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AN ECONOMIC ANALYSIS OF ALTERNATIVE INFORMATION SYSTEMS FOR REAL PROPERTY RECORDS

DISSERTATION

Presented in Partial Fulfillment of the Requirements
for the Degree Doctor of Philosophy in the
Graduate School of The Ohio
State University

By

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* * * * *

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

Statement of the Problem

Historically and prior to the development of any legal concept of ownership, title to real property was by possession and the power to defend it. However, property rights and society have evolved side by side and these rights have continually been changed to meet the needs of man.[1]

Title during the early history of man was mainly by conquest or by discovery in the name of powerful and sovereign nations. Whole continents were acquired by discovery and exploration. Since the development of the concept of land ownership, sources of title in the United States are traceable to grants by foreign powers, grants by state or federal governments, and transfer or grant from person to person.[2]

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[1]Richard U. Ratcliff, Real Estate Analysis (New York: McGraw-Hill Book Company, 1961), p.82.

[2]Nelson L. North and Alfred A. Ring, Real Estate Principles and Practices, (Englewood Cliffs: Prentice Hall, Inc., 1960), p.99.

Probably the earliest transfers of title were by the stronger taking possession from the weaker. Little or no records were being maintained by this time. Society saw this as being unjust and developed protection for the owner.[3]

The early method by which transfer was accomplished was by mere delivery of possession. The person who had been in possession of land for many years, and whose claim had never been questioned, was presumed to be the owner. Transfer by delivery only gave rise to many disputes. There being no written record of the transaction, false statements permitted fraud. As a result, the "statute of frauds" was eventually adopted, which prevented fraud by declaring that no transfer is enforceable unless in writing.[4]

The earliest recording act in the New World was adopted in 1640 by the Massachusetts Bay Colony. Since that time many changes have taken place. For one thing, man has congregated in multiples of hundreds, thousands and even million. In addition, parcels of land have been reduced in size from acres to square feet.

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[3] Ibid.

[4] Ibid., p.95.

As time moved on, the concept of a claim against one's ownership of land was established. Early claims or liens were for charges (taxes) imposed by government. Later, local taxes, mechanics liens and mortgages--liens on the land as security for indebtedness--were used. Leasing to others instead of the owner using the land himself was another change which further increased the need for more detailed and orderly record maintenance to prevent fraud.

Man also devised additional methods of conveying title. Initially, by placing a clod of earth in the hands of another person, a symbol of transfer by delivery, title was conveyed. But today conveyance can be by descent and will, adverse possession, condemnation, foreclosure, and private grant. All these involve storage and maintenance of valuable records. The instrument, properly executed and attested, must be preserved by officials of the local government.

To make an adequate copy of a transfer of property, public officials first duplicated instruments by hand. Script was used until the typewriter established itself as an office machine. The county officials copy-typed

instruments from 1900's to the 1920's. Eventually this became too laborious requiring proofreading. The rapid increase in volume of instruments filed added an additional burden.

The next phase of duplication was photo-copying on silver halide papers and this practice today is most common. Even this technique is too slow and expensive, and is being replaced by other methods.

The handwritten, typed and photo-copied instruments have the disadvantage of being filed in heavy books taking up space and require special equipment for shelving. Consequently, today's operations have heavy material costs.

Another problem of our present real property records is that they have not been multi-purpose in nature. They have been designed to serve but two purposes--to make public the interests people possess in real property and to prevent fraud.

As a society becomes more industrialized and larger in terms of population numbers, it finds itself craving information about its resources--be it land, labor, capital or management. Adequate statistics must cover all essential aspects of the nation's economic and social

life. They must be adequate in volume, accuracy, and relevance; they must be adequate for decision making by government and private business.[5] The presence of this data is a definite characteristic of an economically advanced system such as the United States.

Not only must the data cover all essential aspects of a nation's life, and be adequate in volume, accuracy and relevance, but must be readily available to those who want current information. Timeliness, is perhaps the most important attribute of data or statistics for decision making and at the same time the costliest. Data has little value if it's needed today, but will not be available until tomorrow or the following week or year.

Often data are available in sufficient volume and accuracy but antiquated storage procedures make retrieval time consuming and expensive. Many of our public records pertaining to land are in such a form today, especially at the county level.

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[5]Marion Clawson and Charles L. Stewart, Land Use Information (Baltimore: The John Hopkins Press, 1965), p.1.

Methods and procedures of recording land data established several years ago have changed very little or not at all. Some counties have not felt the pressure to initiate new procedures, for their growth has been stable. Other counties have witnessed very rapid changes with some containing thousands more people than years ago, while numbers have actually decreased in others. In the aggregate, there is a pressing need to improve the status of land records.

The transportation planning agencies need data in order to develop the most feasible route for the majority of the people. City, county and regional planning commissions require data to plot the course for whole communities.

Rural zoning in Ohio has gained prominence in the last twenty years, since the passage of the Ohio enabling legislation in 1947. Since its enactment, townships have voted on its acceptance on 940 occasions. In addition, 102 instances of amending the zoning resolution have occurred. A comprehensive plan must preceed the zoning resolution. This plan should contain a land use study, and consider population numbers, economic data and social trends.

The number of city planning commissions and their expenditures have been on the increase in Ohio. Since 1958 commissions have increased from 88 to 147 or sixty-seven per cent and expenditures by twenty-nine per cent.

Real property attorneys dealing with various legal matters need vast amounts of data. A common problem is determining the marketability of title for a prospective buyer, a title insurance company, or a lending institution. To solve this problem, data over a period of sixty or more years may need to be examined.

A large portion of the informational needs of the planner are present at the county level of government. The city, county and regional planners require data more comprehensive in scope than available at the county level but it is a base from which to work.

Another problem which is allied to the availability and timeliness of data centers on identification and legal descriptions of each parcel of land. Identification difficulties arise when counties become highly urbanized with proliferation of the number of small parcels. The task of keeping track of several thousand

parcels becomes burdensome. In addition, numerous county offices contain information pertaining to each parcel. One may have to visit several offices to collect the necessary data. It may be difficult to associate data with a parcel because of the high degree of autonomy existing in related offices and the absence of a uniform system for identifying parcels.

Legal descriptions presently used in defining the boundaries of land parcels have also been less than desirable. The three common methods used today are: (1) metes and bounds, (2) rectangular survey, and (3) recorded plat. The metes and bounds description presents certain problems since natural boundaries like stones, trees and rivers are used, and they tend to move or even disappear over time. None of the three systems provides a common denominator whereby the land parcels can be identified geographically.

In summary, the problem of real property public records can be broken down into four component parts: (1) property identification, (2) legal description, (3) legal information, and (4) land use information. Most of the information needed in these four areas is

already in the files, somewhere. Retrieval, however, is difficult and costly.

The questions that remain unanswered are "What will be the cost of correcting the deficiencies in public records so as to meet these needs? Will the costs exceed, equal, or be less than the benefits to be gained?" The question of computerization or electronic data processing is relevant because of the possible impact of the system on both meeting informational requirements and the cost-benefit ratio.

Background and Objectives of the Study

This study is an attempt to explore the costs and benefits of alternative information systems for real property. Extensive work has been carried out in regards to various aspects of information systems. However, determination and evaluation of the possible benefits and comparison of costs of alternative systems have not received adequate attention. The question still remains as to the cost of a local and a comprehensive information system for real property.

The principal objectives of this study are as follows:

1. To assess the adequacy of the public records pertaining to real property in relation to existing rights, liens, taxes, easements and other encumbrances.
2. To identify users of real property records and their needs.
3. To identify currently used methods of collection and processing of land records.
4. To discover the most critical problems in implementing an improved real property information system.
5. To evaluate current real property record systems in relation to selected alternative systems.
   a. an economic analysis of private and social costs of the current real property record maintenance.
   b. an assessment of costs and benefits to society through improved real property record systems.

c. an assessment of costs and benefits to the private sector through improved real property record systems.

Procedures

In order to carry out the objectives listed in the preceeding section, two approaches were used. An extensive review of literature was made to achieve objectives one and two. The remaining objectives were carried out by compiling primary and secondary data.

Personal interviews with public officials and professional people was the data collection technique used throughout this investigation. Since the approach was basically case study in nature, interviews were conducted with relatively few people.

Three counties were selected that contained varying characteristics. A county representing a highly urbanized setting was selected along with an urbanizing area and a rural county. Such a diverse sample was undertaken to ascertain the nature of real property records under very different conditions. Franklin County was selected to represent the urbanized area, Fairfield County, the urbanizing community and Hardin County to provide the rural picture.

Expenditures for the operation of the various public offices of these counties were collected from the annual financial reports for the period 1958 through 1967. These reports are completed by the County Auditor, yearly, and submitted to the State Auditor by the third month of each year. Problems were encountered in the data collection since new procedures were being established for storage of past reports. Data pertaining to the ten year period were secured, but a complete breakdown on expenditures within selected offices was available for only the most recent year.

The Financial Report of Ohio Counties was used to supplement the cost data of the selected offices. These reports are published annually by the Auditor of State. A complete breakdown on costs was not made in these publications.

After the cost data were compiled for the selected offices of the three counties, interviews were conducted with the officials. Some of the data were further refined and verified in the interviews. The official's responsibilities and duties were discussed;

current collection and processing procedures concerned with real property records were noted.

The next step involved the development of alternative methods of storing and retrieving of data. The costs of the alternative methods were estimated; the effect of the new methods upon the existing organizations were also ascertained, both quantatively and qualitatively. The effects of the changes on businesses outside of the public offices were considered.

The final step involved a comparison of the alternative methods. The benefits and the costs were evaluated and recommendations were made.

CHAPTER II

LAND USE INFORMATIONAL REQUIREMENTS

Land Use Control

Land possesses certain characteristics which have many implications for social control. These include a limited supply, physical fixity and durability of real estate.[6] Specific land resources like mineral deposits, soil and forest products can be moved around to where they are needed, but land as space remains fixed.[7] This characteristic of fixity means that each parcel of land is vulnerable to factors outside its boundaries. Each and every property is more or less helpless in the face of change around it. A parcel cannot be shifted to a better market.[8]

The supply of land is practically unlimited for some uses, while it is rather restricted for other

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[6]North and Ring, op.cit., p.4.

[7]Raleigh Barlowe, Land Resource Economics, (Englewood Cliffs: Prentice-Hall, Inc., 1958), p.31.

[8]Ratcliff, op.cit., p.45.

purposes. There is practically no limit to the supply of land for urban uses, because cities grow by absorbing the surrounding farm land. Farmers sell out to subdividers when they can get more than the land is worth for agricultural purposes.[9]

On the other hand, there are instances where the supply of land for a particular purpose is definitely limited relative to the demand for the use.[10] Examples are power dams, mountain passes, orchard lands and scenic areas. From an individual owner's standpoint a waterfall may best be used as a power site, but to society it may have a greater value as a scenic attraction.[11] Once the site has been converted for power, its potential as a scenic area has vanished.

Once labor and capital expenditures have been commited for improvements on the land, the investment becomes very fixed.[12] It happens frequently that the physical life of a structure far exceeds its economic

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[9] Ibid., p.44.

[10] Barlowe, op.cit., p.248.

[11] Barlowe, op.cit., p.249.

[12] North and Ring, loc.cit.

life. Society must live with it as long as the structure remains, and in certain respects, must bear the cost of the mis-improvement. Drainage, water, gas facilities, bricks and concrete cannot economically be disassembled and moved to locations where the demand is greater.

In order for society to provide controlled expansion and planned development, attention must be given the physical, economic, social and political conditions of the community. Four principle types of studies are used in the inventory or data collection process. These include: (1) preparation of base maps, (2) population data, (3) studies of the economic base, and (4) land use studies.[13]

Base maps are used to show the resource base of the community and the relation between establishments. Shown on the maps are the transportation network, parks, public properties, and significant geographic features like rivers.

Population studies are concerned with where people

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[13]Barlowe, op.cit., p.481.

live, relative density, trends, and projections of future population growth. The ethnic composition, sex, and age are additional factors of interest.

The economic base study includes the number and types of business establishments, employment, opportunities in the way of future expansion, income, size of the labor force and volume of retail sales.

Land use studies are useful to indicate the intensity of land use, trends in subdivisions and new construction. They can be used as a basis for directing future land use growth. Specific items that are needed include the area of the parcel, ownership, zoning, type of structure, floor area, condition of the structure and value of the improvements.

The need for planning and social control has been brought about by the rapid expansion in urban areas. Expressways and higher permissible speeds have reduced the distance, or at least the travel time, between outlying areas and the core city. Some of the growth has been well planned resulting in good business districts

and attractive residential areas, but some areas have witnessed haphazard growth and mixed uses.[14]

Rapidly growing communities have developed fiscal problems stemming from the increased needs for highways, water systems, and schools. People in such communities have frequently encountered unexpected increases in real property taxes to finance improvements and services.[15]

Many land owners sold their farms, accepting windfall profits resulting from high prices that they had no hand in setting. The urbanization of these farms resulted in higher operating costs for the farmers who did not leave and who had to pay for services they did not need.

Zoning has become the concern of many levels of government. The township level of government has felt the need to enact rural zoning for it is a tool to provide for organized growth, protect property values, and to regulate buildings and land use.[16]

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[14]Erling D. Solberg, "Planning and Zoning for the Future," The Yearbook of Agriculture (Washington: The United States Government Printing Office, 1958), p.525.

[15]Ibid.

[16]John B. Mitchell, "Township Zoning Law and Procedures", Columbus, Agricultural Extension Service, November, 1959. p.2.

Rural zoning resolutions were first submitted to the Ohio voters in eleven counties in 1948, the year following the passage of the enabling act. All or parts of forty-two townships were involved in the first balloting, and thirty-three approved the enactment of zoning. In 1956, the most active year, 111 areas voted on zoning with eighty-eight approving the proposed plan.[17] The most active year for amendments was 1959, with eighteen townships voting.

From 1948 to the present, proposed zoning plans have been considered 940 times. Of the 940 plans, 553 were passed and 387 failed. Over the same period, 102 amendments were voted upon to change the original plan, with forty-nine being approved.

The important factor here is that there have been many occasions where extensive amounts of information were required in reaching a decision. Rural zoning resolutions should be preceeded by a comprehensive plan consisting of an accurate base map, a complete land use inventory, a population survey, an

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[17] H.R. Moore and W.A. Wayt, Policies and Standards in Rural Zoning, Research Circular 89, Ohio Agricultural Research and Development Center, Wooster, Ohio, September, 1960, p.2.

economic base study and a study of the transportation system.[18]

In addition, amendments are frequently considered where selected areas are rezoned or building regulations are changed. Current data are needed along with trends in arriving at a rational decision.

Quite often a large portion of the data required is already available in the county. The County Auditor, acting as an agent for the State Auditor, collects detailed information about every parcel in the county for tax assessment purposes. This information could serve as the basis for a land use inventory. A study of the transportation network can well utilize the maps found in the County Engineer's Office. The Soil Conservation Service does extensive work in mapping and surveys of soil characteristics and land use. The problem encountered is that the data are not in a form which can be readily available or usable for those who have the need. An information system that could provide these data would make better use of that already collected and possibly reduce duplication.

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[18]Mitchell, op.cit., p.3.

Private Sector Requirements

Land use information can be of assistance to the private sector as well as for public officials. In 1961, there was before exemptions 365.9 billion dollars worth of assessed real property in the United States. Locally assessed real property was 280.5 billion dollars with an estimated market value of 969 billion dollars. For Ohio, the gross assessed real property before exemptions was 29.4 billion dollars with an estimated market value of 63 billion dollars.[19] Approximately 50 billion dollars of real property and improvements are added to the national wealth each year.

As an example of the increase in real property valuation, consider the rapidly expanding area of outdoor recreation. The average investment in fifty-two resorts was 740,000 dollars; in sixty-four dude ranches more than 200,000 dollars; in forty-four commercial beaches, more than 530,000 dollars; and in thirteen resort hotels, more than one and one-half million

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[19] United States Department of Commerce, Statistical Abstract of the United States, (Washington: United States Government Printing Office, 1967), p.437.

dollars. Investments in 157 ski areas averaged about 250,000 dollars.[20]

In Ohio extensive work has been completed on investments in outdoor recreation enterprises such as pay lakes, shooting preserves, organized camps, riding stables and picnic areas.[21] Table 1 shows the average investments.

The important point here is that outdoor recreation enterprises require large quantities of resources; at the same time they are considered to have one of the highest business failure rates. The public's interest in outdoor recreation is quite variable. Fads in some sports come and go. Also, the seasons are quite short and poor weather conditions can spell financial disaster. Some people advocate outdoor recreation as the

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[20]Hugh A. Johnson and Max M. Tharp, "Meeting the Demand for Outdoor Recreation," The Yearbook of Agriculture, (Washington: The United States Government Printing Office, 1963), p.314.

[21]Gerald P. Owens, Income Potential from Outdoor Recreation Enterprises in Rural Areas in Ohio, Research Bulletin 964, Ohio Agricultural Experiment Station, Wooster, Ohio, February, 1964, pp.16, 20-23.

cure all for problems of regional underemployment. Only a mal-allocation of resources can result if planning does not preceed the commitment of such resources.[22]

TABLE 1

AVERAGE INVESTMENT FOR SELECTED OUTDOOR ENTERPRISES IN OHIO, 1964

(In Dollars)

Enterprise	Investment
Pay Lakes	13,776
Shooting Preserves	83,150
Organized Camps	49,828
Camp Grounds	11,011
Riding Stables	24,025
Picnic Areas	35,716

Source: Gerald P. Owens, Income Potential from Outdoor Recreation Enterprises in Rural Areas of Ohio, Research Bulletin 964, Ohio Agricultural Experiment Station, Wooster, Ohio, February, 1964.

Recreational use of land is only one of many business enterprises that require large amounts of data for decision making.

[22]Johnson and Tharp, loc.cit.

Individual inquiries about single parcels are frequent. A person may be interested in seeking out data about an adjoining parcel as to its size, construction and ownership. Or one may be interested in information about his own real property. To gain such information usually requires large amounts of time and the aid of other persons who are more familiar with such data or records. This may also require going to a multiple of offices and buildings. A central location where all the data could be found would facilitate meeting such data needs.

Another frequent use of public records is for the purpose of estimating the fair market value of real property. This purpose requires current data on properties that have been sold recently. Obtaining of such data can also be time consuming and expensive. Real property appraisers, brokers, and mortgage loan institutions, as well as public and private agencies concerned with eminent domain are users of such information.

A wide variety of needs and purposes exist for land use information. The problem is that such data are frequently present but not readily available to those needing it.

CHAPTER III

LEGAL DIMENSIONS OF REAL PROPERTY

Rights to Real Property

In addition to the physical attributes of land--its length, width, and locational space--there is the legal content of ownership. The concept of property plays an important part in regard to what one can and cannot do with the land resources.

Forms of Ownership

The concept of property consists not of objects, but rather of man's rights with respect to material objects. Renne describes property as the right to use, lease, and dispose of an economic good or service subject to the limitations established by laws and regulations.[23]

Property has many important characteristics. First, it is an attribute of human beings and not of

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[23]Roland R. Renne, Land Economics (New York: Harper & Brothers, 1947), p.107.

the material objects themselves. It involves only objects of value which are capable of being controlled by man. Also, it is an exclusive right and not an absolute right. These rights are always subject to the control and limitations vested in the sovereign power. So the existence of property rights suggests the presence of three items: (1) an owner with others who can be excluded from the exercise of ownership rights, (2) property objects of value that can be held by man, and (3) a sovereign power that will protect the property rights of the individual.[24]

Property rights or ownership can take on many and diverse forms. Ownership can be placed into three categories: (1) quantity of rights, (2) time of enjoyment, and (3) number of owners.

Ownership is often described as a bundle of rights or sticks, with each stick representing a separate and distinct right. As mentioned previously, these rights are exclusive and not absolute, for society has reserved such rights as taxation,

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[24]Richard T. Ely and George S. Wehrwein, Land Economics (New York: The Macmillan Company), p.75.

eminent domain and police powers. The largest bundle of rights an owner can hold in the United States is ownership in fee simple. The fee simple owner has the right to use and possess, and within reason to exploit, abuse and even destroy the land. He can sell the land with or without deed restrictions, give it away to individuals or groups, trade it for other items, or convey it to a number of heirs in many different ways, or let it revert back to the sovereign power. He can mortgage the property, or permit liens to be established against it. He can subdivide his land holding or grant easements and leases. He can lease the surface, the subsurface or the space above the surface.[25]

An individual can possess rights less than fee simple. Life estates can exist where a person has use of the land during their lifetime, but at death, ownership passes to another person or persons.[26] The holder of a life estate is entitled to the income and use of the land as he sees fit, during his lifetime, but cannot convey the land in fee simple to other people.

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[25]Barlowe, op.cit., p.339.

[26]Ratcliff, op.cit., p.86.

Legal life estates exist and are determined by state law or statutes. Dower, curtesy, homestead and community property are legal life estates. Dower is the interest that a wife has in her husband's real property. It is usually a one-third interest in the land owned by her husband in fee simple during their marriage. If such land had been sold and if she joined in the conveyance, her dower right is extinguished.

Curtesy is a common law right of the husband to a life estate in land owned by his wife during their marriage if a child is born. This has been abolished in many states, including Ohio.

Community property is the estate which is substituted for dower and curtesy. All property acquired by the husband and wife in marriage is held as equal owners.

Homestead legal estate exempts an owner-occupied home from a forced sale to satisfy debts created by the head of the household. A portion of a tract of land which does not exceed so many dollars or size is exempted from certain claims. The requirements for a homestead are: (1) a family, (2) real property has to be occupied as a home, (3) the head of the household has to

own it, and (4) he has to make a proper declaration of a homestead.

In addition to life estates, leasehold estates can exist. A leasehold estate is created by a contract, either expressed or implied. The lessee actually purchases one of the rights in the bundle of rights, the right to use and possess the land owned by the lessor, for a certain period of time. At the end of the lease, the right to use and possess the land reverts back to the lessor.[27]

Time of enjoyment is also a factor in property or ownership. Rights can be possessed at the present or at some future time. An individual can receive possession at termination of another person's estate, for example, at death. A future interest can convert to a present interest upon the passage of a specified time.

In addition to the quanity of rights and time of enjoyment, the number of owners is an additional consideration when examining ownership. Ownership may be vested in a single person or more than one person or

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[27] Ibid., p.88.

joint estates. Joint estates can be tenancy in common, joint tenancy and tenancy by the entirety. Under tenancy in common, the owners hold separate undivided shares where each owner may sell, pledge, or pass it onto heirs. Joint tenancy assumes an undivided estate. Tenancy by the entirety is a form of joint tenancy between a husband and wife.

There is a group of other rights which are not forms of ownership in land. They are in the nature of privileges of use of property owned by another person. An easement is the most common form of this category. It is a nonrevocable right to use the land owned by another person. Easements are created in writing and most commonly conveyed by a deed.

In addition to the sovereign power limiting ownership rights by taxation, eminent domain and public police powers, the individual may impose private restrictions. Two such forms are deed restrictions and reservations. Restrictions may be in the form of covenants or conditions. Covenants are only promises by the grantee to use land in accordance with the provisions stated in the deed. Violation may be enjoined

by court action. In the case of conditions, a violation results in the reversion of the land to the grantor or his heirs.[28]

Reservations are another form of limitation which may be imposed by the grantor in the deed. The purpose is to retain some right or privilege for benefit of the grantor.

Conveyance of Rights

Not only are there a number of ways that the rights to land may be possessed, but there also are a multiple of ways the transfer or conveyance of ownership of rights in land may take place. A transfer may be the result of: (1) a public grant, (2) descent and will, (3) adverse possession, (4) condemnation, (5) foreclosure, or (6) private grant.

At some point in time, the Federal Government granted to states, local agencies, private corporations and individuals a part of the original public domain. The document used to convey ownership from the Government to the grantee is known as a patent.

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[28] Ibid., p.102.

The real property of one who dies without a will passes to the heirs automatically and instantly upon the descendent's death in accordance with the laws of descent. If a will exists, the property is disposed in accordance with the will. In either case, title is granted after validation by the probate court.[29]

Under certain conditions title may automatically pass to one who has gone into and possessed land and remained on it for a period of years as required by law. Title passes without action on the part of the title holder. No documents are recorded and signed. This is known as adverse possession.

