

PUBLIC LAND SURVEY SYSTEM: THE BASICS

**How to Read and Use a Survey in Real Estate Transactions
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Brief History of Surveying in the United States

The first large-scale, methodical surveys in the United States were conducted by the federal government in 1785, under the supervision of the Geographer of the United States. These surveys covered parts of Ohio, the frontier at the time, and were carried out in accordance with federal ordinance. "Townships" typically thirty-six square miles in area were laid out from an east-west "baseline" and a north-south "meridian." The townships were subdivided into thirty-six "sections", approximately one square mile each, and monuments were set at one-mile intervals along the exterior boundaries of the townships. Subsequent laws called for additional subdivision of sections into "quarter sections" and "quarter-quarter sections," and the rectangular system of surveys, or Public Land Survey system as it has come to be known, was gradually refined to its present form.

Principal Elements of the Public Land Survey System

The primary purpose of the Public Land Survey system was to create parcels of land which could be conveyed by the federal government to settlers, railroads, state governments, etc. in a manner that would avoid the chaotic pattern of land ownership and the boundary disputes that were prevalent in the colonies. The Public Land Survey system eventually covered Minnesota and the twenty-nine other states that were created out of lands turned over to the federal government by the original English colonies or acquired from foreign powers. The states that are covered by the Public Land Survey system are shown on **Attachment A**.

Base Lines and Principal Meridians. The Public Land Survey system is comprised of a network of 44 rectangular surveys. Forty-four areas of varying sizes were divided by base lines and principal meridians, from which the land was subdivided into townships and sections. The survey areas range in size from a few hundred square miles to entire states and groups of states. A map of the continental United States showing the principal meridians and base lines in the Public Land Survey system is included as **Attachment B**.

Minnesota was surveyed from two different sets of base lines and meridians. The northeastern portion of the state was surveyed with reference to the Fourth Principal Meridian and Extended Base Line (i.e., the westerly extension of the base line which forms the south boundary of the State of Wisconsin). The rest of Minnesota was surveyed with reference to the Fifth Principal Meridian and Base Line.

Townships. Townships are named based on their location in relation to the "initial point," or the point at which the base line and meridian intersect. The name of a particular township is expressed in terms of the number of townships North or South of the base line, and the number of townships East or West of the meridian. Thus, the first township north and east of the initial point formed by the Fifth Principal Meridian and Base Line is identified as "Township 1 North, Range 1 East, Fifth Principal Meridian." Note that the East-West position of the township is

expressed as “Range 1 East”, rather than “Township 1 East.” Likewise, the township that is the thirty-third township South of the base line and the fourteen township West of the Fifth Principal Meridian is identified as “Township 33 South, Range 14 West, Fifth Principal Meridian.” **Attachments C and D** illustrate the numbering of townships in the Public Land Survey system.

Except for Cook County in southern Minnesota, all of Minnesota is North of the applicable baseline and West of the applicable meridian. As a result, townships in most areas of Minnesota are sometimes identified without reference to being “North” of the base line or “West” of the meridian. For example, “Township 118 North, Range 22, West, Fourth Principal Meridian” may be identified simply as “Township 118, Range 22, Fourth Principal Meridian.” The latter is unambiguous unless the township is located in or around Cook County. Similarly, in Minnesota the number of a township clearly identifies the base line, despite the fact that no reference to the baseline is given. The townships that were laid out from the Fourth Principal Meridian and baseline are numbered 26 through 71 while the townships that were laid out from the Fifth Principal Meridian and baseline are numbered 101 through 168. Thus, “Township 118, Range 22, Fifth Principal Meridian” may unambiguously be identified as “Township 118, Range 22.”

Sections. Each regular township is comprised of 36 sections, numbered as shown in **Attachment E**. Each section is nominally square and nominally one mile on a side, as illustrated in **Attachment F**. In reality, even regular sections are not perfect squares due primarily to errors in the original surveys. By law, the section and quarter-section corners that were monumented during the original government survey are controlling. Thus, each section is really an irregular octagon defined by the four corner monuments and the four quarter-corner monuments set by 18th and 19th Century surveyors. **Attachment G** shows a typical section.

Government Lots. Government Lots are irregular lots created out of the irregular townships and sections that resulted from bodies of water, surveying errors, and the convergence of meridians due to the curved nature of the earth’s surface. Government Lots are often located in the northern and western tiers of sections, where the original government surveyors were required to make adjustments due to surveying errors and the convergence of meridians.

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