

Surveying and Mapping Guidelines
for
Airport Land Projects

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Wisconsin Department of Transportation
Bureau of Aeronautics
4802 Sheboygan Avenue, Room 701
Madison, Wisconsin 53707-7914

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This guideline supersedes the Wisconsin Department of Transportation, Bureau of Aeronautics (BOA) *Airport Owner's Guide to Land Acquisition, 1997; Land Surveys (Guide and Checklist), 2002; and Surveying and Mapping Guidelines for Land Acquisition, 2010.*

INTRODUCTION

This guideline applies to Wisconsin airport development projects involving real property, land surveying and property related mapping. This includes airport land acquisition, land release requests, airport boundary surveys, obstruction survey exhibits, Exhibit A mapping, and other airport property information development and management activities. This guideline shall be used in conjunction with WI statutes and administrative code, BOA airport development project guidance, 49 CRF Part 24 Uniform Act, and FAA's *AIP Handbook, Land Acquisition and Relocation Assistance*, and SOP #3 *Review of Exhibit 'A' Airport Property Inventory Maps*.

ACCESS TO PROPERTIES AND RIGHT OF ENTRY

Surveying and related inspections of privately held lands for airport development projects by municipalities or their agents is authorized under the following Wisconsin statutes:

- 84.01(10) Right of Entry (WisDOT)
- 66.0119 Special Inspection Warrants (municipal law)
- 114.31(2) Studies, Investigations, Airport Development Plan (aeronautics)

The Consultant will notify the landowner in advance that entry will occur, when it will occur, and why it will occur. Reasonable efforts should be made to accommodate the landowner if they wish to be present while the survey or inspection is performed. If entry is denied, politely explain to the landowner the statutory authority to enter private lands by citing section 84.01(10) of the Wisconsin Statutes. If the landowner continues to deny entry, withdraw from the site and inform the Bureau of Aeronautics.

Although Wisconsin Statutes allow the right of entry on private lands for surveys and studies, the exercise of this right may require a Special Inspection Warrant or other legal remedy when a landowner steadfastly refuses entry. If legal assistance is required, BOA will work with the airport owner to obtain that support for the project. For general information on managing public relations and property owner contacts when seeking entry onto private lands, review the State of Wisconsin Department of Transportation Facilities Development Manual Procedure 9-10-5, *as applicable to airport development projects*.

LAND SURVEYS

□ Property Surveys

Property surveys must meet state statutes, administrative code and regulatory requirements of local authorities for developing, filing and recording surveys. All property surveys must be prepared by and bear the stamp and signature of a Wisconsin Professional Land Surveyor.

Airport owners are obligated to maintain good title and to preserve rights and powers in land. Care should be taken to avoid conveying or dedicating public interests on aeronautically obligated property. Airport land should not be divided except for purposes of conveyance.

The surveyor will advise and recommend the appropriate survey product for the project. Surveys for airport land or airspace rights must be monumented and based on a thorough review of all land records. Airport property surveys are typically developed as a WI Ch236 CERTIFIED SURVEY MAP (C.S.M) or WI Adm Ch A-E 7 PLAT OF SURVEY. These surveys are the basis for appraisals, property descriptions, relocation orders, conveyance documents, Exhibit A maps, Airport Layout Plans, and other airport records. The consultant should discuss the use of

lesser work products (exhibits and maps) or other types of plats allowed under WI Ch236 as part of the project proposal and obtain BOA approval prior to their development or use.

For acquisitions greater than 0.1 acres in size, show acreage in acre units. For smaller acquisitions, square footage may be used. Take care not to use both acreage and square footage unless significant figures are considered. CSMs should include a table denoting acreage of each lot or outlot, and include airport parcel numbers.

Property surveys should depict runway endpoints as found in the FAA AVN database and show coordinate values in latitude/longitude and Wisconsin county coordinates (WCCS or WisCRS).

Each airport property survey, including land acquisition parcel or airport boundary surveys, should be independently reviewed and checked by another qualified person, not involved in the development of the survey.

When submitted to BOA for review and approval, property surveys must include a closure report of the exterior boundary of the survey and individual closure report for each parcel if multiple parcels are shown. The closure report shall include the consultant/firm name, project number, parcel number, date and preparer of closure report. The report shall include the calls commencing from a PLSS section or quarter corner to the point of beginning, along with a second PLSS corner tie. It shall show coordinate values for each angle point shown on the property survey, and the bearings and distances, or curve information, between each set of points along the exterior boundary until the traverse returns to the point of beginning. The closure report shall show the closing distance and direction along with the precision ratio. One example of a closure report can be found in the WisDOT FDM, Transportation Planning Plat preparation, Section 12-10, Attachment 1.6 and is included in this guidance.