A public body or quasi-public corporation like a utility company can acquire title to land by the exercise of the power of eminent domain, where it is established that such land is needed for public use.

An individual, a group of individuals, or a governmental agency may start foreclosure proceedings as a result of a lien with conveyance to a new owner.

The most common form of conveyance of title is by private grant. The document is known as a deed. The

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[29]Ibid., p. 96.

deed is a written statement in which the grantor releases his interests and conveys title to the grantee. Two kinds of deeds are used; they are warranty and quitclaim deeds.

The warranty deed guarantees that the grantor does have good and full title to the property, that the grantee will not be evicted by superior title and there are no encumberances on the property except those specified in the deed. The quitclaim deed is used to convey what interests the grantor might have in the property. It is used to convey questionable interests.

Air and Subsurface Rights

In addition to surface rights, air and subsurface rights are present. The fee simple owner holds rights which are sometimes visualized as an inverted pyramid which starts at the center of the earth and extends upward through the surface boundaries and from there straight up.[30] So, in effect, property rights can be divided into three layers.

Except for public use of the air for travel, courts

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[30]Barlowe, op.cit., p.367.

have accepted the principle that surface owners hold rights to the column of air space above their surface holdings.[31] Rights for the support of commercial super structures have been sold like the Chicago Merchandise Mart. Easements affecting air rights are often purchased by utility companies.

Surface and subsurface rights are usually conveyed together, but they can be divided and held separately. Most subsurface rights involve minerals, oil and gas rights.

Liens

Another right that can be present is a lien. A lien is a right held by a creditor to secure the payment of a debt out of the debtor's property.[32] A lien is in the nature of a financial interest in the property. The most common form of lien is a mortgage in which a conditional conveyance of property is made to the mortgagee, contingent upon a failure of payment of the debt. If the debt is repaid, the lien is extinguished. If the

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[31]Renne, op.cit., p.123.

[32]Ratcliff, op.cit., p.91.

debt is not repaid, the lien may be enforced and the property sold to pay the debt. Other forms of liens are tax liens, mechanics liens, materialman's liens, judgment liens and alimony decrees.

Title

The rights to real property are many and varied, to say the least. Rights can take on many forms and many degrees. Present and future interests may be held separately. Two or more individuals may share ownership at the time, or a lender may hold a right which he is permitted to exercise only when the debt is in default. It is the individual rights and the combination of rights which are traded in the real estate market. Even though land and buildings are quite tangible, individuals must establish their rights. One must prove he has clear, unclouded title or at least the cloud must be identified and evaluated. As mentioned previously, there are many forms of ownership and that any one of these may make the property unmarketable or of lesser value. An easement, an unsatisfied judgment lien, a pending suit, a dower right, or property in

an unadministered estate may modify ownership and reduce the value.[33]

For personal property, possession of an item is usually accepted as the evidence of ownership. For real property, however, possession is far from conclusive evidence, for the occupant may be nothing more than a trespasser, a tenant under one of many arrangements, or an owner possessing one of several possible rights.

A system does exist for establishing who owns what rights in real property. The process involved a presentation of evidence that the rights have come down to him from the original grant or patent to an individual through an unbroken chain of property transfers. Valid claims which might be presented as a result of a lien, an estate not probated, a dower interest not released or improper transfers, will constitute a cloud or defect in the title.

Public Records

In each state, provisions have been made for the recording of legal instruments affecting real estate rights.

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[33]Ibid.

A public official known as the County Recorder, a Registrar of Deeds, or County Clerk is delegated the responsibility for accepting and filing a copy of the legal instruments submitted to him. In Ohio, the County Recorder is the individual responsible.

The Recording Process

A legal instrument to be recorded must meet the following requirements: it must be (1) signed, (2) under seal, (3) witnessed by at least two people, (4) acknowledged by a notary public, and (5) the names of the signers, the witnesses and the notary must be typed or printed under their signatures.[34] These requirements also apply in Ohio.

The Recorder checks to see if the instrument meets the requirements. Having determined that it does, he stamps on the instrument the day, hour and minute it was received. He then assigns the instrument a number consecutive to that of the last previous instrument.[35]

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[34] Jacob H. Beuscher, Law and the Farmer (New York: Springer Publishing Company, Inc., 1960), p.111.

[35] Interview with James A. Schaefer, Recorder, Franklin County, January 12, 1968.

These precautions are taken to establish who has the prior right if the question arises.[36]

The individual presenting the document to be recorded pays a fee to the Recorder, the amount of which is fixed by state law. Since it normally requires several hours to complete the procording process, the Recorder notes the mailing address.

Next, the instrument is assigned a book and page number. These numbers indicate where the instrument will be stored. A duplicate copy is then made and the instrument is returned to the individual.

The instrument is entered in the indexes pertaining to that type of instrument. If it is a deed, data are entered in the grantee index to deeds and the grantor index to deeds. The date of filing, location of the parcel and the book and page number are also placed in the two indexes.

If the instrument is a mortgage, the same steps are taken as for a deed except that data is entered in the mortgagee index to mortgages and the mortgagor index to mortgages.

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[36]Beuscher, loc.cit.

Problems of the Recording System

As mentioned previously the establishment and the recording of rights has become more complicated over the past several centuries. Man has broken the complete "bundle of rights" or fee simple ownership into several individual rights. Society has, at the same time, seen the need to know more about all essential aspects of its life. However, the existing offices have not made much progress in meeting the needs of society.

Autonomy of Offices

One weakness concerns the autonomy of the several offices that are necessary to the establishment of rights. There is little coordination of effort even though many of their records bear on the same problem. The Clerk of Courts Office contains records pertaining to pending suits, judgments and executions which may have a direct bearing upon the real property a person may own. The Probate Court handles estates of deceased persons, adoptions, guardianships, insanity cases and changes in names. The County Treasurer keeps records in regard to real property taxes and special assessments and whether or not they are paid. The Recorder's

Office has copies of the legal instruments. All of these records, and in some cases other records, have an influence on the ownership of land, but they are not coordinated in any way. These records may not even be in the same building.

Parcel Identification

A common denominator that would associate the records of the different offices to real property parcels and to the individual would be quite helpful. Real property in urban areas may be identified by a number and street, a parcel number, a lot number within a residential subdivision or a combination thereof. Vacant lots may have no identification. Real property in rural communities may possess a number and road name, a rural route number, a county road number, and a parcel number. Two or three geographic identifiers may be used within the same community.

Numerical identification is becoming quite common because of the increase in population numbers and real property parcels. The Post Office has implemented the zip code system. The Federal Government has been using social security numbers for years. A parcel number may

be useful to the Auditor while the Recorder finds the book and page number most appropriate. A great amount of confusion arises, especially when one may be concerned with several offices.

Legal Description of Real Property

Because of the fixed-location factor of land, some descriptive procedure is needed to pinpoint its position. When rights are bought and sold it is essential to know what portion of the surface is to be conveyed. The term legal description is used to refer to an identification of the property which is complete enough to stand up in court.[37]

The three methods in common use today are the rectangular survey system, the metes-and-bounds description, and the recorded plat. There are, however, some inherent difficulties in these methods. For instance, the rectangular survey which suggests a grid-iron with each six mile square representing a township of thirty-six sections gives a unique description for any tract of land. It has the weakness in that the

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[37]Ratcliff, op.cit., p.47.

original surveys were not sufficiently accurate to insure consistency. Also, it does not lend itself to computations of bearings and distances between points and is of very little use in describing irregularly shaped tracts of land.[38]

In most of the older settled areas of the United States, properties are described by metes-and-bounds in terms of their location with respect to local landmarks and natural objects such as streams, rock formations, and trees. Descriptions start with a reference to some carefully identified monument such as a stone, tree, water or building. They then indicate the distance and direction to each boundary corner.

The method meets its purpose as long as the boundaries and corner monuments can be easily identified. Problems arise when the boundary descriptions are vague, when property owners mentioned have been forgotten, when original monuments have been moved or destroyed, or when properties have been subdivided. The title search

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[38]James I. Taylor, Thomas R. Ory, and Olin W. Mintzer, An Investigation of the Means to Establish Survey Control for Highway Engineering and Right-of-Way Acquisition, Report No.EES 217-2, Engineering Experiment Station, Columbus, December, 1963, p.102.

process often becomes time-consuming and expensive.[39]

Platting or the recorded plat is the third method used in legal descriptions. It is used for most urban and suburban properties. The areas subdivided are first located by metes-and-bounds or the rectangular survey method. Surveys are made, corner monuments for each lot are established and information concerning the size and location of each lot is recorded on a map filed with the Recorder.

The situation in Ohio is complicated and confused because all three systems are in use. Also, modifications of the rectangular survey are found. The United States Military Lands were surveyed into townships five miles square, then again surveyed into quarter townships of two and one-half miles square. The Ohio Company Lands, the Seven Ranges Land, and the Congress Lands were made up of townships composed of twelve sections rather than thirty-six sections. The French Grant, along the Ohio River, was divided into lots. The Virginia Military

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[39]Barlowe, loc.cit.

District, between the Scioto and the Miami Rivers uses the metes-and-bounds description.[40]

Some counties in Ohio are composed of Congress Lands and the Virginia Military District, so both descriptions are in use within the same county.

Space Requirements and Operating Costs

Existing procedures in duplicating and storing documents are expensive and use large amounts of space. A prime example is the Franklin County Recorder's Office, where nearly 122,500 documents are recorded annually. Current photocopy processes cost as much as fifty cents per two page document. Alternative processes can do the same task for fourteen cents.

In addition, binders and special storage racks are needed to store the photo-copied documents. Where facilities are old and large numbers of documents are handled, space limitations may constitute a real problem.

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[40]Raymond S. Bartholomew, Ohio Land Grants, Auditor of State, State of Ohio, Undated, p.18.

Indexing System

Since numerous documents are handled in the county offices, indexes are maintained to direct people to the location of the documents. So, in effect, the indexes are the backbone of the respective offices. But many problems are encountered with the indexes. For one thing, they are several years old and show excessive wear. Many of the entries are handwritten, so they are difficult to read. Only single copies are usually available, thus duplicating pages for security purposes is not possible.

In summary, several problems relating to the records for real property have been discussed. These problems are not independent of each other, but rather interdependent. They do, however, add up to a single problem--a complicated and cumbersome recording system.

CHAPTER IV

LEGAL INFORMATION REQUIREMENTS

It becomes apparent that the recording process is quite complex. When one considers a real estate transaction, not only must the physical property be inspected, but also the records, in order to ascertain the owner, the rights that he or she possesses, and the condition of the title. The examination reveals the entire history of the title from the initial grant by the Government to the latest events, showing the chain of deeds, wills, and actions by which the property has passed from owner to owner, as well as the encumbrances or liens.[41] The completed examination is known as an "abstract of title." An abstract of title, or abstract, is a list in abbreviated form of all the recorded actions affecting the title to a given parcel.

The prospective purchaser of real property must assure himself that the seller does possess a clear and

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[41] North and Ring, loc. cit.

unclouded title, i.e., that there are no outstanding claims or liens that may reduce the value.[42] In many cases it is the custom to require the seller of the property to provide the buyer with the abstract. The buyer's attorney in turn examines the abstract and renders an opinion as to the clarity of title.

Another alternative is title insurance. The company makes a careful examination of the title. If it is satisfied that there are no apparent defects, a policy is issued. If a defect then arises, by reason of forgery or some other defect prior to the insurance, the title company pays the loss.

Abstract of Title Process

Basically, the abstract should be sufficiently complete to enable an attorney to read it and know enough to make an intelligent and accurate opinion as to the status of the title.[43]

The attorney must examine numerous documents for

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[42]Ratcliff, op.cit., p.94.

[43]Ohio Legal Center Institute, The Discovery and Cure of Title Defects, Publication No. 49 (Columbus: Ohio Legal Center Institute, 1968), p.2.03.

there are a multitude of factors that can affect the marketability of title. Variations in descriptions, overlappings, irregularities in execution and acknowledgement of instruments, the dual construction of wills and open and unadministered estates are just a few factors affecting title. Also judicial proceedings like foreclosures, guardianships, and incompetency have to be examined carefully to see if they comply with statutory requirements.[44]

Uncertainty or ambiguity of the parcel description may make the title unmarketable. However, courts are loathe to permit an otherwise valid conveyance to fail for errors in description.[45] Having the point of beginning tied to some permanent monument is desirable.

The length of title searches vary considerably. Title insurance companies suggest checking official sources of title information for a period covering at least sixty years or back to the original grant. Where real property is exchanged every few years, official

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[44]Lawyers Title Insurance Corporation, Title Insurance Manual for Approved Attorneys, Richmond, Virginia, 1962, p.5.

[45]Ohio Legal Center Institute, op.cit., p.2.06.

sources dating back to the last transfer are of concern. With the enactment of the Marketable Title Act in 1961, one need not go beyond a forty year period in some cases.

Claims opposing clear title must be ascertained. These include mechanic's liens, liens for water, sewer, and other utility bills, tax liens, liens for judgments and alimony decrees. The Ohio mechanic's lien law gives everyone who contracts with an owner, part owner, or lessee, or furnishes labor, machinery, material or fuel for the improvement of privately owned real estate, the right to secure payment for such labor or material.[46]

Liens for utility charges are permitted if created by statute. They are confined to services provided by the government, and vary according to the governmental unit or agency involved.[47]

Tax liens include Ohio inheritance taxes, Ohio estate taxes, Federal estate taxes, Federal gift taxes and Federal income taxes.

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[46] Ibid., p.7.01.

[47] Ibid., p.7.08.

Judgments of courts of general jurisdiction in Ohio, including United States District Courts, and judgments of municipal, probate, county, and other courts may be made a lien upon all land of the judgment debtor.

Orders for alimony and child support in domestic relations cases can become a lien on real estate.

Restrictive covenants are of vital concern to the attorney if the property is subject to them. The abstract should show the reversionary or forfeiture clause, if one exists. For example, a grantor may wish to prevent the use of a property for other than residential purposes. Violation may be enjoined by court action.

Restrictive covenants may also be in the form of reservations of easements or a reservation of the right to grant easements. An easement would mean that another individual possesses a right or rights to a part or to the whole parcel of real property.

Maintenance charges may be among the restrictive covenants of a deed. The payment of maintenance charges for the upkeep of streets, alleys and parkways in a subdivision constitutes a lien against the property.

Appurtances to the main property like specifically described easements over other lands are of great importance. The abstractor or attorney must examine the titles to such other lands to be sure that easements are vested in the owner of the main property free and clear of liens.[48] An example would be an easement for access to a parcel of real property that would otherwise be landlocked, thus reducing its value substantially.

Attention must be given to the effect of unadministered estates and debts of deceased persons on the title. It is possible in some states that the property is subject to possible debts of a former deceased owner by reason of the failure to have an administration on the estate of the deceased party. In some states a purchaser for value from the heirs, after the lapse of a certain period, is protected against debts. In other states nothing will dispose of the debt except the opening and closing of the estate.[49]

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[48]Lawyers Title Insurance Corporation, op.cit., p.20.

[49]Ibid., p.21.

Title derived from heirs, devisees, or personal representatives possess many sources of danger. A deed from an heir may fail because of claims by the spouse or creditors of the descendent. Renunciation of the will by the spouse may cause a deed to fail. Statutes and court decisions should be considered in such cases.

Care must be taken to see that statutory requirements are complied with regarding conveyances by married women. In some states, a married woman cannot pass title unless her husband unites in the instrument.[50]

Marital status of parties is important in tracing out the chain of title. Dower, curtesy, homestead, community property, or other rights do exist; rights with respect to marital status, which is all important. Divorce can terminate these rights with an absolute divorce. On the other hand, an alimony decree may exist which can be a lien on the real property.[51]

Title may be derived through power of attorney. Examination of records to see if the attorney-in-fact

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[50] Ibid., p.22.

[51] Ibid., p.23.

has full power to convey and that the marital status has not changed at the time the power was made is a necessity.[52]

Adverse possession to title generally must be established by a decree or judgment of a court of competent jurisdiction. Such fact should be explored by the abstracter.

When conveyance of title is by a corporate body, the abstracter must make sure authority exists for the officers to make the conveyance.

The data necessary in determining the marketability of title are many and varied. The abstracter and/or attorney must seek out the data in the offices of Probate Court, Clerk of Courts, Recorder and the Treasurer. The attorney must seek out the required documents, examine their contents, take notes or make copies, and then render his opinion as to the validity of the title.

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[52] Ibid., p.25.

CHAPTER V

REVIEW OF LITERATURE

Efforts to improve the storage and retrieval of information relating to real property has been the concern of numerous individuals and groups, from the private sector to the federal level. In the past, many efforts to collect real property data have been extremely uncoordinated. It is not unusual for an agency to undertake a costly survey covering a given area, only to discover later that a similar effort had been conducted by another agency. While duplication is taking place, other data needs are left unfulfilled. So it is desirable to organize data collection and storage pertaining to real property in order to more fully utilize our scarce resources.

Land Use Information

Hearle and Mason have done some pioneering work which provides a complete presentation of the application of computer technology to data processing of state and local governments. They have developed what

they call a Unified Information System.[53] It is designed to reduce duplication in the collection, storage, and processing of data, and to increase the accessibility and usefulness of data.

Hearle and Mason divided the Unified Information System into three sub-categories, which they found state and local governments to need in order to properly carry out their responsibilities. They include: (1) real property data, (2) personal property data, and (3) person data.[54] The real property information items include locational data, land and structural characteristics, and owner-occupant characteristics. These items are grouped by parcels and there are 145 items. The person data are composed of identification items like name, social security number, religion, etc., and status data like voting status, licenses, court actions, probation, employment, health, education, etc.[55]

The personal property data relates to all of the property except real property. This includes registered

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[53]Edward F.R. Hearle and Raymond J. Mason, A Data Processing System for State and Local Governments (Englewood Cliffs: Prentice-Hall, Inc., 1963), p.49.

[54]Ibid., p.30.

[55]Ibid., p.40.

personal items such as vehicles, dogs, firearms, etc., and nonregistered property like that used in business and household furnishings.

Hearle and Mason also compiled data in regard to the costs and benefits of the system. They indicate the cost will depend on three major factors: (1) the number of persons and real property parcels in the state, (2) the number, nature, and geographic dispersion of participating governmental units (state agencies, counties, cities, townships and districts), and (3) the required data processing equipment and facilities.[56]

They also selected five states of differing location, population, area, and governmental organization--California, Michigan, Nebraska, New Hampshire, and Virginia. The estimated cost of the Unified Information System was from .23 per cent to 1.93 per cent of the state and local government expenditures.

A benefit of the system would be the reduction in

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[56] Ibid., p.84.

duplication in data collection, storage, and processing, and increasing the accessibility and usefulness of data.[57]

A state-wide central file of data describing persons and parcels would supersede many other files. It would permit the discontinuance of many expensive individual systems.

The greatest benefits are considered to be the increase in the accessibility and usefulness of data. Such a comprehensive system could be used to verify facts accurately and quickly. It would greatly help the social scientists by having data available and up to date.

In terms of real property, the system could permit better decisions to be made in assigning assessed values. The cost for collection of data for planning and transportation could be reduced. Hearle and Mason also list several advantages over separate nonintegrated data systems. First, automatic checking of data compatibility would be possible. Second, data could be monitored for unusual conditions. Third, the system would enable automatic searches to be made for persons and

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[57] Ibid., p.93.

parcels with specified characteristics. Fourth, the system would improve access to the information required for the use of scientific tools like simulation and linear programming.[58]

Kesler at the Massachusetts Institute of Technology carried on research with the objective to develop, structure and demonstrate a land information and recording system of general application as well as of use to right-of-way engineers. A special feature was to provide the capability of identifying parcels geographically.[59]

Kesler indicated that the system should be implemented from the present forward. It would be too difficult to go back and re-record instruments.

Kesler did admit that certain questions still remain unanswered. First, there is the question of the cost of the system. Whether or not this system should be put into effect will depend on the economic feasibility. An economic study should, in addition to

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[58] Ibid., p.99.

[59] James W. Kesler, A Land Information and Recording System, Research Report R 66-35, Cambridge, Massachusetts Institute of Technology, August, 1966, p.18.

evaluating the cost of equipment and personnel, contain the benefits to be derived from using the system. Secondly, work is needed to determine exactly what items of data should be included in a final system design.[60]

Kesler also gave thought to the identification of parcels, parties and transactions since they play an important role in any land information and recording system. The state grid coordinate system and sequential numbering were considered for parcel identification. He recommended that the serial number identification be used. In identifying parties, the use of a universal identifier appears to be more desirable since it would facilitate the transfer of information within the state and would make eventual interfaces with probate records, etc., much easier. The date and time, book and page, and a serial identifier were considered in transaction identification. No definite conclusion was reached except that any of the three could be used and may be needed to place each transaction in time.

One of the most comprehensive studies dealing with

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[60] Ibid., p.65.

land-use data requirements was in California by the TRW Systems Group.[61] Their first task was the identification of users of land-use data including Federal, State, Regional, County, District, City and Private users. In addition, areas of overlap and unfilled needs were identified.

The survey uncovered the fact that data collection is extremely uncoordinated in California. Duplication of data collection is quite frequent. It is expected that one of the major immediate benefits from the project will be cost savings accruing from the efforts by individual agencies to reduce or eliminate data collection overlap.

An attempt was made during the survey to obtain some measure of the number of items which were required by the various agencies but presently not available to them. The elements mentioned most often were: water resource data, land resource data, road and street data,

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[61] TRW Systems Group, California Regional Land Use Information System Project, "First Interim Report," (Redondo Beach, California, 1967), p.10.

utility and service data, land and structure use and urban use intensity.[62]

A comparison of the percentage of unfilled data needs of various governmental levels is summarized below.[63]

Level	Per Cent of Needs Left Unfilled
Federal	5.3
State	20.2
County	15.3
City	7.9
District	1.2
Private Agency	25.4

A more detailed breakdown on data needs are shown in the following two tables. Table 2 indicates the activity data for the five levels of government and private companies. Valuation data requirements are presented in Table 3.

Three primary reasons exist for unfulfilled data needs: (1) the required data are not being collected nor are resources present to do so, (2) the agency requiring data is unaware of the existence of the data in

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[62] Ibid., p.22.

[63] Ibid., p.23.

TABLE 2

UNFULFILLED ACTIVITY DATA REQUIREMENTS FOR DIFFERENT LEVELS OF GOVERNMENT, SPECIAL DISTRICTS AND PRIVATE COMPANIES, CALIFORNIA, 1967[a]

(In Per Cent)

Type of Data	Federal	State	County	City	District	Private Companies
Activity						
Classification	9.1	20.8	20.5	1.8	0	26.1
Zoning	18.8	22.8	9.9	2.5	0	25.0
Land and Structure Use	2.7	25.1	23.9	11.2	0	25.0
Water Use	3.7	14.9	23.0	6.4	10.0	7.0
Legal Constraints or Obligation	50.0	0	11.8	3.7	0	66.7
Total	7.5	20.7	19.2	6.1	2.6	15.6

[a]Calculated from: TRW Systems Group, California Regional Land Use Information System Project, "First Interim Report," (Redondo Beach, California, 1967), p.70.

TABLE 3

UNFULFILLED VALUATION DATA REQUIREMENTS FOR DIFFERENT LEVELS OF GOVERNMENT, SPECIAL DISTRICTS AND PRIVATE COMPANIES, CALIFORNIA, 1967[a]

(In Per Cent)

Type of Data	Federal	State	County	City	District	Private Companies
Valuation						
Tax	11.5	26.4	8.3	5.6	0	24.7
Market Value	3.8	17.1	17.1	17.8	4.2	29.6
Income	14.3	19.0	19.7	38.5	0	0
Insurance	0	0	20.0	0	0	55.6
Total	7.4	20.0	12.5	10.2	11.0	26.9

[a]Calculated from: TRW Systems Group, California Regional Land Use Information System Project, "First Interim Report," (Redondo Beach, California, 1967), p.70.

another file, and (3) the agency requiring the data is aware that it exists, but it is not in a useable form.[64]

The major data collecting agencies in the state were identified. The Army Corps of Engineers was the major collector of land-related data at the Federal level followed by the Forest Service and the Bureau of Reclamation in the Department of the Interior. The Engineers reported gathering 152 distinct data items, largely in the following categories: environmental data, structural improvements, valuation, and activity and intensity of land use. The Forest Service collects 107 items pertaining to climate, water resources, vegatation, and national park improvements, and the Bureau of Reclamation uses data relating to water use and water resources.[65]

At the State level, the Property Acquisition Service was the largest collector, with some 204 data elements. The geographic coverage was limited. The Division of Highways listed 172 items which it collects. Other major collecting agencies are the State Lands Division, the Division of Parks and Beaches and the Department of Public Health.

