ORMAP Map Methodology
Revised: 2008

Tax Lot Base Construction

An assessment of the methodology and the amount and type of information used to construct an assessor's map base can help in determining whether the final product is a reliable assessor taxmap. Any number of methods for developing a taxmap may be acceptable and achieve the desired product, a taxmap that meets the _ORMAP Technical Specifications_. In order for a taxmap to be considered ORMAP compliant, counties will be required to document their "method of mapping." The methodology used must include the eight minimum critical elements of mapping identified below.

1. There is County Assessor and Surveyor involvement
2. All the Surveys, Subdivision maps, and digital orthoimagery that can be found in a re-mapping area are evaluated.
3. All Surveys and Subdivision maps used in the re-mapping area are reproduced using COGO (Coordinate Geometry) methods or other methods that produce the same results and are tied to PLSS (Public Land Survey System) features.
4. No COGO features are warped (rubber sheeted) from the surveyed geometry.
5. All mapping is reviewed and approved by a professional cadastral cartographer and, if necessary, in consultation with the DOR's Cadastral Information Systems Unit.
6. A reliability level for all assessor taxmaps is determined by a test and is reviewed by a professional cadastral cartographer and included in the "MapRelCode" and "MapClass" fields.
7. All counties must be able to produce a countywide shapefile that meets the _Oregon Cadastral Data Exchange Standards._
8. Metadata must be developed and meet the _Oregon Metadata Standard_.

Using sound mapping methods and meeting the minimum critical elements of mapping will improve the likelihood that a county will achieve the ORMAP technical specifications. Even if all of the minimum critical elements are considered in a mapping project, the ORMAP technical specifications may not be achievable for a variety of reasons. One of the goals of the ORMAP program is to improve the accuracy over time, and the maximum scope of the program is to meet the technical specifications.

As new and more reliable survey information becomes available, a county may request that ORMAP fund re-mapping of an area to the _ORMAP Technical Specifications_. All ORMAP proposals will be judged and evaluated to include the minimum critical elements of _ORMAP Map Methodology._ Due to funding constraints, ORMAP is unable to fund projects that would exceed these specifications. A county would always be free to exceed the targets, but any additional time and expense would be paid by the county and/or its partners.

Exhibit A is an example of the methodology that the Cadastral Information Systems Unit at the Oregon Department of Revenue uses to produce ORMAP tax maps. It is not meant to exclude other methods that produce the same results.

EXHIBIT A:
DEPARTMENT OF REVENUE
ORMAP MAP METHODOLOGY
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1. **Project Planning Phase:** Begin coordination of resources and key personnel

   ✓ Establish communications with all of the key players at the Federal, State, County and local levels. Conduct stakeholder meetings to define the scope of the proposed mapping process and what the deliverable(s) will be.

   ✓ Estimate time to complete the project and project cost based on the number of parcels, maps, type of files and complexity of the areas to be mapped. Communicate this to all stakeholders.

   ✓ Determine project start/completion dates based on other work in progress and resources available.

   ✓ Develop a measurable time-line with benchmarks.

2. **Data Gathering Phase:** Research and gather as much digital data as possible.

   ✓ Obtain USGS Digital Orthophoto Quads or link to Digital Line Graphs and Digital Raster Graphics.

   ✓ Aerial mapping that may be available from other Federal, State or local agencies.

   ✓ City public works engineering base maps.

   ✓ Check for larger scale (more detailed) orthophotos done locally.

   ✓ Most current higher resolution conventional aerial photos.

   ✓ Obtain text files of the GCDB (Geographic Coordinate Data Base) from BLM (U.S. Bureau of Land Management).

   ✓ Obtain state plane coordinate data from the county surveyor for any monuments that they may have GPS (Global Positioning System) data and or calculated positions.

   ✓ Obtain copies of the county surveyor's survey index maps and/or his recorded survey database.

   ✓ Obtain county surveys, partition plats and subdivisions.

   ✓ Get a copy of the county road department's county road index map.

   ✓ Using ODOT (Oregon Department of Transportation) right of way map indexes, order strip maps of the entire project.

   ✓ Contact BPA (Bonneville Power Administration) for strip maps of power line right of ways (check for digital versions).

✓ If mapping around major hydroelectric reservoirs, check with USCE (U.S. Corps of Engineers) for water line maps. These may already be in raster form.

3. **Control Phase**

   a. **COGO:** Obtain corner control point information and perform COGO (Coordinate Geometry) work on county surveys, subdivision plats and right-of-way drawings.

      ✓ Create control point files to cover the entire county.
         ▪ Converted GCDB points.
         ▪ City mapping control monuments.
         ▪ County surveyor GPS points.
         ▪ Published NGS control stations.

      ✓ Create a countywide PLSS (Public Land Survey System) file for rebuilding the GLO (General Land Office) plats of each township from the BLM GCDB supplemented with any additional GPS points.

      ✓ COGO entry of the highway strip maps from ODOT making sure to include all of the PLSS corner ties.

      ✓ COGO all other strip map data from power and gas companies, railroads and county road departments.

      ✓ COGO the subdivisions, partition plats and surveys furnished by the county, again being careful to include all of the PLSS corner ties.

   b. **Control Base Assembly:** Use control points gathered and COGO data to assemble a map and countywide base control network.