All property surveys must be reviewed and approved by BOA prior to use on an airport development project.

☐ Airport Boundary Surveys

The airport owner is obligated to maintain a current and accurate Exhibit 'A' Property Map and Airport Layout Plan. Airport boundary surveys serve as the basis of the airport Exhibit 'A' Map. The Exhibit 'A' Map serves as the basis of the Airport Layout Plan and the two must be in agreement. An airport boundary survey may also be required to support fencing or master planning projects, or after large land acquisition projects that significantly alter the airport's boundary. The airport owner, in cooperation with BOA and FAA, will determine if a boundary survey will be conducted based on project need, schedule and funding.

The airport boundary survey should be based on a title review of existing airport property, field reconnaissance of property corners and evidence of occupation, and a thorough search of local public records. A 60 year title search report is generally sufficient, however, circumstances may require other or additional title work or services. The consultant should review airport title for liens, encumbrances and possible defects that may conflict with the airport owner's ability to meet their grant assurances. These should be discussed with the airport owner and BOA to

determine their resolution. Existing subdivision plats and streets within airport property should be vacated or discontinued to remove any underlying public interests.

The consultant will obtain BOA approval prior to conducting a re-survey or using an existing CSM or plat of survey.

Airport boundary surveys shall contain the following note to help identify aeronautically obligated property in public records:

The property depicted is part of the (*airport authority name*). The airport owner is obligated to preserve airport property in accordance with state and federal grant assurances. Obligated airport property may not be sold or used for non-aeronautical purposes without prior written release approval by WisDOT Bureau of Aeronautics and the Federal Aviation Administration.

☐ Land Acquisition/Land Release Parcel Surveys

Airport land acquisition and release parcels should be developed with reasonable and logical boundaries that are based on airport needs and design standards, then adjusted for other considerations. Boundaries may be adjusted to consider existing property lines or land use, natural or manmade boundaries such as waterways or roadways, airport safety and operations, and property owner preferences. Boundaries should assure safe, efficient and cost effective airport operations.

Land acquisition, exchanges or release of airport property interests in fee simple or easement ownership must be supported by a WI Ch236 or A-E7 compliant property survey. Property surveys should include ties to two PLSS corners and include coordinate values for the corners. The instrument of conveyance shall incorporate a Plat of Survey by reference and attached and included it as part of the recorded document. CSMs or other WI Ch236 plats shall be referenced in conveyance documents, but not attached to or included as part of the recorded document.

The airport parcel survey will be based on a review of the title report for the property, field reconnaissance of property corners and evidence of occupation, and a thorough search of local public records. The consultant will review the property title for liens, encumbrances and possible defects that may conflict with the airport owner's ability to meet their grant assurances. These will be discussed with the airport owner and BOA and, to the extent determined practicable, removed or extinguished as part of the land acquisition project. The consultant shall obtain BOA approval prior to conducting a re-survey or using an existing CSM.

To prevent conflicts with airport grant assurances, BOA policy regarding land division is to divide airport property only for purposes of conveying a fee simple ownership interest, and to divide, then convey, by separate instruments. In particular, airport property shall not be divided to describe a leasehold interest. Avigation and clear zone & avigation easements shall be created via deed and must not be created by Certified Survey Map.

Avigation Easement Surveys

Avigation easement surveys are a permanent public record developed to support the conveyance of property interests. Avigation easement surveys should not contain temporary or transitory information such as obstruction information.

In addition to general property survey requirements, avigation easement surveys should:

- Monument easement corners coincidental with fee simple property corners and lines.
- Show elevations to the nearest 1 foot of ground (terrain) at the property corners, and elevation and height above ground of avigation easement airspace intercept at the property and easement corners, runway centerline and other key points.
- Contain a statement describing the type and size of protected surface and relationship to easement surface. For example –

The easement applies to the Airspace above an imaginary plane over the real property. The plane is described as follows:

The imaginary plane above the hereinbefore described real property, as such plane is defined by Part 77 of the Federal Aviation Regulations and consists of a 34:1(horizontal:vertical) sloping plane together with a 7:1(horizontal:vertical) sloping plane, said planes being 5 feet below and parallel with the Part 77 surface for Runway 1-19, including the future 220 foot Southerly extension of said runway as shown on the Airport Layout Plan for Price County Airport, dated 8/14/09. The elevation of said planes being based on NAVD88(1991) datum with the South end of Price County Airport Runway 1-19, including said 220 foot extension, being at the proposed elevation of 1464.9 feet. Said planes cover the entire property as described above and shown hereon with the 34:1 plane passing through the corners of the property at Feature ID's A, B, C, D, E, F, G, H, I, J, K and L at the elevations as shown in the table below.