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[64] Ibid., p.23

[65] Ibid., p.24.

The Assessor and the Planning Department were the major collectors at the County level. The Assessor performs a complete enumeration periodically on all parcels.

At the City level, City Engineers, Public Works Department, and the Planning Department were the largest data collectors.

Major collectors of land data at the district level were School and Flood Control Districts.

Of the 15 private agencies, nine were considered regulated companies, five, real estate development firms, and one a savings and loan company.

This study also identified the twenty most frequently listed land use items collected by the six user categories. Those items common to all six categories were: topographic features, market value of parcels, right of way dimensions, existing land use, parcel area, owner's name, utilities, population figures, rainfall, structural features, tax rates, owner address, and subdivision dimensions.

Clawson and Stewart made a survey of land use

statistics in the United States.[66] They explored the existing problems as they relate to land use data, the role of land use statistics, the history, and the identification of Federal agencies using data and types of information. Emphasis was placed on the uniformity of data and ways to bring about this uniformity. One such way is the adoption of a standard coding procedure for identifying land use activities to facilitate data handling on automatic data processing equipment.

They also specify several reasons why improved data are necessary. They are: (1) an increasing demand for land for many purposes is pressing upon a fixed total land area, (2) the nation is developing increasingly complex and closely knit interrelations in the use of one land area and another, (3) numerous agencies are now collecting data about land, independently and without coordination, (4) there are great conceptual and analytical advantages to land use comparisons over time, and (5) there is a great need to relate data about land and its use to all other data about economic and social factors.[67]

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[66] Clawson and Stewart, loc.cit.

[67] Ibid., p.161.

The study also identified what an ideal land data system should consist of. The prime requisite is that it be built upon logical concepts, for instance, activity, natural qualities, improvements, intensity of land-use, land tenure, market data, and interrelations. Secondly, data about land should relate to a specific area. Third, data should be based upon securing maximum detail in the enumeration stage, with groupings and summaries only at a later stage. Fourth, flexibility in data use should be permitted; in great detail or in broad groups. Fifth, the data system should be readily available to anyone who needs it. Lastly, the data system should be efficient, in the sense of least cost for the results obtained.[68]

Clawson and Stewart also identified the Federal agencies and their interest in land use data. The Bureau of Public Roads, although itself not a collector of land use data, provides financial assistance to many state highway programs for planning activities, which may include the collection and analysis of land use information for highway planning. The federal highway

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[68] Ibid., p.165.

planning and research funds are used for such studies and programs as the impact of highways on community development, variation in land values, highway mapping, and urban transportation planning.[69]

The kind of information collected in a transportation study includes the location and identification of every residential and non-residential activity in the study area, a listing of all households in the study area, previous day's travel of some households, a complete investory of streets and intersections, and the land and/or floor area of the different uses on the property.[70]

The Economic Research Service of the United States Department of Agriculture has been collecting and analyzing statistics on major uses of land since 1912. A systematic and continuing investory of major uses and trends in regard to the nature and intensity, shifts in uses and future prospects has been provided.

Closely related to land economics research and complementary to statistical studies of land use are water

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[69] Ibid., p.193.

[70] Ibid., p.228.

use and supply inventories, development and analysis of basic land ownership and tenure information, urbanization and recreational impacts on rural land and water use, and land and water resource institutions in legal analysis.[71]

The type of data needed does not vary from purpose to purpose but only on emphasis. Environmental data like soil characteristics, topography and water resources are demanded. Utilities available are needed. Taxes, property values, current owners, easements, liens and permits are other information items in need. Activities on each parcel of land, the intensity of use and the legal constraints affecting use are required for many purposes.

Legal Information

Our system of title records is obsolete and has been inadequate for at least half a century.[72] The need for data has proliferated. The detail required has increased. Yet there has been but little change in the

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[71] Ibid., p.228.

[72] Robert N. Cook and James L. Kennedy (ed.), Proceedings of the Tri-State Conference on a Comprehensive Unified Land Data System (Cincinnati: University of Cincinnati, 1967), p.9.

title records system. Until recently few people have called attention to their inadequacy, because few people really know of the condition and most do not really know what to do to improve their efficiency.[73]

The earliest recording act was adopted in 1640 by the Massachusetts Bay Colony. Since then many changes have taken place. Man has congregated in multiples of hundreds, thousands, and millions. New legal documents like deeds, mortgages, mechanics liens, leases, power of attorney, and other instruments have been created and recorded in the Recorder's Offices. The Recorder in Cuyahoga County, Ohio, received over 164,000 legal instruments in 1967. Even at that, this is far from the largest county in the United States.

The maintenance of accurate, legible, and readily accessible records is the heart of a modern title system. Whether the title is searched by a real property attorney, an abstracter or a title insurance company, the need is the same.[74]

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[73] Ibid.

[74] Ibid.

To attain simplicity in real property records, four basic changes are necessary. They are:[75]

1) Accurate duplication of instruments on the public records,
2) Orderly arrangement or storage of these records,
3) Adoption of uniform and simple methods for the designation of individual tracts of land,
4) The installation of land data banks which will make it possible to appraise titles quicker and more efficiently by providing quick access to all title records.

The Committee on Improvement of Land Title Records for the American Bar Association has made recommendations. Their main concern is the coordination of local, state and national efforts to develop a modern, efficient and accurate system of title records.[76] Only piecemeal and limited improvements have taken place concerning the system of title records.

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[75] Ibid.

[76] Real Property, Probate and Trust Law, American Bar Association, "The 1966 Report of the Committee on Improvement of Land Title Records," 1966, p.2 (mimeographed).

As pointed out by the Committee, a title search involves many kinds of information. The accuracy of the legal description, existence of boundary disputes, legal instruments, liens and building codes are but a few of the items the attorney must ascertain. A title search can also be time consuming, for many indexes must be searched with records kept by county and municipal officials.[77]

This Committee in 1967 indicated the elements that a complete information system should contain. These seven items are: (1) description of land by using coordinates which are ties to national control system, (2) title records indexed by parcels and by owners, (3) a code number for each parcel indicative of its geographic location, (4) use of the same parcel code number for land title, taxation, land use and planning, (5) use of grid system of plane coordinates, (6) use of national system of code numbers to identify natural persons, corporations, and organizations and (7) coordination of

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[77] Ibid.

local, state, and federal activities in collection, storage, reprieval and use of data.[78]

Parcel Identification

Parcel identifications are used for many purposes by almost everyone and also even by organizations.[79] By far the most widely used land-parcel identification is the street address. Such an alpha-numeric code presents certain problems. First, there is the problem of duplicate street names, or names of similar spelling. An example would be McLain Street. It might be spelled MacLeane, McLaine, McLane, or McLeen Street. Then there is a problem of a street being known as an avenue, a street, a boulevard, a road, a circle, or even a court.[80]

In addition, various county officials have established methods of land parcel identification to meet

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[78]Real Property, Probate and Trust Law, American Bar Association, "The 1967 Report of the Committee on Improvement of Land Title Records," July, 1967, pp.1-2 (mimeographed).

[79]Robert T. Howe, "Preliminary Thoughts on Parcel Identification," University of Cincinnati, October,1967 p.1, (mimeographed).

[80]Jerome Dyba, "Comments on Parcel Identification," July, 1967, p.19 (mimeographed).

their individual needs. The County Auditor may identify parcels as areas appearing on tax maps. The statement, parcel number 61 on page 5 of Plat Book 87 is a complete and legal identification of a parcel for tax assessment purposes.[81] Again, the Auditor may assign a five or six digit number to each parcel in a county as does Franklin County, while others assign no numbers. The information or records are filed alphabetically within the taxing districts for many counties.

When the recorder makes a record of a transfer of a parcel, he is concerned with the grantor, grantee and some reference to location like township, section or survey, or lot number, and the addition or subdivision. Depending on the parcel transferred, the identification can be rather specific, as for a subdivision lot, but not for a rural parcel of land. The recorder's main objective is making reference to the location of the legal document with little emphasis on pinpointing the geographic location.

When a plat of a subdivision is filed, parcels are

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[81]Howe, op.cit., p.3.

identified either by a single lot number or lot and block number depending on the size. When the lot is transferred, reference is made to the lot number and the subdivision name.

Not only is there a need for a parcel identifier to locate land geographically, but to coordinate and reference records back to the parcel. For instance, the Auditor makes a thorough inventory of every parcel in the county for real property tax assessment purposes. The Treasurer uses the information furnished by the Auditor for billing the owner for the taxes assessed. Also, the Treasurer keeps an account of taxes assessed, paid, and due, special assessments, any penalties, etc. As mentioned previously the recorder keeps the documents pertaining to legal records. The Probate Court handles matters concerning estates, competency, guardianship appointments, adoptions and other items about persons who may or may not own real property. The Clerk of Courts has records on pending suits, judgments and executions pertaining to people who may or may not own real property. The Recorder also has records of liens on both personal and real property. In each case people

are involved who may or may not own real property, but no reference is made back to a parcel that may be affected. Some identifier associating records back to the real property is not present, but needed.

Dade County, Florida, identifies parcels by a nine digit number; the first four digits identify a section, the next two the subdivision, and the last four the parcel within the subdivision.

In the District of Columbia, each lot is identified by a number. In addition, each lot is identified by address, house number, street and quadrant.

In Santa Clara, California, a comprehensive land use data file is being developed, which it is expected will use a three-way index cross-referencing parcel number, street address and some standardized grid coordinate reference.[82]

The TRW study in California identified fifty-six geographic reference units used in the 800 agencies contacted. The four most frequent units were; (1) the street address, (2) the lot-block-tract number, (3) the city and (4) the county.

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[82]Dyba, op.cit., p.15.

Legal Descriptions

A suggested alternative method for describing legal boundaries is the use of the state plane coordinate system. In a number of states, including Ohio, the locations of parcel corners may be legally described by giving their coordinates with respect to a state-wide coordinate system. These plane coordinate systems were developed by the United States Coast and Geodetic Survey so that the methods of plane surveying might be extended over much larger areas with good precision. Each of these systems covers an entire state or a large portion. They are directly related to the national geodetic survey, and as a result, engineers and surveyors can relate their work to the network of geodetic control for purposes of coordination, consistency and checking. They may also give the location of points or re-establish lost points. Any survey station is practically indestructible since it may readily be relocated quite accurately from other points whose coordinates are known.[83]

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[83]Taylor, Ory, and Mintzer, op.cit., p.104.

There is the question of the relation between the state plane coordinate systems and the rectangular surveys established by the General Land Office. There is practically no relation. Some of the public land states have opposed legislation to recognize state coordinate systems, because of the fear that by such legislation coordinate systems could replace the rectangular surveys. The coordinate system was not intended to replace any existing system already well established by tradition, custom and law. The advantage of the coordinate system lies in its usefulness as supplementary information to property descriptions, particularly the recovery of lost corners.[84] The only difficulty with this system is that it gives no general indication where the property is located. Its use in conjunction with some other method would be highly desirable.[85]

The following indicates how state plane coordinates might be used to produce a legal description that is both complete and consistent. The parentheses indicate the insertion of coordinates.

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[84]Cook and Kennedy, op.cit., p.87.

[85]Taylor, Ory, and Mintzer, loc.cit.

> Being the North part of Lot No.10 and the South part of Lot No.9 of a plot of acreage in Quarter Township 2, Township 2, Range 16, U.S.M. Lands, and being part of the lands of George Campbell, deceased, of record in Chancery Record 12, page 42, Court of Common Pleas, Franklin County, Ohio, more particularly described as follows:
>
> Beginning at an iron pin (coordinates N 719, 846-86, E 1,869,040.86) in the centerline of the Delaware State (Harlem) Road, which pin is South 9°35' oo" East a distance of 2208.20 feet from an iron pin (N 722,024.24, E 1,868,673.23) in the intersection of the centerline of the Delaware State Road with the centerline of Central College (Harbaugh) Road; thence North 89°58' 13" East, 1180.45 feet to an iron pin (N 719,847.47, E 1,870,221.31); thence South 9°36' 55" East, 224.32 feet to an iron pipe (N 719,626.30, E 1,870,258.78); thence South 89° 57' 03" West, 1180.27 feet to an iron pin (N 719,625.29, E 1,869,078.71) in the centerline of the Delaware State Road; thence North 9° 46' 30" West along the centerline of said road 129.94 feet to an iron pin (N 719,753.34, E 1,869,056.65); thence North 9° 35' oo" West along the centerline of said road 94.84 feet to the place of beginning, containing 6.00 acres of land.[86]

The coordinates referred to in the above description are for the Ohio (South) Coordinate System as established by the U.S. Coast and Geodetic Survey.

The state plane coordinate system also offers the advantage of providing a parcel identifier by using the coordinate digit of a corner. The number of digits

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[86] Ibid.

determines the accuracy to which the point is to be specified. A number of four digits would give the location of a point to the nearest one hundred thousand feet. If a point were to be specified to the nearest foot; the easting and the northing each would be composed of seven digits.[87] The variation would be one foot in twenty-four thousand feet.

The biggest advantage of this system is that it can provide a direct relationship between the parcel identifier and the location of the parcel.[88]

In summary, current literature describes the present problem of our real property public records. Part of the problem is duplication, part of it is inadequate data and inaccessibility. Questions that still remain unanswered concern the economics of automating title records and the choice of level at which records should be automated.

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[87]Kesler, op.cit., p.18.

[88]Ibid.

CHAPTER VI

THEORY OF BENEFIT-COST ANALYSIS AND DESCRIPTION OF SAMPLE AREAS

Theory of Benefit-Cost Analysis

Benefit-cost analysis is defined by Prest and Turvey as a practical way of assessing the desirability of projects where it is important to take a long and wide view because of its effect on many persons.[89] Although the process has been applied to large development projects, it does not necessarily have to be limited to them.[90] It can also be applied to proposed changes in laws or regulations.

Benefit-cost analysis is a tool that can be used to evaluate the allocation of our scarce resources. The analysis permits the selection of those projects where benefits exceed costs and a ranking of several projects to establish priorities among alternatives.

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[89] A.R. Prest and R. Turvey, "Cost-Benefit Analysis: A Survey," The Economic Journal, December, 1965, p.683.

[90] Barlowe, op.cit., p.484.

Benefits are normally defined as increases or gains in the value of goods and services which result from conditions with the project, as compared with conditions without the project. An example would be the value of farm crops, electric power, flood protection, etc., resulting from a dam. As used throughout this investigation, benefits are defined as reduction in costs of operation to the respective offices and the users of information.

Benefits can be both tangible and intangible. Tangible benefits are those that can be expressed in monetary terms based on or derived from actual or simulated market prices. Intangible benefits are those which, although recognized as having real value in satisfying human needs or desires, are not fully measureable in monetary terms. The reduction in aggravation and confusion in use of public records could be considered an intangible benefit.

Secondary benefits can occur and must be taken into consideration. This can be made clear by taking the case of irrigation which results in an increase in grain

production. The increased grain output will involve increased activity by grain merchants, transport concerns and millers.[91]

Costs include the value of land, labor, and materials used in establishing, maintaining and operating the project plus an allowance for any adverse effects resulting from the projects.

Once the benefits and costs have been calculated, any surplus of benefits over costs can be called net benefits.

Three approaches in determining the benefit-cost ratio can be taken. One approach is to take the total cost of each project and subtract it from its benefits to arrive at net benefits. The second method involves the computation of a rate of return on the cost investment. Under this procedure, total costs are subtracted from total benefits and the difference is divided by the total cost to get a percentage rate of return.

A third approach involves the division of the total benefits by total costs to get a benefit-cost ratio. The guiding principle is that no project should be undertaken

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[91]Prest and Truvey, op.cit., p.689.

unless it has a benefit-cost ratio of at least 1.0; that is, unless its estimated benefits are at least equal to its probable costs. This approach has been used throughout this investigation.

Characteristics of the Three Selected Counties

One of the hypotheses of this study is that social and economic conditions affect the need for and the desirability of alternative information systems. It was therefore necessary to draw a sample which would include heterogeneity of social characteristics, economic conditions and trends or rates of change. The three counties of Ohio which were selected for the study represent a wide variety if not the extremes in respect to urbanization, population, and rate of growth. These and other characteristics of the selected counties are described in the following pages.

Hardin County

Selected characteristics and trends of Hardin County are discussed here; supporting data are shown in the tables of the Appendix.

This county is located in northwestern Ohio, being

on the easterly edge of the corn belt. Some industry is scattered throughout, but it is primarily agricultural in nature with some non-farm rural residences.

Over the past ten years, the population has remained stable at about 30,200. The number of households has followed the population. A slight decrease has existed since 1958 and 8,911 households are expected in 1970.

The urban population has decreased over the ten year period. Since 1963 it has, however, remained constant. In addition, the urban population has constituted a relatively constant proportion of the total for this county, being about forty-three per cent.

Total effective buying income for Hardin County has increased 30 per cent since 1958, compared to an increase of 62 per cent for Ohio in the same period. On a per capita basis, this county has witnessed a 36 per cent increase in purchasing power as revealed by this indicator, while the State has increased 30 per cent between 1958 and 1966. Similar changes have also taken place on a household basis.

The per cent of this county devoted to agricultural production has varied little over the past 34 years.

Actually more area was devoted to farming in 1964 than in 1930. About 92 or 93 per cent has remained in agricultural use. For Ohio, the proportion devoted to agriculture has decreased from 82.5 per cent in 1930 to 67.2 per cent in 1964. The data can be found in the Appendix.

The average size of farm in Hardin County has been on a steady upswing since 1930. It is expected that this will continue with the average size reaching about 185 acres in 1970. This increase in average size has been the result of fewer farms since the area of land in farms has remained constant. There were 2,542 farms in 1930 but only 1,541 in 1964, a decrease of 1,001 farms. Ohio has nearly 100,000 fewer farms than in 1930.

The total cash receipts from the sale of agricultural products have been increasing but not as rapidly as the rate for the state. Gains of approximately 34 and 36 per cent for Hardin County and Ohio, respectively, have taken place from 1958 through 1966.

Fairfield County

Geographically this county is located in central Ohio. It has felt the influence of urbanization with the expansion of the City of Columbus. Over the last

decade, the population has increased by about 18 per cent and 72,500 people were residing in the county during 1967.

As with Hardin County, the number of households has followed the population trends. There were 21,800 in 1967, an increase of 17.2 per cent since 1958.

The urban people of this county have constituted a smaller proportion of the total population. This indicates that a number of people are taking residence in the areas outside of the metropolitan centers. The urban population was 34,300 in 1966, an increase of 9 per cent over 1958.

The total effective buying income has increased 79 per cent over the 1958 era. For Ohio, over a same period, the change was 62 per cent. On a per capita basis, the change was about the same for Fairfield County and Ohio. The per household income was 8,153 dollars for the county in 1967.

In terms of land use, 91.4 per cent of the county was devoted to agricultural purposes in 1930, but only 77 per cent in 1964. The average size of farm has changed from 78.7 acres in 1930 to 141.2 acres in 1964,

less than the State average. The total number of farms has decreased from 2,985 in 1930 to 1,756 in 1964.

Total cash receipts from the sale of agricultural products has increased but less than the State.

Franklin County

This county is located in central Ohio adjacent to Fairfield County. This is one of the more populous counties in Ohio being second only to Cuyahoga County. The present population is 802,600, an increase of 22 per cent over the past decade. The number of households has increased from 196,100 in 1958 to 240,400 representing a 22.6 per cent change in the last nine years. It is estimated that there will be about 258,060 households by 1970.

In addition, this is a highly urbanized community. Nearly 92 per cent of the population was classified as urban in 1966. A large portion of the county has been annexed to the city of Columbus or other municipalities. The trend will probably continue in this direction.

The total effective buying income of Franklin County has increased by 66.5 per cent in the last 10 years, and this is above the State average but less than

Fairfield County. On a per capita basis, gains of mearly 31 per cent took place as compared to 39 per cent for Ohio from 1958 through 1966. Income per household was 9,666 and 9,203 dollars for Franklin County and Ohio, respectively, in 1967.

The proportion of the county used for agricultural production in 1964 was about 51 per cent or 176,787 acres. In 1930, 75 per cent of the area was devoted to this purpose. For Ohio, about 67 per cent of the land is used for agriculture.

The number of farms in 1964 was 1,081, far less than the 2,968 in 1930. There are only 36.4 per cent as many farms in 1964 as in 1930. It is estimated that 961 farms will exist in 1970, representing only 32.4 per cent of 1930 era.

Cash receipts from farming have continued to rise despite the reduction in farm land. The 1966 receipts were 123 per cent of 1958. Receipts for Ohio rose 40 per cent over the same period.

Summary

Table 4 summarizes comparative data for the three selected counties and Ohio. Percentage changes

in selected characteristics are portrayed in Table 5.

Hardin County can be characterized as a rural county with rather static conditions. The population and number of households have remained rather constant over the last ten years. An increase in rural-nonfarm residences has altered slightly the rural-urban balance. Income has increased, but at less than the rate for the State. The land has changed little from farm to non-farm uses with about 93 per cent in farm land. The number of farms has decreased with average size on the increase.

Fairfield County is characterized by relatively more rapid change than Hardin County, for population, number of households, urban population, and especially for effective buying income. It has more farms but typically they are of smaller size.

Franklin County is primarily urban in nature. A smaller proportion of the land area of the county is devoted to agricultural production than in the other two counties. Franklin County has the largest number of people and the highest proportion of urban numbers. The effective buying income is also higher on a household and per capita basis. The average size of farm is larger than in Fairfield County.

TABLE 4

COMPARISON OF CHARACTERISTICS FOR THREE SELECTED COUNTIES AND OHIO, 1967

Item	COUNTY			
	Hardin	Fairfield	Franklin	Ohio
Population	30,400	72,500	802,600	11,207,649
Urban Population, 1966	12,800	34,300	727,900	7,721,200
Urban Population, 1966 (Per Cent of Total)	42.4	47.7	91.8	73.7
Total Effective Buying Income (Thousands of Dollars)	64,935	177,727	2,323,802	29,166,253
Number of Households	9,200	21,800	240,400	3,169,200
Per Capita Buying Income, 1966	$1,941	$2,283	$2,748	$2,587
Per Household Buying Income	$7,058	$8,153	$9,666	$9,203

TABLE 4 (Continued)

Item	COUNTY			
	Hardin	Fairfield	Franklin	Ohio
Average Size of Farms, 1964	179.9	141.6	163.5	146.4
Total Number of Farms, 1964	1,541	1,756	1,081	120,381
Per Cent of Total Area in Farm Land, 1964	92.7	76.9	51.4	67.2
Agricultural Products, 1966 (Thousands of Dollars)	21,567	18,905	16,981	1,383,021

Source: Sales Management, Inc., Survey of Buying Power, A Bill Publication, New York, Volumes 82 Through 100, 1959 Through 1968.

Source: United States Department of Commerce, Bureau of the Census, United States Census of Agriculture, 1930 Through 1964 (Washington: The United States Government Printing Office).

Source: Department of Agricultural Economics and Rural Sociology, Ohio Farm Income, Ohio Agricultural Research and Development Center, Wooster, Ohio, 1958 Through 1966.

