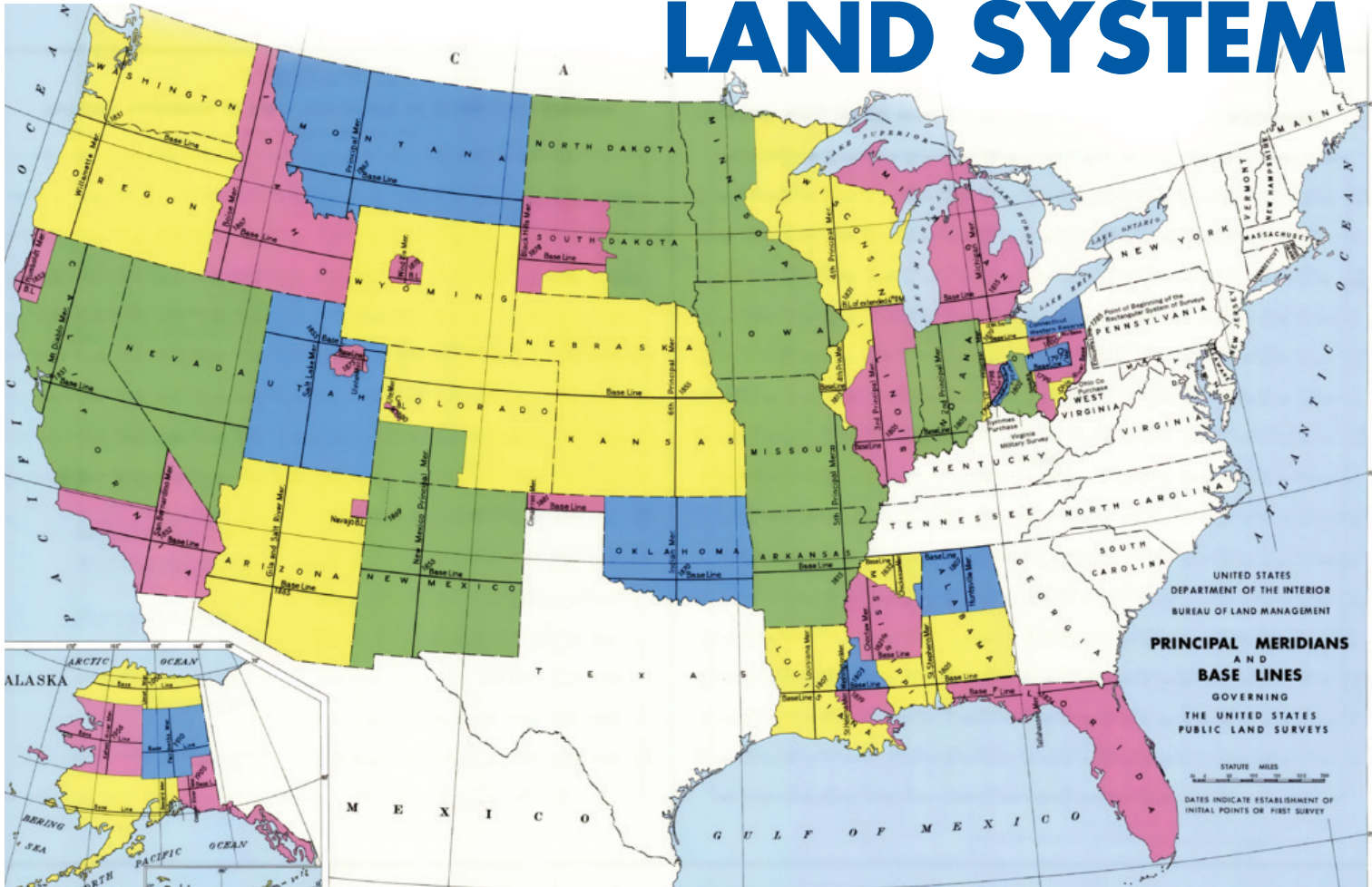


THE UNITED STATES LAND SYSTEM



A historical perspective

BY KENNETH K. WANG, PE

Nowadays, we don't hear very much about property line disputes in the United States. However, during colonial times, they were so prevalent and the associated legal process dominated so much of the government's resources that they were considered a social nuisance. The U.S. government became desperate to figure out a way to prevent future disputes in a way that would work for the rapidly growing nation.

Flaws in the System

British and other European settlers came to the eastern U.S. as early as the 16th century, and what is now known as the original 13 states became a British colony. For centuries, Britain had used the metes and bounds method to describe property ownership,

which uses physical features of the local geography to delineate property lines. As it was the system they were familiar with, the British settlers used it to describe their property in the New World as well.