Similar to horizontal boundary determinations, avigation easement heights and boundaries should be developed as reasonable and logical boundaries. Avigation easement heights must protect FAR Part 77 and the 20:1 visual area surface. Consideration should also be given to the need to protect other critical safety surfaces. Per FAA guidance, avigation easement heights are recommended to be set 10' below the protected surface to support a longer maintenance cycle and minimize disruption to private property owners. Where actual tree species growth rates are known, the easement buffer or avigation easement height may be adjusted to support not less than a 5 year obstruction clearing maintenance cycle.

Topographic Surveys

Topographic surveys may be required to support airport mapping projects. Specifications for these surveys will developed based upon the needs of the project. All topographic survey electronic submittals should meet BOA CADD requirements for level and file format.

MAPS AND EXHIBITS

Obstruction Exhibits

Obstruction survey data may be collected terrestrially or increasingly, remotely, using newer technology such as LIDAR. See BOA guidance for obstruction survey requirements. General obstruction analysis planning may be conducted using generalized property information or local government parcel data. Obstruction analysis for land acquisition projects must be referenced to property boundaries surveyed by a Wisconsin Professional Land Surveyor.

Obstruction exhibits are developed to assist the property owner's understanding of the avigation easement rights being purchased, and to assist appraisers, arborists and other professionals in evaluating the easement's impact.

The obstruction exhibit and avigation easement surveys serve different functions and should be developed as separate documents. The obstruction exhibit should be developed as an ANSI A (8.5x11) or B (11x17) size drawing and depict the following information:

- Avigation easement area, corners, and easement contour lines at 5', 10' or other appropriate interval (Note: avigation easement height is recommended to be set 10' below the protected surface)
- Property and easement corners, runway centerline and other key points – Show elevations to the nearest 1 foot at ground level and avigation easement height at corner
- Prominent features, structures and/or trees which constitute obstructions
- Prominent land features such as knolls - Show ground elevation along with elevation of avigation airspace intercept for those features which are obstructions
- Prominent structures, land features, trees, etc. that are not obstructions
- Symbolize features which are not obstructions as green; symbolize features which are within 0-10' of easement surface as yellow; symbolize features which penetrate easement surface as red.

The obstruction exhibit should include an obstruction table with the following information: feature number or identification, description of feature, top of feature elevation, easement elevation, feature height above or below easement, and comments. Table text for features that are obstructions should be in red. The comments field should describe the monument if there is a monumented corner, the proposed disposition of the feature if an obstruction (ex: tree to be removed), or "No Obstruction" if the feature is not penetrating easement surface.

❑ Encumbrance Exhibits

Encumbrance exhibits assist the property owner's understanding of existing impacts on property value and are also used by the appraiser and other professionals to evaluate property value and acquisition impacts. Encumbrance exhibits are not required for all acquisitions but should be developed when title encumbrances on the property are numerous or complex.

Airport surveys for land acquisition include a review of the property title for liens, encumbrances and possible title defects. Based on that review and as required, the consultant should develop an ANSI A (8.5x11) or B (11x17) size encumbrance exhibit depicting existing easements or encumbrances that impact the property's use and value. Encumbrance source documents (ex: easement recording information) should be referenced on the drawing. The exhibit should also note whether local height limitation zoning impacts the property, and if so, the controlling elevation.

❑ Relocation Order Maps

The Exhibit A project map will be used as the Relocation Order map. The Relocation Order is filed at the beginning of the project. If the acquisition is revised with regard to property interest, area or easement height, the Relocation Order must be updated and re-filed prior to commencing condemnation.

CONVEYANCE DOCUMENTS AND PROPERTY DESCRIPTIONS

Property acquisitions should use approved BOA conveyance document forms and include a survey or map as part of the recorded document. BOA real estate documents are designed with fillable locations for consultant use. Other portions of the document may not be modified without prior written authorization of the Bureau of Aeronautics. All conveyance documents must be reviewed by BOA prior to obtaining signatures.

Property descriptions that support the conveyance of real property interests must be developed by a Wisconsin Professional Land Surveyor. The instrument of conveyance should incorporate the survey by reference. A plat of survey should be included as part of the recorded document and incorporated by reference; CSMs must not be re-recorded.

To prevent conflicts with airport grant assurances, BOA policy regarding land division is to divide airport property only for purposes of conveyance. Airport leases should be described by exhibit or metes and bounds (ex: plat of survey). Airport property shall not be divided for purposes of describing a leasehold interest without prior coordination with BOA.

BOA AIRPORT LAND FILE

The Bureau of Aeronautics maintains an airport “Land File” for all Wisconsin general aviation airports on behalf of airport owners. This spreadsheet catalogs a broad array of information about current and historic airport property holdings. Airport Land files have been developed for some primary airports and will continue to be developed as opportunities arise with related airport projects. The goal of BOA airport land records modernization projects is to develop accessible and shareable airport property information and systems that integrate with FAA’s Airports GIS and local government GIS systems.

