

Layer Status

- Washington County has the following historic countywide digital orthophotographic datasets.
  - 2017 – 9″ pixel, leaf-off, true color (Pictometry project – not AccuPLUS)]
  - 2015 – 6″ pixel, leaf-off, true color
  - 2013 – 9″ pixel, leaf-off, true color (Pictometry project – not AccuPLUS)
  - 2010/2011 – 6″ pixel, leaf-off, true color (The entire county was flown in 2010. Snow, in an amount exceeding the project specification, required about 25% of the county to be re-flown in 2011)
  - 2005 – 1′ pixel, leaf-off, true color
  - 2000 – 1′ pixel, leaf-off, black and white
  - 1995 – 2′ pixel, leaf-off, black and white
- Washington County has the following countywide historic orthoimagery datasets. In each case the original negatives were scanned and georeferenced using an analytical aerotriangulation solution. Although georeferenced, the positional accuracy is not defined. The pixel resolution is one foot.
  - 1990 – Leaf-off. Black and White, 1:19200, Source of historic aerial negatives: SEWRPC
  - 1985 – Leaf-off. Black and White, 1:20000, Source of historic aerial negatives: SEWRPC
  - 1980 – Leaf-off. Black and White, 1:20000, Source of historic aerial negatives: SEWRPC
  - 1970 – Leaf-off. Black and White, 1:20000, Source of historic aerial negatives: SEWRPC
  - 1963 – Leaf-off. Black and White, 1:24000, Source of historic aerial negatives: SEWRPC
  - 1950 – Leaf-on, Black and White, 1:20000, Source of historic aerial negatives: National Archives
  - 1941 – Leaf-on, Black and White, 1:20000, Source of historic aerial negatives: National Archives

Custodian

- IT Department – GIS Division

Maintenance

- The goal was to scan and georeference at least one set of historic imagery per decade for as far back as possible. With this goal met, there is no current plan to scan additional years of historic digital data.

Standards

- Undefined – 1941, 1950, 1963, 1970, 1980, 1985, 1990, 2013, 2017
- National Map Accuracy Standards for 1:4800 scale mapping – 1995
- National Map Accuracy Standards for 1:2400 scale mapping – 2000, 2005
- National Map Accuracy Standards for 1:1200 scale mapping – 2010/2011

Other Types of Imagery – Oblique Imagery (Pictometry)

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

Layer Status

- 4-way Countywide, Community (9" GSD) oblique imagery from 2017
- 4-way Countywide, Community (9" GSD) oblique imagery from 2013

Custodian

- IT Department – GIS Division

Maintenance

- In 2013 Washington County initiated a program with Pictometry to acquire imagery between the regional orthophotography projects. The future of the imagery program after the 2020 regional flight is still to be determined.

Standards

- None

Address Points and Street Centerlines

Address Point Data

Layer Status

- Complete when City of West Bend data is merged with Washington County data.

Custodian

- IT Department – GIS Division
- City of West Bend Department of Development

Maintenance

- Washington County does not assign any addresses. All address assignment is done at the local level and Washington County is reliant on the local governments to report addresses that are created, modified, or retired.
- Washington County created a geoform to facilitate the communication of addresses from the local governments to the county.
- Address points are continually updated. The geographic feature is placed on the structure as observed on orthophotography. When structures are newer than the available orthophotography, the point is placed at an approximate location. The location of the point is refined when new photography is acquired.
- The County and City of West Bend have an agreed 'area of responsibility' and have similar data models. The data from the county and city can be combined to create a seamless data layer.

Standards

- None

Building Footprints

Layer Status

- Building footprints were one of the planimetric features captured as part of legacy photogrammetric topographic projects. Those projects include:
  - 1994 – 12 sections around and including the Village of Kewaskum.
  - 1995 – 36 sections that make up the Town of Erin.
  - 1997 – 14 sections around and including the Village of Slinger.
  - 2003 – 18 sections in the Oconomowoc River sub-watershed.
- Building footprints for the City of West Bend are available from the City Department of Development.

Custodian

- IT Department – GIS Division
- City of West Bend Department of Development

Maintenance

- Building footprints are not actively maintained by Washington County.
- A project to create a countywide building footprint layer is not in the current plan.

Standards

- None

Other Types of Address Information – Address Ranges

e.g., Address Ranges

Layer Status

- Washington County maintains left and right addresses ranges on its road centerline features. This layer is complete for Washington County.

Custodian

- IT Department – GIS Division

Maintenance

- Washington County does not assign any addresses. All address assignment is done at the local level and Washington County is reliant on these local governments to report addresses that are created, modified, or retired.
- Address ranges are continually updated using the best data available to Washington County.

Standards

- None

Street Centerlines

Layer Status

- Complete

Custodian

- IT Department – GIS Division

Maintenance

- Street centerlines are added using new subdivisions and road plans. Locations are refined using current orthophotography.

Standards

- None

Rights of Way

Layer Status

- 100% complete for Washington County

Custodian

- IT Department – GIS Division

Maintenance

- Continually updated as part of the parcel mapping workflow. Data is maintained using the Esri Parcel Fabric.

Standards

- None

Trails – Major Recreational Trails

e.g., Recreational Trails

Layer Status

- Major state and local trails. (I.e. Ice Age Trail, Eisenbahn Trail, West Bend River Walk, etc…) This layer does not include local park trails. This layer is believed to be complete.

Custodian

- Planning and Parks Department
- IT Department – GIS Division

Maintenance

- Updated as needed

Standards

- None

Land Use

Current Land Use

Layer Status

- 2015 Land Use is complete for Washington County

Custodian

- Southeastern Wisconsin Regional Planning Commission

Maintenance

- Traditionally updated every 5 years in conjunction with the regional orthophotography program

Standards

- SEWRPC land use mapping standards

Future Land Use

Layer Status

- 2050 Land Use is completed as part of SEWRPC's Vision 2050

Custodian

- Southeastern Wisconsin Regional Planning Commission

Maintenance

- The Washington County Board will consider an update to the county comprehensive plan with a planning horizon to 2050 in early 2019. The current comprehensive plan has a planning horizon to 2035

Standards

- s. 66.1001, Wis. Stats. Comprehensive planning.
- SEWRPC land use mapping standards

Zoning

County General Zoning

Layer Status

- Not administered by the county

Shoreland Zoning

Layer Status

- The County maintains a GIS representation of county shoreland zoning boundaries
- The layer is 100% complete for the unincorporated areas of the county.
- The county does not have regulatory authority for the incorporated areas of the county and does not maintain a GIS representation for these areas.