TABLE 5

PER CENT CHANGE IN SELECTED CHARACTERISTICS, THREE SELECTED COUNTIES AND OHIO, 1958 THROUGH 1967[a]

(1958 = 100)

Item	COUNTY			
	Hardin	Fairfield	Franklin	Ohio
Total Population	- 1.6	+ 17.9	+ 21.6	+ 12.0
Urban Population (1958-1966)	- 4.5	+ 8.9	+ 25.7	+ 16.7
Households	- 2.1	+ 17.2	+ 22.6	+ 11.4
Total Effective Buying Income	+41.2	+ 79.2	+ 66.5	+ 62.0
Total Effective Buying Income Per Capita (1958-1966)	+35.7	+ 37.5	+ 30.5	+ 38.9

TABLE 5 (Continued)

Item	COUNTY			
	Hardin	Fairfield	Franklin	Ohio
Total Effective Buying Income Per Household	+ 45.0	+ 52.9	+ 35.8	+ 45.4
Number of Farms (1930-1964)	- 39.4	- 41.2	- 64.4	- 46.1

[a]Calculated from information in source listed below.

Source: Sales Management, Inc., Survey of Buying Power, A Bill Publication, New York, Volumes 82 Through 100, 1959 Through 1968.

Source: United States Department of Commerce, Bureau of the Census, United States Census of Agriculture, 1930 Through 1964 (Washington: The United States Government Printing Office).

Source: Department of Agricultural Economics and Rural Sociology, Ohio Farm Income, Ohio Agricultural Research and Development Center, Wooster, Ohio, 1958 Through 1966.

Limitations of the Study

Certain limitations are always imposed when one attempts to determine the future by projection of past trends. Yet benefit-cost analysis as it considers future benefits and costs is forced to rely on estimates of what will happen at different points in the future.

In most cases, costs can be projected with greater certainty than benefits. Expenditures "fit" into a definite trend over time for materials and labor and thus provide a better basis for projection.

Future benefits are very difficult to estimate. Will an information system reduce or increase the amount of labor required to operate the system? What kind of an effect will it have on the users in terms of their time? There are always the problems of non-monetary benefits and cost. What is the value of the increased public service? There is a question surrounding problems of a dual system, since the cost of converting past records is prohibitive. Another problem is that it is difficult to identify and assess all benefits that will accrue to an alternative information system. Perhaps the largest benefit of any system is the timeliness in data

availability. At the same time it is most difficult to evaluate the benefits to be gained from having data within minutes of the need.

The selection of particular counties for study will also influence the results. Since the characteristics of a county such as population, number of documents, parcels, etc., affect costs and benefits, different counties will have varying benefit-cost ratios.

CHAPTER VII

EXPENDITURES AND RESPONSIBILITIES OF SELECTED OFFICES MAINTAINING REAL PROPERTY RECORDS

Before costs and benefits of alternative procedures or systems can be estimated, it is necessary to establish the delegated responsibilities of county offices maintaining real property records and their costs of operation. These offices include the County Auditor, County Recorder, County Treasurer, County Clerk of Courts and Probate Court.

The County Auditor

The County Auditor is the fiscal officer for the county government. He supervises the finances of the county, so his office is a focal point in county affairs.

The office holder estimates all income and expenditures for each taxing subdivision (village, township, school district, etc.) in the county. Then, within the provisions of the state constitution and state laws, he also determines the tax rate for each taxing subdivision. Such a rate is set after the respective budgets are

received. Any tax above the flat ten mill limitation cannot be levied without at least a majority vote.

This office, under the general supervision and direction of the State Board of Tax Appeals, is also the appraiser for taxation purposes for all real estate in the county. To carry out this function, a detailed inventory of improvements and land are made either by a member of the Auditor's Office or an engineering appraisal firm. These data are filed in the office on $8\frac{1}{2}$ by 11 inch cards.

In addition, the Auditor acts as an agent for the State Department of Taxation in the handling of all personal and classified taxes. Also, he must take an inventory of the contents of all safety deposit boxes for inheritance tax purposes.

This office has many other miscellaneous functions. The County Auditor seals weights and measures; sells vendor, cigarette and dog licenses; serves as a secretary on the county budget commission and county board of revision. He is the county general and payroll fiscal officer and distributes taxes to the subdivisions. All real property transfers are intiiated in this office.

Franklin County

Of the Auditor's Offices in the three counties examined, Franklin County by far is the most complex. Ninety-five persons are employed and the work is departmentalized into five divisions: (1) appraisal, (2) classified and personal property tax, (3) inheritance taxes, (4) accounting, and (5) real estate transfers.

The appraisal department has three full time appraisers who are concerned with keeping the property records (appraisal cards) up to date. They appraise new residences and additions such as garages. For a complete re-appraisal, which occurs every six years, the county government contracts with an engineering-appraisal firm.

The tax appraisal cards are stored on revolving shelves for access by employees since inquiries for the data are frequent. As many as 1,500 to 1,600 copies are made monthly with peaks of 1,800. In 1950, approximately 150,000 parcels existed; by 1967, this number reached 232,332. An addition of about 4,860 parcels per year has occured since 1958. The present system of storing cards on revolving shelves is considered to be

adequate by the present employees, but space is becoming a problem.

The real estate transfer department handles the data regarding the change of ownership. The deed is surrendered to an employee, who in turn locates the tax record of the property. A check is made concerning names, size of lot, parcel number and location. After information pertaining to the new owner's mailing address is noted, the grantee is sent with his deed to the Recorder's Office.

The tax records for each parcel are kept alphabetically within the eighty-six taxing districts of the county.

Parcels of land have been steadily increasing in Franklin County. Table 6 shows the total number of parcels for the last ten years.

A tax map containing the owner's name and the date of the last transfer is kept current. Since this map is drawn to such a scale which requires many pages, it is necessary to code each page with a letter and number. A larger and more general map of Franklin County is maintained containing all letters and numbers indicating on what map a particular parcel is located.

TABLE 6

NUMBER OF REAL ESTATE PARCELS, FRANKLIN COUNTY, OHIO, ANNUALLY, 1958 THROUGH 1967

Year	Number
1958	194,602
1959	195,753
1960	199,942
1961	206,019
1962	212,835
1963	216,675
1964	222,168
1965	228,118
1966	230,507
1967	232,332

The real estate tax department prepares the tax duplicate. Each page contains the valuation, owner's address, parcel number and amount of taxes. This is a ten year duplicate--the tax bills for ten years are shown on the duplicate for each parcel.

The cost of operating this office is shown in Table 7. Total expenditures have doubled since 1958. All items have increased since that time. The cost of assessing personal property and appraising real property is presented in Table 8.

TABLE 7

EXPENSES OF THE COUNTY AUDITOR'S OFFICE, FRANKLIN COUNTY, OHIO, TRIENNIALLY, 1958 THROUGH 1967

(In Dollars)

Item	1958	1961	1964	1967
Auditor's Salary	9,000	9,600	13,200	16,000
Compensation of Employees	209,251	242,130	273,056	315,973
Compensation, Deputy of Weights	5,400	5,870	6,120	7,155
Stationery and Supplies	5,635	34,757	15,595	18,640
Advertising, Financial Report	829	1,188	3,037	3,150
Advertising, Delinquent, Forfeited Lands	9,019	11,486	10,748	11,620
Advertising, Other General	104	302	306	761

TABLE 7 (Continued)

Item	1958	1961	1964	1967
Engineer, Tax Map Draftsmen[a]	(43,523)	(49,100)	(47,595)	(64,877)
Other	00	1,336	14,779	46,493
Total	239,238	306,669	336,641	419,792

[a]This expenditure is not incurred by the County Auditor's Office, but by the County Engineer's Office. It is included to indicate the cost of maintaining the cadaster maps.

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Franklin, Form No. 55, 1958 Through 1967.

TABLE 8

EXPENSES FOR ASSESSING PERSONAL PROPERTY AND APPRAISING REAL PROPERTY, FRANKLIN COUNTY, OHIO, TRIENNIALLY, 1958 THROUGH 1967

(In Dollars)

Item	1958	1961	1964	1967
ASSESSING PERSONAL PROPERTY				
Compensation of Employees	115,365	139,153	147,500	182,500
Stationery and Supplies	8,003	7,628	15,956	24,312
Other	00	00	00	00
Total	123,368	146,781	163,456	206,812
APPRAISING REAL PROPERTY				
Compensation of Employees	125,000	139,153	147,500	182,500
Stationery and Supplies	432	854	381	1,657
Other	42,542	52,017	69,846	72,898
Total	167,974	192,024	217,727	257,055

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Franklin, Form No. 55, 1958 Through 1967.

Fairfield County

The Auditor's Office for this county is considerably smaller than that in the above county. The Auditor is aided by ten employees. Two of the ten people are sealers of weights and measures, and also do the appraisal work on new construction. Three-fourths of the time of these two people is devoted to the appraisal activities. They also seek out new construction not reported, since building permits are not required outside the City of Lancaster, the county seat.

Table 9 indicates the frequency of the different kinds of real estate parcels in Fairfield County. The total number of parcels has been increasing by about 620, annually.

Fairfield County, like Franklin, contracts with an engineering-appraisal firm for the complete reappraisal of real estate parcels.

A unique characteristic of this office is the extensive use of maps. A new tax map is developed January 1 of each year. On the maps, in addition to the owner's name and the date of transfer, are shown the value per acre. Colored maps are used to show the various taxing

districts in the county. Aerial photographs are also used for the purpose of assessing taxes when a farm is divided as a result of a sale.

TABLE 9

CLASSIFICATION OF REAL ESTATE PARCELS, FAIRFIELD COUNTY, OHIO, 1967

Kind of Parcel	Number
Agricultural	4,603
Residential	25,825
Commercial	2,166
Industrial	228
Utilities	291
Exempt[a]	711
Other	115
Total	33,939

[a]Exempt parcels include real estate owned by government.

Parcel numbers are assigned within wards, but no uniform method of parcel number assignment is used on a county-wide basis. The office is, however, in the process of assigning house numbers to all parcels in the county including farms. The reference point or base is the intersection of the longitude and latitude which quarters the county.

Extensive use of mechanical equipment by Addressograph is used in this office. The printed plates contain the owner's name, address, land value, building value, total value and location of the parcel. These plates are used in preparing tax duplicates and in analyzing taxes by taxing districts.

The tax appraisal cards for each parcel are the same as those used in Franklin County. The cards are filed by city and townships; within townships, they are kept by subdivisions and school districts. Cards are stored in three-drawer file cabinets. When an inquiry is made, the appropriate card is located by office personnel.

The expenditures for this office are portrayed in Table 10. Some fluctuation has existed from year to year, but the total expenses generally have trended upward since 1958. Compensation to employees has accounted for most of the increase.

Hardin County

The staff for this office is made up of three people and the Auditor. The organization is quite similar to Fairfield County, except that the job is less voluminous.

TABLE 10

EXPENSES OF THE COUNTY AUDITOR'S OFFICE, FAIRFIELD COUNTY, OHIO, TRIENNIALLY, 1958 THROUGH 1967

(In Dollars)

Item	1958	1961	1964	1967
Auditor's Salary	5,173	6,300	7,300	8,800
Compensation of Employees	28,277	33,242	36,513	50,070
Compensation, Deputy Sealer of Weights	3,740	4,785	5,205	00
Stationery and Supplies	6,455	7,338	7,981	6,758
Advertising, Financial Report	421	443	539	611
Advertising, Delinquent, Forfeited Lands	271	293	396	464
Advertising, Other General	00	00	00	00
Other	586	480	299	870
Total	44,923	52,881	58,233	67,573

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Fairfield, Form No.55, 1958 Through 1967.

The property record tax appraisal card information is quite similar to that used in Franklin and Fairfield Counties. The cards are stored in file drawers, alphabetically within taxing districts.

The number of parcels at the beginning of 1967 was 15,929. The yearly increase has been approximately 230.

The breakdown into types of parcels is shown in Table 11.

Printed plates in Addressograph equipment are used to print the tax duplicates as in Fairfield, but they do not perform summary work by tax districts.

Table 12 shows the cost of operating this office for selected years. Total costs have fluctuated some, but costs have changed little, increasing by only 1435 dollars in the last decade.

This office is much simpler than the other two. The problem of "paper work" seemed to be the most burdensome responsibility. The Auditor, rather than an employee, personally checks any problems or inquiries about data relating to real estate assessments. Table 13 shows the expense for the assessment of personal property and appraising real property.

TABLE 11

CLASSIFICATION OF REAL ESTATE PARCELS, HARDIN COUNTY, OHIO, 1967

Kind of Parcel	Number
Agricultural	5,006
Residential	9,749
Commercial	772
Industrial	55
Utilities	21
Exempt	325
Total	15,928

TABLE 12

EXPENSES OF THE COUNTY AUDITOR'S OFFICE, HARDIN COUNTY, OHIO, TRIENNIALLY, 1958 THROUGH 1967

(In Dollars)

Item	1958	1961	1964	1967
Auditor's Salary	3,934	5,389	5,896	6,723
Compensation of Employees	13,117	11,297	11,147	10,985
Compensation, Deputy Sealer of Weights	2,880	2,880	2,888	3,235
Stationery and Supplies	1,529	2,063	2,800	1,887
Advertising, Financial Report	205	193	279	225
Advertising, Delinquent, Forfeited Lands	235	222	462	390

TABLE 12 (Continued)

Item	1958	1961	1964	1967
Advertising, Other General	21	00	27	37
Other	873	470	884	747
Total	22,794	22,514	24,383	24,229

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Hardin, Form No. 55, 1958 Through 1967.

TABLE 13

EXPENSES FOR ASSESSING PERSONAL PROPERTY AND APPRAISING REAL PROPERTY
HARDIN COUNTY, OHIO, TRIENNIALLY, 1958 THROUGH 1967

(In Dollars)

Item	1958	1961	1964	1967
ASSESSING PERSONAL PROPERTY				
Compensation of Employees	873	985	1,200	1,500
Stationery and Supplies	700	552	592	778
Other	50	34	00	00
Total	1,623	1,571	1,792	2,278
APPRAISING REAL PROPERTY				
Reappraisal Fee	00	00	00	00
Compensation of Employees	1,970	2,500	2,500	2,500
Stationery and Supplies	19	00	00	00
Other	94	33	00	00
Total	2,083	2,533	2,500	2,500

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Hardin, Form No. 55, 1958 Through 1967.

The County Treasurer

This official is basically the bill collector for the county government. He collects the real property taxes, personal property taxes, and numerous miscellaneous revenues such as dog and trailer licenses. The largest job, however, is the collection of the real property taxes.

Practically all of the information required for the processing of tax bills is furnished by the Auditor's Office. If delinquencies and penalties develop as a result of non-payment, the Treasurer must calculate the amount. Special assessments may also require further work on his part. A typical tax bill will contain the owner's name, mailing address, brief description of the property location, size, valuation, first half taxes, delinquencies and penalties if any, the tax rate, second half taxes, total taxes and when the tax books will be closed.

The biggest problem of this office is the maintenance of a current mailing list of property owners, since the tax bills are sent to them. People frequently fail to notify the Treasurer of address changes.

Franklin County

This office is staffed by approximately forty people plus the Treasurer. Much of the accounting is done by hand entries. The tax duplicates are, however, being printed by the computer.

The records of individual parcels are kept alphabetically by taxing districts of the county. The tax list is somewhat unique. Employees maintain what is called a ten year duplicate tax list with information on each parcel for the last ten years. This is considered to be very useful to title examinations in the county for on one page is the record of payment regarding taxes, the amounts, special assessments, property owner's name, and penalties. It can be a guide for title examinations in checking other data.

The cost of operating this office since 1958 is shown in Table 14. As the case has been in other offices, the costs of operation have been on a steady increase. Each category has contributed to the rise.

TABLE 14

EXPENSES OF COUNTY TREASURER'S OFFICE, FRANKLIN COUNTY, OHIO, TRIENNIALLY, 1958 THROUGH 1967

(In Dollars)

Item	1958	1961	1964	1967
Treasurer's Salary	9,600	10,424	12,300	15,259
Compensation of Employees	214,559	240,641	254,488	275,494
Delinquent Tax Collector	10,000	20,000	20,000	30,000
Advertising, Rates of Taxation	1,164	5,153	7,565	7,922
Advertising, Other General	00	00	00	00
Stationery and Supplies	5,827	7,801	9,845	14,986
Other Expense	8,585	12,000	13,375	14,965
Total	249,735	296,019	317,573	358,626

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Franklin, Form No. 55, 1958 Through 1967.

Fairfield County

The general operation of the County Treasurer's Office in Fairfield County is quite similar to Franklin County, except that it is smaller. Some departure does exist, however, in regard to the grouping of parcels. The parcels are divided by wards with a number assigned to coincide with the alphabetic listing. Where special assessment taxes are involved, billing is separated from the regular real property tax bill. The expenses of this office are shown in Table 15.

Hardin County.

This office consists of the Treasurer and three full time employees. The tax list is maintained alphabetically within the forty-one taxing districts. The tax bill is quite similar to Fairfield County.

Costs of operation are presented in Table 16. Costs have risen by 34 per cent over the last ten years.

TABLE 15

EXPENSES OF COUNTY TREASURER'S OFFICE, FAIRFIELD COUNTY, OHIO, TRIENNIALLY, 1958 THROUGH 1967.

(In Dollars)

Item	1958	1961	1964	1967
Treasurer's Salary	6,000	6,341	7,050	8,850
Compensation of Employees	19,518	23,579	26,364	31,040
Delinquent Tax Collector	00	00	00	00
Advertising, Rates of Taxation	197	213	213	225
Advertising, Other General	00	00	00	00
Stationery and Supplies	3,456	5,183	6,180	8,214
Other	7	10	00	210
Total	29,178	35,326	39,807	48,539

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Fairfield, Form No. 55, 1958 Through 1967.

TABLE 16

EXPENSES OF COUNTY TREASURER'S OFFICE, HARDIN COUNTY, OHIO, TRIENNIALLY, 1958 THROUGH 1967

(In Dollars)

Item	1958	1961	1964	1967
Treasurer's Salary	4,500	4,647	4,950	6,150
Compensation of Employees	7,434	8,218	9,567	10,295
Delinquent Tax Collector	00	00	00	00
Advertising, Rates of Taxation	189	128	159	159
Advertising, Other General	00	00	00	00
Stationery and Supplies	1,201	1,799	1,512	1,851
Other	148	28	94	143
Total	13,472	14,820	16,282	18,958

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Hardin, Form No.55, 1958 Through 1967.

The County Recorder

The Recorder is basically the custodian of public records. He maintains a record of deeds, mortgages, powers of attorney, plats, leases, liens of all types, bankruptcy and certain miscellaneous documents. In addition, records of soldier's graves and discharges are maintained.

All instruments entitled to be recorded are filed in the order in which they are presented to the Recorder. Certain records may be indexed, kept and recorded together. Unemployment compensation liens, mechanics liens, personal tax liens, federal tax liens, notice of liens, discharges of recognizances, and excise and franchise tax liens on corporations may be kept in one volume.

Notices of liens for internal revenue taxes and certificates discharging such liens are filed in the Office of the County Recorder of the county where the property subject to such a lien is located. When such a lien is filed the Recorder enters the notice in a book known as the "federal tax lien index," in alphabetical order showing on one line the name and residence of the

taxpayer, the collector's serial number, the date and hour of filing, and the amount of taxes and penalties assessed. The Recorder files and keeps all original notices in numerical order. When a certificate of discharge of any tax lien issued by the collector of internal revenue is filed, the certificate number along with the date of filing are entered on the line where the notice of the lien is entered. The original certificate of discharge is then attached to the notice of lien.[92]

The Recorder must record either by legible handwriting, typewriting, or printing, or by any authorized photographic process, all deeds, mortgages, plats or other instruments required to be recorded, presented to him for that purpose. The instruments are to be recorded in regular succession, according to the priority of presentation, entering the file number. The date and precise time the instruments are presented is placed on the document.[93]

General alphabetical indexes must be maintained

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[92]Ohio, Revised Code, Anderson, 1953, Section 317.09.

[93]Ibid., Section 317.13.

daily. The indexes must show the kind of instrument, the date, and for identification of the parcel the range, township, and section or survey number, size of lot and sublot number if a tract of land is mentioned. The name of the grantor is entered followed by the grantee on the same line; for the reverse index, the name of the grantee followed by the grantor.

Where indexing concerns deeds, mortgages, or other instruments made by a sheriff, commissioner, marshall, auditor, executor, administrator, trustee, or other officer, for the sale, conveyance, or encumberance of land, the parties are indexed as follows: (1) the names of the persons represented by such an officer as owners of the land, and (2) the official designation of the officer by whom such an instrument was made.[94]

A daily register of all deeds and mortgages is also maintained. This register is open to inspection by the public during business hours.

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[94] Ibid.

Franklin County

The Recorder's Office is composed of thirty-three employees. The operation can be divided into two sections, the main office and the records area. The main office handles administrative affairs and initiates the recording process. The records area keeps the indexes current and stores the copies of photostated instruments.

The number of documents recorded has reached peaks of nearly 165,000 in past years. This has required considerable space for storing these documents. In addition, facilities are quite antiquated. Sections of this office are found on different floors of the County Court House which adds to the complexity. Numerous people are using the records and at the same time, the staff is attempting to keep the indexes and documents current.

Table 17 portrays the number and types of instruments recorded. Due to the change in the law regarding the reinstatement of chattel liens, there has been a reduction in the number of total instruments recorded since 1962. Prior to July 1961, land contracts were placed in the miscellaneous records but now they are maintained in the mortgage records.

TABLE 17

NUMBER OF INSTRUMENTS RECORDED BY THE COUNTY RECORDER'S OFFICE, FRANKLIN COUNTY, OHIO, TRIENNIALLY, 1958 THROUGH 1967[a]

Items	1958	1961	1964	1967
Deeds	24,265	25,365	28,993	28,564
Mortgages	20,795	20,747	24,195	20,307
Mortgage Cancellations	15,706	15,505	18,350	15,517
Chattel Liens	101,506	102,602	52,795	46,988
Leases	587	709	504	617
Plats, Real Property Liens and Other Instruments	-------	-------	11,649	10,486
Total	162,859	164,928	136,486	122,479

[a]For years 1958 through 1961, the number of plats, real property liens and miscellaneous instruments were not available.

The Franklin County Recorder's Office does have more specialized indexes than the two other counties examined. Seventeen indexes were available as compared to ten for Fairfield and Hardin County.

The costs of operation have reflected the complexity of this office over the past ten years. Total expenses have more than doubled between 1958 and 1967. Compensation to employees has accounted for a large part of the increase.

Fairfield County

This Recorder's Office is much smaller, being composed of the Recorder and three full time people. In recent years, less than 10,000 documents per year have been recorded.

The rapid growth of the county has not really been a problem. Adequate space has always been available to store new documents.

Many of the old deed records have been converted from script to typewritten entries. All indexes pertaining to deeds from 1801 to 1955 were typed at a cost of 70,000 dollars.

TABLE 18

EXPENSES OF THE COUNTY RECORDER'S OFFICE, FRANKLIN COUNTY, OHIO, TRIENNIALLY, 1958 THROUGH 1967

(In Dollars)

Items	1958	1961	1964	1967
Recorder's Salary	9,000	11,300	11,300	14,300
Compensation of Employees	109,995	166,445	188,530	223,798
Stationery and Supplies	16,899	17,819	37,098	45,903
Other	00	00	00	00
Total	135,894	195,564	236,928	284,001

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Franklin, Form No. 55, 1958 Through 1967.

Table 19 shows the number of legal instruments recorded for selected years. The total number has been decreasing, in part due to the reinstatement of chattel liens.

The breakdown on costs of operating the office are portrayed in Table 20. Some rather large fluctuations have occurred but the general trend has been upward.

Fewer indexes are maintained in Fairfield County than in Franklin. Ten indexes are available and they include: (1) grantor index to deeds, (2) grantee index to deeds, (3) mortgagor index to mortgages, (4) mortgagee index to mortgages, (5) index to power of attorney, (6) index to plats, (7) index to federal tax liens, (8) grantor-grantee index to miscellaneous records, (9) lessee index to leases, and (10) lessor index to leases. Fewer indexes are the result of aggregating records like liens.