The airport Land file contains the information required by airport owners, FAA and BOA to manage current and historic airport property information, released or terminated property interests, property obligations and restrictions, and property interests granted by the airport to others. The Land file is viewed as the central repository of airport property information and is used as the basis for Exhibit ‘A’ Map and ALP updates and future GIS development. Consultants should obtain a copy of the most current airport Land file from BOA when updating property information on Exhibit A maps or ALPs.

Consultants and airport owners must notify BOA of any updates, additional information, discrepancies or corrections needed to the airport Land file.

EXHIBIT ‘A’ PROPERTY INVENTORY MAP

The Exhibit ‘A’ Map serves as the airport’s official property record and documents land that is dedicated for aeronautical use. This map is used by the airport sponsor, FAA and BOA to make determinations regarding airport property and must be kept current. The Exhibit ‘A’ Map depicts current property holdings and historic airport property interests, along with information regarding prior acquisitions,

easements and restrictions on the property. Exhibit 'A' Maps are also modified for use as project maps for land acquisition or land release projects.

FAA's Exhibit 'A' Property Inventory Map standards are found in Figure 1-2 of the FAA Advisory Circular 150/5100-17, *Land Acquisition and Relocation Assistance for Airport Improvement Program (AIP) Assisted Projects*. FAA review procedures for Exhibit 'A' Maps are found in *FAA Standard Operating Procedure (SOP) #3* which is supplemented here with *Wisconsin Implementation of SOP#3* guidance. An ALP Property Map is not a substitute for an Exhibit 'A' Map unless it is prepared in accordance with FAA requirements for Exhibit 'A' Maps. Wisconsin will maintain these as separate products.

If the Exhibit 'A' Map will be prepared by a consultant, it is important to determine exactly what information and documentation is available to the consultant and what additional research and survey work must be completed. The airport owner, in cooperation with BOA and FAA, will determine if a boundary survey will be conducted based on project need, schedule and funding.

The Exhibit 'A' Map must be based on a thorough review of all land records. Existing documentation held by the sponsor and BOA should be leveraged and supplemented as required to complete the mapping update. When additional property information is discovered, it will be integrated with sponsor and BOA records.

The Exhibit 'A' Map must show all dedicated airport property regardless of the type of funds (federal, state, local, etc.) used to acquire that property. The map must also indicate other detached parcels owned by the airport sponsor that are dedicated to airport purposes.

The BOA Airport Land file contains detailed property information for the airport and should be used as the basis for Exhibit 'A' Map research, documentation of records, and map content. Exhibit 'A' Map property tables and schedules must be derived from the airport's Land file; secondary or ancillary data sources should not be used.

In addition to the Exhibit 'A' Map, final project deliverables will include an updated airport Land file and property information in hard copy and digital format and organized in a manner similar to BOA's permanent airport land records. Other formats may be considered with prior review and approval.

❑ BOA Airport Land File

A copy of airport Land file will be provided to the consultant by BOA. The consultant should edit and supplement the Land file based on property record research and do so in a manner that the consultant's changes are readily apparent. Changes to the file will be reviewed at the end of the project to assist BOA in finalizing the master copy maintained for the airport. The consultant and sponsor will be provided a copy of the final master Land file for the airport.

❑ Exhibit 'A' Map Supporting Documentation

Documents for individual parcels acquired or removed from airport property should be arranged in digital directories mirroring the BOA files, directory structure and file-naming conventions. These digital files will be provided as a final deliverable, along with hard copies of the documents. For parcels, this documentation should include the deed, survey, survey closure report and title policy for each parcel. For airport boundary surveys, this documentation should include the boundary survey, survey closure report and title reports.

❑ **Exhibit 'A' Map – Airport Property and Historic Airport Property Inventory**

The Exhibit 'A' Map shall consist of two or more sheets of drawings. The first sheet shall be the basic property map depicting current airport property interests, including the entire airport boundary, airport runway(s), fee ownership and aviation easement interests, base map features, property schedule and other information. The second sheet shall depict the entire airport boundary, airport runway(s), the inventory of historic and current airport property interests, base map features, the land table and other information. Additional sheets may be added to show details, enlargements, tables, etc., as necessary.