      ✓ The first and primary building block is the GLO sectionizing or PLSS. This file may start with the GCDB corner coordinates but it is constantly subjected to revisions as other data gets plugged in, such as GPS points and other mapping control points.

      ✓ The individual ODOT strip map graphic groups are copied into the countywide highway file and fit to the orthophoto, PLSS and photogrammetric maps.

      ✓ The remaining strip maps are also copied into countywide files. One being the railroad file and the other is the utility file.

      ✓ Subdivision, partition plat and survey COGO work is copied into and positioned in the "Township Control" file while retaining their graphic group status for possible future adjustment.

      ✓ The PLSS file is now adjusted to fit the corner ties of the previous COGO work (if necessary).

4. **"Map Finishing"**

   a. **Line Work:** Complete the line work to Department of Revenue cadastral mapping standards.

- ✓ The mapping process now proceeds to a single master taxlot file for each township. All of the previous work is now copied into the master file and includes sectionzing, highways, railroads, power lines, subdivisions, and surveys.

- ✓ Some public road right of ways as well as major private access roads will still be missing and we map these from other digital sources. The DLG (Digital Line Graph) of the transportation layer of the Baseline 97 project gives us an approximate location for the roads. Generally these are accurate enough for the 1" = 2000' scale but not for larger scales. We then have to verify the road locations using the orthophoto reference file. For the public roads that had no surveys, digitize those using precision tools.

- ✓ Water features are copied into the master file from the hydrography DLG files and here again they are generally accurate enough for the township map but not the "blowups". The stream courses (shorelines for wider streams) must be digitized from the orthophoto image. When there are traverses of the stream they will be paramount and digitized line strings tied into them.

- ✓ The remaining "holes" in the parcel map are filled in by plotting the legal descriptions on the instruments of conveyance. This process has historically been called "taxlotting." The exception is that we do not assign new parcel numbers to complicate the records. Time is required on the counties behalf for pulling deeds, researching records, mailing etc. and more time by the Cartography Unit to COGO the fill-in deeds; but the results will yield the most accurate map possible at this time.

- ✓ Make sure that all taxlot polygons are made only by a combination of road R/W's, railroad R/W's, and taxlot boundaries and that all polygons are closed.

- ✓ Make all map boundaries exactly match the taxlot lines that make up the edge of an assessor's map. Use the center of a road R/W if appropriate. The map boundaries should be township wide with no gaps or overlaps and there should only be one line between two separate map polygons and all map boundary intersections must be broken.

- ✓ Make sure Code boundaries exactly match the taxlot lines, PLSS lines or road R/W centerlines. Try to replicate the old mylar map as closely as possible. Edge match problems will need to be resolved on a case by case basis. Zone lines will be treated in the same manner if those features are included on a county's assessor's maps.

- ✓ When the line work is complete the township line work file is then run through a series of line work cleanup procedures. All errors will be found and resolved.

b. **Annotation:** Complete the text work to Department of Revenue cadastral mapping standards.

- ✓ All text is entered onto the new map just as it appears on the old map. Care is taken however, to include all of the county survey numbers that were used in the process.

- ✓ Verify all street names, county road numbers, road access layers, and spelling. Street names are verified from the ODOT city maps and county road names and numbers are verified from the county road index map.

- ✓ Check all hydrographic features for location and naming using the published USGS (United States Geological Survey) quadrangle maps.

- ✓ The township files are edge matched to all of the surrounding files for accuracy and continuity.

- ✓ Parcel centroids are placed, map coverage and tax code boundaries are digitized, associated text is entered and graphic grouped as required to produce polygon feature classes.

- ✓ Section corner crosses and text are added.

5. **Quality Control:** Map work is checked for accuracy, completeness, and edgematched to adjacent maps.

- ✓ Check plots are run and reviewed for accuracy and completeness.

- ✓ Files are checked for duplicate elements and are deleted.

- ✓ Check map boundary line for exact match to the parcel lines and adjacent map boundaries.

- ✓ Check code lines for exact match to parcel lines and edge match to code lines of adjacent townships.

6. **Format Conversion (optional):** Migrating data from a MicroStation file to a geodatabase.

- ✓ Run through cleanup procedures in MicroStation.

- ✓ Run conversion on MicroStation data to an arc & polygon coverage.

- ✓ Check for un-attributed polygons.

- ✓ Convert all the township tiles from coverage to geodatabase and feature classes.

- ✓ Produce an ArcMap plot

- ✓ Quality Control check of map plot

- ✓ Final Quality Control check

- ✓ Convert feature classes to shapefiles for ORMAP

7. **Delivery:** A seamless county taxlot base, all other cartographic lines and annotation that make an assessment map.

- ✓ County boundary must match adjacent counties and state boundary. A shared agreement statement is required.

- ✓ All polygons must be free from slivers, overlaps, and gaps; unless gaps are taxlotted and topology is run on all appropriate feature classes.

- ✓ All data must be able to be updated and maintained following standard DOR procedures.

- ✓ The countywide database must link to the Assessors database records.

- ✓ All land within the county must be accounted for and properly attributed including Roads, Rails, Water, and NONTL.

- ✓ Must produce a standardized digital file and paper Assessment Map.

- ✓ Must have the proper DOR spatial domain and correct projection

- ✓ Proper metadata must be completed for the digital files

- ✓ Hard copy assessor maps are produced.

- ✓ Data will be delivered in the county's software of choice.

- ✓ Maps will meet *ORMAP Technical Specifications*.