LOCATION ANALYSIS OF OFFICE ACTIVITY:
DOWNTOWN AND SUBURBAN OFFICE PARK

by

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ABSTRACT

This study is based on the premise that urban functions should be located in response to inner and inter activity relationships.

Being one of the important and growing urban functions, office activity was examined to study activity relationships and locational processes. Its growth, changing location in the urban context, and its national pattern was studied in a historical perspective. Then its future growth and development were reviewed.

The office types incorporated in this research are: Manufacturing, Transportation, Communication, Utilities, Government, Services, Insurance and Real Estate. These types cover about 90% of the office employment in the New York region. Using a vertical hierarchy office types were broken down into three levels: Headquarter office, Middle office, and Local office. The criterion to differentiate them was the physical jurisdiction of each office level.

A one-way matrix was constructed as a tool to trace the "in" and "between" interactions of office functions. Factors that bring about the location of office activity in downtown or suburban office parks were researched from previous studies. Matrices were used for developing a relationship between office types and their locational needs.
Concrete application confirms its (matrix) usefulness though the scaler value judgements used are somewhat subjective, based on the knowledge of and research done by the author.

The matrices when completed give a clear picture of the relationships, within an activity and between activities and their location needs, which can be a valuable aid in locating office activity specifically and urban functions in general.
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INTRODUCTION

The trend of urbanization has paralleled the change in the urban economic base from primary to secondary and eventually to tertiary industry. To accommodate these phenomena, growth, development, and redevelopment of urban centers have occurred. The rate of growth and the processes adopted to effectuate policies and plans into physical environment have been influenced by a host of factors ranging from national and international economic climate to federal policies, resources allocated for urban development, social thinking and life style. Needed change has been responded to by programs initiated by entrepreneurs and by federal, state and local subsidized programs. The City of Columbia (located between Washington D.C. and Baltimore) was the result of an entrepreneur initiated program. Urban Renewal, urban freeway system, and now Model Cities program are examples of federal government subsidized capital improvement programs that respond to needs of growth and redevelopment of urban physical environment.

The majority of urban communities in the United States that have been committed to a comprehensive program for development have tried zoning as a tool to control land-use, and in turn influenced urban activity location. In fact, even urban centers lacking a comprehensive plan (such as
Houston) have often utilized limited "zoning" (restrictive covenants and deed restrictions) to control land use. For example, residential pockets have attempted to safeguard their environment by the establishment of enforced system of deed restrictions by the subdivision developer. This method has been effective in wealthy areas such as River Oaks, but has failed in other areas, either by termination of the period or by losing a legal test.

The zoned cities that have attempted to comprehensively plan development have often obtained the power to do so through enabling legislation (where the state delegates to an incorporated city the legal power to implement plans and build capital improvements). In some cases the city has been empowered by home-rule charter. In such a case, the city grants itself the needed power to prepare and adopt a comprehensive plan to guide the growth and development of the community. To implement and regulate the comprehensive plan, three tools have generally been used: the taxing power, eminent domain, and police power. These tools have not only been used to effectuate plans, but also to change land use in cities when such a need has been felt.

Yet too often these comprehensive plans have been a product of "simple quantitative criteria of growth,"¹ and have proved insensitive to needed change, evolving community

goals and technological innovations. For example, the inner freeway loop construction around downtown Indianapolis has considerably changed the accessibility pattern. Yet, the landuse plan for redevelopment and guidance of growth was adopted by the community in May 1965.\(^2\) In all probability this plan was prepared, " ... with heavy reliance placed on subjective observation and intuition,"\(^3\) in response to the needs interpreted for the data of the 1960 census. The same landuse plan was still being followed in 1970, presumably for lack of a better tool to guide redevelopment.

Of course, plans of this nature can be updated but generally they are changed gradually by and for those individuals who have the ability and financial backing to go through the stepped process built in for change. Needless to say, it is slow, full of red tape, often ending in blind alleys. The resultant picture of the cities not committed to a comprehensive plan is essentially the same as those that do.

Time and again, the policy makers have lobbied the decision making process--turning the planning body into a puppet planning agency, which then feed to the needs of the rich and those who control considerable stock in the community's economic base. An example that brings to light the deficiencies of this process is the recent purchase

\(^2\)Comprehensive General Landuse Plan for Indianapolis and Marion County, Indiana, May, 1965, (fold out).