Custodian

- Planning and Parks Department
- IT Department – GIS Division

Maintenance

- Washington County uses FEMA floodplains in the determination of shoreland zones, but has, and continues to aggressively complete floodplain mapping projects that will remove all Zone A floodplain in County.
- Shorelands are modified when navigability studies are completed or when the floodplain is studied.

Standards

- s. 59.69 Wis. Stats. Planning and Zoning Authority
- s. 59.692 Wis. Stats. Zoning of shorelands on navigable waters
- s. 87.30 Wis. Stats. Floodplain Zoning
- s. 281.31 Wis. Stats. Navigable waters protection law
- Washington County Ordinance Chapter 23

Farmland Preservation Zoning

Layer Status

- Not administered by county

Floodplain Zoning

Layer Status

- The County maintains a GIS representation of floodplain zoning boundaries
- The county's floodplain zoning GIS data is the same as the FEMA map
- A flood storage district, created by the DNR, is available for Rock River Watershed and incorporated into the floodplain zoning maps. At this time no such layer exists for the Milwaukee River watershed.

Custodian

- Federal Emergency Management Agency
- Wisconsin Department of Natural Resources
- Planning and Parks Department
- IT Department – GIS Division

Maintenance

- Washington County uses FEMA floodplains, but has and continues to aggressively complete floodplain mapping projects that will remove all Zone A floodplain in County

Standards

- FEMA floodplain mapping standards

Wetland Zoning

Layer Status

- The County maintains a GIS representation of county wetland zoning boundaries
- The layer is a simplified version of the Wisconsin Wetland Inventory that has been enhanced to show site specific wetland delineations where available.
- The layer is 100% complete for the unincorporated areas of the county.
- The county does not have regulatory authority for the incorporated areas of the county and does not maintain a GIS representation for these areas.

Custodian

- Planning and Parks Department
- IT Department – GIS Division

Maintenance

- Washington County uses a simplified version of the most current Wisconsin Wetland Inventory that has been further improved by the Washington County board based on site specific wetland determinations.
- County regulated wetlands are modified as Shoreland zones shrink or expand

Standards

- s. 59.69 Wis. Stats. Planning and Zoning Authority
- s. 59.692 Wis. Stats. Zoning of shorelands on navigable waters
- s. 87.30 Wis. Stats. Floodplain Zoning
- s. 281.31 Wis. Stats. Navigable waters protection law
- Washington County Ordinance Chapter 23

Airport Protection

Layer Status

- Not administered by county

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

- In progress for the Village of Richfield. Washington County and Village of Richfield have an MOU whereby Washington County is providing mapping support for the Village as they update their general zoning ordinance. Washington County will then maintain this layer at the request of the Village.

Custodian

- Village of Richfield
- IT Department – GIS Division

Maintenance

- Richfield will submit amendments to the zoning ordinance to Washington County whenever adopted by the Village Board.

Standards

- Village of Richfield Zoning Ordinance

Administrative Boundaries

Civil Division Boundaries

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

Layer Status

- 100% complete for Washington County

Custodian

- IT Department – GIS Division

Maintenance

- Continually updated as part of the parcel mapping workflow. Data is maintained using the Esri Parcel Fabric.

Standards

- None

School Districts

Layer Status

- **Progress toward completion/maintenance phase:** Complete
- **Relation to parcels:** All parcels are attributed with the school district(s) to which it belongs. Parcels were merged based on the school district attribute to create school district polygons.
  - **Attributes linked to parcels:** District name and district tax code

Custodian

- Real Property Lister
- IT Department – GIS Division

Maintenance

- On-going as part of the tax listing database maintenance workflow.
- The county has worked with specific school districts in the past to correct errors. Additional verification in some areas is needed.
- Washington County participates in voluntary data submittals to the Wisconsin Department Public Instruction with the hope of improving district boundary maps at the state and local level as well as in US Census Bureau maps.

Standards

- None

Election Boundaries - Wards

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

Layer Status

- Complete
- Wards are attributed with polling location/address, alder/trustee district, supervisor district, state assembly and senate districts, congressional district, court of appeals district, sanitary districts, and school districts

Custodian

- County Clerk
- IT Department – GIS Division

Maintenance

- Wards were developed in 2011 by the local units of government with assistance from Washington County
- Current wards are modified whenever annexations occur and will be redrawn following the 2020 decennial census.

Standards

- s. 5.15 Wis. Stat. Division of municipalities into wards

Election Boundaries – County Supervisory Districts

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

Layer Status

- Complete

Custodian

- County Clerk
- IT Department – GIS Division

Maintenance

- Current supervisor districts were created to coincide with a board size reduction effective with the April 2016 election.
- This feature will not change until the 2021 redistricting effort.

Standards

- s. 59.10 Wis. Stat. Boards: composition; election; terms; compensation; compatibility

Election Boundaries – Polling Places

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

Layer Status

- Complete

Custodian

- County Clerk
- IT Department – GIS Division

Maintenance

- Modified whenever there are changes to polling places.

Standards

- None

Utility Districts

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

Layer Status

- Some utility districts have taxing authority and are maintained as an attribute in the tax roll. For these districts, the layer is complete. Washington County does not maintain data for districts that are not included as a tax roll attribute.

Custodian

- Real Property Lister
- IT Department – GIS Division

Maintenance

- On-going as part of the tax listing database maintenance workflow.