In a metes and bounds land description, there is a starting point, which is always a corner, followed by directional measurements and physical features. For example, a land deed from Vermont in 1885 described the property lines thusly:

“Beginning at a stake and stones about forty feet from the center of the brook that runs across the road South westerly from the dwelling house of the late Arnold Leonard deceased now occupied by the widow Phrelove Leonard and in the west line of the highway leading by the dwelling house now occupied

by the widow Phrelove Leonard. Thence Westerly three rods to a stake and stones. Thence northerly five rods to a stake and stones. Thence Easterly three rods to the west line of the highway. Thence Southerly to the place of beginning containing fifteen rods of ground be the same more or less.”

As you may imagine, almost immediately issues sprang up. To define the boundaries of a parcel of land, the metes and bounds system relied on physical landmarks such as trees, streams, walls and roads, along with directions and distances. However, these features can easily change or move over time, leading to inconsistencies. Large trees can get chopped down for firewood, die and disappear, or even get confused with another tree. Streams can meander, change course or even dry up. Manmade structures like roads can be realigned and walls can easily be torn down. As a result, it became very difficult, sometimes even impossible, to determine the original locations of these landmark boundaries. The disputes surrounding the property boundary lines were perpetual problems that led to endless court cases and wasted government resources.

A Solution Emerges

President Thomas Jefferson quickly recognized the problems associated with using metes and bounds, and came up with a solution. In 1785, he proposed the Rectangular Survey System, now known as the Public Land Survey System (PLSS). The central and western U.S. began to transition to this new system beginning with the Land Ordinance of 1785, although the metes and bounds methodology is still used in the 13 original colonies, and in other states where land was allocated prior to 1785. Since its implementation, boundary line disputes within the public domain in the United States have largely been alleviated. This effective land system has been identified as the first mathematically designed system and nationally conducted cadastral survey in any modern country, and has been cited as a basis for land reform in other countries.

In 1946, the Department of Interior established the Bureau of Land Management (BLM) to succeed the General Land Office and the U.S. Supervisor of Surveys, which previously managed the system. The

BLM is responsible for regulating and maintaining the PLSS. For this purpose, it created the Manual of Instructions for the Survey of the Public Lands of the United States, which is available on the BLM website.

Rectangular Land Survey System

There are two main components of the Rectangular Survey System - townships and sections. The survey of the PLSS was completed in the early 1970s and uses the townships and sections as a standard template to subdivide the land within the public domain area. A typical township is a six-mile square of land, bound by the meridian and latitude lines. Each township is further divided into 36 mile-square sections. Ohio State was the first state chosen to implement this system (see Figure 1).

Subdividing the Public Land

The main north-south axis that delineates a large region is known as a principal meridian, and the east-west axis is called the base line. The intersection of the north-south axis line and the east-west axis line is the origination of the township,

