

*The only way to sort out the confusion in the land records is to proceed with the surveying and evaluation of each land parcel in the Empire.*

*A good cadastre will constitute a complement of my code as far as land possession is concerned.*

*The cadastral maps must be sufficiently accurate and complete so that they can determine the boundaries between properties to prevent litigation.*

*Napoleon Bonaparte 1807*

# CHAPTER 1

## CADASTRES AND CADASTRAL MAPS

Based on translation by Dr. T.J. Blachut;  
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Council of Canada. 1975 Molds Proceedings.



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# Introduction

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**Assessment cadastre.** The complete inventory of real property, the cadastral maps and map records; ownership lists; assessment roll; statements of value, etc.; used to apply equitable ad valorem taxes on such property.

**Cadastral.** Relating to cadastre or to an element of a cadastre. The term also refers to a survey to measure the size, shape, location and extent of a land parcel.

**Cadastral cartography.** The science and art of making cadastral maps.

**Cadastral map.** A map that shows the size, shape, location, and extent of each land parcel in a prescribed geographical map area. (See: Standard cadastral map.)

**Cadastre (general).** “A record of interests in land, encompassing both the nature and extent of these interests.”<sup>1</sup> The root of the word is in the late Latin *capitastrum*, meaning poll tax register. The history runs via the Italian *catastro*, the early Italian *catistico*; from the late Greek work *katastichon*, meaning notebook; from the Greek *kata*—by, plus *stichos*—row line. The English *cadaster* is rarely used.

**Cadastre (historical).** A detailed register; inventory; statement of public record of lands; their extent, ownership, locations and value, executed by government as the base of a taxation system. One of the more famous cadastrals was the *Domesday Survey* executed by the Normans under the conqueror of England, William, Duke of Normandy. The record of that survey, contained in two volumes, is known as the *Domesday Book*.<sup>2</sup> The survey, initiated in 1085, was an exceptionally efficient inventory of nearly every landholding in England. It included the extent, value, and source of title of each landholding, showing all title and boundary changes that took place after William’s conquest.<sup>3</sup>

**Cadastre (in common law).** An official statement of the quantity and value of real property in any district; made to justly apportion the taxes on such property.<sup>4</sup>

**Land Parcel.** A tract of land, lot or contiguous lots, block or contiguous blocks, section of a township or contiguous sections, owned by one party at one time, for which there is a unique and complete bundle of rights. A land parcel can be enclosed by one unbroken boundary line. Public easements—as in dedicated streets and alleys and **most** county roads—do not divide servient estates. From a technical point of view, land in one ownership at the same time can be considered a single parcel even though divided by a road, street or alley (much the same as if it were

divided by a private easement). For assessment and taxation purposes, such land is treated as separate parcels where the use, values, or identities are separate. **Note:** “Under one ownership” means that no part of the land is subject to any taxes due, conveyance, or separate interest, different from that of the remainder of land.

**Legal cadastral.** The land title recording system.

**Real property (general).** Sir William Blackstone (1723-1780), English jurist, law professor, Justice of the Court of Pleas, and author of *Commentaries on the Laws of England*, divided property into two classes: *personal property* and *real property*. Neither classification has definite meanings (except as regards certain sections of the Oregon Revised Statutes). However, *personal property* is *easily movable* property of a personal nature, a right to personal things, or an interest less than a freehold interest in realty.<sup>5</sup> *Real property* is a term used to describe *lands, tenements and hereditaments*. In effect, real property is *movable property*, including any right, title or interest in real property.<sup>6</sup>

**Standard cadastral map (Oregon).** A map that meets the graphic and technical requirements specified and outlined in the four volumes of the Oregon Cadastral Map System.

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This chapter provides the general standards for the Oregon Cadastral Map System. It includes a brief history of the system, *i.e.* from the advent of property taxation, to the problems leading up to legislation to develop a uniform map system, and finally to the present statewide cadastral map system. To quote the Honorable Justice Holmes:

“Upon this point a page of history is worth a volume of logic.”

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## History, 1859-1951

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In 1859, at the beginning of statehood, state and local government were funded by property taxes. In 1909, the Legislature created the State Tax Commission to resolve the problems that plagued the property tax system. However, the commission was poorly staffed and had little statutory power to straighten out the mess in the tax system.<sup>7</sup>

In 1929, the Legislature gave the Tax Commission the authority and staff to secure statewide property tax equity.<sup>8</sup> The commission’s 1929-1930 biennial report outlined a program to achieve assessment uniformity. One statement in that report said:

“This program contemplates employment of standardized methods in making appraisals and inventories to deter-

*mine true value of particular properties for the purpose of taxation."*

Inventories were incomplete because there was no complete map system in this state.