Standards

- None

Public Safety

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

Layer Status

- Ambulance - Complete
- Dive Team – Complete
- ESN – Complete
- Fire – Complete
- First Response – Complete
- Haz Mat – Complete
- MABAS – Complete
- Patrol Area – Complete

Custodian

- Sheriff Department
- Real Property Lister
- IT Department – GIS Division

Maintenance

- Updated as needed

Standards

- None

Lake Districts

Layer Status

- Parcels are attributed with the lake district to which it belongs. Parcels were merged based on the lake district attribute to create lake district polygons

Custodian

- Real Property Lister
- IT Department – GIS Division

Maintenance

- On-going as part of the tax listing database maintenance workflow.
- The county has worked with specific lake districts in the past to correct errors. Additional verification in some areas is needed.

Standards

- None

Native American Lands

Layer Status

- Washington County does not have any Native American lands

Other Administrative Districts - Parks

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

Layer Status

- The layer is believed to be complete for all local, county, and state parks. The layer also includes areas owned by land trusts, or others, which are open to the public. The layer may not be complete for privately held land that is open to public
- The polygons are attributed with the amenities available at the park or public open space

Custodian

- Planning and Parks Department
- IT Department – GIS Division

Maintenance

- Updated as changes are reported to the county

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

- Believed to be 100% complete. Includes flowing water and lakes/ponds (> 2 ac) as seen on, and digitized to match, current orthophotography

Custodian

- IT Department – GIS Division

Maintenance

- This layer is critical to and maintained as part of the shoreland/floodplain/wetland zoning feature dataset

Standards

- s. 59.69 Wis. Stats. Planning and Zoning Authority
- s. 281.31 Wis. Stats. Navigable waters protection law
- Washington County Ordinance Chapter 23

Cell Phone Towers

Layer Status

- Washington County does not maintain Cell Phone Tower information

Bridges and Culverts

Layer Status

- An inventory of county inspected bridges is complete. This is not a comprehensive inventory of all bridges in the county.
- An inventory of culverts under county highways is being considered

Custodian

- Highway Department
- IT Department – GIS Division

Maintenance

- As needed.

Standards

- None

Other - Railroads

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

Layer Status

- Complete for the county

Custodian

- IT Department – GIS Division

Maintenance

- Railroad right of way is maintained in the parcel database and railroad centerlines were digitized to match current orthophotography.

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.

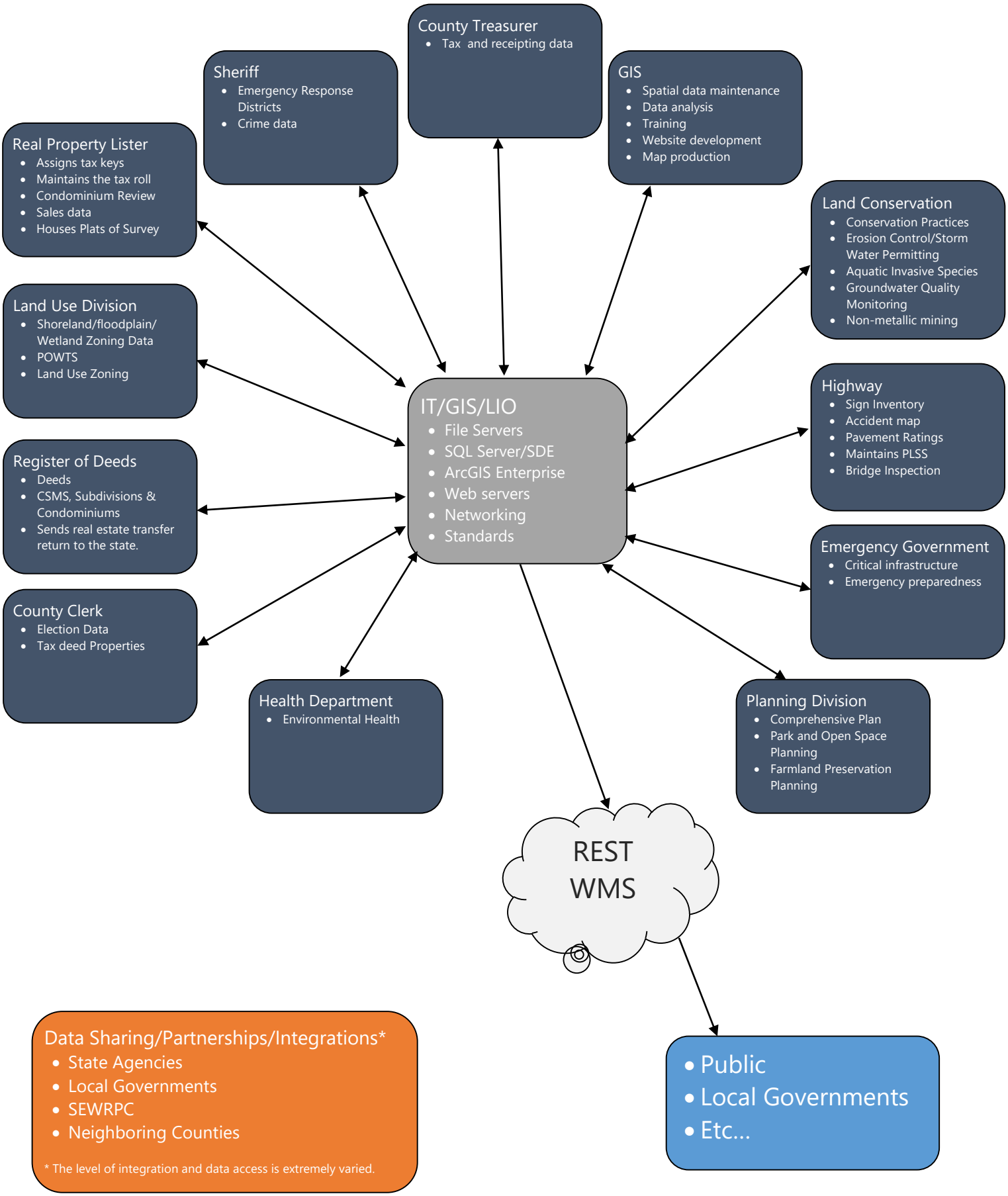
One integration requirement is listed under s. 16.967(7)(a)(1), Wis. Stats., which states that counties may apply for grants for:

- 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.