\(^3\)Chapin, op. cit., p. 8.
(1970) of a thirty-two block area by The Texas Eastern Transmission Company. This area is located inside the inner freeway loop in downtown Houston. Announced plans include a complex containing offices, residences, transit residences, recreation facilities, retail trade centers, and the like. No consideration has been given to existing improvements on adjacent property which will probably be preempted by the simple phenomenon of soaring land prices.

Thus planning strategies and effectuative systems prevalent in the United States have only partially succeeded in responding to new growth and changing needs of urban communities.

Time has come to recognize the failures of these planning systems that have considerable effect on the direction taken by urban physical development. Admittedly, U.S. planners and urban designers have not enjoyed the advantages of public acceptance of legislative backing. Though American planning practices have encouraged technically efficient methods in the past, there has been renewed need to retool the profession to cope with the rapidly changing urban scene. One possibility is to explore and trace interactions between urban functions without the urban context, and then use these interactions as a basis to formulate landuse and development plans. Of course, the interaction data must be updated as often as deemed necessary to keep abreast with change. Research work pertaining to study of urban activity, application of urban activity interactions, and application
of location theory to urban planning has been attempted generally by academicians and scholars of disciplines other than planning. However, Chapin, a Professor of Planning, University of North Carolina, explored the field in the middle 60's, limiting his examination to residential activity, which in his opinion was least researched. This research utilizes this approach in examining specifically the office 'industry' to understand the locational process and the inner-office and inter-office linkages. Office activity was chosen as a vehicle for studying the locational phenomenon, because this tertiary industry is not only becoming an economic function of the central city but also an important economic base of the urban centers--accounting for ever increasing numbers of employed people.

The study includes a review of office activity in an attempt to evaluate its importance as an urban function. It also expresses various implicit and germane implications that are not apparent on a cursory examination. Matrices have been employed to construct a paradigm of the existing linkages.

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4 Chapin, op. cit., p. 10.
CHAPTER I

STATEMENT OF PROBLEM

This research attempts to study a tertiary 'industry', office activity, and identify its locational factors. Also, it investigates the process of locating different office types and levels in the central business district and suburban locations.

PURPOSE OF THE STUDY

The purpose is twofold. First, to shed light on one of the pertinent elements (the office) which have brought about general expansion of the urban areas and, in particular, growth of the central business district. Second, the study includes the development of matrices in an attempt to understand relationships between different office levels, office types, and locational factors. Locations considered are the CBD and the suburban office park.

DEFINITIONS

To facilitate the understanding of different terms a list of definitions was developed and is given below.

Office. A place where written information is processed and the basis for decisions is prepared. Its emergence
coincided with the time when the urban process began.

**Headquarters.** An office which operates at a level of national or international market.

**Middle Office.** Offices which perform population serving functions at the level of metropolitan region and, service headquarter jobs.

**Local Office.** Offices that serve the population of residential districts.

**General Purpose Office Structure.** "Multi-tenant", "competitive", or "general tenant" can be used interchangeably and refer to those structures which offer space to the general office market. This group includes, but is not restricted, to such principal categories as attorneys, real estate firms, insurance agencies, and medical and dental professions.

**Single Purpose Office Structures.** "Non-competitive", "single purpose", and "headquarters-institutional" designate office buildings primarily or solely occupied by single tenants.

**Firms.** An organization of specialized activities designed to perform that function; firm is generally thought of as a business term.

**Activity Systems.** Behavioral patterns of individuals, families, institutions, and firms which occur in spatial
patterns that have meaning in planning for landuse.

**Within-Interaction.** Activities occurring within a particular adopted space.

**Between-Interaction.** The communication component, it involves person movement, goods movement, and message flow between particular adopted spaces.

**Linkages.** A relationship between establishments. It is characterized by continuous or frequently occurring interaction.

**HISTORY AND GROWTH OF OFFICE "INDUSTRY"**

Office activity (defined as information processing to form bases for decisions) has existed since the formation of urban centers.\(^5\) It has been expanding at a significant rate during the past 100 years. It was in about 1880, when 7% of the jobs in the United States were office oriented, that this activity was recognized as an entity in itself. By 1970 the percentage of office type jobs had risen significantly, and further growth is predicted barring, of course, national and international disaster.\(^6\)

Reasons for the phenomenal growth rate has been identified as automation, and movement of labor force from

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\(^6\)Ibid., p. 1.
primary industries (such as mining and agriculture) towards manufacturing and construction (secondary industries) and eventually tertiary industry (namely, trade, finance, services, transportation and government).