TABLE 19

NUMBER OF INSTRUMENTS RECORDED BY THE COUNTY RECORDER'S OFFICE, FAIRFIELD COUNTY, OHIO, TRIENNIALLY, 1958 THROUGH 1967

Item	1958	1961	1964	1967
Deeds	2,384	2,484	2,646	2,666
Mortgages	2,181	2,361	2,614	2,282
Chattel Liens	11,481	9,575	3,118	3,630
Leases, Plats, Federal Tax Liens, and Other Instruments	1,020	1,148	2,365	1,257
Total	17,066	15,568	10,743	9,835

TABLE 20

EXPENSES OF THE COUNTY RECORDER'S OFFICE, FAIRFIELD COUNTY, OHIO, TRIENNIALLY, 1958 THROUGH 1967

(In Dollars)

Item	1958	1961	1964	1967
Recorder's Salary	4,900	5,900	5,899	7,700
Compensation of Employees	10,695	8,666	11,525	15,330
Stationery and Supplies	5,983	4,114	4,713	6,352
Other	109	163	289	108
Total	21,687	18,843	22,426	29,490

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Fairfield, Form No. 55, 1958 Through 1967.

Hardin County

The County Recorder has two people to assist him in carrying out his responsibilities. Since 1964 the number of documents has been declining. This is attributed, in part, to the rapid reduction in the number of oil and gas leases filed. Table 21 shows the breakdown and frequency of different types of instruments.

Expenses have risen as in the other two counties, but have leveled off in the last three years. Table 22 shows the expenditures, triennially, for the 1958 through 1967 era.

The County Clerk of Court

The Clerk of the Court of Common Pleas is the custodian of all orders, decrees, judgments, and proceedings of the courts. He must make a complete record of each case and pay over to the proper parties all monies coming into his hands as a Clerk.

Section 2303.12 of the Revised Code of Ohio specifies that the Clerk of the Court of Common Pleas shall keep at least four books.[95] They include: (1) appearance

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[95] Ibid., Section 2303.12.

TABLE 21

NUMBER OF INSTRUMENTS RECORDED BY THE COUNTY RECORDER'S OFFICE, HARDIN COUNTY, OHIO, ANNUALLY, 1964 THROUGH 1967

Item	1964	1965	1966	1967
Deeds	953	950	840	941
Mortgages	1,026	1,103	944	898
Mortgage Cancellations	787	828	650	658
Financing Statements	1,257	1,135	1,172	1,296
Financing Statements Releases	625	496	468	658
Oil and Gas Leases	811	96	67	00
Other Instruments	703	710	720	572
Total	6,162	5,318	4,861	5,023

TABLE 22

EXPENSES OF THE COUNTY RECORDER'S OFFICE, HARDIN COUNTY, OHIO TRIENNIALLY, 1958 THROUGH 1967

(In Dollars)

Item	1958	1961	1964	1967
Recorder's Salary	3,900	4,893	4,899	6,100
Compensation of Employees	4,440	5,587	9,812	6,989
Stationery and Supplies	678	1,451	1,551	2,125
Other	64	3	00	8
Total	9,082	11,934	16,262	15,222

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Fairfield, Form No. 55, 1958 Through 1967.

docket, (2) trial docket and printed duplicates of the trial docket for the use of the court, (3) a journal, and (4) an execution docket. He can keep a record book form or by using any photostatic, photographic, miniature photographic, film, microfilm or micro-photographic process. Direct indexes to the trial docket, journal and appearance docket, and direct and reverse indexes to the execution docket must be maintained.

The appearance docket at the time of the commencement of an action or preceeding will contain (1) the names of the parties, (2) the names of their legal counsel, and (3) the index in the name of the plaintiff and defendant. At the time it occurs, the Clerk of Court enters the issuance of the summons and the filing of each paper and the return of such order, with its date, to the court.[96]

The Clerk of the Court must also maintain an alphabetical index of all the names of all plaintiffs and defendants to active pending suits and living judgments, showing the names, the court, and number of the suit or execution.

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[96] Ibid., Section 2303.13.

All suits are indexed at the time of the filing of the petition and all judgments are indexed at the time of the entry on the journal.

In sum, the Index to Pending Suits, Living Judgments, Executions is a record of active judgments. The appearance docket is a summary of the history of events of a case. It contains notes regarding the petition, affidavit and precipe and where these documents are located. The petition states the reason for the suit, the affidavit is the statement by the plaintiff and the precipe is the request for issuance of the summons.

A judgment docket is another record maintained in the Clerk of Court Office which contains the results of lower courts.

The real property attorney is interested in these records because court actions may affect the rights one possesses. As a result of a judgment, a lien may be placed against the real property a person owns.

Franklin County

Nearly 10,000 cases were filed in the Common Pleas Court of this county in 1967. Table 23 portrays the number of cases filed in this court for selected years.

The trend has been steadily upward for the total number of cases filed.

TABLE 23

NUMBER OF CASES FILED IN COMMON PLEAS COURT, FRANKLIN COUNTY, OHIO, SELECTED YEARS

Item	1960	1961	1962	1964	1965	1967
Criminal Cases	861	1,146	1,078	1,052	897	1,237
Domestic Relation Cases	3,832	3,722	4,002	4,621	4,510	5,233
Other Civil Cases	2,952	2,963	2,969	3,192	3,443	3,482
Total	7,645	7,831	8,049	8,865	8,850	9,952

Source: The Supreme Court of Ohio, Ohio Courts, Selected Years.

The cost of carrying out the delegated responsibilities of this office have increased. In 1958, 308,222 dollars were required to operate this office; by 1967, the figure had reached 584,567,a 90 per cent increase over 1958. This is presented in Table 24. A more complete breakdown of costs can be seen in Table 25. Salaries and supplies constitute most of the expenses.

TABLE 24

EXPENSES OF THE COUNTY CLERK OF COURTS OFFICE, SELECTED COUNTIES, OHIO, TRIENNIALLY, 1958 THROUGH 1967

(In Dollars)

County	1958	1961	1964	1967
Fairfield	36,682	47,906	54,212	63,534
Franklin	308,022	412,183	479,892	584,567
Hardin	14,257	16,729	18,374	20,196

Source: Auditor of State, State of Ohio, Financial Report of Ohio Counties, 1958 Through 1967.

TABLE 25

EXPENSES OF THE COUNTY CLERK OF COURTS,
FRANKLIN COUNTY, OHIO, 1967

(In Dollars)

Item	1967
Salary, Clerk of Courts	14,550
Compensation of Employees	510,220
Stationery and Supplies	58,715
Advertising, Times of Holding Court	00
Advertising, Omitted Land List	00
Advertising, Other	00
Other	1,082
Total	584,567

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Franklin, Form No. 55, 1967.

Fairfield County

The magnitude of the job is about the only difference between the Clerk of Courts in Fairfield and Franklin Counties. Seven hundred sixty-two cases were filed in 1967 as compared with nearly 10,000. Domestic relations cases make up a major portion of the Common Pleas Court cases. The burden of maintaining these records has risen from 36,682 dollars in 1958 to 63,534 dollars in 1967. As in the previous county, the bulk of the cost is for salaries and supplies. Table 27 indicates a more detailed breakdown.

Hardin County

Two hundred seventy-six cases were registered in 1967. No definite trend is indicated in regard to the cases filed in Common Pleas Court. Variation exists from year to year, as shown in Table 28.

Costs of operation have trended upward, with some variations. Expenditures in 1967 were 20,196 dollars as compared to 14,257 dollars in 1958. Table 29 shows a detailed breakdown of costs for 1967.

TABLE 26

NUMBER OF CASES FILED IN COMMON PLEAS COURT,
FAIRFIELD COUNTY, OHIO, SELECTED YEARS

Item	1960	1961	1962	1964	1965	1967
Criminal Cases	81	110	87	81	83	51
Domestic Relation Cases	272	302	269	339	333	426
Other Civil Cases	305	347	270	368	303	285
Total	658	759	626	788	719	762

Source: The Supreme Court of Ohio, Ohio Courts, Selected Years.

TABLE 27

EXPENSES OF THE COUNTY CLERK OF COURTS,
FAIRFIELD COUNTY, OHIO, 1967

(In Dollars)

Item	1967
Salary, Clerk of Courts	8,800
Compensation of Employees	45,818
Stationery and Supplies	8,642
Advertising, Times of Holding Court	23
Advertising, Omitted Land List	00
Advertising, Other	23
Other	228
Total	63,534

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Fairfield, Form No. 55, 1967.

TABLE 28

NUMBER OF CASES FILED IN COMMON PLEAS COURT, HARDIN COUNTY, OHIO, SELECTED YEARS

Item	1960	1961	1962	1964	1965	1967
Criminal Cases	17	31	25	24	22	9
Domestic Relation Cases	133	100	136	147	133	167
Other Civil Cases	119	141	92	120	120	100
Total	269	272	253	291	275	276

Source: The Supreme Court of Ohio, Ohio Courts, Selected Years.

TABLE 29

EXPENSES OF THE COUNTY CLERK OF COURTS,
HARDIN COUNTY, OHIO, 1967

Item	1967
Salary, Clerk of Courts	6,400
Compensation of Employees	10,260
Stationery and Supplies	3,299
Advertising, Times of Holding Court	00
Advertising, Omitted Land List	00
Advertising, Other	00
Other	236
Total	20,195

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Hardin, Form No.55, 1967.

Probate Court

The Ohio Constitution of 1851 established the Probate Courts--one in each county of the State of Ohio. The jurisdiction of the Probate Court includes: (1) admission of wills to probate, (2) settlement of estates, (3) appointment and supervision of guardians and administrators, (4) adoption of children, (5) hearings on affidavits of mental illness, (6) commitments to state mental institutions, (7) issuance of marriage licenses, (8) determination of state inheritance taxes, (9) supervision of trusts created by wills, (10) certificates of births in certain cases, (11) actions for change of name, and (12) appointments to various boards and agencies.

Section 2102 of the Revised Code of Ohio specifies the records that shall be kept by this court. A criminal record must be kept with entries of the proceedings in criminal actions instituted in the court prior to January 1, 1932. An administrative docket, showing the grant of letters of administration, the name of the decedent, the amount of the bond and name of the sureties, the time of filing, and a brief note

of each order or proceeding relating to the estate with references to the record or proceeding must also be preserved in the records.[97]

A third record is the guardian's docket, showing the name of each award, and if an infant, the age, the name of his father, the amount of bond and names of the sureties, and time of filing each paper, and a brief note of each order or proceeding relating to the case with reference to the journal or record in which the order or proceeding is found.

A fourth record, the civil docket, must contain the following items: (1) the names of parties to actions and proceedings, (2) the time of the commencement of such actions, and (3) the proceedings and the filing of the papers relating thereto, along with a brief note of the orders made and the time of entering them.

All minutes of official business transacted in the Probate Court, or by the probate judge, in civil actions and proceedings shall be kept in a journal.

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[97] Ibid., Section 2101.12.

A record of wills must be maintained with a certificate of the probate court.

An additional record, containing a complete record in each matter of the petitions, answers, demurrers, motions, returns, reports, verdicts, awards, orders, and judgments shall be kept.

Within thirty days of the return of inventories, sale bills, and allowances to widows, such records must be maintained in a book provided for that purpose.

A record of accounts, which shall contain an entry of the appointment of executors, administrators, and guardians, partial and final accounts, and the orders and proceedings of the courts, shall be made within sixty days after the filing and approval.

An execution docket, in which shall be entered by the memorandum of executions issued by the probate judge stating the names of the parties, the name of the person to whom delivered, his return, the date of issuing the execution, the amount ordered to be collected, costs that are fines and those being damages, the payments, and the satisfaction when it is satisfied, is another requirement.

The marriage record shall contain the license, names of the parties to whom issued, the name of persons applying, a brief statement of the facts sworn to, and the returns of the person solemnizing the marriage.

Bonds made to executors, administrators, guardians, trustees and assignees approved by the probate judge are maintained.

A naturalization record or a declaration of intention must also be kept.

Records of all births and deaths occurring within the county shall be kept as designated by the director of health.

For each record maintained, an index must be attached and bound in the volume. Each index shall be kept current with the entries listed alphabetically by names of the persons along with the page of the book.

Franklin County

Probate Court in Franklin County transacted nearly 20,000 items of business during 1967. Probating estates and issuing marriage licenses account for most of their

business. Approximately 300,000 dollars were required to carry out their responsibilities. Table 30 portrays the breakdown on types and the frequency of items handled. Expenditures are indicated in Table 31 with a more detailed breakdown in Table 32 for 1967.

Fairfield County

The volume of business is the main difference between Fairfield and Franklin County. There is a high degree of association between population numbers and the number of probate cases. So a smaller county might be expected to have fewer cases. About 2,220 items were processed at a cost of 34,565 dollars. A breakdown of costs for 1967 is presented in Table 33.

Hardin County

The activities of the Hardin County Probate Court included 910 cases in 1967. The probating of estates and the issuance of marriage licenses constitute the bulk of the work as in the other two counties. Procedures are relatively the same also. The expenses for 1967 are in Table 34.

TABLE 30

NUMBER AND KIND OF CASES HANDLED BY PROBATE COURT, SELECTED COUNTIES, OHIO, 1967

Item	Hardin	Fairfield	Franklin
Admission of Wills	121	308	2,086
Settlement of Estates	196	399	2,522
Appointment and Supervision of Guardians and Administrators	226	495	3,445
Adoption of Children	17	53	1,006
Hearings on Affidavits of Mental Illness	7	39	842
Commitments to State Mental Institutions	7	39	761
Issuance of Marriage Licenses	293	603	7,280
Certificates of Births	---	60	364
Change of Name	2	---	195
Other	41	222	1,362
Total	910	2,218	19,863

TABLE 31

EXPENSES OF PROBATE COURT, SELECTED COUNTIES, OHIO, TRIENNIALLY, 1958 THROUGH 1967

(In Dollars)

County	1958	1961	1964	1967
Fairfield	25,332	29,326	33,129	34,565
Franklin	196,157	246,046	257,755	299,720
Hardin	13,561	14,093	13,325	16,094

Source: Auditor of State, State of Ohio, Financial Report of Ohio Counties, 1958 Through 1967.

TABLE 32

EXPENSES OF PROBATE COURT, FRANKLIN COUNTY, OHIO, 1967

(In Dollars)

Item	1967
Judge's Salary	11,500
Compensation of Employees	220,031
Court Constances, Bailiffs	12,054
Stationery and Supplies	38,164
Jurors and Witnesses	17,797
Other	174
Total	299,720

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Franklin, Form No.55, 1967.

TABLE 33

EXPENSES OF PROBATE COURT, FAIRFIELD COUNTY, OHIO, 1967

(In Dollars)

Item	1967
Judge's Salary	6,543
Compensation of Employees	23,239
Court Constances, Bailiffs	00
Stationery and Supplies	4,126
Jurors and Witnesses	280
Other	377
Total	34,565

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Franklin, Form No.55, 1967.

TABLE 34

EXPENSES OF PROBATE COURT, HARDIN COUNTY, OHIO, 1967

(In Dollars)

Item	1967
Judge's Salary	4,052
Compensation of Employees	9,066
Court Constances, Bailiffs	00
Stationery and Supplies	2,932
Jurors and Witnesses	20
Other	24
Total	16,094

Source: Bureau of Inspection and Supervision of Public Offices, Auditor of State, Financial Report, County of Hardin, Form No.55, 1967.

CHAPTER VIII

ALTERNATIVE INFORMATION SYSTEMS

In this chapter, alternative systems are explored as to their benefits, costs and effects upon the existing method of processing and storing records. In developing the alternatives, conformation with the existing Revised Code of Ohio, which specifies what must be done in the maintenance of records, was not necessarily complied with. This was done so that current expensive procedures could be identified.

In estimating the future benefits and costs, it is necessary to make projections for items like number of parcels, population, salaries and volume of documents of the selected offices. The projections for the next decade are shown in Table 35. When data were continuous over the 1958 through 1967 period, a trend line estimated by the least squares technique was used for the projections. For other items it was necessary to use a mean or data for the most current year.

TABLE 35

DATA USED IN ESTIMATING EXPENDITURES AND SAVINGS FOR ALTERNATIVE INFORMATION SYSTEMS, SELECTED OFFICES, THREE COUNTIES, OHIO, 1968 THROUGH 1977

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Parcels										
Franklin	237,191	242,050	246,909	251,768	256,627	261,486	266,345	271,204	276,063	280,922
Fairfield	34,559	35,179	35,799	36,419	37,039	37,659	38,279	38,899	39,519	40,139
Hardin	16,158	16,388	16,618	16,848	17,078	17,308	17,538	17,768	17,998	18,228
Population										
Franklin	828,524	846,486	864,448	882,410	900,372	918,334	936,296	954,258	972,220	990,182
Fairfield	73,970	75,005	76,040	77,075	78,110	79,145	30,180	81,215	82,215	83,285
Hardin	30,076	30,014	29,952	29,890	29,828	29,766	29,704	29,642	29,580	29,518
Salaries (Hourly rate)										
Franklin	3.48	3.57	3.67	3.76	3.85	3.94	4.04	4.13	4.22	4,31
Fairfield	2.63	2.71	2.79	2.87	2.95	3.03	3.10	3.18	3.26	3.34
Hardin	1.92	2.01	2.09	2.18	2.27	2.35	2.44	2.52	2.61	2.70
Number of Cases Clerk of Court										
Franklin	8,532	8,532	8,532	8,532	8,532	8,532	8,532	8,532	8,532	8,532
Fairfield	717	717	717	717	717	717	717	717	717	717
Hardin	273	273	273	273	273	273	273	273	273	273

TABLE 35 (Continued)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Probate Court										
Franklin	20,713	21,162	21,611	22,060	22,509	22,958	23,407	23,856	24,306	24,755
Fairfield	2,071	2,100	2,129	2,158	2,187	2,216	2,245	2,274	2,303	2,332
Hardin	902	900	899	897	895	893	891	891	887	886
Number of Documents Recorder										
Franklin	122,500	122,500	122,500	122,500	122,500	122,500	122,500	122,500	122,500	122,500
Fairfield	9,850	9,850	9,850	9,850	9,850	9,850	9,850	9,850	9,850	9,850
Hardin	5,025	5,025	5,025	5,025	5,025	5,025	5,025	5,025	5,025	5,025

since figures were not available for each year and the data were quite variable.

The number of parcels for Franklin County were estimated by the least squares trend line since the data permitted the use of the technique. For Fairfield and Hardin County, the reappraisal contracts were used to indicate the change in the number of parcels between the reappraisal periods of six years. Parcels have been increasing at a rate of 620 per year for Fairfield and 230 per year for Hardin County. The beta coefficients, the coefficients of determination and the levels of significance for the t and F-tests are shown in the Appendix.

Least squares was also used to estimate population numbers from 1968 through 1977 for each of the three counties. Franklin County has been increasing by 17,962 people annually, Fairfield by 1,035 people while Hardin County has been loosing 62 people each year.

Data supplied by the Bureau of Unemployment Compensation was used for the estimation of salaries. The base year was 1967, with least squares supplying the adjustment factor. Data for each county were available.

A simple mean was computed and used for the number of cases in Clerk of Court Office for the period of

analysis. A mean was used since the data for each year (1958-67) were not available. Data must be continuous and at least eight degrees of freedom must exist before least squares can be applied.

Data for 1967 was available in the three selected counties regarding Probate Court cases but not for other years. Data supplied by other counties in Ohio indicated a high association or correlation of cases with population numbers. Variation exists between highly urbanized and rural counties, but the ratio of cases to people remains stable within a county. A rate of 25 cases per thousand people was used for Franklin County, 28 cases per thousand in Fairfield and 30 in Hardin County.

For the Recorder's Office, data regarding the most recent year, 1967, was used for the 1968 through 1977 period. A change in the law regarding the reinstatement of chattel liens has resulted in a large reduction in the documents recorded in this office. Data indicates that this downward trend is starting to level out.

System Number One

This is the procedure as it exists today. One must go to a number of offices or sources to collect the needed information for a particular purpose. An inquiry as to the rate of taxation and the annual tax bill is not so difficult or time consuming as is a title search for a parcel of land.

Under this system, to search out liens or encumberances which may affect title to land, one has to check numerous indexes in the Recorder's Office, Probate Court, Clerk of Court and Treasurer's Office. Some of these indexes pertain to specific parcels of land and to persons. It is difficult to identify the records that pertain to a particular parcel under study.

Under the existing procedure of providing "notice to the world" as to real property rights pertaining to a parcel of land, the system is time consuming. The established way of doing things has continued; no coordinated effort has been made to implement improvements. The existing method is expensive to the taxpayer and to the people transferring property and establishing rights.

The cost of operating the selected offices was presented in the previous chapter. However, the expenditures of the private sector have not been mentioned concerning the establishment of rights in regard to real property. Table 36 presents the number of title examinations that are expected to take place in the next ten years. The projections are based upon the number of deeds and mortgages recorded in the last ten years. A trend line was fitted by least squares. The projections may tend to be low since the figures do not include examinations for title insurance policies.

The expenditures per title examination are portrayed in Table 37. The figures are based upon fees suggested by the local bar associations and the actual fees charged by attorneys in the respective counties. Attorneys interviewed indicated that most title examinations require two to two and one-half hours for completion. About one hour is required to locate the documents and one hour to render the attorney's opinion. It is estimated that fees for this type of legal work will increase three per cent per year over the base period (1967). The total expenditures are shown in Table 38.

TABLE 36

ESTIMATED NUMBER OF TITLE EXAMINATIONS, THREE SELECTED COUNTIES, OHIO, ANNUALLY, 1968 THROUGH 1977

County	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Franklin	45,200	45,828	46,456	47,084	47,712	48,340	48,968	49,596	50,224	50,852
Fairfield	4,741	4,816	4,891	4,966	5,041	5,116	5,191	5,266	5,341	5,419
Hardin	1,947	1,960	1,973	1,986	1,999	2,012	2,025	2,038	2,051	2,064

TABLE 37

ESTIMATED EXPENDITURES PER TITLE EXAMINATION FOR SYSTEM NUMBER ONE,
THREE SELECTED COUNTIES, OHIO, ANNUALLY
1968 THROUGH 1977

(In Dollars)

County	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Franklin	56.65	58.30	59.95	61.60	63.25	64.90	66.55	68.20	69.85	71.50
Fairfield	46.35	47.70	49.05	50.40	51.75	53.10	54.45	55.80	57.15	58.50
Hardin	51.50	53.00	54.50	56.00	57.50	59.00	60.50	62.00	63.50	65.00

TABLE 38

ESTIMATED EXPENDITURES FOR TITLE EXAMINATIONS FOR SYSTEM NUMBER ONE, THREE SELECTED COUNTIES, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

County	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Franklin	2,560,580	2,671,772	2,785,037	2,900,374	3,017,784	3,137,266	3,258,820	3,382,447	3,508,146	3,635,918
Fairfield	219,745	229,723	239,904	250,286	260,872	271,660	282,650	293,843	305,238	317,012
Hardin	100,271	103,880	107,529	111,216	114,943	118,708	122,513	126,356	130,239	134,160

[a]Data rounded to the nearest dollar.

Alternative System Number Two

The alternative approach to the improvement of real property records is concerned with the indexes only. The procedure virtually eliminates handwritten copies and facilitates the duplication and maintenance of indexes.[98]

When an individual brings a deed in to be recorded, the indexing information is typed on a special form. The form contains pre-cut pressure-sensitive strips and two carbon copies. The information may be typed twice if it is a deed, mortgage, etc., where two indexes are maintained. For other documents, one strip is typed.

After being typed, each line of information on a pre-cut strip is peeled from the form. The strip or strips are posted in the appropriate index book. The index is "current", and immediately "up-to-date" for abstracters and attorneys.

As for the two carbon copies, one is kept for an office record and the other is mailed to the processing firm.

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[98]This alternative utilizes the Cott Index System. The process is based on data provided by Richard Boring in an interview at Columbus, Ohio, April 20, 1968.

The agency processing the data checks the sequence, and edits each line for errors. The information is converted to punched paper tape, which is transferred to magnetic tape. The tape is placed through the computer with indexes printed in any desired sequence.

The duplicate storage also provides a security list. The computer can periodically supply a consolidated printed sheet of indexes. These sheets replace the "current" indexes or pressure-sensitive strips. All entries of a particular index can be collated to produce a chronological sequence, alphabetical sequences within years, or other arrangements as desired.

Since county records are stored in a computer, it is possible to merge the original index with subsequent sets, and to duplicate or replace sheets.