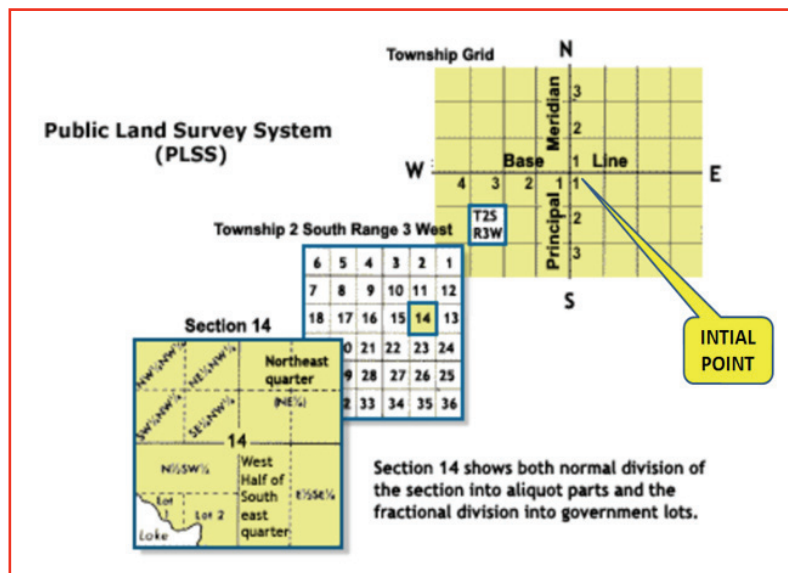


Figure 1: Section and Townships

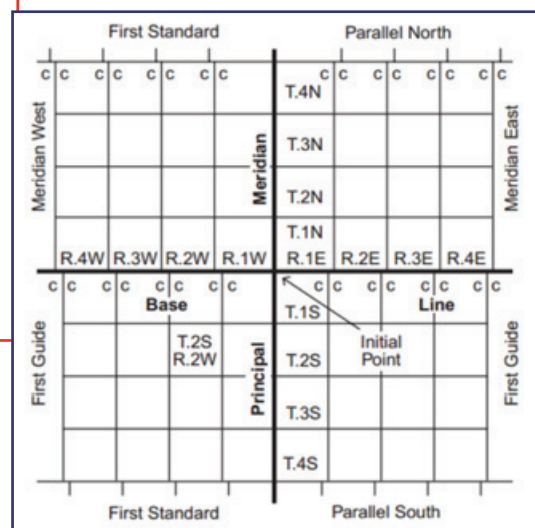


Figure 2: Intersection of Principal Meridian and Base Line

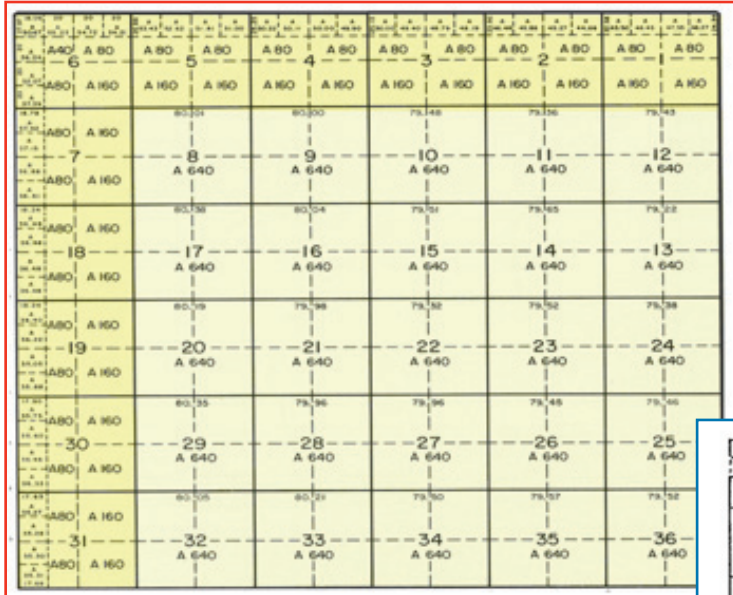


Figure 3: Fractional Lots in a Township

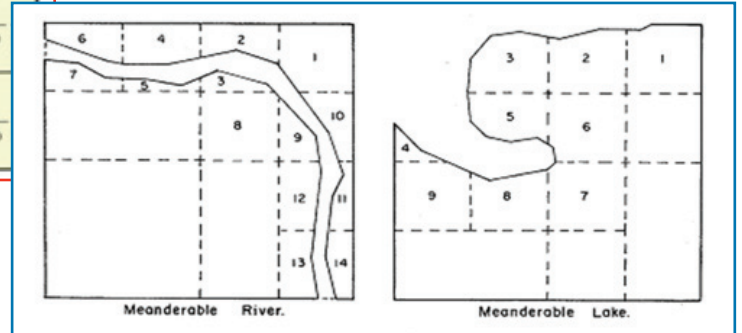


Figure 4: Section encounters obstacles

which is called the initial point (see Figure 2). The principal meridian is given a name to which all subdivisions are based on. All in all, there are 37 principal meridians in the U.S., and each is named to distinguish the various surveys.

Compensation for the Earth's Curvature

On paper, the 36 sections fit within each township like a jigsaw puzzle. However, because the earth is round and the meridian converges, it is impossible to lay out square township lines mathematically. The earth converges gradually as latitude moves away from the equator. To compensate for these differences, the BLM decided to place these adjustments in the northern and western part each of the townships (see Figure 3).

Most sections, except the northern and western part mentioned above, look like Figure 3. However, there are circumstances where an aberration occurs, such as when a section encounters obstacles such as rivers, mountains or land that was granted by Spain or Mexico. The shape of the section can vary depending on the obstacle (see Figure 4).

Monuments

In early years, private surveyors who worked under government contracts did the field work of subdividing the public land into townships, sections and quarter sections. They used crude instruments such as a compass and chains. Some survey records were incomplete or even fraudulent. And even though the corners are often found not in the theoretical positions, these original corners established legally stand as the true corners. They must guide the surveyor in making resurveys or subdivisions, regardless of the irregularities in the original survey.

The PLSS system is based on using place boundary markers to clearly delineate property lines in way that is not up for interpretation. Once placed, all the future surveys will be based on these monuments. There were wide varieties of monuments used in the past, mostly created from whichever materials were available locally, such as wooden stakes or posts, pits or piles of rocks. As the materials became more readily available, metal monuments became and continue to be the standard. Today, they are usually inscribed tablets set on iron rods or in concrete.

Conclusion

President Jefferson can claim a number of major achievements in his lifetime. The most significant was his part in writing the U.S. Constitution, and specifically the Declaration of Independence, to which we can credit with protecting our most inalienable of rights. And although it is a lesser-known accomplishment, President Jefferson's vision and contributions to the U.S. land system also unarguably has a reach that goes far beyond anything he could have ever imagined. ★



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