The need for a complete cadastral map system was described by Wallace S. Wharton<sup>9</sup> at the 1947 annual convention of the Oregon County Assessors Association. Mr. Wharton outlined the basic program the commission would follow to achieve uniformity in ad valorem taxation.<sup>10</sup> Sections two and three in his outline were:

"2. Establish uniformity of tax records, including the working records.

"3. *Maximum development and use of adequate maps, including aerial photographs.*"

The 1947 Legislative Assembly recognized the "quagmire" the property tax system was in. Consequently, it eliminated property taxation as a source of state revenue. It then directed the commission to provide in-service training for assessors and tax collectors, and to help assessors reappraise all property.<sup>11</sup>

In 1949, the Tax Commission began preparing basic cadastral maps. The only standards were in regard to map size and scale.<sup>12</sup>

By 1951, studies showed that training and assistance programs were not improving assessment conditions. In a Valuation Division (now the Assessment and Appraisal Division) Bulletin,<sup>13</sup> the assessment cadastre was singled out as the key to achieving equalization in ad valorem taxation. The report placed special emphasis on the cadastral maps "*because they specify the most important physical properties with which the assessor deals. Without the maps the other records are almost useless.*"

By 1951, the deterioration of the property tax system had gone too far. The Legislature began to address the problem by providing for a statewide reappraisal program. House Bill 702, signed April 26, 1951, provided for appraisal assistance to counties, but failed to make provision for mapping.

Once the reappraisal program was in progress, two things became evident: (1) the real property inventories were incomplete, and (2) the assessor's maps were inadequate for appraisal use. As one appraiser reported:

*"It is almost impossible to appraise the land in absence of reliable maps to locate, identify and determine the size, shape, and extent of land parcels."*

Another problem became apparent: there was no accuracy or uniformity between the existing map

systems, and little uniformity within many of those systems.

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## The Pre-reappraisal Map Systems

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Before talking about the program to develop "better" uniform cadastral maps, something must be said in defense of the original "assessors maps," "legal maps," "ownership maps," or "tax maps" (as they were referred to).

Early Oregon assessors had to design and draw their maps. They stated that the primary purpose of the maps was to discover, identify, and inventory real property. "It was nearly impossible to know that a land parcel needed to be appraised, assessed and taxed if there was no evidence to show that it existed as a separate parcel of land."<sup>14</sup>

These maps contained good features, but often they were:

- not uniform in size,
- incomplete,
- inaccurate,
- lacking good horizontal control, and
- not dependable for reflecting the true right, title and interests in real property.

There also were other faults with these original map systems. But in all fairness to the people who created and produced those systems, other things should be considered.

First, "in the nineteen thirties and forties, when most of these maps were developed, assessor's budgets were inadequate for any high-level, large-scale mapping project; any mapping that was in a budget was usually a low priority item."

Second, there were no written map standards or instructions on how to make a cadastral map.

Third, the reference sources used in today's mapping systems were not readily available (such as high-quality aerial photography, orthophotos or satellite imagery, up-to-date 7.5-minute U.S.G.S. quadrangles and triangulation nets, extensive land parcel surveys, improved subdivision plats and standards, state-of-the-art route maps and surveys based on state plane coordinates).

Fourth, most of the instruments and equipment used in today's mapping projects were not available. Available equipment was too expensive for most counties to acquire.

Fifth, few people designing, creating, and maintaining the original map systems had any formal training

in cartography, surveying, real property law, and the like.

Sixth, “most of the original map systems were made at a time when land was relatively plentiful, land holdings were large, the population was small, land values were low, property taxes were relatively lower than today, and the maps were seldom used by anyone but assessment personnel and title companies.”<sup>15</sup> This resulted in little justification for concern about the accuracy, dependability or completeness of “tax maps.”

However, several counties produced surprisingly high-quality, complete map systems. Ideas produced by these systems helped form the design elements of today’s model “State Standard and Cadastral Map System.”