The cost of converting indexes to the pressure-sensitive strips and magnetic tape is 18 cents per line or entry. Where two indexes are used, 36 cents per instrument is assessed. To collate or merge indexes periodically, 1.5 cents per line is required.

The cost of converting past indexes depends upon the quantity and quality of the entries. The range is

usually 18 to 25 cents per entry. This cost includes the return of the indexes in any sequence preferred, since the largest factor is the conversion of well-used and usually hand-written entries to paper tape.

Table 35 provided the basic data for estimating the cost of this alternative. The estimated yearly volume of records to be handled were first multiplied by the cost of converting each index entry. The product was then adjusted upward by an index number representing an increase of 1.6 per cent per year over the base year (1967). This index reflects the rate of change that has occurred in the last ten years (1958 through 1967) for services and retail goods purchased by consumers. The data used to compute this index are shown in the Appendix.

The expenditures for this alternative are variable. The office using this system does not have to invest in any automatic data processing equipment. A service is purchased and not equipment, thus eliminating a large initial investment in equipment.

Table 39 shows the estimated cost of the alternative indexing system for a period of ten years for the offices

TABLE 39

ESTIMATED COST OF AN ALTERNATIVE INDEXING PROCEDURE, THREE OFFICES, THREE SELECTED COUNTIES, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

Office	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Recorder										
Franklin	44,806	45,511	46,217	46,922	47,628	48,334	49,039	49,745	50,450	51,560
Fairfield	3,603	3,659	3,716	3,773	3,830	3,886	3,943	4,000	4,057	4,113
Hardin	1,838	1,867	1,896	1,925	1,954	1,983	2,012	2,041	2,070	2,098
Clerk of Courts										
Franklin	3,121	3,170	3,219	3,268	3,317	3,366	3,416	3,465	3,514	3,563
Fairfield	262	266	271	275	279	283	287	291	295	299
Hardin	100	101	103	105	106	108	109	111	112	114
Probate Court										
Franklin	3,788	3,931	4,077	4,225	4,376	4,529	4,685	4,844	5,005	5,169
Fairfield	379	390	418	413	425	437	449	462	474	487
Hardin	165	167	170	172	174	176	178	181	183	185
Total										
Franklin	51,715	52,612	53,513	54,415	55,321	56,229	57,140	58,054	58,969	60,292
Fairfield	4,244	4,315	4,405	4,461	4,534	4,606	4,679	4,753	4,826	4,899
Hardin	2,103	2,135	2,169	2,202	2,234	2,265	2,299	2,333	2,365	2,397

[a]Data rounded to the nearest dollar.

of the Recorder, Clerk of Court and Probate Court. The documents in the Recorder's Office generally have two indexes, a direct and reverse, while some documents contain only one. Variation does exist concerning indexes in the Clerk of Court Office. Generally, a plaintiff index and a defendant's index are maintained. Franklin County separates divorce cases from other civil actions but this does not affect costs in converting to a new system. The Probate Court maintains a general index concerning their responsibilities.

As mentioned previously, it is desirable to update, merge and/or duplicate indexes. The cost to collate indexes annually is shown in Table 40. The cost is attributed to or based on an increase in documents. The total cost for the alternative indexing system plus collation is shown in Table 41.

Another way of improving indexes is to convert past indexes to magnetic tape that were formerly handwritten. The cost varies between 18 and 25 cents per index entry. As mentioned previously, costs vary depending on the condition of past indexes. To indicate the costs of converting past indexes, Table 42 presents

TABLE 40

ESTIMATED COST TO COLLATE INDEXES, THREE OFFICES, THREE SELECTED COUNTIES, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

Office	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Recorder										
Franklin	1,867	1,896	1,926	1,955	1,985	2,014	2,043	2,073	2,102	2,132
Fairfield	150	152	155	157	160	162	164	167	169	171
Hardin	77	78	79	80	81	83	84	85	86	87
Clerk of Courts										
Franklin	130	132	134	136	138	140	142	144	146	148
Fairfield	11	11	11	11	12	12	12	12	12	12
Hardin	4	4	4	4	5	5	5	5	5	5
Probate Court										
Franklin	316	328	340	352	365	377	390	404	417	431
Fairfield	32	33	33	34	35	36	37	38	40	41
Hardin	14	14	14	14	14	15	15	15	15	15
Total										
Franklin	2,313	2,356	2,400	2,443	2,488	2,531	2,575	2,621	2,665	2,711
Fairfield	193	196	199	202	207	210	213	217	221	224
Hardin	95	96	97	98	100	103	104	105	106	107

[a]Data rounded to the nearest dollar.

TABLE 41

TOTAL COST OF THE ALTERNATIVE INDEXING SYSTEM, INCLUDING COLLATION, SELECTED COUNTIES, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

County	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
FRANKLIN Total	54,028	54,968	55,913	56,858	57,809	58,760	59,715	60,675	61,634	63,003
FAIRFIELD Total	4,437	4,511	4,604	4,663	4,741	4,816	4,892	4,970	5,047	5,123
HARDIN Total	2,198	2,237	2,266	2,300	2,334	2,368	2,403	2,438	2,471	2,504

[a]Data rounded to the nearest dollar.

the cost of converting the number of documents recorded annually during the 1958-67 decade. The figures are based on the average number of documents and cases filed in the respective offices. Estimated average costs are shown since the exact cost is not known. Costs can be expected to vary by 15 per cent either way from the average.

TABLE 42

ESTIMATED AVERAGE COST TO CONVERT PAST INDEXES FOR ONE YEAR, THREE OFFICES, THREE SELECTED COUNTIES, OHIO, 1968 THROUGH 1977[a]

(In Dollars)

	County		
Office	Franklin	Fairfield	Hardin
Recorder	59,737	5,630	2,297
Clerk of Court	1,877	158	60
Probate Court	4,517	461	200
Total	66,131	6,249	2,557

[a]Data rounded to the nearest dollar.

The conversion of past indexes could improve access. Peak demand periods for indexes are encountered; duplicate copies could facilitate meeting this demand. In addition, records concerning a period of forty years or more may be of interest.

The Recorder's Office is the only office that receives any monetary benefits. Benefits or savings resulting from this alternative were calculated by comparing costs (labor and materials) under current procedures with estimated costs under the new system. The difference was attributed to the new system. The estimated benefits resulting from this system are presented in Table 43.

The amount of labor was reduced as a result of eliminating the duplication of indexes applicable to deeds and mortgages. Under existing procedures, these documents are indexed as many as five times. The alternative indexing system reduces the number of entries by sixty per cent. In addition, expenditures for binders and paper are reduced.

The rates per hour that were applied to estimate savings from reduction in labor required can be found

TABLE 43

ESTIMATED BENEFITS (SAVINGS) RESULTING FROM AN ALTERNATIVE INDEXING SYSTEM FOR THE RECORDER'S OFFICE, THREE SELECTED COUNTIES, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

County	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Franklin										
Labor	31,062	32,343	33,618	34,946	36,420	37,639	39,005	40,425	41,869	43,303
Materials	680	701	721	742	763	785	807	829	851	874
Total	31,742	33,044	34,339	35,688	37,183	38,424	39,812	41,254	42,720	44,177
Fairfield										
Labor	2,254	2,343	2,456	2,571	2,646	2,784	2,906	3,030	3,131	3,260
Materials	72	73	76	78	81	83	85	88	91	93
Total	2,326	2,416	2,535	2,649	2,727	2,867	2,991	3,118	3,222	3,353
Hardin										
Labor	691	738	753	802	852	884	917	949	1,002	1,035
Materials	29	30	31	31	32	30	33	34	35	35
Total	720	768	784	833	884	914	950	983	1,037	1,070

[a]Data rounded to the nearest dollar.

in Table 35 for the ten year period. Binder costs applied were 18.3 cents per page of indexing.

Although only one office benefits monetarily, certain intangible or non-monetary benefits arise. More flexibility is incorporated in this system as compared to the existing procedure. Indexes can be duplicated if the need arises; security can be maintained; collation by name, time, case number, plaintiff, defendent, subject, etc., is possible.

Benefits and costs also accrue to the private sector as well as to the public offices. One cost or disadvantage in implementing a new procedure is the confusion that results until the users become acquainted with the alternative. A dual system is likely to be imposed on any record system that has been in existence for several years. That is, one may have to use two systems, the new and the old, until most or all records are converted to the new method. Another definite disadvantage that can become costly to the users is the breakdown of equipment. This would not be a problem with this system since these offices buy the services of a computer and not the computer itself. Also, this

service may be purchased as infrequently as once or twice a year.

It is difficult to evalaute or estimate the benefits to the users. The situation can be handled by making certain assumptions in regard to time saved and convert the time to dollars. Table 44 shows the time saved, in total hours, at varying rates of time reductions per title examination. These hours are converted to dollars and portrayed in Table 45. It was assumed that two hours per title examination are required. By dividing the estimated expenditure per title examination by two, as shown in Table 37, the hourly rate can be extracted. For example, it is estimated that the average title examination in Hardin County will cost 51.50 dollars with the attorney charging 25.75 dollars per hour. This is the hourly rate used to compute the savings accruing to Hardin County during 1968.

The data in Table 45 indicates that approximately one minute saved per title examination would justify the system, in the aggregate, for Franklin County; one and one-fourth minutes in Fairfield County, and one and three-fourths minutes in Hardin County.

TABLE 44

TOTAL ESTIMATED TIME SAVED PER YEAR AT VARIOUS RATES PER TITLE EXAMINATION, THREE SELECTED COUNTIES, OHIO, ANNUALLY, 1968 THROUGH 1977

(In Hours)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Franklin										
One Min/Exam	753	763	774	785	795	806	816	827	837	848
Five Min/Exam	3,767	3,819	3,871	3,924	3,976	4,028	4,081	4,133	4,185	4,238
Ten Min/Exam	7,533	7,533	7,638	7,743	7,847	7,952	8,056	8,266	8,371	8,475
Fifteen Min/ Exam	11,300	11,457	11,614	11,771	11,928	12,085	12,242	12,399	12,556	12,713
Fairfield										
One Min/Exam	79	80	82	83	84	85	87	88	89	90
Five Min/Exam	395	401	408	414	420	426	433	439	445	451
Ten Min/Exam	790	803	815	828	840	853	865	878	890	903
Fifteen Min/ Exam	1,185	1,204	1,223	1,242	1,260	1,279	1,298	1,317	1,335	1,355
Hardin										
One Min/Exam	32.4	32.7	32.9	33.1	33.3	33.5	33.8	34.0	34.2	34.4
Five Min/Exam	162	163	164	166	167	168	169	170	171	172
Ten Min/Exam	325	327	329	331	333	335	338	340	342	344
Fifteen Min/ Exam	487	490	493	497	500	503	506	510	513	516

TABLE 45

ESTIMATED EXPENDITURES SAVED AT VARIOUS RATES PER TITLE EXAMINATION, THREE SELECTED COUNTIES, OHIO, ANNUALLY, 1968 THROUGH 1977

(In Dollars)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Franklin										
One Min/Exam	21,332	22,241	23,205	24,178	25,146	26,155	27,156	28,201	29,236	30,316
Five Min/Exam	106,719	111,324	116,053	120,859	125,761	130,709	135,815	140,935	146,182	151,509
Ten Min/Exam	213,410	219,587	228,987	238,484	248,201	258,042	268,104	281,871	292,399	302,981
Fifteen Min/ Exam	320,129	333,972	348,188	362,547	377,283	392,158	407.414	422,806	438,581	454,489
Fairfield										
One Min/Exam	1,831	1,908	2,011	2,092	2,174	2,257	2,369	2,455	2,543	2,633
Five Min/Exam	9,156	9,564	10,008	10,433	10,869	11,310	11,791	12,248	12,718	13,192
Ten Min/Exam	18,312	19,152	19,992	20,866	21,739	22,647	23,554	24,496	25,436	26,413
Fifteen Min/ Exam	27,468	28,715	30,000	31,298	32,609	33,957	35,345	36,744	38,154	39,664
Hardin										
One Min/Exam	850	875	899	924	949	1,003	1,029	1,054	1,080	1,105
Five Min/Exam	4,172	4,320	4,469	4,648	4,801	4,956	5,112	5,270	5,429	5,590
Ten Min/Exam	8,369	8,666	8,965	9,268	9,574	9,883	10,225	10,540	10,859	11,180
Fifteen Min/ Exam	12,540	12,985	13,434	13,916	14,375	14,839	15,307	15,810	16,288	16,770

The important point is that relatively little time has to be saved by the private sector or practicing attorneys to justify the system in the aggregate. Also, over time the benefits to the private sector increase more than do the costs of the system resulting in a larger gap between costs and benefits.

Alternative System Number Three

This alternative approach to the storage and retrieval of documents concerns the instruments themselves. Numerous county court houses are incurring problems with delapidated structures, inadequate space and outdated duplicating equipment. An alternative approach to the storage and retrieval of public documents could reduce the magnitude of the space problem.

Techniques in duplicating and recording documents have passed through three stages. First came the handwritten copies of instruments. In many cases script was used until the typewriter established itself. In the 1900's to the 1920's, the offices copy-typed the instruments being recorded. This procedure required proofreading, and spelling errors were prevalent and may still be present in the documents.

The next phase of duplication was photo-coping on silver halide paper. This practice is still common in many counties today.

The handwritten, typed and photo-copied instruments have a major disadvantage. All of them have to be filed in books -- books that take up space and need special equipment for shelving. Consequently, today's operations have a heavy material cost for the reproduction and for permanent binders to withstand heavy public usage.

An alternative that reduces the space problem and permits easier handling of documents is the aperture card system.[99] Each card is the size of an 80 column punch card with a small window containing microfilm. As many as six legal size images can be stored on the microfilm. Data can be typed on the card and/or punched in the appropriate columns. One file drawer can hold the same amount of recordings as six bound volumes. A single cabinet of 20 drawers can hold the equivalent of 120 volumes. The 20 drawer file cabinet occupies about 17 cubic feet of space as compared to 52 cubic feet for 120 volumes of recordings. However, the camera and

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[99]This alternative utilizes the 3-M Company process. The estimates are based on data provided by James Strapp in an interview at Columbus, Ohio, March 21, 1968.

reader-printer require space, thus preventing any net savings in space until about the eighth year after the system is implemented.

The biggest advantage from the standpoint of space is that less work area is required for the users since they are handling a 3 by 7 inch card instead of a bound volume of recordings containing as many as 350 pages. It can also ease the demand on the offices by quickly providing duplicates of instruments for attorneys, abstracters and other users. In general, the aperture card system would permit better office organization.

In addition to space savings and the convenience, the counties using microfilm could reduce costs 40 to 50 cents per instrument.

The microfilm in the card can be reproduced in three ways: (1) viewed on a reader, (2) paper copy from a reader-printer, and (3) a duplicate card from a copier.

The work flow does not differ much from the existing procedure. The instrument is given a sequence number, deed book and page number as before. The deputy may post on the card the type of instrument, date of filing,

grantor and grantee. A place may be provided to record future satisfactions of mortgages. Instead of photostating a copy, the instrument is microfilmed. One big advantage is that an instrument can be returned to the person filing it within a few minutes.

The cost of this approach to record improvement was budgeted for each of the five offices in the three selected counties. The following tables (46, 47, and 48) show the cost of the system over a ten-year period.

The equipment category represents expenditures that are needed initially to implement the aperture card system. The estimated total costs may tend to be low for no allowance was made for equipment breakdown. Data were not available concerning the frequency and extent of equipment failure. The digits in the parenthesis indicate the number of units of different pieces of equipment required.

Expenses listed under the selected offices represent costs for labor and supplies. The labor cost was computed by estimating the hours required to microfilm the documents annually and applying the rates listed in Table 35. The expenditures labeled supplies are for the

TABLE 46

ESTIMATED COST OF THE APERTURE CARD SYSTEM, FIVE SELECTED OFFICES, FRANKLIN COUNTY, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Equipment										
Processor-Camera (4)	26,620									
Card Duplicator (2)	2,190									
Reader Printer (20)	33,500									
Reader (5)	500									
File Cabinets	6,879	2,152	2,197	2,241	2,284	2,328	5,278	2,416	2,461	2,506
Opportunity Cost	2,826	2,544	2,261	1,979	1,696	1,413	1,130	848	565	283
Total	72,515	4,696	4,458	4,220	3,980	3,741	6,408	3,264	3,026	2,789
Clerk of Courts										
Supplies	4,681	4,755	4,828	4,902	4,976	5,050	5,123	5,197	5,271	5,344
Labor	3,706	3,802	3,909	4,004	4,100	4,196	4,303	4,398	4,494	4,590
Total	8,337	8,557	8,737	8,906	9,076	9,246	9,426	9,595	9,765	9,934
Probate Court										
Supplies	5,682	5,897	6,115	6,337	6,564	6,794	7,028	7,266	7,508	7,753
Labor	4,496	4,712	4,947	5,174	5,405	5,646	5,898	6,150	6,398	6,659
Total	10,178	10,609	11,062	11,511	11,969	12,440	12,926	13,416	13,906	14,412

TABLE 46 (Continued)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Recorder										
Supplies	16,802	17,067	17,331	17,596	17,861	18,125	18,390	18,654	18,919	19,184
Labor	0	0	0	0	0	0	0	0	0	0
Total	16,802	17,067	17,331	17,596	17,861	18,125	18,390	18,654	18,919	19,184
Auditor										
Supplies	32,533	677	687	698	708	719	39,984	740	750	761
Labor	25,748	539	554	568	581	593	33,564	624	637	651
Total	58,281	1,216	1,241	1,266	1,289	1,312	73,548	1,364	1,387	1,412
Treasurer										
Supplies	65,066	66,768	68,491	70,234	71,990	73,784	75,284	77,418	79,267	81,137
Labor	51,497	53,368	55,417	57,344	59,297	61,279	63,444	65,481	67,565	69,637
Total	116,563	121,136	123,908	127,578	131,297	135,063	138,728	142,899	146,832	150,774
Change in Ownership										
Supplies	6,795	7,043	7,295	7,551	7,812	8,077	8,347	8,621	8,869	9,181
Labor	5,377	5,633	5,934	6,478	6,757	7,037	7,353	7,669	7,938	8,241
Total	12,172	12,676	13,229	14,029	13,569	15,114	15,700	16,290	16,837	17,442
TOTAL	294,848	175,957	179,958	185,106	189,041	195,041	275,126	205,482	210,672	215,927

[a]Data rounded to the nearest dollar.

TABLE 47

ESTIMATED COST OF THE APERTURE CARD SYSTEM, FIVE SELECTED OFFICES, FAIRFIELD COUNTY, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Equipment										
Processor - Camera (1)	6,655									
Card Duplicator (1)	1,095									
Reader Printer(5)	8,375									
Reader (1)	100									
File Cabinets	610	354	362	367	375	383	1,053	398	404	409
Opportunity Cost	730	657	584	511	438	364	292	219	146	73
Total	17,565	1,011	946	878	813	747	1,345	617	550	482
Clerk of Courts										
Supplies	393	400	406	412	418	424	431	437	443	449
Labor	237	243	251	258	266	273	279	286	293	300
Total	630	643	657	670	684	697	710	723	736	749

TABLE 47 (Continued)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Probate Court										
Supplies	568	585	602	620	638	655	674	693	711	730
Labor	339	355	371	387	404	421	434	452	469	488
Total	907	940	973	1,007	1,042	1,076	1,108	1,145	1,180	1,218
Recorder										
Supplies	1,351	1,372	1,394	1,415	1,436	1,457	1,479	1,500	1,521	1,543
Labor	0	0	0	0	0	0	0	0	0	0
Total	1,351	1,372	1,394	1,415	1,436	1,457	1,479	1,500	1,521	1,543
Auditor										
Supplies	4,740	86	88	89	90	92	5,746	94	96	97
Labor	2,835	51	53	55	56	58	3,701	60	62	63
Total	7,575	137	141	144	146	150	9,447	154	158	160
Treasurer										
Supplies	9,480	9,716	9,954	10,195	10,439	10,685	10,964	11,186	11,441	11,698
Labor	5,670	5,894	6,121	6,351	6,584	6,821	7,036	7,279	7,524	7,772
Total	15,150	15,610	16,075	16,546	17,023	17,506	18,000	18,465	18,965	19,470

TABLE 47 (Continued)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Change in Ownership										
Supplies	665	686	708	730	752	775	798	821	845	869
Labor	397	420	435	453	478	497	515	541	561	574
Total	1,062	1,106	1,143	1,183	1,200	1,272	1,313	1,362	1,406	1,443
TOTAL	44,240	20,819	21,329	21,843	22,374	22,905	33,402	23,966	24,516	25,065

[a]The data is rounded to the nearest dollar.

TABLE 48

ESTIMATED COST OF THE APERTURE CARD SYSTEM, FIVE SELECTED OFFICES, HARDIN COUNTY, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Equipment										
Processor-Camera(1)	6,655									
Card Duplicator (1)	1,095									
Reader Printer (5)	8,375									
Reader (1)	100									
File Cabinets	305	248	168	170	173	175	178	284	183	186
Opportunity Cost	730	657	584	511	438	365	292	219	146	73
Total	17,260	905	752	681	611	540	470	503	329	259
Clerk of Courts										
Supplies	149	152	154	157	159	162	164	166	169	171
Labor	65	68	71	74	77	80	83	86	89	92
Total	215	220	225	231	236	242	247	252	258	263

TABLE 48 (Continued)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Probate Court										
Supplies	245	251	254	258	261	264	268	271	274	278
Labor	100	112	117	122	127	132	137	141	146	151
Total	355	363	371	380	388	396	405	412	420	429
Recorder										
Supplies	689	700	710	722	733	744	754	765	776	787
Labor	0	0	0	0	0	0	0	0	0	0
Total	689	700	710	722	733	744	754	765	776	787
Auditor										
Supplies	0	2,315	32	33	34	34	35	2,706	36	36
Labor	0	1,029	15	15	16	16	17	1,398	18	19
Total	0	3,344	47	48	50	50	52	4,105	54	55
Treasurer										
Supplies	4,432	4,534	4,637	4,741	4,846	4,952	5,058	5,166	5,275	5,385
Labor	1,939	2,044	2,140	2,247	2,356	2,456	2,567	2,667	2,782	2,897
Total	6,371	6,578	6,777	6,988	7,202	7,408	7,625	7,833	8,057	8,282

TABLE 48 (Continued)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Change in Ownership										
Supplies	131	269	277	285	293	302	310	318	327	335
Labor	115	241	259	270	286	300	312	333	345	362
Total	246	510	536	555	579	603	622	651	672	697
TOTAL	25,136	12,620	9,418	9,605	9,799	9,983	10,175	14,521	10,566	10,772

[a]The data is rounded to the nearest dollar.

aperture cards. The expenses for supplies were adjusted upward by 1.6 per cent per year over the base year (1967) to reflect an expected increase in the price level.

Labor was required in all offices except the Recorder. The use of the aperture card system is not an additional function of this office, but rather a replacement of an existing procedure.

The first year is quite expensive because of the initial conversion of the records in the office of the Treasurer and the Auditor plus the purchase of equipment. Also, the Treasurer's records must be updated twice each year as a result of the semi-annual real property tax bills. Another expenditure attributable to the Auditor and Treasurer is the cost of the constant updating of records required as a result of changes in ownership of parcels. Since changes cannot be made on microfilm, the original documents must be updated and another image placed on the card.

An additional expenditure was charged, that being an opportunity cost of the capital invested in the equipment. An interest rate of 4.5 per cent was applied to the value of the equipment at the beginning of each

year, depreciating over ten years. The 4.5 per cent rate is based upon the borrowing rate for county governments.

The benefits occuring from this method include a reduction in the expenditures for equipment and making copies from photostatic-copy processes. It presently costs about 58 cents to copy and store a two page document as compared to about 15 cents for the aperture card system. Copies for use by the public cost 17 cents per page under the existing process as compared to 10 cents for a copy from an aperture card. The savings that are possible can be seen in Tables 49 and 50. To estimate total savings, the per unit savings listed in Tables 49 and 50 were applied to the total estimated number of documents expected annually for the period 1968 through 1977.

On a county basis, the savings in storing documents are shown in Table 51. This includes the savings that are possible in duplicating documents for a public copy, binders and storage racks.