✓ **Basic Drawing Details** (common to all map sheets)

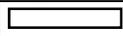
- All drawings will be prepared as an ANSII D (22x34) size drawing with the ability to be legibly reproduced and used at ANSII B (11x17) size.
- All drawings will be developed for reproduction and use in black and white format. For larger or more complex airports, color format may be allowed.
- All drawings to scale and oriented alike, scale and north arrow shown.
- All drawings must include notation of source and date of data depicted, basis of bearing, and spatial reference information.
- The Exhibit 'A' drawings shall include the following:
 - Title (first line) - Exhibit 'A' Map
 - Title block with name of airport, city location, preparer (agency/firm name), title, and sheet number (sheet __ of __ sheets).
 - Review block for preparer with Wisconsin Professional Land Surveyor approval signature and date, and BOA Real Estate Project Manager, initials and date.
 - Revision block with date, purpose, and by whom.
 - Show roads, streets, highways, railroads and waterways with names or designations.
 - PLSS section and quarter corners should be shown and labeled with section numbers, township and range identified. Monumented corners should be depicted with monuments described.
 - Airport boundary information with surveyed bearings and distances and curve information.
 - Delineate existing runway configuration(s) (Runway 18/36 - 3800' x 75') with number designations, and displaced thresholds.
 - Show existing runway protection zones (RPZ) with dimensions, type of approach, and slope for each existing runway end. Examples of information required: 20:1 visual area surface; RPZ 250' x 450' x 1000'.
 - Show runway safety areas, object free areas, taxiways and building restriction lines.
 - Place legend on each sheet identifying each type of line or symbol used that is not identified separately by note. Except when not feasible, legends should be consistent on all sheets.

✓ **Sheet 1**

- Title (second line) – Airport Property
- Property Schedule including property interest areas, uniquely designated by shading or hatching (Fee Simple ownership, Clear Zone Easement, Avigation Easement and

other key property interests), current owner, property interest, and property interest acreage totals.

Property Schedule

Symbol	Owner	Property Interest	Acreage
	Badger County	Fee Simple	537.07
	Badger County	Clear Zone Easement	48.02
	Badger County	Avigation Easement	79.14

- Sponsor approval block with governing authority name, signature, title of signer, date and the following statement –
 - Airport sponsor acknowledges its obligation to preserve airport property in accordance with Trans. 55 Wisc. Admin. Code, “Conditions of State Aid for Airport Improvement” and FAA grant assurances.
- The following notice shall be placed in a prominent location on the first sheet of the drawings -

NOTICE: The sale or long term lease (>5 years) of any airport property for non-aeronautical purposes is prohibited without prior written FAA and BOA approval.

✓ **Sheet 2**

- Title (second line) – Historic Airport Property Inventory
- Show the boundary of each parcel of land for which interest has been acquired. Boundary and acreages should be depicted as acquired (ex: to centerline of road if so described, or to road right-of-way if so described). All contiguous land acquired on or before May 13, 1946 may be shown as a single parcel and designated as “Original Airport Property”.
- Show the boundary of each parcel of land which has been released from grant assurances and conditions of state aid for disposal.
- Identify each parcel with its assigned parcel number. Each fee simple parcel and avigation or clear zone and avigation easement must be given a unique number in sequential order based on the airport’s Land file. Parcel numbers are assigned by BOA at the beginning of an acquisition project. Parcel numbers must not be re-used or pre-assigned in advance of an acquisition project.
- Include Land Table noting: Parcel Number, Acquired Acreage, Adjusted Acreage, Acreage Adjustment Note, Former Owner, Property Interest, Acquisition Project, Reimbursement Project, Recording Information, Date of Release, Date of Disposal, and Programmatic or Other Property Restrictions.
- Include under the Land Table, any relevant Notes, including but not limited to: ownership interest in roadways, street discontinuations and vacations with date and name of agency taking official action, plat vacations with date and name of agency taking official action, notice of approach protection plan with recording information, etc.

- Depict and include a table of Easements Granted to Others, including easement type, grantee, easement description, and recording information. Types of easements to note include access roads, conditional or permanent limited easements for specific uses, and where reasonably accomplished, utility easements. (Detailed depiction of airport utility information is found on the ALP utility map sheet.)

Exhibit ‘A’ Map – Land Acquisition/Land Release Project Maps

The Exhibit ‘A’ Map/Airport Property shall serve as the basis of an Exhibit ‘A’ project map. Project maps are typically a one map sheet product unless otherwise required by size of airport or project. The following modifications and/or additional detail are required for Exhibit ‘A’ project maps:

✓ **Exhibit ‘A’ Map - Proposed Land Acquisition or Proposed Land Release**

- Title (second line) – (federal or state project number) Proposed Land Acquisition or Proposed Land Release
- Number map sheet as Sheet 1 of 1 (unless project requires more than one map sheet)
- Remove sponsor approval block
- Show the boundary of each parcel of land and the property interest to be acquired or released. Boundary and acreages should reflect full ownership interest to be acquired or released (ex: to centerline of road if so described, or to road right-of-way if so described).
- Identify each parcel with its assigned parcel number. Each fee simple parcel and avigation or clear zone and avigation easement must be given a unique number in sequential order based on the airport’s Land file. Parcel numbers are assigned by BOA at the beginning of a land acquisition or land release project. Parcel numbers must not be re-used or pre-assigned in advance of a land acquisition project.
- Indicate clearly, by shading or hatching, parcels to be acquired or released with symbology unique by property interest type.
- Modify Property Schedule to include Acquisition Project Number, properties to be acquired, and post-acquisition acreage totals.