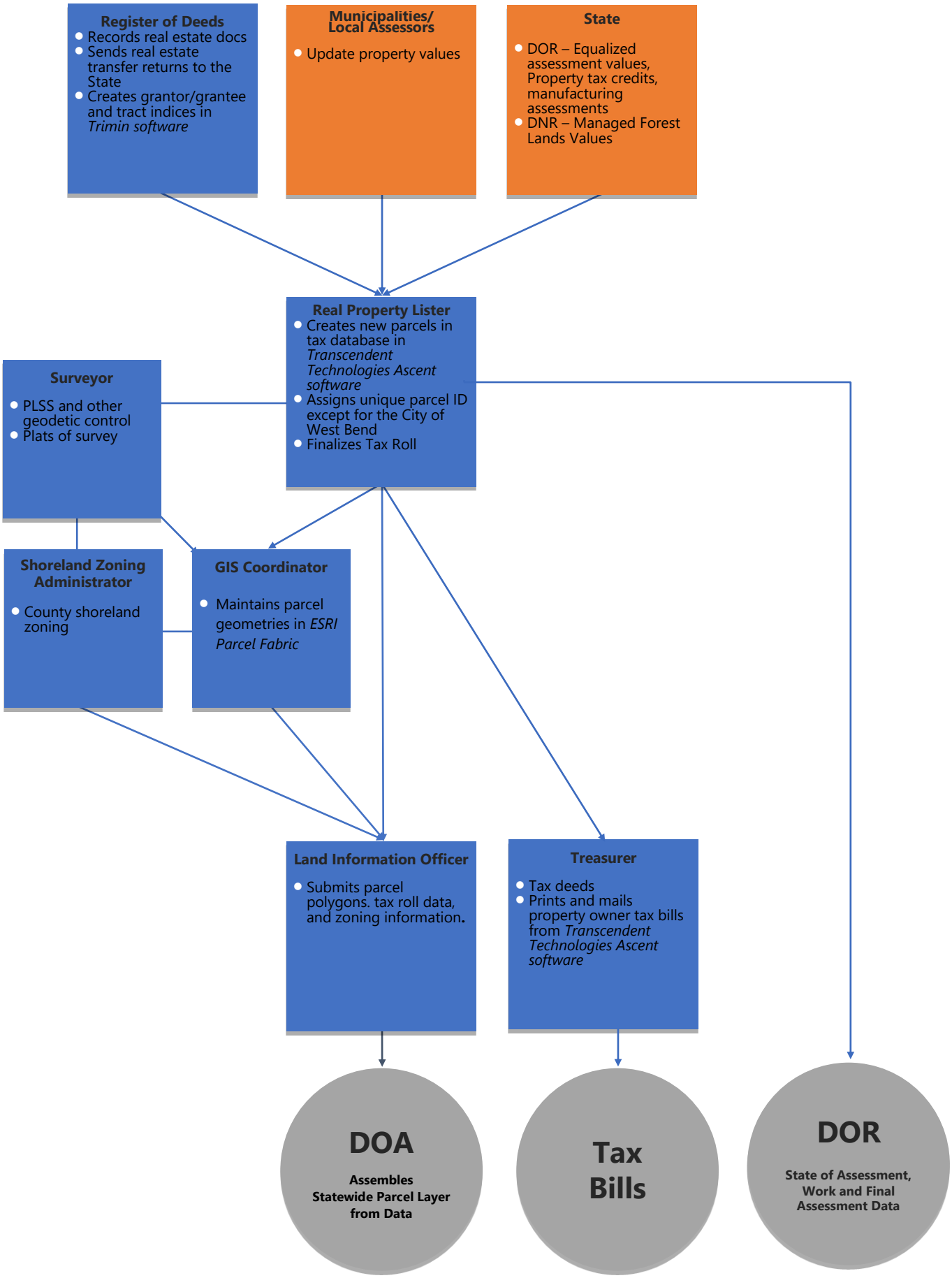
This chapter describes the design of the county land information system, with focus on how data related to land features and data describing land rights are integrated and made publicly available.

Current Land Information System

Diagram of County Land Information System



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

Land information systems are integrated into the general county IT environment. Servers are created in the county's virtualized server environment and integrated in enterprise maintenance, back-up and disaster recovery plans/systems. All servers are in a climate controlled environment and served with backup power. In 2018 some server functions will be migrated to the Microsoft Azure cloud.

Endpoints are selected based on the need of the end user. Endpoints range from thin clients for non-graphic data entry to high-end workstations for those with graphic intensive workflows. Mobility continues to be a driving factor with laptops and increasingly tablets and smart devices being deployed. All devices are networked, with the option of disconnected editing when needed.

Peripherals include large format plotters and a large format scanner in addition to the more routine office print and scan devices.

Survey grade GPS, mapping grade GPS, and other surveying equipment are available and frequently used to collect land information.

Software

Esri's ArcGIS Desktop and ArcGIS Professional, with extensions, are used for nearly all desktop GIS needs. Licenses are pooled to maximize investment and the availability of GIS software to county staff. The use of ArcGIS online and Esri's field collection apps is an area of growth. Blue Marble's Global Mapper is available for specific desktop needs.

Bentley's Power InRoads and OpenRoads designer is the primary software used for CAD/Civil engineering projects. Licenses are pooled to maximize investment and the availability of CAD software to county staff. Internal policies and procedures are in place to easily share data between Esri and Bentley software.

The core GIS datasets are maintained in an Esri enterprise geodatabase using Microsoft SQL Server. This provides a robust, multi-user environment to store, update and serve data to all county users. The database design of the GIS features includes the necessary primary keys to ensure integration with related tabular data. National and State standards and vendor supplied best practices are considered whenever databases are designed.

Register of Deeds records are maintained in the Trimin suite of products. Washington County selected Transcendent Technologies' Ascent suite for tax, POWTS and zoning data. The highway department uses Cartegraph to manage sign assets. Asset management is a potential area of future growth. IMS21 is the county's enterprise imaging system and used to store scanned documents.