In fact, the beginning of the twentieth century saw the blue collar count overtake the farm employment. By 1935 tertiary industry accounted for over 50% of total employment in the United States. Then in 1955 white collar employment overtook the total number of blue collar workers. If the present trends continue, white collar employment will account for more than half of the total employment by the year 1980.\(^7\) After electronic equipment, such as the computer, was introduced to the office industry in 1954, it was speculated that capitalization of the white collar industry might reduce its manpower requirements. This had happened in the production sector when capital replaced labor. What has actually happened in the last fifteen years is quite different. As the number of computers rose, from 200 in 1954 to 70,000 in 1969, the need for office workers also rose astronomically.\(^8\) Thus space required for housing the white collar workers and the data processing equipment has increased and has resulted in accelerated construction of new and renovation of existing office buildings.

Before office work was recognized as an independent

\(^7\)Ibid., p. 2.

\(^8\)Ibid., p. 2.
activity type, offices were located in buildings which were planned and built for other important uses—namely residential, commercial, manufacturing and the like. At that time, this activity has at its command the most inconspicuous locations in these buildings. Later offices became a separate activity for a number of reasons, including the invention of the telephone and the typewriter which aided office work and communications. Meanwhile, building industry improved vertical transportation and developed steel frame construction, making possible taller buildings. These were generally located at central locations, and could be used economically for office space because of relatively higher floor area ratio.

Another factor that contributed to office space needs was increased net area per worker caused by the increasing proportion of professional and technical employees to clerical workers. The graph below demonstrates that net area for worker increased from 110 square feet per person in 1948 to 140 square feet in 1967, and the following graph shows that the ratio of 53 technical and professional personnel per 100 clerks rose to 80/100 in 1965 and was estimated to reach 84/100 in 1970.9

This enormous growth took place in both general purpose and single purpose buildings.

Source: Commercial Land Use Analysis, Metropolitan Indianapolis, 1970. P. C-2.
The following two graphs exhibit and predict the rate of growth of office space.

On the left, Figure shows that the rate of growth of office space nearly doubled in a short span of twelve years (from 294 million square feet between 1957 and 1960 to 490 million square feet between 1964 and 1968). The graph on the right plots the growth of office space during the past forty years and the projected growth in the next thirty years. Gross office area has jumped from one billion square feet to three
billion square feet in forty years. This growth amounts to 5% annually and is three times that of the population growth. 10

Office-type occupation has enjoyed a study increase since its recognition as an entity in the late nineteenth century. The graph below shows this trend since the beginning of the century until 1968. The wave-like growth can be explained by the impact of wars and business cycles on economic growth. 11 The New York Regional Plan Association's projections show that the office workers in the United States will increase from 16.8 million in 1968 to 40 million by the year 2000. They implicitly assumed that total population of the United States at that time will be 300 million. This accounts for 57% growth in population as compared to 136% growth in office workers. The following figures show the share of labor force employed by the office "industry". These growing percentages demonstrate that office type activity is gaining both relative and absolute importance.

Office construction, reached a significant level in big metropolitan areas like Chicago, Detroit, Philadelphia and Los Angeles by the beginning of the 20th Century. It was reduced as a result of World War I. This trend was documented by Larry Smith and Company's report, 12

10 Armstrong, op. cit., p. 3.
11 Ibid., p. C-1.
Source: Commercial Land Use Analysis, Metropolitan, Indianapolis, 1970, p. C-l.
... as long ago as the depression commencing in 1929, office building construction was almost non-existent in the United States. During this long period a significant backlog of demand built up, especially for prestige office space.

By the end of the second World War, office space was in short supply and this backlog of demand was not met immediately because of three factors. First, office building developers feared another economic recession as has happened after the first war. Second, legal restrictions by the federal government did not permit the use of certain building materials for construction until 1952. And thirdly, both permanent and construction financing was available but in limited amounts, as federal policies were aimed at encouraging housing.\(^{13}\) This sluggish growth continued during World

\(^{13}\)Ibid., p. A-1.
War II and until 1952, when office construction gained tremendous momentum as demonstrated by the following graph.

This graph shows the amount of money spent in private office building construction from 1946 to 1965. The next graph reinforces the same facts, while also showing percent share of office construction.

This growth was experienced in different proportions by various cities depending upon their geographic location.

and their national importance. In particular, suburbs of metropolitan areas like Los Angeles and center of cities like Chicago have experienced growth in office construction.


In general growth and development is occurring in most of the major metropolitan areas, throughout the United States and is predicted to continue at an accelerated rate in the years to come.