TABLE 49

COMPARISON OF COSTS FOR THE PHOTOSTATIC-COPY PROCESS AND THE APERTURE CARD METHOD OF DUPLICATING PUBLIC DOCUMENTS, RECORDER'S OFFICE, OHIO

(In Dollars)

Photostatic-Copy Method		Aperture Card Method	
Paper Per Document	.333	Card Cost Per Document	.135
Chemical Cost Per Document	.010	Chemical Cost	.000
Binding Cost	.183	Binding Cost	.000
Material Cost	.526	Material Cost	.135
Filing Cost (Book Racks)	.055	Filing Cost (Cabinets)	.01
Total Cost	.581	Total Cost	.145

Total Cost Photostatic Copy Method	.581
Total Cost Aperture Card Method	.145
Savings	.436

TABLE 50

ESTIMATED SAVINGS BY USING APERTURE CARD METHOD FOR CLERK OF COURTS AND PROBATE COURT, OHIO

(In Dollars)

	Clerk of Courts	Probate Court
Binder Cost Per Page	.0915	.0915
Cost Per Case	2.286	.5490
Filing Costs Per Page	.0275	.0275
Cost Per Case	.688	.1650
Total Cost- Present Method	2.974	.7140
Total Cost- Aperture Card	.540	.2700
Savings Per Case	2.434	.4440

TABLE 51

ESTIMATED SAVINGS RESULTING FROM THE APERTURE CARD SYSTEM IN STORING DOCUMENTS, FOR THREE OFFICES, THREE SELECTED COUNTIES, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

Office	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Recorder										
Franklin	54,265	55,119	55,977	56,828	57,683	58,537	59,392	60,246	61,101	61,956
Fairfield	4,363	4,432	4,501	4,569	4,638	4,707	44,776	4,844	4,913	4,981
Hardin	2,226	2,261	2,296	2,331	2,366	2,401	2,436	2,471	2,506	2,541
Clerk of Courts										
Franklin	29,733	30,201	30,669	31,133	31,606	32,074	32,542	33,011	33,479	33,947
Fairfield	1,770	1,798	1,826	1,854	1,882	1,900	1,937	1,965	1,993	2,021
Hardin	674	685	695	706	716	727	738	748	758	770
Probate Court										
Franklin	9,343	9,697	10,056	10,422	10,794	11,172	11,557	11,948	12,345	12,750
Fairfield	934	962	990	1,019	1,049	1,078	1,108	1,139	1,170	1,201
Hardin	407	412	418	424	429	435	440	455	450	456
Total										
Franklin	93,341	95,017	96,702	98,388	100,083	101,783	103,491	105,205	106,925	108,653
Fairfield	7,067	7,192	7,317	7,442	7,569	7,695	7,821	7,948	8,076	8,203
Hardin	3,308	3,358	3,409	3,461	3,511	3,563	3,614	3,674	3,716	3,766

[a]Data are rounded to the nearest dollar.

Table 52 portrays the estimated savings that are possible in duplicating copies of public records for the users. These savings can be considered a benefit to the public offices or to the private sector. In this analysis these savings will be considered a benefit to the public offices since there is a question as to whether the savings would be passed on to the private sector. Total savings from the aperture card system for the three counties are shown in Table 53.

The benefit-cost ratio can be computed from the summation of the annual costs and benefits. Table 54 shows the figures for the three counties. A rather unfavorable benefit-cost ratio results in each county. The ratio indicates the amount of the expenditures recaptured in the form of benefits or savings.

Reasons exist for deleting the Auditor's Office and the Treasurer's Office from a legal information system. For one thing, the records of the Auditor are used infrequently or not at all in a title examination. In addition, the Treasurer's Office must be constantly updated because of the semi-annual payments and the sale of parcels. Data relating to taxes are

TABLE 52

ESTIMATED SAVINGS RESULTING FROM APERTURE CARD SYSTEM IN DUPLICATING DOCUMENTS, SELECTED OFFICES, THREE SELECTED COUNTIES, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

Office	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Recorder										
Franklin	1,829	1,858	1,886	1,915	1,944	1,973	2,002	2,030	2,059	2,088
Fairfield	146	149	151	153	156	158	160	162	164	167
Hardin	75	76	77	78	79	80	82	83	84	85
Clerk of Courts										
Franklin	1,096	6,192	6,288	6,384	6,480	6,576	6,672	6,768	6,864	6,960
Fairfield	502	520	528	536	544	552	560	569	577	585
Hardin	195	198	201	204	207	210	213	217	220	223
Probate Court										
Franklin	1,666	1,692	1,719	1,745	11,771	1,797	1,824	1,850	1,876	1,902
Fairfield	166	169	171	174	177	179	182	184	187	190
Hardin	72	73	74	75	77	78	79	80	80	82

TABLE 52 (Continued)

Office	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Auditor										
Franklin	945	959	975	990	1,004	1,019	1,034	1,049	1,064	1,079
Fairfield	138	139	142	144	146	149	151	153	155	157
Hardin	63	65	67	68	69	70	71	72	73	74
Total										
Franklin	10,536	10,701	10,868	11,034	11,199	11,365	11,532	11,697	11,863	12,029
Fairfield	952	977	992	1,007	1,023	1,038	1,053	1,068	1,083	1,099
Hardin	407	412	419	425	432	438	445	452	457	464

[a]Data are rounded to the nearest dollar.

TABLE 53

TOTAL ESTIMATED SAVINGS RESULTING FROM THE APERTURE CARD SYSTEM, SELECTED OFFICES, THREE SELECTED COUNTIES, OHIO, ANNUALLY, 1968 THROUGH 1977

(In Dollars)

County	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Franklin	103,877	105,719	107,567	109,421	111,282	113,149	115,022	116,902	118,788	120,682
Fairfield	8,030	8,170	8,310	8,450	8,681	8,733	8,875	9,017	9,159	9,302
Hardin	3,713	3,771	3,829	3,886	3,555	4,001	4,059	4,126	4,173	4,231

as readily available as any real property records because only one record per parcel is maintained. Any data that might be historically important like penalties will be found on the current tax record.

TABLE 54

BENEFITS, EXPENDITURES AND BENEFIT-COST RATIOS, APERTURE CARD SYSTEM, FIVE OFFICES, THREE SELECTED COUNTIES, OHIO, 1968[a]

(In Dollars)

	County		
	Franklin	Fairfield	Hardin
Benefits	1,122,409	86,727	39,345
Expenditures	2,120,937	258,843	122,524
Benefit-Cost Ratio	.529	.335	.321

[a]The data includes the expenditures and savings when five county offices are included in the system.

If these two offices are excluded, more favorable ratios exist. Expenditures are reduced much more than are the benefits. The benefits are reduced because of some savings accrued to the Auditor's Office in the

duplication of tax appraisal cards for individual users. Refer to tables 55, 56, and 57 for costs when the Auditor and Treasurer are removed from the system. The costs for the County Clerk of Court, Probate Court and Recorder remain the same. The amount of equipment required is reduced since a smaller volume of records are placed on aperture cards. The benefit-cost ratios for the system are shown in Table 58.

The benefits vary greatly among the three counties. This is mainly due to the fact that the equipment is more fully utilized in the more urbanized areas and the volume of documents is increasing rapidly resulting in greater savings to the offices.

Franklin County starts to receive a payoff, when benefits exceed costs, within the first year; Fairfield during the third and Hardin County, the seventh year.

From the standpoint of the users of these data, reproduction is easier and quicker, and more centralization of records is possible. A disadvantage is that a dual system may be imposed because the conversion of past records is expensive.

TABLE 55

ESTIMATED COST OF THE APERTURE CARD SYSTEM, THREE SELECTED OFFICES, FRANKLIN COUNTY, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Equipment										
Processor-Camera(3)	19,665									
Card Duplicator (2)	2,190									
Reader Printer (20)	33,500									
Reader (5)	500									
File Cabinet	4,024	4,106	4,189	4,272	4,356	4,438	4,524	4,610	4,696	4,782
Opportunity Cost	2,513	2,262	2,011	1,759	1,508	1,258	1,005	754	503	251
Total	62,392	6,368	6,200	6,031	5,864	5,696	5,529	5,364	5,199	5,033
Clerk of Courts Total	8,387	8,551	8,737	8,906	9,076	9,246	9,426	9,596	9,765	9,934

TABLE 55 (Continued)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Probate Court Total	10,178	10,609	11,062	11,511	11,969	12,430	12,926	13,415	13,905	14,412
Recorder Total	16,802	17,067	17,331	17,596	17,861	18,125	18,390	18,654	18,919	19,184
TOTAL	97,759	42,601	43,330	44,044	44,770	45,497	46,271	47,029	47,788	48,563

[a]The data is rounded to the nearest dollar.

TABLE 56

ESTIMATED COST OF THE APERTURE CARD SYSTEM, THREE SELECTED OFFICES, FAIRFIELD COUNTY, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Equipment										
Processor-Camera (1)	6,655									
Card Duplicator (1)	1,095									
Reader Printer (3)	5,025									
Reader (2)	200									
File Cabinets	343	349	356	362	369	376	383	390	396	403
Opportunity Cost	584	525	467	409	350	292	233	175	133	58
Total	13,902	874	823	771	719	668	616	565	529	461

TABLE 56 (Continued)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Clerk of Court Total	630	643	657	670	684	697	710	723	736	750
Probate Court Total	907	940	973	1,007	1,042	1,077	1,108	1,144	1,181	1,218
Recorder Total	1,351	1,372	1,394	1,415	1,436	1,457	1,479	1,500	1,521	1,543
TOTAL	16,790	3,829	3,847	3,863	3,881	3,899	3,913	3,932	3,967	3,972

[a]The data is rounded to the nearest dollar.

TABLE 57

ESTIMATED COST OF THE APERTURE CARD SYSTEM, THREE SELECTED OFFICES, HARDIN COUNTY, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Equipment										
Processor-Camera(1)	6,655									
Card Duplicator (1)	1,095									
Reader Printer (3)	5,025									
Reader (1)	100									
File Cabinet	160	163	166	168	170	173	176	178	180	182
Opportunity Cost	579	521	463	406	348	290	231	173	116	58
Total	13,614	684	629	574	518	463	407	351	296	240

TABLE 57 (Continued)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Clerk of Court Total	215	220	226	230	236	241	247	251	258	262
Probate Court Total	355	363	371	380	388	396	404	411	420	429
Recorder Total	689	700	710	722	733	743	754	765	776	787
TOTAL	14,873	1,967	1,936	1,906	1,875	1,843	1,812	1,788	1,750	1,718

[3]The data is rounded to the nearest dollar.

TABLE 58

BENEFITS, EXPENDITURES, NET BENEFITS AND BENEFIT-COST RATIOS, APERTURE CARD SYSTEM, THREE SELECTED COUNTIES, OHIO, 1968[a]

(In Dollars)

	County		
	Franklin	Fairfield	Hardin
Benefits	1,112,291	85,253	38,654
Expenditures	502,078	50,597	29,551
Net Benefits	610,213	34,656	9,103
Benefit-Cost Ratio	2.215	1.685	1.308

[a]The data includes the expenditures and savings when the Office of the Recorder, Clerk of Court and Probate Court are in the system.

The cost to convert the past records of an office for any one year would be approximately 52,689 dollars for Franklin County, 4,039 for Fairfield and 1,722 dollars for Hardin County. If the net benefits or savings from the ten year period were invested in the old records, Franklin County could convert 11 years of records, Fairfield County, 8 years, and Hardin County, 5 years.

Direct monetary benefits to the users would be . . very small initially. The benefits would increase as the old record system is converted to the new system since past records contain most of the required data for title examinations. A majority of the title searches cover at least forty years. As the new system contains more past records, the savings to the users become larger. Assume for a moment that five minutes is saved per examination and Franklin County reinvested its savings into past records. This would represent 151,509 dollars of savings and when discounted at 4.5 per cent, yields a present value of 101,950 dollars, which is attributable to the new system. The discount rate is based upon the cost of borrowing money by the county government. Applying the comparable figures to Fairfield and Hardin County would mean a benefit of 8,877 and 3,762 dollars, respectively. A reduction of at least five minutes per examination would be within reason, for approximately one hour is required just to locate documents and take necessary notes with the existing system.

This alternative can offer monetary advantages

when the system is designed to convert records of the County Recorder, County Clerk of Court and Probate Court. Inclusion of the records of the County Treasurer in the system cannot be justified since they are constantly being updated. The records of the County Auditor are of little value in title examinations. They were included in the system initially to provide some data on the approximate cost of a more comprehensive information system.

No benefits to the users can be expected initially. As the new records are placed in the system and past records are converted, definite advantages are indicated.

Alternative System Number Four

This alternative is a microfilm random access retrieval system.[100] The basic access unit is a 4 x 4 x 1 inch magazine weighting 6 ounces. Inside each magazine is 100 feet of 16 millimeter film on which are two types of images, reproducible images of documents and adjacent to each, an identifying code. Approximately 3,000 - $8\frac{1}{2}$ by 14 inch images can be stored in each magazine.

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[100]This alternative utilizes The Eastman Kodak Company process. The estimates are based on data provided by Jerry Wittenmier in an interview at Columbus, Ohio, April 10, 1968.

The manual system of coding documents is composed of a microfilm camera and an input keyboard; the operator sets the code by positioning a group of switches. The code is exposed on the film by a series of lights and the film unit of the camera. After exposure, the film advances automatically and the document image is exposed on the film.

An alternative to the manual system is the cathoderay tube whereby the microfilming is connected to a computer system. The image of the document is displayed on the cathoderay tube and this display along with a code image is photographically recorded on microfilm.

Once the images are on the film and coded, a search for a document involves four steps: (1) select the film magazine, (2) insert the magazine in the reader, (3) enter the identifier (code number), and (4) push the search button.

The expenditures for this system were estimated in the same manner as in the aperture card system. Table 35 provided the basic data. Expenses for equipment and the supplies and labor required in the offices were separated. Supplies consist of microfilm magazines.

The labor cost was estimated by taking the production (documents per hour) and dividing the factor into the estimated number of documents to be recorded to arrive at total hours required. The total hours were multiplied by the appropriate hourly wage for each year. For example, 120 - two page documents can be microfilmed per hour. If 120,000 documents are expected, 1000 hours of labor will be needed. The production per hour and the number of documents that can be placed on each microfilm magazine for different offices are shown in the Appendix. After the total expenses for magazines (supplies) were estimated, the figures were adjusted upward by 1.6 per cent per year over the base period (1967).

An interest charge of 4.5 per cent was applied to the equipment. This rate was based on the cost of borrowing money by the county government. The charge represents an opportunity cost of the funds invested in the equipment.

As in the aperture card system, the estimated total cost for equipment may be low because no allowance was made for equipment repair. The random access system

has not been on the market very long, thus the frequency of breakdown is not known.

Where the records of the County Auditor and Treasurer are placed on microfilm, an index must be developed so the user can locate the desired information. The appraisal cards and the tax duplicates must be assigned a number and this number has to be available to the user. A procedure similar to the deed indexes that are needed in the Recorder's Office to direct the user to the duplicate deed must be created.

The cost of updating records in the Office of the Auditor and Treasurer as a result of changes in ownership are placed in a separate category and shown in Tables 59, 60 and 61. As mentioned previously, microfilmed images cannot be changed; the original document must be altered and then microfilmed again to keep an information system current.

The initial expenditures for this alternative are higher than for the aperture card method. Equipment must be purchased and the records of the Auditor and Treasurer are microfilmed. Costs do decrease rapidly after the initial year.

TABLE 59

ESTIMATED COST FOR THE RANDOM ACCESS MICROFILM SYSTEM, FIVE SELECTED OFFICES, FRANKLIN COUNTY, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Equipment										
Camera (3)	45,000									
Retrieval Center(20)	300,000									
Opportunity Cost	15,525	13,973	12,420	10,867	9,315	7,763	6,210	4,657	3,105	1,553
Total	360,525	13,973	12,420	10,867	9,315	7,763	6,210	4,657	3,105	1,553
Recorder										
Equipment	1,167	1,186	1,205	1,223	1,241	1,260	1,278	1,297	1,315	1,333
Total	1,167	1,186	1,205	1,223	1,241	1,260	1,278	1,297	1,315	1,333
Clerk of Courts										
Equipment	922	937	951	966	980	995	1,009	1,024	1,038	1,053
Labor	2,972	3,049	3,134	3,211	3,287	3,365	3,450	3,527	3,604	3,681
Total	3,894	3,986	4,085	4,177	4,268	4,359	4,459	4,551	4,642	4,733
Probate Court										
Equipment	595	618	640	664	687	712	736	762	786	813
Labor	1,719	1,799	1,890	1,977	2,064	2,155	2,254	2,346	2,443	2,543
Total	2,324	2,417	2,530	2,642	2,751	2,867	2,990	3,107	3,230	3,356

TABLE 59 (Continued)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Auditor										
Equipment	2,243	47	47	48	49	50	2,757	51	52	52
Labor	6,603	139	143	146	156	153	8,608	161	164	167
Index	13,977	298	311	324	337	350	19,942	389	391	405
Total	22,823	484	501	518	535	553	31,307	600	607	625
Treasurer										
Equipment	4,486	4,603	4,675	4,842	4,964	5,087	5,211	5,338	5,465	5,594
Labor	13,207	13,690	14,217	14,711	15,213	15,722	16,278	16,801	17,332	17,869
Index	13,977	298	312	324	337	350	364	389	391	405
Total	31,670	18,592	19,202	19,878	20,514	21,159	21,854	22,528	23,188	23,868
Change in Ownership										
Equipment	479	487	507	528	536	557	565	601	623	632
Labor	1,378	1,446	1,516	1,583	1,652	1,722	1,798	1,871	1,945	2,021
Total	1,858	1,933	2,023	2,111	2,187	2,279	2,363	2,471	2,568	2,653
TOTAL	424,262	42,571	41,966	41,417	40,811	40,240	70,461	39,213	38,655	38,121

[a]Data rounded to the nearest dollar.

TABLE 60

ESTIMATED COST FOR THE RANDOM ACCESS MICROFILM SYSTEM, FIVE SELECTED OFFICES, FAIRFIELD COUNTY, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Equipment										
Camera (1)	15,000									
Retrieval Center(3)	45,000									
Opportunity Cost	2,925	2,633	2,340	2,047	1,755	1,463	1,170	878	585	293
Total	62,925	2,633	2,340	2,047	1,755	1,463	1,170	878	585	293
Recorder										
Equipment	98	100	101	103	105	106	108	109	111	112
Total	98	100	101	103	105	106	107	109	111	112
Clerk of Courts										
Equipment	86	87	89	90	91	93	94	96	97	98
Labor	189	195	201	207	212	218	223	229	235	240
Total	275	283	290	297	303	311	317	325	332	339

TABLE 60 (Continued)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Probate Court										
Equipment	61	62	63	64	65	66	67	68	69	70
Labor	132	136	142	146	153	161	167	175	179	187
Total	193	197	206	211	218	227	235	243	249	257
Audi or										
Equipment	327	6	6	6	6	6	396	7	7	7
Labor	727	13	14	14	15	15	949	16	16	17
Index	1,514	27	28	29	29	30	1,978	32	33	33
Total	2,569	47	48	49	51	51	2,323	54	55	57
Treasurer										
Equipment	654	670	686	702	718	734	750	766	782	798
Labor	1,454	1,509	1,567	1,627	1,687	1,747	1,804	1,866	1,929	1,993
Index	1,515	27	28	29	30	30	31	32	33	33
Total	3,622	2,206	2,281	2,357	2,435	2,512	2,585	2,664	2,744	2,824
Change in Ownership										
Equipment	49	50	51	52	52	53	54	55	55	56
Labor	103	108	112	118	121	127	133	137	143	147
Total	152	158	162	169	173	180	187	191	199	203
TOTAL	69,835	5,625	5,428	5,234	5,040	4,850	6,925	4,464	4,275	4,085

[a]Data rounded to the nearest dollar.

TABLE 61

ESTIMATED COST FOR RANDOM ACCESS MICROFILM SYSTEM, FIVE SELECTED OFFICES, HARDIN COUNTY, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Equipment										
Camera (1)	15,000									
Retrieval Center(2)	30,000									
Opportunity Cost	2,025	1,823	1,620	1,418	1,215	1,103	810	608	405	203
Total	47,025	1,823	1,620	1,418	1,215	1,013	810	608	405	203
Recorder										
Equipment	49	50	51	52	52	53	54	55	55	56
Total	49	50	51	52	52	53	54	55	55	56
Clerk of Courts										
Equipment	37	37	38	39	39	40	40	41	42	42
Labor	54	56	59	61	64	66	68	71	73	76
Total	79	81	84	87	89	92	94	96	9	102

TABLE 61 (Continued)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Probate Court										
Equipment	37	37	38	39	39	40	40	41	42	42
Labor	42	44	46	48	50	52	54	55	57	59
Total	79	81	84	87	89	92	94	96	99	102
Auditor										
Equipment	0	157	2	2	2	2	2	2	2	2
Labor	0	264	4	4	4	4	4	358	5	5
Index	0	549	8	9	9	9	10	746	10	11
Total	0	970	14	15	16	16	16	1,107	18	18
Treasurer										
Equipment	320	327	334	341	348	356	363	370	377	384
Labor	499	527	551	579	607	633	661	688	717	747
Index	518	8	8	9	9	9	10	10	10	11
Total	1,337	861	893	929	964	998	1,034	1,068	1,104	1,142
Change in Ownership										
Equipment	25	25	25	26	26	27	27	27	28	28
Labor	31	32	33	35	36	40	41	43	44	49
Total	56	57	58	61	62	66	68	70	72	77
TOTAL	48,637	3,935	2,817	2,662	2,501	2,344	2,184	3,116	1,868	1,716

[a]Data rounded to the nearest dollar.

Monetary benefits occurring from the random access microfilm system are the same as in the aperture card system. Both alternatives will eliminate the same amount of storage and photo-duplicating equipment. However, when all costs and benefits are added and a cost-benefit ratio is computed, the results are very different. Table 62 shows the data for the costs and benefits when all five offices are included. Only one of three counties, Franklin, has a favorable ratio. As in the preceeding method, Fairfield County has a more favorable ratio than does Hardin County.

If the Office of the Auditor and Treasurer are eliminated from the system in each county, then the results tend to be more favorable. Tables 63, 64, and 65 show the costs when the Recorder, Clerk of Court and Probate Court are included. Benefits are reduced when the offices of the Treasurer and Auditor are not included, but far less than are the costs. Table 66 shows the data and indicates that a county the size of Fairfield is necessary to justify the random access microfilm system. In terms of payoff periods, Franklin County reaches a payoff during the fourth year and Fairfield, the tenth year.

TABLE 62

BENEFITS, EXPENDITURES, NET BENEFITS AND BENEFIT-COST RATIOS, MICROFILM RANDOM ACCESS SYSTEM, FIVE OFFICES, THREE SELECTED COUNTIES, OHIO, 1968[a]

(In Dollars)

	County		
	Franklin	Fairfield	Hardin
Benefits	1,122,409	86,727	39,345
Expenditures	783,217	108,761	67,280
Net Benefits	304,692	(23,034)[b]	(27,935)[b]
Benefit-Cost Ratio	1,433	.790	.585

[a]The data includes the expenditures and savings when five county offices are in the system.

[b]These figures represent expenditures not recovered in the benefits.

TABLE 63

ESTIMATED COST FOR THE RANDOM ACCESS MICROFILM SYSTEM, THREE SELECTED OFFICES, FRANKLIN COUNTY, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

(In Dollars)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Equipment										
Camera (2)	30,000									
Retrieval Center(20)	300,000									
Opportunity Cost	14,850	13,365	11,880	10,395	8,910	7,425	5,940	4,455	2,970	1,485
Total	314,850	13,365	11,880	10,395	8,910	7,425	5,940	4,455	2,970	1,485
Recorder										
Total	1,168	1,186	1,205	1,223	1,241	1,260	1,278	1,297	1,315	1,333
Clerk of Courts										
Total	3,894	3,985	4,085	4,177	4,268	4,359	4,460	4,550	4,642	4,733
Probate Court										
Total	2,324	2,417	2,530	2,642	2,751	2,867	2,990	3,107	3,230	3,356
TOTAL	352,236	20,953	19,700	18,437	17,170	15,912	14,668	13,409	12,157	10,907

[a]Data rounded to the nearest dollar.