Preference is always given to systems that can be integrated to reduce redundancy and create an efficient and user friendly environment.

Website Development/Hosting

ArcGIS Server is currently used to publish data for Internet distribution. The published services are consumed by internal and ArcGIS On-line applications. ArcGIS Web AppBuilder, developer edition, along with industry solution templates are the basis for Washington County's mapping web applications. Because the services are publically available, authoritative data is available for inclusion in applications that are not created or hosted by Washington County. A transition to ArcGIS Enterprise, including Portal for ArcGIS, will be deployed on the Microsoft Azure cloud in late 2018.

Metadata and Data Dictionary Practices

Metadata Creation

- **Metadata creation and maintenance process:** Metadata is included as a deliverable whenever new data is acquired. Metadata is created for all core features at the feature dataset level. The metadata is periodically reviewed and updated as needed. The metadata is supplemented with data schema diagrams and data dictionaries

Metadata Software

- **Metadata software:**
  - A combination of ArcGIS desktop and TKME are used to create and manage metadata.

Metadata Policy

- **Metadata Policy:** Metadata Parser (MP) is used to validate the metadata records that are created to ensure consistency with the FGDC Content Standard for Digital Geospatial Metadata.

Municipal Data Integration Process

- Washington County and the City of West Bend are connected through a Municipal Area Network. GIS users at the city have read-only access to county GIS database servers. County staff have read only access to city GIS database servers. The MAN is also used as part of an ETL processes that integrates tax and address point data from city systems to county systems to create countywide layers.
- The county has worked with a number of municipalities to publish REST services allowing the municipalities to display live county hosted data within their own Intranet or Internet applications.
- Although now rare, in some cases data is still exchanged using DVDs or ftp transfer.
- Consistent referencing systems and good metadata ensure that when it is received, the shared data is easy to use.

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
http://gisweb.co.washington.wi.us/Apps/washcogis/	http://washingtoncowi.maps.arcgis.com/apps/MapSeries/index.html?appid=0db0dd8e8e9f4f51931a58ec26a5037a	http://landrecords.co.washington.wi.us/LandRecords/	https://landshark.co.washington.wi.us/LandShark/login

Single Landing Page/Portal for All Land Records Data

URL
http://gisweb.co.washington.wi.us/apps/gallery

Municipal Website Information

Municipal Website	Municipal Website URL
Village of Germantown Interactive Map	https://germantown.ags.ruekert-mielke.com/
City of Hartford Interactive Map Gallery	http://hartfordwi.maps.arcgis.com/home/index.html
Village of Kewaskum Interactive Map	https://kewaskum.ags.ruekert-mielke.com/
City of West Bend Interactive Map	http://www.ci.west-bend.wi.us/GIS/

Data Sharing

Data Availability to Public

Data Sharing Policy

- Most land records are accessible to the public through free on-line applications. Statutory fees are changed when accessing documents recorded in the Register of Deeds.
- Access to the data is also available through publically accessible services or free data download.

Open Records Compliance

- Whenever possible, land information is made available on-line and free of charge.

Data Sharing Restrictions and Government-to-Government Data Sharing

Data Sharing Restrictions

- None

Training and Education

- Washington County encourages staff to stay current in their field by attending conferences and training. Typically the staff attending the training will report back and present what they learned to the staff unable to attend the training.
- The county has an internal GIS Users group for staff to gather and share experiences.
- For those using our public on-line offerings, the county has provided user manuals, YouTube videos and in some cases in-person classes or presentations.

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.