✓ **Exhibit ‘A’ Map - Final Land Acquisition**

This map is the final revision to a land acquisition project map and is used to document final parcels as acquired and sponsor acceptance of acquired property as dedicated airport property. The Proposed Land Acquisition project map should be modified to represent final land acquisition as follows:

- Title (second line) – (federal or state project number) Final Land Acquisition
- Add sponsor approval block
- Show the final boundary and acreage of each property acquired and total airport acreages.

Exhibit ‘A’ Map – Approval by Airport Sponsor

BOA is responsible for coordinating with the airport sponsor to obtain Exhibit ‘A’ Map approvals and signatures.

DATA MANAGEMENT AND SPATIAL REFERENCING

❑ Parcel Numbers

Airport parcels are defined by common ownership, not by tax parcel descriptions. A parcel includes not only a single tract of land embraced within a particular conveyance document, but all contiguous tracts in common ownership.

Parcel numbers are unique by property owner and property interest being acquired. In the case of multiple takings from one property owner (ex: purchase of fee simple ownership and an avigation easement), each property interest should be assigned a unique parcel number. Parcel numbers must not be re-used or pre-assigned in advance of a land acquisition project.

Since parcel information by its nature is dynamic and changes on a daily basis, future property interests should be depicted as a general area of interest and not as individual ownership parcels. If it is necessary to depict individual parcels, they should be clearly identified as a future interest using a temporary parcel number that is *clearly distinguishable from permanent airport parcel numbers*. Examples of temporary future parcel numbering are alpha designations or a combined alphanumeric designation indicating future (ex: FP1, FP2). Permanent airport parcel numbers will be assigned prior to land acquisition when the exact extent of the taking and ownership is known.

Historically, airport parcel numbering varied greatly. As a result, airport property management must accommodate a variety of legacy parcel numbering schemas. Best practice today uses sequential numeric values for parcel numbers and avoids assigning duplicate parcel numbers. To support improved airport parcel data management and parcel numbering, parcel numbers *shall not* be pre-assigned to future or ultimate airport property interests.

Parcel numbers used for general aviation airport land acquisition are managed by the BOA. Parcel numbers used for primary airport land acquisition should also follow BOA conventions. Parcel numbers are assigned as part of the initiation of a land project; parcels should not be pre-numbered prior to acquisition. Consultants should check with BOA as early as possible to obtain parcel numbers used for project maps, legal descriptions and other documents. Conveyance documents and surveys cannot be completed - and should not be filed or recorded - without verifying parcel numbers.

❑ Coordinate System and Datums

Property surveys and maps developed for Wisconsin airports should be based on the Wisconsin Coordinate Reference Systems (WISCRS) except where local ordinance requires a different coordinate reference system. For detailed information on Wisconsin coordinate reference systems and datums, see *Wisconsin Coordinate Reference Systems* and other resources available from the Wisconsin State Cartographer's Office website: www.sco.wisc.edu/coordsys/index.php

Coordinate data should be referenced to the North American Datum of 1983 (NAD83), 1991 or subsequent adjustment or to the North American Vertical Datum of 1988 (NAVD88), 1991 or subsequent adjustment. Use of the term "mean sea level" is no longer an accepted datum

reference and must not be used. Spatial referencing information should be noted on surveys and maps, for example:

Coordinates and bearings on this plat are referenced to the Badger County Coordinate System (WCCS), NAD83 (2011).

Elevations and heights are referenced to NAVD88 (1991).

Property survey data that is required to be submitted to FAA's AGIS should be developed in the county coordinate system to support use and integration at the local government level, and converted to state plane coordinates for submission to AGIS. (See FAA AGIS Advisory Circulars 150/5300-16, 17 and 18 for AGIS requirements.)

☐ CADD and GIS Files

When CADD or GIS systems are utilized to develop maps and plans and the contract is completed or terminated, an electronic copy (compatible with the WisDOT/BOA CADD system and ArcGIS system) of the maps and files shall be delivered to the Bureau of Aeronautics.