TABLE 64

ESTIMATED COST FOR THE RANDOM ACCESS MICROFILM SYSTEM, THREE SELECTED OFFICES, FAIRFIELD COUNTY, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Equipment										
Camera (1)	15,000									
Retrieval Center(3)	45,000									
Opportunity Cost	2,925	2,633	2,340	2,048	1,755	1,463	1,170	878	585	293
Total	62,925	2,633	2,340	2,048	1,755	1,462	1,170	878	585	293
Recorder										
Total	98	100	101	103	105	106	108	109	111	112
Clerk of Courts										
Total	275	283	290	297	304	311	317	325	332	339
Probate Court										
Total	193	198	206	211	219	227	235	243	249	257
TOTAL	63,491	3,214	2,937	2,659	2,383	2,107	1,830	1,555	1,277	1,001

[a]Data rounded to the nearest dollar.

TABLE 65

ESTIMATED COST FOR RANDOM ACCESS MICROFILM SYSTEM, THREE SELECTED OFFICES, HARDIN COUNTY, OHIO, ANNUALLY, 1968 THROUGH 1977[a]

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Equipment										
Camera (1)	15,000									
Retrieval Center(2)	30,000									
Opportunity Cost	2,025	1,823	1,620	1,418	1,215	1,013	810	608	405	203
Total	47,025	1,823	1,620	1,418	1,215	1,013	810	608	405	203
Recorder										
Total	49	50	51	52	52	53	54	55	55	56
Clerk of Courts										
Total	91	94	97	100	103	106	109	112	115	118
Probate Court										
Total	79	82	84	87	90	91	94	96	99	102
TOTAL	47,244	2,049	1,852	1,657	1,460	1,263	1,067	871	674	479

[a]Data rounded to the nearest dollar.

TABLE 66

BENEFITS, EXPENDITURES, NET BENEFITS AND BENEFIT-COST RATIOS, RANDOM ACCESS SYSTEM, THREE SELECTED COUNTIES, OHIO, 1968[a]

(In Dollars)

	County		
	Franklin	Fairfield	Hardin
Benefits	1,112,291	85,253	38,654
Expenditures	462,549	76,454	54,116
Net Benefits	649,742	8,799	(15,462)[b]
Benefit-Cost Ratio	2.405	1.115	.714

[a]The data include the expenditures and savings when the office of the Recorder, Clerk of Court and Probate Court are in the system.

[b]This figure represents expenditures not recovered in the benefits.

An important characteristic of the random access system as compared to the aperture card system is the annual operating expenses. They are much less for the random access system. A comparison is made in Table 67.

TABLE 67

COMPARISON OF OPERATING EXPENSES FOR THE APERTURE CARD SYSTEM AND RANDOM ACCESS MICROFILM SYSTEM, THREE SELECTED OFFICES, THREE SELECTED COUNTIES, OHIO, 1968[a]

(In Dollars)

	Method	
County	Aperture Card	Random Access
Franklin	39,392	7,386
Fairfield	3,231	567
Hardin	1,420	219

[a]This includes operating expenses for the Office of Recorder, Clerk of Court and Probate Court.

The random access system can reduce the mechanics of title examinations much more than would the aperture card method. Presently, 120 volumes of recordings would occupy 52 cubic feet of space. These volumes would use less than one cubic foot if they were placed on random access microfilm. As in the aperture card system, the equipment occupies more space than the existing system resulting in no net savings until the

eighth or ninth year after installation. Less work area is required per user since data can be located at one microfilm retrieval center. Substantial savings could result if space had to be rented or new facilities constructed.

An important attribute of any information system is not so much the cost of the data from the present forward as is the cost from the present to past records. Past records are as important as current records in title examinations. This is a requirement that the random access microfilm system can meet.

Assume for a moment that all records a title examiner requires will be converted by 1977. Also, let's assume that fifteen minutes can be saved per examination. This would convert to a savings or benefit of 454,489 dollars in Franklin County and 39,664 dollars for Fairfield. Discounting these figures at 4.5 per cent represents a present value of 305,825 and 26,670 dollars for Franklin and Fairfield County, respectively, attributable to the system.

The question that arises at this point is in regard to the county that cannot justify the investment

monetarily. A general objective of any improved recordation system is uniformity. Hardin County, by the end of the tenth year would not have accumulated sufficient benefits to recapture the first year expenditures. About 55 counties in Ohio have less than 72,000 people in 1967, and 56 of the 88 counties are expected to fall in this category by 1970.[101]

An alternative that is available to finance improvements at the county level is to increase recordation fees. Presently, the Office of the Recorder, Clerk of Court and Probate Court generally receive sufficient fees for services performed to cover their operating costs. By increasing fees the improvements could be financed more easily and at the same time the user of such records, who benefits the most, would also be paying for part of the cost.

In sum, the random access microfilm system requires a larger initial investment than the aperture card method. It does offer the advantage of lower annual operating costs. Investment in the equipment can be

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[101]F.P. Neuenschwander, Ohio Population, Ohio Development Department, State of Ohio, January, 1968, p.79.

justified in two of the three selected counties. Fairfield tends to be at or near the breakeven point in terms of costs and benefits over a ten year period.

Since legal documents that are historical in nature are of interest to the title examiner, a system that can convert these records quickly and at a low cost would be desirable. The random access system can meet these requirements. The difficulty arises for the counties which cannot even recapture the first year expenditures for such equipment after ten years of use. Numerous counties could fall into this category. If uniformity in systems are to be achieved and the random access system appears desirable to the state legislature, a subsidy program may have to be enacted so the smaller counties can withstand the financial burden.

CHAPTER IX

SUMMARY AND RECOMMENDATIONS

As a society becomes more industrialized, it develops a need for more information about its resources. Data must cover all essential aspects of the nation's life.

An important attribute of data is that it must be readily available to those who want current information. Timeliness is one of the most important aspects of data and at the same time the costliest to achieve. Data are often available in sufficient volume and accuracy but antiquated storage procedures make it time consuming and expensive to retrieve. Many of our public records pertaining to land are in such a form today.

One of the more spectacular technological developments which may be of assistance in bridging the information gap is that of electronic data processing. EDP or computerization as it is frequently called, is viewed by some as the solution, potentially if not currently, to practically any problem encountered.

However, questions have remained unanswered as to the cost of correcting the deficiencies in public records. What are the benefits to be gained? Will costs exceed, equal, or be less than the benefits to be gained?

Before alternative procedures could be applied to the modification of the recording system, it was necessary to discover the existing problems. The problems that were identified include: (1) the autonomy of the county offices concerned with rights to real property, (2) parcel identification, (3) legal descriptions, (4) expensive duplicating and storage equipment, (5) antiquated indexes, and (6) security of the records. This project was primarily concerned with the first, fourth, fifth and the sixth problems.

The alternatives considered and discussed in this project were: (1) an indexing system, (2) an aperture card system, and (3) a random access microfilm system.

The alternative indexing system offers to the counties the advantages or benefits of analysis by the computer. The counties do not have to purchase or rent equipment since the service is offered by a firm. This approach offers immediate improvements without large cash

outlays. The indexes are an important aspect of the recordation process because they direct one to the location of documents. It is the backbone of the system.

The second alternative concerns the documents or instruments themselves. The aperture card system offers relatively more benefits to the larger counties since they can utilize the equipment better and have larger volumes of documents from which to draw benefits. This method requires a smaller investment, initially, but annual operating expenses are higher as compared to the third alternative. Each of three counties can justify application of the system to the offices of the County Recorder, Clerk of Court and Probate Court as indicated by a benefit-cost analysis. There is little justification for including the Auditor's and Treasurer's Offices for they add considerable expense and offer little benefit or savings.

Benefits to the users of the system are small initially. After a period of years benefits increase and can amount to substantial savings especially if past records are converted to the system.

The random access microfilm system requires a large initial investment. Also increments of equipment are in large amounts of approximately 15,000 dollars. It will be difficult for many counties to recapture the initial investment within a reasonable span of time. However, once the equipment is installed, operating costs are relatively low compared to the aperture card system. Past records can be converted at a lesser cost also. There will be a number of counties in Ohio that cannot justify the investment in such a system because of their size and volume of documents recorded. It offers more of an advantage to the user especially where most of the title examination can be performed with the system.

It would also be possible to combine the indexing system with the aperture card or the random access system. The best combination will depend upon the specific county, since conditions and needs vary from county to county in Ohio.

Recommendations for Further Study

The following are recommendations concerning further study that the author feels is needed to solve

the problems surrounding the unification and the development of comprehensive information systems relating to land.

1) A comprehensive undertaking dealing with the demand for information relating to land needs to be considered. A differentiation of data needs at various levels is crucial. That is, what are the demands at a township, county, city, regional, and national level. Establishing this demand is needed in order to develop the kinds of data required, and where it should be made available. It would be a waste of money and space to store data at a national level, where all of the lower orders of government would have access, but would not need or use it. In effect, the demand for and the supply of data should be considered at various levels of governmental organization. The TRW study in California could provide important information for approaching this problem.

2) A comprehensive undertaking dealing with the supply or availability of data needs to be considered. What kinds of data are now collected and perhaps the most important aspect, how accessible is it, must be

ascertained. The supply of data must be appraised at the various levels of government.

3) A study concerning the economics of changes in laws regarding real property would be beneficial. One problem is that many documents are retained for public use but serve no purpose. What would be the costs and benefits of simplifying the warrenty deed to the size of an 80 column punch card? What would be the costs and benefits of documents adaptable to an optical scanner? What are the costs and benefits of deleting from indexes and the records any mortgages which have been satisfied, liens which have been paid or expired, and any restrictions which have expired?

4) Research in regard to the centralization of data maintenance is lacking. The American Bar Association has suggested the creation of a State Land Records Commission along with an Office of County Land Records Commissioner for the supervision of land records. What are the advantages and disadvantages, and the costs and benefits of such proposals? Another problem allied to these suggestions is the governmental organization of centralizing data. What would be the

optimal size either in terms of land area, population or number of parcels in utilizing data processing equipment? It may be necessary to cut across existing political boundaries like county lines to obtain an optimal allocation of scarce resources. Special districts may suggest part of the answer to the question or problems.

5) To what extent would better maintenance of public records substitute for research and special study funds of planning commissions at various levels, state departments of development, agricultural research and development centers, etc.?

The whole problem of real property and the data related to it is quite complex. It involves people of the private and governmental sectors. Planners, elected officials at various levels of government, researchers, attorneys, economists, systems analysts, surveyors, and last, but not the least, the taxpayer, all have a part in the drama to aid in solving the problem. It is vital that an organized effort be the over-all objective of those contributing to the solution of the problem, or otherwise it will be a tremendous waste of scarce research monies.

APPENDIX

TABLE 68

POPULATION NUMBERS FOR OHIO AND THREE SELECTED COUNTIES, ANNUALLY, 1958 THROUGH 1967

County	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Fairfield	61,500	67,800	64,900	66,400	67,000	68,200	68,400	71,700	71,900	72,500
Hardin	30,900	30,700	29,700	29,900	29,900	30,000	30,100	30,100	30,200	30,400
Franklin	660,100	668,200	698,800	714,400	733,800	751,800	779,800	784,300	792,600	802,600
Ohio	9,518,800	9,698,600	9,881,200	10,036,400	10,194,600	10,365,900	10,471,200	10,517,200	10,537,200	10,661,700

Source Sales Management, Inc., Survey of Buying Power, A Bill Publication, New York, Volumes 82 through 100, 1959 through 1968.

TABLE 69

NUMBER OF HOUSEHOLDS FOR OHIO AND THREE SELECTED COUNTIES, ANNUALLY, 1958 THROUGH 1967

County	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Fairfield	18,600	20,500	19,600	19,700	19,900	20,200	20,300	21,300	21,500	21,800
Hardin	9,400	9,300	9,000	9,000	9,000	9,900	9,100	9,100	9,100	9,200
Franklin	196,100	198,500	208,700	209,700	215,500	210,900	229,100	231,700	236,500	240,400
Ohio	2,845,600	2,898,500	2,966,200	2,944,100	2,987,800	3,036,400	3,068,100	3,090,500	3,119,300	3,169,200

Source: Sales Management, Inc., Survey of Buying Power, A Bill Publication, New York, Volumes 82 Through 100, 1959 through 1968.

TABLE 70

URBAN POPULATION FOR OHIO AND THREE SELECTED COUNTIES, ANNUALLY, 1958 THROUGH 1966[a]

County	1958	1959	1960	1963	1964	1965	1966
Fairfield	31,500	33,000	30,400	31,100	32,500	33,900	34,300
Hardin	13,400	13,700	12,700	12,800	12,800	12,800	12,800
Franklin	579,100	597,300	643,200	685,400	710,600	721,300	727,900
Ohio	6,616,400	6,735,000	7,236,400	7,542,200	7,624,900	7,691,600	7,721,200

[a]Data for 1961, 1962, and 1967 not available.

Source: Sales Management, Inc., Survey of Buying Power, A Bill Publication, New York, Volumes 82 Through 100, 1959 Through 1968.

TABLE 71

URBAN POPULATION AS A PER CENT OF TOTAL POPULATION FOR OHIO AND THREE SELECTED COUNTIES, ANNUALLY, 1958 THROUGH 1966[a]

County	1958	1959	1960	1963	1964	1965	1966
Fairfield	51.2	48.7	46.8	45.6	47.5	47.3	47.7
Hardin	43.4	44.6	42.8	42.7	42.5	42.5	42.4
Franklin	87.7	89.4	92.0	91.2	91.1	92.0	91.8
Ohio	69.5	69.4	73.1	72.8	72.8	73.1	73.3

[a]Data for 1961, 1962, and 1967 not available.

Source: Sales Management, Inc., Survey of Buying Power, A Bill Publication, New York, Volumes 82 Through 100, 1959 Through 1968.

TABLE 72

TOTAL EFFECTIVE BUYING INCOME FOR OHIO AND THREE SELECTED COUNTIES, ANNUALLY, 1958 THROUGH 1967

(In Thousands of Dollars)

County	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Fairfield	99,191	115,817	112,020	120,851	123,716	128,565	136,651	154,107	164,125	177,127
Hardin	45,762	48,370	46,746	44,419	44,858	46,024	48,306	51,823	58,620	64,935
Franklin	1,395,635	1,486,049	1,624,190	1,577,300	1,654,932	1,726,597	1,881,868	2,033,769	2,177,939	2,323,302
Ohio	18,006,657	19,384,713	20,525,918	20,504,610	21,306,485	22,049,746	23,403,356	25,326,211	27,262,043	29,166,253

Source: Sales Management, Inc., Survey of Buying Power, A Bill Publication, New York, Volumes 82 Through 100, 1959 Through 1968.

TABLE 73

EFFECTIVE BUYING INCOME PER CAPITA FOR OHIO AND THREE SELECTED COUNTIES, ANNUALLY, 1958 THROUGH 1966[a]

(In Dollars)

County	1958	1959	1960	1961	1962	1963	1964	1965	1966
Fairfield	1,613	1,708	1,726	1,820	1,847	1,885	1,998	2,149	2,283
Hardin	1,481	1,576	1,574	1,486	1,500	1,534	1,605	1,722	1,941
Franklin	2,114	2,224	2,324	2,208	2,255	2,297	2,413	2,593	2,748
Ohio	1,892	1,999	2,082	2,043	2,090	2,128	2,235	2,408	2,587

[a]Data not available for 1967.

Source: Sales Management, Inc., Survey of Buying Power, A Bill Publication, New York, Volumes 82 Through 100, 1959 Through 1968.

TABLE 74

EFFECTIVE BUYING INCOME PER HOUSEHOLD FOR OHIO AND THREE SELECTED COUNTIES, ANNUALLY, 1958 THROUGH 1967

(In Dollars)

County	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Fairfield	5,333	5,650	5,715	6,135	6,217	6,365	6,732	7,235	7,634	8,153
Hardin	4,868	5,201	5,194	4,935	4,984	5,114	5,308	5,695	6,442	7,058
Franklin	7,117	7,486	7,732	7,522	7,679	7,816	8,214	8,778	9,209	9,666
Ohio	6,328	6,668	6,937	6,965	7,131	7,265	7,628	8,195	8,740	9,203

Source: Sales Management, Inc., Survey of Buying Power, A Bill Publication, New York, Volumes 82 Through 100, 1959 Through 1968.

TABLE 75

TOTAL LAND AREA AND PROPORTION IN FARMS FOR OHIO AND THREE SELECTED COUNTIES, BY CENSUS PERIODS, 1930 THROUGH 1964

County	1930	1940	1945	1950	1954	1959	1964
FAIRFIELD							
Total Land Area (acres)	316,800	323,200	323,200	323,200	323,200	323,200	323,200
Land in Farms (acres)	134,508	288,094	278,204	284,144	279,696	267,340	248,682
Per Cent in Farms	91.4	89.1	86.1	87.9	86.5	82.7	76.9
HARDIN							
Total Land Area (acres)	302,720	298,880	298,880	298,880	298,880	298,880	298,880
Land in Farms (acres)	277,744	272,225	279,686	283,300	273,562	262,170	277,164
Per Cent in Farms	91.7	91.9	93.6	94.5	93.2	87.7	92.7

TABLE 75 (Continued)

County	1930	1940	1945	1950	1954	1959	1964
FRANKLIN							
Total Land Area (acres)	330,880	344,320	344,320	344,320	344,320	343,680	343,680
Land in Farms (acres)	248,925	256,579	256,932	238,445	217,469	198,660	176,787
Per Cent in Farms	75.2	74.5	74.6	69.3	63.2	57.8	51.4
OHIO							
Total Land Area (acres)	26,073,600	26,318,080	26,318,080	26,240,000	26,240,000	26,222,080	26,222,080
Land in Farms (acres)	21,514,059	21,907,523	21,927,844	20,969,411	19,991,586	18,506,796	17,619,167
Per Cent in Farms	82.5	83.2	83.3	79.9	76.2	70.6	67.2

Source: United States Department of Commerce, Bureau of the Census, United States Census of Agriculture, 1930 Through 1964 (Washington United States Government Printing Office).

TABLE 76

AVERAGE SIZE OF FARM FOR OHIO AND THREE SELECTED COUNTIES, BY CENSUS PERIODS, 1930 THROUGH 1964[a]

(In Acres)

County	1930	1940	1945	1950	1954	1959	1964
Fairfield	78.7	95.0	96.9	102.1	111.3	127.9	141.6
Hardin	109.3	115.4	134.1	136.8	147.9	160.0	179.9
Franklin	83.9	73.0	82.3	90.3	106.0	143.6	163.5
Ohio	98.1	93.7	99.4	105.2	112.9	131.9	146.4

Source: United States Department of Commerce, Bureau of the Census, United States Census of Agriculture, 1930 Through 1964 (Washington: The United States Government Printing Office).

TABLE 77

TOTAL NUMBER OF FARMS FOR OHIO AND THREE SELECTED COUNTIES, BY CENSUS PERIODS, 1930 THROUGH 1964[a]

County	1930	1940	1945	1950	1954	1959	1964
Fairfield	2,985	3,031	2,870	2,782	2,514	2,090	1,756
Hardin	2,542	2,358	2,085	2,071	1,883	1,639	1,541
Franklin	2,968	3,513	3,121	2,641	2,051	1,383	1,081
Ohio	219,296	233,783	220,575	199,359	177,074	140,353	120,381

Source: United States Department of Commerce, Bureau of the Census, United States Census of Agriculture, 1930 Through 1964 (Washington: The United States Government Printing Office).

TABLE 78

TOTAL CASH RECEIPTS FROM THE SALE OF AGRICULTURAL PRODUCTS AND GOVERNMENT PAYMENTS FOR OHIO AND THREE SELECTED COUNTIES, ANNUALLY, 1958 THROUGH 1966

(In Thousands of Dollars)

County	1958	1959	1960	1961	1962	1963	1964	1965	1966
Fairfield	14,345	12,610	14,325	16,927	16,746	16,475	15,861	16,786	18,905
Hardin	16,102	15,105	15,344	17,055	16,157	16,712	16,110	17,070	21,567
Franklin	14,556	13,515	13,472	14,987	14,838	14,887	14,474	15,683	16,981
Ohio	1,014,622	955,982	1,024,191	1,089,026	1,114,895	1,105,497	1,163,596	1,186,579	1,383,021

Source: Department of Agricultural Economics and Rural Sociology, Ohio Farm Income, Ohio Agricultural Research and Development Center, Wooster, 1958 Through 1966.

TABLE 79

BETA COEFFICIENTS, t-RATIOS, F-RATIOS, LEVELS OF SIGNIFICANCE AND COEFFICIENTS OF DETERMINATION FOR SELECTED DATA, THREE COUNTIES, OHIO

Item	Beta Coefficient	t-Ratio		F-Ratio		Coefficient of Determination
		t_b	Level of Significance	F	Level Significance	
Population						
Franklin	17,961.67	18.87	.01	356.05	.01	.981
Fairfield	1,035.00	4.96	.01	24.55	.01	.78
Hardin	61.67	1.27	.3	1.61	.3	.187
Parcels						
Franklin	4,859.03	20.61	.01	424.77	.01	.98
Price Index	1.63	13.07	.01	170.86	.01	.95
Wage Rates						
Franklin	3.32	30.13	.01	907.94	.01	.99
Fairfield	3.02	17.26	.01	297.98	.01	.97
Hardin	3.55	11.34	.01	128.64	.01	.94
Number of Title Examinations						
Franklin	628.39	1.62	.2	2.608	.2	.246
Fairfield	75.08	2.28	.1	5.186	.1	.393

TABLE 80

PRICE INDEX FOR RETAIL GOODS AND SERVICES
PURCHASED BY CONSUMERS
1958 THROUGH 1967

(1957-1959=100)

Year	Price Index
1958	100.7
1959	101.5
1960	103.1
1961	104.2
1962	105.4
1963	106.7
1964	108.1
1965	109.9
1966	113.1
1967	116.3

Source: United States, President, 1963-68 (Johnson), Economic Report of The President (Washington: The United States Government Printing Office, 1968), p.264.

TABLE 81

AVERAGE WEEKLY EARNINGS, THREE SELECTED COUNTIES, OHIO, ANNUALLY, 1958 THROUGH 1966

(In Dollars)

Year	County		
	Franklin	Fairfield	Hardin
1958	89.92	79.50	69.95
1959	95.08	84.24	73.56
1960	96.62	85.28	75.42
1961	99.39	86.79	76.77
1962	102.76	90.05	81.02
1963	105.69	91.25	83.02
1964	110.17	97.73	88.96
1965	113.39	101.19	92.81
1966	118.40	104.83	102.91

Source: Bureau of Unemployment Compensation, Division of Research and Statistics, Ohio Labor Market Information, Columbus, Ohio, 1967.

TABLE 82

SELECTED DATA USED TO BUDGET LABOR AND SUPPLIES FOR APERTURE CARD SYSTEM, THREE COUNTIES, OHIO

Items	Factor
Cards Per Document	
Recorder	1
Auditor	1
Treasurer	1
Cards Per Case	
Probate Court	2
Clerk of Court	4
Cost Per Card (cents)	
Original	9
Duplicate	4.5
Cards Processed Per Hour of Labor	
Original	44
Duplicate	120

Source: Interview with James Strapp, The 3-M Company, Columbus, Ohio, March 21, 1968.

TABLE 83

SELECTED DATA USED TO BUDGET LABOR AND SUPPLIES FOR RANDOM ACCESS MICROFILM SYSTEM, THREE COUNTIES, OHIO

Item	Factor
Documents or Cases Processed Per Hour of Labor	
Recorder	125
Auditor	125
Treasurer	125
Probate Court (cases)	42
Clerk of Court (cases)	10
Documents or Cases Per Microfilm Magazine	
Recorder	1300
Auditor	1300
Treasurer	1300
Probate Court (cases)	428
Clerk of Court (cases)	115
Cost Per Microfilm Magazine (Dollars)	6.05

Source: Interview with Jerry Wittenmier, Eastern Kodak Company, Columbus, Ohio, April 10, 1968.

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