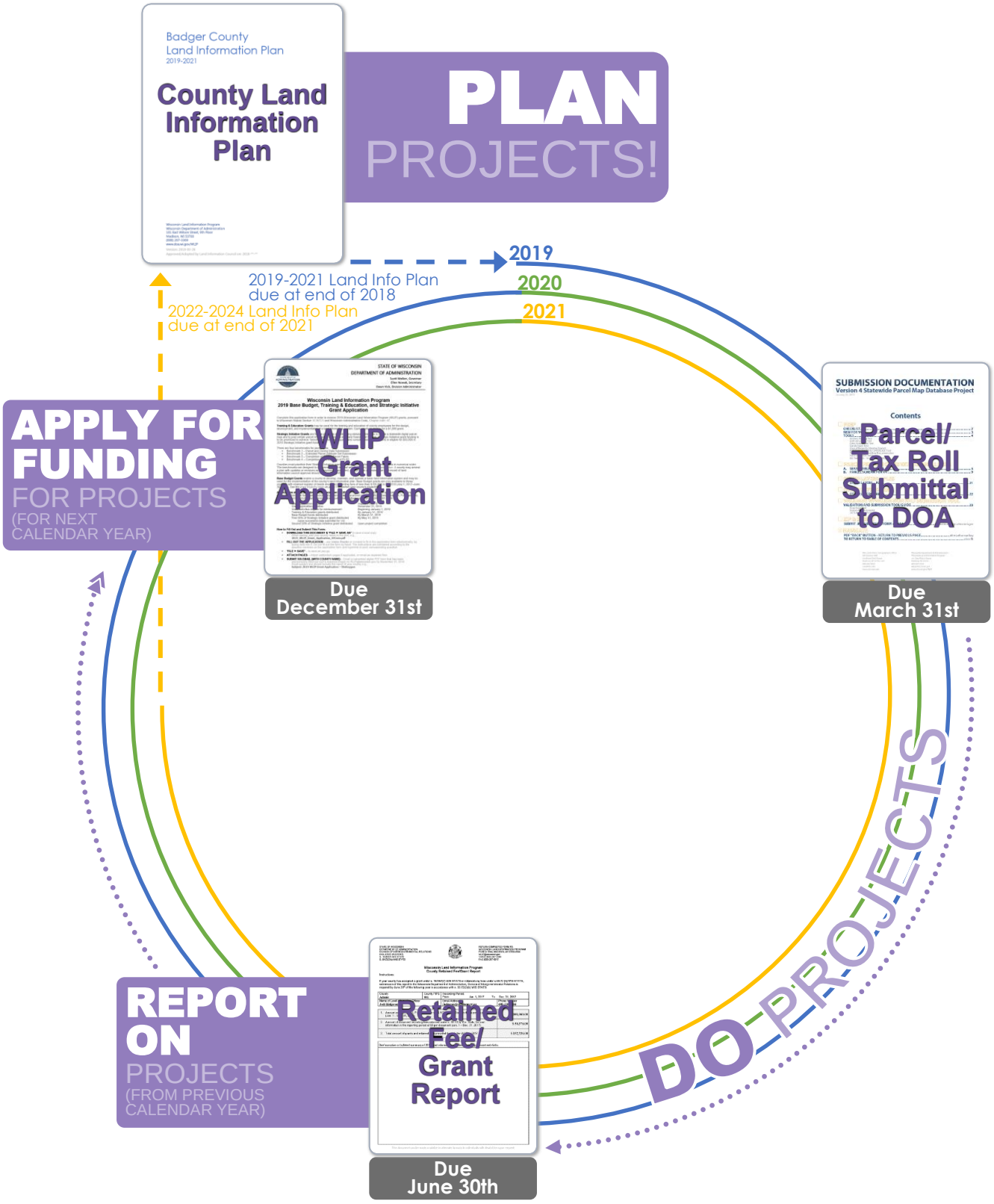


Figure 1. The WLIP Land Information Plan/Grant Project Cycle

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

Project Description/Goal

How Searchable Format Will Be Maintained

- Washington County will continue to support the program/script available from Transcendent Technologies to reformat tax roll attributes to the searchable format and then export those attributes in a way that they can be joined to parcel polygons.

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 DOA.

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**
Submit data to DOA	–	Annually by March 31

Responsible Parties

- Transcendent Technologies – Keep database view consistent with the searchable format.
- Washington County – Join tax information to parcel geometry, compile zoning data and submit to DOA.

Estimated Budget Information

<$1000 Support customized database view

Project Plan for PLSS (Benchmark 4)

Project Description/Goal

Planned Approach

- Washington County is nearing completion of a project to convert all PLSS Coordinates from NAD27/NGVD29 to NAD83(2011)/NAVD88(2012). To do this, Washington County, through a contract with SEWRPC, reoccupied all monuments using modern GPS equipment. This will also upgrade corner accuracy from Third Order Class I to a value that meets the County Survey's definition of "survey grade". We expect an accuracy approaching 1 in 50,000.
- A separate project will be contracted to 1) integrate the newly acquired coordinate values in the parcel fabric and 2) clean minor parcel fabric data 'errors' that degrade performance.

Current Status

- **Tally of the total number of corners:** 2065
- **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:** 2065 (100%)
- **Accuracy class for these new coordinates: "**Survey Grade"
- **Way in which these points will be integrated into the parcel fabric:** Contracted project that will move the entire Esri Parcel Fabric in a single process.

Missing Corner Notes

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

County Boundary Collaboration

- We share updated tie sheets with neighboring county surveyor offices on an annual basis. We inform neighboring county surveyor offices when we find discrepancies with PLSS data on shared county borders. We plan and share field work responsibilities with neighboring county surveyors when required to preserve and maintain the PLSS corners on our borders.

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.
- Improved accuracy and a modern datum will simplify survey functions in our Highway, Land Conservation, Parks, and Facilities Departments. Surveyors doing work for local governments, Wisconsin Department of Transportation and the private sector will have the same benefit.
- Current workflows often require the conversion of datasets between the older and newer datums. This has the potential to introduce error. This project will dramatically reduce the need for datum conversion. An example of when datum conversion is required is when trying to use Washington County topographic data that was traditionally captured in NGVD29 with FEMA flood elevations published in NAVD88.
- Improved performance of the parcel fabric dataset.

Objectives/Measure of Success

- The objective is to meet Benchmark 4 (Completion and Integration of PLSS) by Dec 31, 2019

Project Timeframes

Timeline – Project Plan for PLSS		
Milestone	**Duration**	**Date**
Field Collection Begins	–	Late 2017
Delivery of Horizontal control network	-	January 31, 2019
Parcel Migration/Clean-up Project	1 Month	Feb 1-28, 2019
Delivery of Vertical control network	–	December 31, 2019

Responsible Parties

- SEWRPC – Field survey work, establish horizontal and vertical control networks.
- County Surveyor – QC, Project Management, Reset damaged monuments.
- Consultant – Project parcel fabric and clean parcel data
- GIS Coordinator – Parcel delivery QC
- LIO – Project management.

Estimated Budget Information

$315,000 Field collection and control network development (2016, 2017 and 2018 Strategic Initiative grants have already been committed to this project.)

$10,000 Parcel projection/cleanup.

Project #1: Public Land Survey System Monument Maintenance

Project Description/Goal

- Maintain all public land survey system monuments, ties and references benchmarks in Washington County. In 2006 Washington County completed a pilot project in the Village of Richfield to inspect all monuments and repair the problems found. From 2007 – 2017, similar projects were completed for the remaining Townships. The purpose of the project is to inspect every monument in the county at least once every 12 years. In 2018 the second pass through the county began with the Village of Richfield. The intent is to continue with 1 township per year for the duration of this plan with the specific township identified by the County Surveyor.
- **Land Info Spending Category:** PLSS

Business Drivers

- Washington County has spent considerable resources to remonument the entire county. Maintenance is needed to protect this investment.
- If a single monument is lost, it is less expense to relocate one monument than it would be if there was a significant deterioration of the network.
- Surveyors and other professionals rely on the monuments.
- Monuments are the basis for all land descriptions
- Many GIS layers are referenced to the PLSS network.