CADD Requirements

CADD map requirements and standards are the same as for manually prepared documents except as follows:

- Lines and Art Work - Line weights and symbols for CADD development will conform to the BOA ALP Checklist.
- Lettering - Lettering size is based on the final product. Minimum size lettering desired on the final product is to be equal to 100 Leroy on a 22" x 34" drawing, whenever possible, lettering shall be vertical gothic. Font type shall be Arial, or Type 1 (MICROSTATION).
- Reference Files - DO NOT DETACH any reference file(s) used in the creation of any design file, even if copied to the Active Design File. Include all reference files when submitting digital project files.

GIS Requirements

GIS data should be delivered in ESRI ArcGIS shapefile format with complete metadata. Parcel geodatabases developed for general aviation airport projects must include a parcel identifier field corresponding to BOA parcel numbers and reflect the information contained in the BOA airport Land spreadsheet.

OWNERSHIP OF DATA AND DOCUMENTS

Survey field notes, computations and analysis, title searches, and other documents and digital files developed or obtained within the scope of an airport land project, including LIDAR, imagery, and geospatial data sets, shall become property of the airport owner. Copyright for materials prepared under contract for an airport development project shall be transferred to the airport owner.

The Consultant shall provide copies of all files and documents available to BOA for all Bureau administered projects. The airport owner shall make files and documents available to the Bureau or FAA upon request.

Implementation of FAA SOP #3 Wisconsin Bureau of Aeronautics

Map Sheets and Map Content

Issue: FAA's Figure 1-2 standard for Exhibit 'A' Property Inventory Map and SOP#3 attempt to depict several distinct thematic maps on one map. In practice, this can result in an ineffective and confusing map. Figure 1-2 does not reflect current mapping standards and accepted professional practice.

Solution: The Exhibit 'A' Map is a snapshot of airport property and can never convey all of the details of property ownership. Therefore, it is BOA's practice to separate and manage map themes as distinct but related property map products –

- Exhibit 'A' Map – property and parcel information
- Exhibit 'A' Map – project map

Solution: Focus Exhibit 'A' Map on airport parcel information and management.

- Land Use/Concurrent Use – Per Grant Assurance #29, the location of all existing and proposed aviation and non-aviation areas (concurrent use) will be depicted on the ALP.
- Property Management/Leases – Lease information changes more frequently than other airport property information and is a property management activity. Leases are reviewed as part of BOA's airport compliance inspections and will not be shown on Exhibit 'A' maps.

Issue: Showing both current and historic parcel information on one map sheet is confusing and results in an overly crowded and difficult to read map. Historic parcel information is referenced far less frequently than current or existing property interests.

Solution: Separate the Exhibit 'A' Map into two map sheets so that current information is readily available and easily read, and historic information is available as a second sheet to be referenced as needed.

- Exhibit 'A' Map – current and historic property management
 - Sheet 1 of 2 – Airport Property (current property interests and summary information)
 - Sheet 2 of 2 – Historic Airport Property Inventory (all historic parcels, acquired and released or terminated, and detailed property information)

Issue: FAA Figure 1-2 and SOP#3 address federal requirements for property mapping, and the tracking and management of federal investments and activities. Wisconsin administers state grants-in-aid and must also track state investments and projects and federal reimbursement of state funded projects. Locally funded and administered land acquisition must also be included in airport property mapping on projects.

Solution: Expand Exhibit 'A' Map and the BOA Airport Land File to track and manage both federal and state funded airport projects and airport property.

CHECKLIST FOR EXHIBIT "A" PROPERTY MAPS

(also see FAA Standard Operating Procedure 3.00)

This checklist must be included when an Exhibit 'A' Property Map is submitted to BOA for review.

NO.	DESCRIPTION	COMMENTS	ACCEPTABLE	
			YES	NO
<i>Documents Required to be Submitted with Exhibit 'A' Map</i>				
	Exhibit 'A' Map Update - Airport Parcels – Include the deed, survey, survey closure report, and title policy for each parcel acquired or removed from airport property with this Exhibit 'A' Map update.		<input type="checkbox"/>	<input type="checkbox"/>
	Exhibit 'A' Map Update - Airport Boundary Survey – Include boundary survey, survey closure report and title reports supporting this Exhibit 'A' Map update.		<input type="checkbox"/>	<input type="checkbox"/>
<i>Drawing Details Common to All Map Sheets</i>				
1.	Scaled Drawings, reproducible in black/white Two ANSII D (22x34) size prints D-size pdf file; reproducible at B (11x17) size		<input type="checkbox"/>	<input type="checkbox"/>
2.	CADD file (GIS file if developed)		<input type="checkbox"/>	<input type="checkbox"/>
3.	Title block identifying airport, site number, associated city, state, and appropriate map sheet title		<input type="checkbox"/>	<input type="checkbox"/>
4.	Bureau of Aeronautics REVIEW BY block for BOA Land Program Manager, initials and date		<input type="checkbox"/>	<input type="checkbox"/>
5.	Revision box with date, purpose, by whom, and checked by		<input type="checkbox"/>	<input type="checkbox"/>
6.	Preparer's block with firm name, drawn by, checked by, date, and review by a Wisconsin Professional Land Surveyor		<input type="checkbox"/>	<input type="checkbox"/>
7.	Legend on each sheet identifying each type of line or symbol shown that is not identified by note		<input type="checkbox"/>	<input type="checkbox"/>