HISTORY OF OFFICE LOCATION

Office activity came about in the Central City around the turn of the Century especially in large urban centers such as Chicago and New York. In 1926 Haig defined a Central City or the central business district as an area of maximum
amount of concentration of people in a market, with its size dependant upon the population and wealth of the Community. There seemed to be a cohesion of urban functions in the Central City, due to labor saving conveniences and greater ease of interaction. Naturally, rents gradually increased towards the City Center. As metropolitan areas grew in size, a hierarchy of land uses developed depending upon the rent paying capability of certain activities. Thus certain activities began to be crowded out of the center while others held their own. Even different functions of the same Corporation would locate at different areas. This shuffling of urban activities resulted in the location of office activity in the most central location. In other words activities involved with production and movement of goods relocated on cheaper land, whereas urban functions involved with decision making and information gathering occupied land that commanded a higher land rent. This resulted in proliferation and relocation of activities of a corporation. In Haig's words,

"But as, in the game of Chess, a pawn is sacrificed to gain a king, management costs are increased when by so doing site rentals can be decreased by larger amounts."

The history of the C.B.D. is that of relocation of urban activities. During the 1930's the business district

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15 Ibid., p. 48.
actually shrunk in size and unused buildings were demolished to save property tax dollars. In the 40's office activity moved to the fringe of the downtown area. Then in the 50's some office activity even moved into the Suburbs though the central business district grew due to expansion of retail trade and various other commercial activities. The Reader's Digest Company took the initiative in moving offices to the Suburbs as early as 1937. Then Eversharp, Inc. moved out of the Empire State Building to relocate in Milford, Connecticut, and Central Precision Equipment Corporation moved to Tarrytown, New York. The following year American Cyaramid Company moved from Manhattan Island to Wayne, New Jersey. Cheaper land, lower tax rates, and better accessibility have been identified as some of the catalysts for this movement. Physical deterioration, poor appearance, and congestion in downtown areas were often determining factors. Suburban offices also provided the essential tax base much needed for residential development. On the other hand, increased reliance on modern communication and use of relatively inexpensive data systems further fostered development in hinderland.

In the early 60's Corporate headquarters began to

move from the Suburbs to the Center again. One of the first companies to do so was Royal McBee Corporation, a company that for the past five years had housed its headquarters on a nineteen acre suburban tract.\textsuperscript{18} Urban Renewal, better accessibility due to inner loop of urban freeway system and the subway system, need for direct information exchange--face to face negotiations, corporate prestige, and inner office linkages were some of the main reasons for the reversal of trends. As noted by an official of the United States Chamber of Commerce in 1961,\textsuperscript{19} "moving out isn't considered quite as much the thing to do now, . . . in fact, the case for moving back in is getting stronger as redevelopment of cities gets going."

Not all office types and levels have followed this trend. Some offices which clustered in a park-like setting (called office, business and technology parks) have survived the return of the Corporate headquarters and professional firms to the Center.\textsuperscript{20} Though small two or three story offices which are located between the Center and the Suburbs have been successful, this paper will concentrate on the phenomenal growth in size and employment of offices activity in the office parks and in the Center.

\textsuperscript{18}Ibid., p. 1.
\textsuperscript{19}Ibid., p. 1.
NATIONAL PATTERN OF OFFICE LOCATION

Before attempting to understand the locational patterns of office types in urban centers, it is necessary to develop an understanding of the national pattern. This will involve a cursory look at those metropolitan areas which account for the major portion of the three billion square feet of gross office space in the United States.

As of 1960, the seventy-six metropolitan areas with a population between a quarter of a million to a million accounted for 19% of the total population and over 21% of office oriented occupations. The twenty-four metropolitan areas that had a population of over one million accounted for 34% of total U.S. population and 43% of national office employment. At the same time they had 38% of production jobs in manufacturing, 49% of non-production supervisory jobs, and 65% of the Central Administrative Office and Auxiliary employment.\footnote{Armstrong, \textit{op. cit.}, p. 4.}