Objectives/Measure of Success

- 100% of monuments are placed and stable.
- Every monument has at least 4 ties.
- Every monument has at least 2 reference benchmarks

Project Timeframes

Timeline – Project #1 Public Land Survey System Monument Maintenance

Milestone	Duration	Date
Phase I – Monument inspection and reporting	–	Jan-June
Phase II – Monument Repair	-	July-Dec

Responsible Parties

- County Surveyor – Project management and Quality Control
- Contracted Surveying Firms – Phase I and Phase II work

Estimated Budget Information

$50,000/yr

Project #2: Land Use Sanitation/Zoning Modernization

Project Description/Goal

- Scan all zoning permit files. Scanned shoreland zoning images will be tied to their matching database record and the spatial parcel database
- **Land Info Spending Category:** Other

Business Drivers

- Enhanced public access (all records will be available on-line, including scanned permit files)
- Improved access to records for internal staff
- Better archiving and disaster recovery

Objectives/Measure of Success

- All shoreland zoning permit files are scanned and in the county imaging system, tied to parcel data, and publicly available over the Internet.

Project Timeframes

Timeline – Project #2 Land Use Sanitation/Zoning Modernization

Milestone	Duration	Date
Shoreland Zoning Scanning	6 months	March 2019

Responsible Parties

- IT Department – GIS Division - Contract and project management
- Planning and Parks Department – File prep and QA/QC
- Contracted services – Scanning of shoreland zoning permit files.

Estimated Budget Information

$60,000 Shoreland zoning file scanning

Project #3: Floodplain Mapping

Project Description/Goal

- Washington County is a developing county in the metro-Milwaukee area. The accuracy of floodplain data does not match current needs. During the FEMA Map Modernization program floodplain studies completed in the 1980's were rejected, which for many owners meant the zoning of their property reverted to unstudied floodplain. Washington County has an ambitious goal of elimination all zone A floodplains in the County. Over the past 8 years significant projects were completed to improve floodplains in parts of the County. This on-going project will complete the work for the county.
- **Land Info Spending Category:** Other

Business Drivers

- Much of the floodplain in the county, including some areas with development pressure, is approximate.
- Floodplain zoning became more challenging after map modernization when many studied floodplains reverted to unstudied floodplain.
- Accurate floodplains will reduce unnecessary delays for property owners looking to improve their property.
- Accurate floodplains will allow for better zoning administration and reduce the risk of property loss during a flooding event.

Objectives/Measure of Success

- All floodplains in Washington County are studied using modern methods and mapped using detailed topographic information.

Remaining Project Timeframes

Timeline – Project #3 Floodplain Mapping

Milestone	Duration	Date
QC Mapping	–	December 31, 2018
Final Submittal to FEMA		December 31, 2018
Update zoning maps	-	TBD (Dependent on DNR and FEMA schedules)

Responsible Parties

- Planning and Parks Department – Project management, data review, county zoning updates, public hearings
- IT Department – GIS Division – Map production and data integration
- Wisconsin DNR – Coordinate floodplain studies, consultation, in-kind contribution to county projects
- Private Surveying firm – Structure and cross section surveys
- Private Engineering firm – Hydrologic and hydraulic mapping

Estimated Budget Information

Mid Milwaukee

$39,465	Surveying
$0	Hydraulics, Hydraulics and Mapping completed by DNR.

North and West Branch Milwaukee River

$42,310	Surveying
$99,316	Hydrology, Hydraulics and Mapping

Menomonee River Tributaries

$1509	Surveying

$3331	Hydrology, Hydraulics and Mapping
Nor-X-Way Channel	
$2300	Surveying
$5078	Hydrology, Hydraulics and Mapping
Rock River	
$57,772	Surveying
$127,547	Hydrology, Hydraulics and Mapping

A significant portion of this project is complete and paid for

Project #4: Historic Tax Roll Scanning

Project Description/Goal

- Washington County has many years of historic tax rolls that are in paper form that the county must maintain in perpetuity. This project would scan and enhance public access to those records.
- **Land Info Spending Category:** Other Parcel Work

Business Drivers

- Disaster recovery
- Enhanced county and public access when these records are needed for property or genealogical research.

Objectives/Measure of Success

- Clear and readable scanned images are created for historic tax rolls.
- The scanned images are indexed in a way that they are searchable by the public and county staff.

Project Timeframes

Timeline – Project #4 Historic Tax Roll Scanning

Milestone	Duration	Date
Image and index delivery	–	2021

Responsible Parties

- County Treasurer – Project management and QC
- IT Department – GIS Division – Loading imagery into county document imaging system
- Contracted Services – Scanning and indexing

Estimated Budget Information

$75,000 Document scanning and indexing.

Project #5: Major Hardware Acquisitions

Project Description/Goal

- Acquire UAS and related software needed to collect information on highway construction, roadway assessments, utility verification, topsoil/fill site pile quantity computation, pre and post project topographic mapping and a variety of other land information related projects.
- Acquire survey grade GPS to be used for PLSS, construction and other surveying needs.
- Replace other hardware systems when they've reached end of life to ensure staff efficiency is maintained.
- **Land Info Spending Category:** Hardware and Software

Business Drivers

- Investing in these technologies provide significant staff efficiency gains.
- Current survey grade GPS is nearing end of life and its replacement needs to be planned for.

Objectives/Measure of Success

- Staff time required to complete data acquisition projects is reduced
- Data accuracy is improved
- Staff have access to the tools necessary to collect and maintain foundational elements and other land information datasets.

Project Timeframes

Timeline – Project #4 Major Hardware Acquisitions

Milestone	Duration	Date
UAS Acquisition	–	2019
Survey Grade GPS		2019

Responsible Parties

- IT Department GIS Division – Hardware selection and deployment
- County Surveyor – Hardware selection and deployment

Estimated Budget Information

$10,000 UAS and related software
$30,000 Survey Grade GPS

Project #6: County Surveyor Modernization Projects

Project Description/Goal

- All surveys completed in the county are required to be filed with the county surveyor. This project would allow those surveys to be submitted electronically
- Washington County anticipates donations of historic surveys from retiring surveyors. This project would scan and index those surveys, making them available in the plat of survey search applications.
- Scan all available historic PLSS dossiers and make them available on-line
- **Land Info Spending Category:** Parcel Other

Business Drivers

- Quality of digital files could be improved if submitted electronically instead of the current print and scan workflow.
- Staff efficiencies due to less rekeying of information.
- Reduced time lag between survey completion and when that survey is publicly available.
- There is value to the surveying community and the public by making historic surveys accessible.
- Although the current dossier for each PLSS monument is available on-line, the historic dossiers are not. There is value in the historic dossiers.
- Improved access will eliminate the need travel to the courthouse when information from historic dossiers needs to be accessed.