NO.	DESCRIPTION	COMMENTS	ACCEPTABLE	
			YES	NO
8.	Notation of data sources and currency, basis of bearing, and spatial reference citation		<input type="checkbox"/>	<input type="checkbox"/>
9.	PLSS section and quarter corners shown and labeled (section number, township and range identified) with monument description		<input type="checkbox"/>	<input type="checkbox"/>
10.	Roads, streets, highways, railroads and waterways with names or designations		<input type="checkbox"/>	<input type="checkbox"/>
11.	Existing runway configuration delineated on map with number designations, and displaced thresholds (if applicable)		<input type="checkbox"/>	<input type="checkbox"/>
12.	Existing runway length and width (Example: 3500' x 75')		<input type="checkbox"/>	<input type="checkbox"/>
13.	Existing RPZ with dimensions, type of approach, and slope (Example: 20:1 visual area surface RPZ 250' x 450' x 1000') Verify latest runway information shown.		<input type="checkbox"/>	<input type="checkbox"/>
14.	Bearings and distances for perimeter of existing airport property (distances in feet rounded to nearest hundredth and angles in degrees, minutes and seconds)		<input type="checkbox"/>	<input type="checkbox"/>
<i>Exhibit 'A' Map – Airport Property (map sheet 1 of 2)</i>				
15.	Title for title block – Exhibit 'A' Map Airport Property		<input type="checkbox"/>	<input type="checkbox"/>
16.	Sponsor approval block with governing authority name, signature, title of signer, date and obligation statement – as outlined in guidance		<input type="checkbox"/>	<input type="checkbox"/>
17.	Property Schedule for map sheet 1 – as outlined in guidance		<input type="checkbox"/>	<input type="checkbox"/>

NO.	DESCRIPTION	COMMENTS	ACCEPTABLE	
			YES	NO
18.	Notice regarding “sale or lease” of airport property on map sheet 1 – as outlined in guidance		<input type="checkbox"/>	<input type="checkbox"/>
<i>Exhibit ‘A’ Map – Historic Airport Property Inventory (map sheet 2 of 2)</i>				
19.	Title for title block – Exhibit ‘A’ Map Historic Airport Property Inventory		<input type="checkbox"/>	<input type="checkbox"/>
20.	Boundary and parcel number for each parcel that has been acquired or released depicted on map. Information should be summarized in tabular form as shown below; if released, depict released area		<input type="checkbox"/>	<input type="checkbox"/>
21.	Land Table for map sheet 2 – as outlined in guidance		<input type="checkbox"/>	<input type="checkbox"/>
22.	Include as notes under the Land Table: street discontinuations and vacations, plat vacations, approach protection plans, and other related historic property information		<input type="checkbox"/>	<input type="checkbox"/>
23.	Depict on map and include a table of Easements Granted to Others – as outlined in guidance		<input type="checkbox"/>	<input type="checkbox"/>
24.	Show any off-site areas owned by airport		<input type="checkbox"/>	<input type="checkbox"/>
<i>Exhibit ‘A’ Map – land acquisition/land release project maps</i>				
25.	Exhibit ‘A’ Map/Airport Property serves as the base map for project maps; remove sponsor approval block		<input type="checkbox"/>	<input type="checkbox"/>
26.	Title for title block for initial map and revisions: Exhibit ‘A’ Map XXX-XX Proposed Land Acquisition		<input type="checkbox"/>	<input type="checkbox"/>

NO.	DESCRIPTION	COMMENTS	ACCEPTABLE	
			YES	NO
27.	Show boundary and parcel number for each parcel to be acquired or released		<input type="checkbox"/>	<input type="checkbox"/>
28.	Show with shading or hatching, parcels to be acquired or released with symbology unique by property interest		<input type="checkbox"/>	<input type="checkbox"/>
29.	Modify Property Schedule to include parcels to be acquired or released, project number, and airport final acreage totals – as outlined in guidance		<input type="checkbox"/>	<input type="checkbox"/>
30.	Title for title block for final land acquisition: Exhibit 'A' Map XXX-XX Final Land Acquisition		<input type="checkbox"/>	<input type="checkbox"/>
31.	Add sponsor approval block to Exhibit 'A' Map – Final Land Acquisition		<input type="checkbox"/>	<input type="checkbox"/>

ADDITIONAL COMMENTS: 	
COMPLETED BY:	DATE: