LAND PARCEL IDENTIFICATION FOR AUTOMATED LAND INFORMATION SYSTEMS

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RECOGNITION OF NEED FOR MORE EFFICIENT SYSTEM

The impetus for a computerized information system grew out of a need for an improvement in the present land title system. It is well known, to the surveyor, that to find perimeter descriptions—for the property being surveyed and for the adjoining properties—it may require considerable skill and time in searching the public records. It is equally well known to abstractors and attorneys that all the elements for a title search cannot always be obtained with certainty. These factors of time and uncertainty are frustrating to the professionals and costly to society.

In 1963 the American Bar Association's Section on Real Property, Probate, and Trust Law created a Committee on the Improvement of Land Title Records to work toward modernization of land records through proper and efficient use of technological developments, including computers, and the enactment of needed laws. This committee recognized that perhaps a multi-discipline approach was needed. Subsequently, through the efforts of the legal, the surveying and mapping, and the land title communities as well as backing from some governmental agencies, conferences were held to look into the problems associated with land data systems.

The first two conferences—one in Cincinnati, Ohio (1966) and the other at Mackinac Island, Michigan (1966)—dealt with determining general problems concerned with automated land information systems and how they might be solved. Similar conferences were also held in Canada. The third conference—in Atlanta, Georgia (1972), the CLIPPP Conference—concerned itself with the selection of an identifier to link all data with a specific land parcel and the definition of just what a parcel should be. Subsequent to the CLIPPP Conference, the North American Institute for Modernization of Land

Data Systems was incorporated to help evolve and implement modern land data systems in North America. This organization held a conference in the spring of 1975 and concerned itself with the conceptual, technical, and operational aspects of a modern land information system.

SOME BASIC PROBLEMS

The following are some of the pertinent findings that can be inferred from the first two conferences:

1. Large volume of data in more than one location: not efficiently organized for volume processed.
2. Many branches of government collect, organize, and use data which are related to specific parcels of land: land use, resources, people, titles.
3. There is often duplicate effort in collecting and processing land data: perhaps one-third of the data are collected in duplicate.
4. Nonstandard method of data collection and processing: makes multiple use and comparison of data among government agencies difficult or impossible.

A SOLUTION TO PROBLEMS

The conclusion was that an integrated land information system with development input from many disciplines was needed to eliminate duplication and provide for the efficient handling of data. There is a need for more than just the automation of the present system. This would not eliminate duplication or provide for an easy interchange of information. Also, automation for single purposes is very expensive and has not always proved totally acceptable. Some planning agencies have initiated computerized land information systems only to find that their information was outdated in a short time and that updating the information was prohibitively expensive.

CHARACTERISTICS OF A MODERN SYSTEM

Professor Robert N. Cook (1966) of the University of Cincinnati has outlined some characteristics of what might be the ultimate in the way of automated land information systems. These are characteristics of what Professor Cook calls the CULDATA—Comprehensive, Unified Land Data—System. The characteristics are as follows:

1. Comprehensive—must be comprehensive to meet total governmental—local, state, and federal—responsibilities and needs with no unnecessary duplication.

2. Unified—so that data can be compared and aggregated with data of the same type from other systems.
3. Description of land by use of coordinates which are tied into the national control system and which meet recognized legal standards for land descriptions.
4. A modern system of land title records with an index by parcels as well as by owners.
5. Use of the same parcel identifier for land title, taxation, land use, and land planning.
6. Use of a national grid, or two or more compatible grid systems of which at least one meets legal standards of accuracy for land surveys, as well as meets requirements for the national mapping program using the modern technology of photogrammetry and remote sensing for collecting environmental data.
7. Use of a national system of code numbers to identify natural persons, corporations, and organizations.
8. Use of a uniform method of coding data so that it can be efficiently stored and with the proper software be manipulated to yield any possible combination in an output tabulation.
9. Must be compatible with manual techniques and be susceptible of stepwise implementation.

PARCEL IDENTIFIER

The problem of determining what the parcel identifier, mentioned in characteristic number five should be, was considered at the CLIPPP Conference in Atlanta in 1972. At this conference a definition of a parcel was also established. This was important because of the various types of data that may be linked to the land (e.g., what might be a satisfactory unit or area for planning data may not be satisfctory for land title data). The definition of a parcel is as follows:

> "A parcel is a contiguous area of land described in a single description in a deed or as one of a number of lots on a plat; separately owned, either publicly or privately; and capable of being separately conveyed. For ease of indexing data, a segment of a street, highway, railroad right-of-way, pipeline, or other utility easement maybe treated as though it were a parcel." (Moyer and Fisher, 1973)

The various types of identifiers that were considered could be classified into two groups: (1) noncoordinate systems and (2) coordinate

systems. Some examples of noncoordinate systems are: (1) street address, (2) grantor-grantee index, (3) block and parcel system used in some cities, (4) U.S.P.L.S. digits along with perhaps an arbitrary parcel number, and (5) map-based systems—based on tax assessor's map —which generally consist of a book number, sheet number, block number, and arbitrary parcel number.

Some examples of coordinate-based identifiers are those based on: (1) latitude and longitude (2) U.T.M. grids, or (3) the state plane coordinate grids. Consideration was also given to identifiers based on a combination of coordinate and noncoordinate numbers.

The conferees in Atlanta recommended a standard parcel identifier based on plane coordinates of the visual center of the parcel. They also recognized the need for more than one type of identifier. This recommendation was modified to some extent by Moyer and Fisher, the editors of the conference proceedings, to be an identifier based on the state plane coordinate grids. Moyer and Fisher recommend that the basic identifier be a 15-digit number consisting of three elements. The three elements are:

1) State number (from Federal Information Processing Standards (FIPS) = 2 digits
2) County number (from FIPS) = 3 digits
3) Parcel number (state plane coordinate values to nearest ten feet for the visual center of the parcel) = 5 digits for X coordinate and 5 for Y coordinate

In addition a check digit is recommended to be appended to the basic identifier.

VERTICAL PARTITIONING

For vertical partitioning it is recommended that a Z coordinate or elevation above sea level be used. It is also recognized that other identifiers might be more suitable for a particular use (e.g., apartment numbers for condominiums). In any event the vertical partition identifiers would be stored in a separate file, but, of course, linked to a horizontal location with the standard parcel identifier.

IMPLICATIONS FOR SURVEYING

Some implication of a CULDATA System for the surveying community are:

1. Does not mean large-scale surveying operations to resurvey each individual property.

2. Perhaps addition control surveying will be needed—particularly for mapping.
3. The surveyor, particularly the county surveyor, should make recommendations for tax mapping, keeping in mind that the maps should be based on sufficient control so that a state plane coordinate grid could be over laid on it.
4. The surveying profession as a whole may be called on to upgrade surveying practices so as to be commensurate with the advantages of using a state plane coordinate grid.
5. When the system is implemented, it should make the surveyor's job of acquiring record information considerably easier.

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