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## The Reappraisal Mapping Program

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Many factors combined to effect the demise of the old map systems, but the four major factors were: (1) the maps were not uniform within the state and even within some counties, (2) the overall accuracy was poor, (3) the maps were incomplete, and (4) the maps were not up to date. These problems surfaced as a result of the reappraisal program. They were identified as one of the deep-rooted causes of tax inequality in the ad valorem taxation.<sup>16</sup>

Once the deficiencies in the map systems were “officially” acknowledged, the State Tax Commission and most county assessors agreed that equalization and uniformity could not be achieved by appraising alone. Map standards had to be developed and employed in a massive statewide mapping program. This program is so massive that it will be near 1995 before every county has been brought to the statewide standards.

With assistance from several counties, the Tax Commission began to develop map standards in 1952. A legislative interim tax study committee concluded that the problem demanded immediate attention. On April 2, 1953, the governor signed House Bill 232 which authorized the Tax Commission to “. . . install, and assist in preparation and maintenance of maps, plats or standardized record systems **as prescribed** by the department, in the offices of assessors and tax collectors.”<sup>17</sup> It also provided for “the department and county courts to enter into agreements for the sharing of the expenses of such appraisals and installations including salaries and expenses of department employees engaged therein.”<sup>18</sup>

In the September 1953 A&T Bulletin, the importance of maps was again emphasized:

*“The value of a comprehensive set of tax maps for the assessor’s use can hardly be overestimated. The assessor who has a fine set of maps to back up his assessment record will find his position immeasurably strengthened. Without such maps the normal activities of the office are delayed and handicapped.”*

The A&T report also recognized one important fact about cadastral maps:

*“No quick, cheap method has yet been found for providing these maps. For most counties, the mapping program should be considered not in terms of man-months, but in terms of man-years.”*

The June 1954 A&T Bulletin contained an article by Edward Birkenwald.<sup>19</sup> He summarized the importance of cadastral maps in two paragraphs:

*“Assessors know, and all taxpayers should know, that property must have been discovered or found in order to comprise a part of the assessment cadastre. Likewise, if taxable property is omitted from that cadastre, as from not having been found, they should be aware that some taxpayers will pay more and some less than their fair share of the cost of government.*

*“Without the assistance of some device which shows each lot (parcel) of land, in a town, placed correctly with respect to every other parcel, no one can have assurance that all property has been listed. It is well to keep in mind that property must be found before it can be listed and then valued. The name of this device, a basic tool of the assessor, is the tax map.”*

In 1954, a legislative interim tax study committee concluded that the new maps were far too valuable to the assessment program and too expensive not to be maintained to state standards. The committee recommended:

*“The state should provide for the preparation and maintenance of adequate maps for county assessment purposes. This can be done by maintaining a staff of draftsmen under sound **technical** direction...”*

By 1987, the Oregon Department of Revenue’s Cartographic Unit, in cooperation with 34 of the 36 counties, had prepared and installed the Oregon Cadastral Map System in each of the 34 counties. This involved drawing “from scratch” 33,092 cadastral maps of 95,414 square miles. All but Multnomah and Marion counties have been brought to state standards.<sup>20</sup>

In addition to the foregoing accomplishments, three counties have been mapped twice, adding 3,174 maps to bring the grand total of maps produced under the mapping program to 36,266.<sup>21</sup>

# General Map Standards

Oregon's reappraisal program was one of the first to include a statewide mapping effort to bring all assessment maps to one uniform set of standards. In 1953, there were no model cadastral map systems to show what the "ideal" map should be. Moreover, the intellectual community had yet to "discover" cadastral cartography. There were no studies on multipurpose cadastres, geographic information systems or parcel identifier systems that would be helpful in developing standards. So the State Tax Commission, assisted by all 36 counties, had to develop the procedures and standards. The general and technical standards outlined in the September 1953 Tax Commission A&T Bulletin were:

## General (1953)

1. Each county must have a complete set of uniform, standard maps that accounted for **all** real property in the county (assessable and nonassessable, taxable and nontaxable).
2. All deeds must be reviewed to develop a complete real property inventory.
3. The U.S. Rectangular Survey—specifically the township, section and section subdivision—must be the foundation of map areas and map boundaries.
4. The parcel identifier was to be a serial number.