Objectives/Measure of Success

- Easy and intuitive interfaces for PLSs to submit plats of surveys
- Application to submit surveys is integrated with survey search applications and enterprise imaging systems.
- Quality scans of historic surveys are obtained and made accessible to internal and external users.
- All known PLSS dossiers are accessible anywhere and at any time.

Project Timeframes

Timeline – Project #6 County Surveyor Modernization Projects

Milestone	Duration	Date
Online plat submission	–	2019
Survey Scanning		2019
Dossier Scanning		2019

Responsible Parties

- County Surveyor – Project management and QC
- IT Department – GIS Division – Project support and public access
- Consultant or temporary employee – File scanning

Estimated Budget Information

$10,000	Online plat submission
$20,000	Survey scanning
$10,000	Dossier scanning

Project #7: 2020 Orthophotography Acquisition

Project Description/Goal

- Obtain countywide, leaf-off, 4-band orthophotography with 3" pixel resolution in spring 2020.
- **Land Info Spending Category:** Orthoimagery

Business Drivers

- Orthophotography is one of the most used layers in the county GIS and is used to determine current ground condition and the measurement of ground features.
- Current orthophotography is important for zoning, planning, law enforcement and other county programs.
- Orthophotography is the base on which other layers like surface water and address points are digitized.
- Continual changes in land use requires periodic updates.
- Enhanced resolution will produce more clarity which, in some cases, could prevent field work.

Objectives/Measure of Success

- Delivery of Orthophotography meeting all project specifications

Project Timeframes

Timeline – Project #7 Orthophotography Acquisition

Milestone	Duration	Date
Ortho flight	–	March- April 2020
Final Deliverable		Dec 2020

Responsible Parties

- SEWRPC – Contract administration, QA/QC, consortium coordination.
- Contracted Firm – Data collection and processing
- IT Department – GIS Division

Estimated Budget Information

$75,000 Orthoimagery acquisition

Project #8: Land Conservation Program Upgrades

Project Description/Goal

- This project will upgrade the program and system the Land Conservation Division of the Planning and Parks Department uses to track and manage best management practices and other land conservation activities. Data will be tied to and integrated with the parcel database.
- **Land Info Spending Category:** Other Parcel Work

Business Drivers

- Existing applications are not consistent with the current direction of IT.
- Improved integration with tax, land use and geographic features are possible.
- Improved internal and external access.

Objectives/Measure of Success

- An intuitive system to track and report on land conservation activities is delivered that is tightly integrated with all related spatial and non-spatial data.

Project Timeframes

Timeline – Project #8 Land Conservation Program Upgrades

Milestone	Duration	Date
Development	–	2020

Responsible Parties

- Planning and Parks Department – Identify system requirements and program testing
- IT Department – Development and project management.

Estimated Budget Information

$20,000 System Development

Project #9: Ongoing Costs Not Associated with a Specific Project

Project Description/Goal

- Maintain on-line mapping capabilities. This includes server software support, hosting fees, internal charges directly related to the maintenance of on-line mapping applications and external agreements for minor tweaks to the application.
- Enhance the budget of the GIS Office by funding hardware acquisition for those responsible for maintaining land information, GIS software support, and training of GIS staff.
- **Land Info Spending Category:** Software, Hardware, Website Development/Hosting Services, Training and Education, Other

Business Drivers

- Public demand for access to public information
- County staff have the tools and training necessary to be efficient

Objectives/Measure of Success

- GIS mapping sites are available to the public and integrated with related systems.
- Staff are appropriately trained and current in their field.
- Software is supported and upgraded to current versions
- Staff have the hardware and software to be effective.

Project Timeframes

- NA

Responsible Parties

- NA

Estimated Budget Information

$8,500/yr	Internet Mapping Application software support, hosting and minor enhancements.
$10,000/yr	Training, software support, and hardware upgrades for land information staff in the GIS office.
$7,500/yr	Hosted Servers (IaaS)
$2,000/yr	Oblique Imagery Software Support

Amendment #1: City of West Bend Tax Roll Data Integration

Project Description/Goal

- Before 2019, Washington County provided tax listing services for all communities in Washington County except the City of West Bend. The purpose of this project is to migrate existing tax listing data from the City of West Bend into the county's tax listing database/software so that Washington County can begin providing tax listing services to the City on January 1, 2019.
- **Land Info Spending Category:** Other Parcel Work

Business Drivers

- To have consistent parcel tax records across all Washington County communities.
- To be better able to meet the 'searchable' format requirements when annually submitting data for the statewide parcel map initiative.
- To be able to consistently associate ownership/tax information to parcel geometries across the county for both internal analysis and public look-up.
- To provide workflow efficiencies at the City of West Bend.

Objectives/Measure of Success

- All City of West Bend data is successfully migrated to the County's tax listing software
- The Washington County Real Property Lister is able to provide high quality tax listing services to the City of West Bend that is consistent with all other communities.
- Washington County is annually able to provide 'Act 20' parcel data with fewer exceptions
- A more seamless and consistent user experience for the public looking up tax data in the County

Project Timeframes

Timeline – Amendment #1 City of West Bend Tax Roll Data Integration

Milestone	Duration	Date
Data Migrated	3 months	Jan-March 2019

Responsible Parties

- Data cleaning and reformatting – Washington County IT/GIS
- Import and verification of city data into Ascent Land Records Management System – Transcendent Technologies
- Quality Control and Testing – Washington County Real Property Lister and City of West Bend Assessor

Estimated Budget Information

$2,000

Amendment Approval

06/04/19 Land Information Council
06/27/19 Land Use and Planning Committee