## Technical

1. Map size would be 18 by 20 inches. The size was determined by how large a map would have to be to accommodate a  $\frac{1}{4}$   $\frac{1}{4}$  section at  $1'' = 100'$  scale.<sup>22</sup> The scales of the  $\frac{1}{4}$  section map, the section map and the township map were based on the map size.
2. The maps were to be traced on linen tracing cloth. Although ink was used for most tracings, it was not mandatory. A few maps were traced in pencil, but that technique proved more expensive than ink.<sup>23</sup>
3. Map scales were designated as:
  - a.  $1'' = 100'$ .  $\frac{1}{4}$   $\frac{1}{4}$  sections, usually populated urban areas; business, commercial and industrial areas; or other areas where map detail and content is such as to make this the more feasible scale.
  - b.  $1'' = 200'$ .  $\frac{1}{4}$  section; usually suburban or industrial areas or other areas where this scale is appropriate. The  $1'' = 200'$  map could also be used as index maps of  $1'' = 100'$  scale maps.
  - c.  $1'' = 400'$ . Section; usually rural, industrial, but could be ranch, timber or desert in situations where

some lands are smaller than 40 acres, or where some property lines do not conform to sectional subdivision lines. This scale can be used to map undeveloped subdivisions (as defined in ORS Chapter 92), and is used to index  $1'' = 100'$  and  $1'' = 200'$  scale maps.

- d.  $1'' = 2000'$ . Township; usually ranch, timber, urban, where property lines conform to township, section,  $\frac{1}{4}$  section, or  $\frac{1}{4}$   $\frac{1}{4}$  section lines. It is permissible to put some large metes and bounds parcels on this scale of map if there is a reasonable means to show the traverse detail on the map. It is also permissible to show patented mining claims on this scale of map. However, a  $1'' = 800'$  scale detail map had to accompany the township map. Township maps also served as the index map for  $1'' = 400'$  scale section maps and, when necessary, for  $1'' = 200'$  scale maps.

4. Letter designations for  $\frac{1}{4}$  and  $\frac{1}{4}$   $\frac{1}{4}$  section maps were to be

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|-------------------------------------------|-------------------------------------------|
| a. A = NE $\frac{1}{4}$                   | k. BC = SW $\frac{1}{4}$ NW $\frac{1}{4}$ |
| b. B = NW $\frac{1}{4}$                   | l. BD = SE $\frac{1}{4}$ NW $\frac{1}{4}$ |
| c. C = SW $\frac{1}{4}$                   | m. CA = NE $\frac{1}{4}$ SW $\frac{1}{4}$ |
| d. D = SE $\frac{1}{4}$                   | n. CB = NW $\frac{1}{4}$ SW $\frac{1}{4}$ |
| e. AA = NE $\frac{1}{4}$ NE $\frac{1}{4}$ | o. CC = SW $\frac{1}{4}$ SW $\frac{1}{4}$ |
| f. AB = NW $\frac{1}{4}$ NE $\frac{1}{4}$ | p. CD = SE $\frac{1}{4}$ SW $\frac{1}{4}$ |
| g. AC = SW $\frac{1}{4}$ NE $\frac{1}{4}$ | q. DA = NE $\frac{1}{4}$ SE $\frac{1}{4}$ |
| h. AD = SE $\frac{1}{4}$ NE $\frac{1}{4}$ | r. DB = NW $\frac{1}{4}$ SE $\frac{1}{4}$ |
| i. BA = NE $\frac{1}{4}$ NW $\frac{1}{4}$ | s. DC = SW $\frac{1}{4}$ SE $\frac{1}{4}$ |
| j. BB = NW $\frac{1}{4}$ NW $\frac{1}{4}$ | t. DD = SE $\frac{1}{4}$ SE $\frac{1}{4}$ |

**Note:** These designations are still part of the map standards.

5. Map prints had to be bound, 100 pages to the binder, and available for reference by the public.
6. Subdivision indexes were required that would serve as a cross-index of lot and block numbers to the new maps.

Some maps being used today will meet those standards, yet are seriously deficient for assessment and taxation purposes. Those maps, of course, do not meet the present (1989) cadastral map standards.

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The course to today's standards could be considered as natural and logical. As the mapping program progressed, needs and problems were identified. Appraisers who were using the maps in the reappraisal program were the first to provide feedback, constructive criticism, and suggestions. County cartographers would have to maintain the system and respond to questions about the maps. They supplied input on

problems with the existing maps, and provided input on standards that would resolve those problems. Title companies, county surveyors, assessors, county clerks, private surveyors and other map users also contributed to the development of the present system.

New laws or amendments to existing laws have required revisions of the standards.

For example, a 1977 amendment to the timber tax laws provided that Western Oregon timber be taxed as severed, rather than when standing (the Western Oregon Severance Tax–W.O.S.T.). Since Eastern Oregon timber was subject to a yield tax, there was no longer a need for a special interest number for standing timber taxed to a party other than the landowner. The standard “T1” number was omitted as part of the tax lot number.

The Oregon Condominium Act presented a problem in providing a tax lot number for units being tax-lotted separate from the land, and for identifying “common areas.”

The Oregon Beach Zone Act required cadastral map standards for identifying ocean shore land that was west of the 16-foot-elevation vegetation line. That part of a taxable party’s land lying below the 16-foot line became exempt from taxation because of the public easement over the ocean shore.

New technology also played an important role in the development of the map standards. The application of computer-assisted mapping required an examination of map content. Every element on a map occupied space in computer map files. It was necessary to eliminate information that was redundant, rarely used, or cosmetic. Computer-driven plotters provided large savings in map drafting, but have one drawback. The plotters cannot print as small as a good draftsman. The standards had to change to allow for the omission of data that required tiny printing.

State-of-the art computers capable of creating computerized geographic information files are now used in the mapping process. This and other technology will demand that the standards stay abreast of the new technology.

Even though the standards have been amended, the changes have been so minor that map users were unaware that anything changed. Even though ever-present elements can cause changes in the standards, it is necessary to publish and adhere to the standards as they exist at the time. Here are today’s general standards and comments and clarifications regarding the standards.

1. **Primary objective of the Oregon cadastral map:**  
*To develop, install, and maintain an affordable, uni-*

*form, accurate, and complete statewide cadastral map system as part of the goal of achieving the equalization in the assessment of all locally assessed real property at the statutory level.*

**Comment.** That objective is the key to understanding the general cadastral map standards. *These standards are designed to solve a problem as we perceive that problem, i.e. nonstandard, incomplete, seriously deficient, or out-of-date maps, records and real property inventories. These problems make it difficult to discover newly created land parcels, to appraise real property, to assess all taxable real property to the current owners, to administer tax relief programs, and to collect taxes.*

There is a lot of debate today about requirements of the Oregon Cadastral Map System. One side argues for high-level orthophotography, employment of surveys executed at high-level accuracy standards only, and map accuracy that meets the National Map Accuracy Standards. The other side argues that the map base be survey-oriented, and contends that **all** available sources be used in the cadastral map process. This is the Department of Revenue’s position. Our responsibility is not by choice. It is assigned by the Legislature, and does not extend beyond assessment and taxation.

2. **Primary purposes of the Oregon Cadastral Map System:** *For the discovery, identification, inventory, appraisal, assessment, and taxation of all taxable real property.*

**Comment.** One misconception about the map system is that it is intended to establish legal title or legal ownership. We have explained the problem the map system was designed to solve. “Legal title” and “legal ownership” were not part of that problem. The cadastral map will never be capable of offering indisputable evidence that the boundaries and ownerships are legal. Such questions are for attorneys and courts of equity.

3. *All cadastral maps used for the discovery, identification, inventory, appraisal, assessment, and taxation of real property in Oregon must conform to these general standards, the graphic standards, and the technical standards published by the Oregon Department of Revenue, and as provided for by ORS 305.100.*

*The standards affecting cadastral maps are updated periodically to reflect changes in the statutes and new technology. Maps prepared under prior standards will be recognized as “standard” for assessment and taxation. However, each county is responsible for upgrading its maps to current standards as soon as possible. Changes in the standards which create deficiencies to assessment and taxation programs require immediate action.*

4. *Map content, size, scale, area, symbology, and information requirements are designated in "Graphic Standards" (Chapter 2, Volume 1, "Oregon Cadastral Map System: Concepts and Standards").*
5. *The parcel identifier of the Oregon Cadastral Map System is the Standard Tax Lot Number (as outlined in Chapter 3, Volume 1). The tax lot number must be used on the maps, appraisal records, the assessment roll, tax lot card, and all other assessment records which require a parcel identifier.*

*Other parcel identifiers may be used for purposes other than assessment and taxation. These numbers must not appear on the cadastral maps and map records. If they are noted on other assessment records, they are not to be "in lieu of" the standard tax lot number.*

6. *The technical standards are the statutory and common law principles and rules that govern:*
  - a. *Right, title and interest in real property.*
  - b. *Public ways, state highways, and all other dedicated lands.*
  - c. *Subdivisions, condominiums, land partitioning.*
  - d. *Assessment and Taxation.*
  - e. *Riparian lands and boundaries.*
  - f. *Real property boundaries, corners, and monuments.*
  - g. *State plane coordinates.*
  - h. *Common law and statutory rules of law, rules of construction, and rules of intent.*
  - i. *U.S. Rectangular Survey System (when applicable).*
  - j. *Surveys and surveying (when applicable).*
  - k. *State, county, and city lands (when applicable).*

*The technical standards also include the accepted practices, standards, and rules associated with: drafting, photogrammetry, mathematics, surveying, and cartography as applied to cadastral cartography and the Oregon Cadastral Map System.*

7. *It is the intent of these general standards that all real property in this state be mapped on standard cadastral maps and accounted for in the real property inventories of the individual assessor's offices.*

*"All real property in this state" includes exempt and nonassessable real property, taxable real property, governmental, and private, from the smallest parcel to the largest.*

*The inventory must include taxable interests less than fee-simple-absolute title, such as "mineral rights."*

8. *The geographic "reference" base of the cadastral map system is the U.S. Rectangular Survey System. The survey system is the foundation of the standard map boundary, and is the key identifier in the tax lot number.*

**Comment.** The Rectangular Survey was chosen as the basis for the map number, and subsequently for the tax lot number. One of the State Tax Commission's goals, prompted by requests from counties, title companies, and surveyors, was to develop an **identifier** that was also a good "people number." It required an identifier that had some element that people could easily recognize. The other key goal was to have an identifier that had some geographic significance.

The township, range, section,  $\frac{1}{4}$  section, and  $\frac{1}{4}$   $\frac{1}{4}$  section of the U.S. Rectangular Survey met those demands. This number appears on most deeds, survey, subdivision plat, large scale maps, and the majority of the other parcel documents, records, and instruments. It is a number that is easily recognized by people who work with land records, and, for some inexplicable reason, it is a number that is easy to remember. It identifies the township and range the parcel is in. In urban areas, the survey-based map number will identify the location within a section.

Some other numbers have distinct advantages over the survey-based number. For example, the state plane coordinate-based centroid provides a precise location of the approximate center of a parcel of land. However, those numbers have their own peculiar problems, and they rarely appear on deeds, surveys, subdivision plats, local plats, and the other miscellaneous documents, records, and instruments. Some numbers are superior numbers for entry and retrieval in computer files. But these numbers appear on few records, and are not good "people-numbers." Since computers can be programmed to recognize any number, the State Tax Commission, now the Department of Revenue, maintained that concern should be for the people who must work with the parcel identifier from day to day.

9. *The geometric base of the map system is the survey control consisting of a framework of monuments, corners, and points that have been identified, located or established by independent private and governmental horizontal land surveys.*
10. *Mathematical control of the geometric base is to be maintained by using the Oregon State Plane Coordinate System as the base for plotting survey monuments, corners, and points.*
11. *Bearings shown on the cadastral map are to be based on the geodetic meridian (e.g. north is "true north"). Grid or magnetic bearings may be noted on the maps; however, when noted they must be identified as "GRID" or*

“MAG” (for magnetic). If a bearing is based on a local grid, it should be so identified on the map.

12. The English system of measure—the inch, foot, yard, mile—is the standard system of measure on the cadastral maps. Other systems of measure, such as chains, rods, furlongs, etc., may be noted on the maps; however, they are to be identified as “ch.,” “rds.,” “fur.” The measurement must show the conversion to feet (see the graphic standards).

**Comment.** It has been suggested that the maps should be converted to the metric system. This suggestion has been opposed by most map users. The opposition is not because there’s resistance to change. It is because very few surveys, deeds, plats, etc., are in metric measurement and/or scale. The Department of Revenue Cartographic Unit knows of fewer than a dozen documents where the measurements are metric. The decision was made that the metric system will not be adopted in the cadastral map system until such time as **most** reference data is metric.

13. The basic unit of the cadastral map is the “land parcel.” Regardless of the many definitions of “parcel,” “land parcel” in context with this requirement is defined as: “That portion of land that is to be assessed separately from other land.” The graphic standards will outline specific requirements.
14. The method of cadastral map development will be “iterative.”<sup>24</sup> Mapping is to be based on all information available, taking into consideration all source documents (route surveys, private property surveys, Army Corps of Engineers surveys, BLM transmission line surveys, Forest Service surveys, U.S. Rectangular and mineral surveys, deeds, aerial photographs and photogrammetric products, topo and quadrangle maps, etc.). In this system, the maps are a product of not only each of the many reference sources, but also of an analysis of the combined reference sources. The resultant maps are **always** superior to the unanalyzed individual reference source because the analytical process of the combined data resolves problems and ambiguities that cannot be resolved by the individual sources.<sup>25</sup>

**Comment:** Could all of this complex process be simplified by preceding the mapping with a comprehensive survey of all parcels?

The answer is, “yes” and “no.” Such a survey, if practical and cost-effective, would be helpful in resolving problems. However, the survey could never be used in lieu of all of the source data just discussed.

When resolving boundary problems (for mapping purposes), a cartographer must consider many of the facts considered by a court of law. The only factors not considered would be testimony and evidence

that is usually not available to the cartographer. Such factors as *junior and senior rights, junior and senior surveys* (which are unrelated to junior and senior rights), *intent of parties, the situation, statutory and common law rules and principles, rules of construction, rules of law, etc.*, must enter into the decision-making process. No decision can be made without considering **all** available evidence.

Other reasons a new survey could not be used in lieu of all source data are:

- a. No survey can guarantee that all parties will accept that survey. Consider:

*“A boundary line fixed by a surveyor employed by various property owners, or others, is not binding upon an owner who was not a party to the surveying, and who never agreed to the line fixed by the surveyor.”<sup>26</sup>*

Although a property owner is estopped by his or her own survey, that owner is not bound by any survey not agreed to by him or her. Consequently, the owners would not be bound by a county or state survey. Such surveys would not eliminate boundary conflicts.

- b. Regardless of the degree of precision which measurements are taken, there is no guarantee that the surveyor has found the right corner, has run a traverse on the correct line, has oriented bearings to the correct line, tied to the correct monument, etc.
- c. Where lines on the maps were contested in the court, the court would consider **all** evidence, not merely the newer survey.
- d. Boundary line conflicts between owners are concerns of the owners, not of the state, a county, nor a city.

The only reason such conflicts are considered in the *iterative mapping process* is to provide some assurance that property is assessed to the correct owner. Since a cadastral map cannot affect the bona fide rights of the owner of property, a comprehensive survey of all parcels would **not** be cost-justifiable (and not really practical).

Any comprehensive survey of parcels intended to resolve boundary conflicts or determine “true” and “legal” boundaries (and this is the purpose behind such a scheme) would be so time-consuming that, in reality, the job would never be completed. It would be so costly it would never be approved. If the survey were a “mass survey” intended to be completed in a few years, the resultant product would be little better than the available source data.

15. *The cadastral maps must be maintained to the general, graphic, and technical standards outlined by the Department of Revenue. The maps and records must reflect the most recent real property ownerships (as provided by statutory law, and in recognition of the common law). New survey information must be recognized or considered, and the natural and cultural land features must be revised to conform to present conditions and locations.*
16. *Cadastral Map Records. A tax lot record is to be created for each parcel of real property that exists on each cadastral map. The Department of Revenue recommends the record format. However, counties can create their own hard-copy or computerized tax lot record as long as it contains adequate space to record:*
  - a. *The official description used to establish parcel boundaries. Where the boundaries have been established by survey, and the true plotted boundary is slightly different than the deed,<sup>27</sup> the survey **must** be noted.*
  - b. *Deed record number (identifying where recorded in the office of the county clerk or county recorder), or if unrecorded, must be noted.*
  - c. *Date deed is recorded in office of county clerk or county recorder, or is filed in the office of the county assessor.*
  - d. *Gross acreage of parcel purchased; all subsequent acreages of parcels conveyed from the parent parcel; net acreage; acreage revisions and corrections (noting why the acreage has been changed, and the date changed).*
  - e. *Tax lot number, including the parcel number, and special interest number (if any), and the tax code area number.*
  - f. *“Parent parcel number,” if this number is derived from another tax lot number.*

*The intent of the tax lot record is to support all work on a map relating to a parcel of land, i.e. a history of the cadastral mapping of each parcel. Although this is an official record, it is an informal record that can be filled out in pen, pencil, by typing or computer. To maintain an affordable system, the standards regarding this record are more concerned with **content** than with **looks** or **bureaucracy**.*

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## Endnotes

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1. *“Need for a Multipurpose Cadastre,”* Washington, D.C., National Academy Press (1980).
2. *See: Douglas & Greenway’s 1042 English Historical Documents–1042 to 1189;* N.Y., N.Y., Oxford University Press.
3. The Domesday Survey was very unpopular in England because it included a very complete inventory of every personal resource.
4. *Strothers v. Lucas*, 12 Pet. 410, 428, note 9 L. Ed. 1137. *See also:* Black’s Law Dictionary.
5. *Personal property* can be grouped into *corporeal personal property* (tangible, movable things) and *incorporeal personal property* (such as stocks, bonds, patents and copyrights).
6. Property can also be classified as *tangible* and *intangible*. Tangible property is that capable of being perceived by sense of touch. Intangible is not capable of being touched, such as a water right, easement, etc.
7. *Disintegration of Oregon’s Property Tax System*, Oregon Department of Revenue, p 25, March 1987.
8. *Id.* “Income tax was legislated as a property tax relief measure.”
9. Commissioner, State Tax Commission.
10. *A&T Bulletin*, No. 6; Oct. 31, 1947.
11. *Disintegration of Oregon’s Property Tax System*, *supra*.
12. *A&T Bulletin* No. 8, August 1949.
13. *Id.*, March 1951, Section 5.
14. N.V. Hurst, manager, Tax Commission Mapping Section. Speech before the 1961 Assessors Conference.
15. Earl J. Elliott, project manager, Dept. U.R. Map Unit, 1956 to 1974; notes on evolution of the cadastral map system.
16. A note of interest. In the Department of Revenue’s March 1987 *Disintegration of Oregon’s Property Tax System* (for presentation to the 1987 Legislative Assembly), inadequate maintenance of some of the *standard* map systems of certain counties was identified as an important factor contributing to the recent deterioration of the property tax system. The same problem was discovered before the 1951 reappraisal move.
17. ORS 306.125(1).
18. ORS 306.125(2).
19. Director, Property Tax Division, Maine Bureau of Taxation. This was reprinted from the New Brunswick Municipal Monthly of May 1954.
20. At this writing (August 1987), Multnomah County has signed an agreement with the Department of Revenue to map that county. Marion County is engaged in a cooperative effort with the City of Salem to bring its maps to state standards.
21. Baker County maps are now 25 years old. That county has signed an agreement with the department for computer-based state-of-the-art maps.
22. 1” = 100’ scale was selected as the base because early Tax Commission maps of urban areas were drawn at that scale, and it was considered adequate for assessment and appraisal purposes. The 1” = 100’ maps could have been of ¼ section; however, the resultant map size was considered to be awkward for field work.

23. Pencil was inadequate because it was necessary to use hard lead that would hold its shape when applied to the abrasive linen; the hard lead did not produce prints as good as soft lead (that smeared easily). The hard lead usually required so much pressure that the tracings were difficult to revise.
24. Webster's New Collegiate Dictionary defines *iterative* as: "Involving repetition . . . being a computational procedure in which replication of a cycle of operations produces results which approximate the desired result more and more closely." (Syn. *reiterative*.) Use of the term here, adopted from "Procedures and Standards for a Multi-purpose Cadastre," National Research Council, National Academy Press, Washington, D.C. (1983), p. 57.
25. For example, an area of a map may contain several deeds that have been based on incorrect surveys. The deed problem could be complicated by ambiguities and questions regarding intent. Some new surveys may have been executed to resolve problems on some parcels, but they may also create other problems. When all of this data is analyzed and considered as a whole, and other data such as subdivision plats, engineering surveys, route surveys, etc., are included in the process, the resultant maps will be better than the source document.
- Such successes are the norm when the cartographer is well versed in surveying, deed interpretation, photogrammetry and real property law.
26. Thompson, §3041, p 558, footnote 62 for citations. (1962 replace.)
- 27 "The office of a deed description is not to identify or locate the land, but to afford the **means** of identification." The courts have consistently held that it is the intent and the land survey's purpose to locate the actual boundaries. See: *Gubser v. Town*, 273 P2d 430.