The twenty-four metropolitan areas have been classified by the summary report into three categories, depending upon the amount of production and/or office activity. The categories are: office oriented, production oriented, and office and production oriented. The map of the Continental United States gives the locations of these metropolitan areas and their activity orientation.\footnote{\textit{Ibid.}, p. 5.}
<table>
<thead>
<tr>
<th>Office</th>
<th>Production</th>
<th>Office/Production</th>
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<tr>
<td>New York</td>
<td>Chicago</td>
<td>Minneapolis-St. Paul</td>
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<td>Los Angeles</td>
<td>Philadelphia</td>
<td>Seattle</td>
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<td>San Francisco</td>
<td>Detroit</td>
<td>Kansas City</td>
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<td>Boston</td>
<td>Pittsburgh</td>
<td>Atlanta</td>
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<td>Washington</td>
<td>St. Louis</td>
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<tr>
<td>Houston</td>
<td>Cleveland</td>
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<td>Dallas</td>
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<td>San Diego</td>
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<td>Buffalo</td>
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<td>Cincinnati</td>
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<td>Milwaukee</td>
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<td></td>
<td>Paterson</td>
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<tr>
<td>City/Region</td>
<td>Percentage</td>
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<tr>
<td>Washington</td>
<td>20.4</td>
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<tr>
<td>New York</td>
<td>17.6</td>
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<tr>
<td>Dallas, Boston, Minneapolis</td>
<td>16.0</td>
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<tr>
<td>San Francisco</td>
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<td>Seattle</td>
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<tr>
<td>Los Angeles</td>
<td>15.2</td>
<td></td>
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<tr>
<td>Kansas City</td>
<td></td>
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<tr>
<td>Atlanta</td>
<td></td>
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<tr>
<td>Metropolitan Over 1 million</td>
<td>15.2</td>
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<tr>
<td>Average for United States</td>
<td>10.7</td>
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This figure above shows the percentage of people employed in office type occupations in ten different cities, the average for the nation as a whole and the average for metropolitan areas with over a million persons. Washington D.C. heads the list with over 20% of its population employed in office work (compared to the national average of 10.7%). Major metropolitan areas have a greater percentage of office employment than the average or small metropolitan areas.

Thus the office work done that is surplus for a metropolitan area is "exported" to other urban centers; just as the work produced by 6.9 office workers per hundred
residents of New York is "consumed" in other parts of the country. These workers do the job of basic workers instead of the service type—the category in which office work falls by definition. Work produced by these workers is not consumed in the community but "exported" to other communities. Generally these workers are employed at the headquarters of a national or international company. The Credit Card department of Humble Oil Company is an example. This department has a centralized office located in the company's headquarters in downtown Houston. The clerical staff is hired in Houston for purposes of bookkeeping, accounting, mailing bills and receiving payments for all the retail trade transactions done on credit by Humble Oil retail outlets in the United States. If the same help had been hired at regional locations, then this work force would have been categorized as service workers. As this study is relevant to locational processes only, it will not examine causes of centralization of office work which would necessitate a complete study of the economics of scale and is beyond the scope of its paper.

Looking at these metropolitan areas with size as a criterion, we find that the largest ones (New York, Chicago, and Los Angeles) show a gradual but steady upward growth. This also holds true for the following urban centers, Pittsburgh, Minneapolis, Boston, San Francisco and Philadelphia. In contrast, St. Louis, Cleveland, and Dallas have had a

23 Ibid., p. 5.
decline in central administrative employment. The smallest metropolitan areas on the list (Cincinnati, Atlanta, Kansas City and Milwaukee) have shown a significant rate of growth in employment.24

Yet, statistics show that a few headquarters have been leaving the largest metropolitan areas. For example, the operating headquarters of Shell Oil Company moved from New York to Houston. Office activity in the twenty-four metropolitan areas has expanded at a slightly lower rate compared to the nation as a whole. These metropolitan areas reduced their share of CAOAA* jobs from 69% to 65% between 1954 and 1967. However, projections predict a relative growth of office activity in these metropolitan areas, resulting in the location of two of the three million new jobs in urban areas by the year 2000.25

By focusing on headquarter office activity rather than general office employment it is noticed that between 1960 - 1969 a dozen metropolitan areas accounted for one-fourth of the United States population and netted 44% of new office construction. Washington, Atlanta and Seattle have had a high rate of construction, whereas Detroit, Philadelphia and Cleveland are at the lower end of the scale.26

24Ibid., p. 6.

*Central Administrative Office and Auxiliary Employment.

25Ibid., p. 6.

26Ibid., p. 7.
CHAPTER II

GENERAL LOCATION THEORY

Concern for and formal research pertaining to location, and distribution of activities and population has existed for over a hundred years. (Carey, 1858-59, Gravity Model),
(Marthe, 1877, "The Where of Things"). Research done under various disciplines has contributed to the understanding of spatial organization of urban areas.

For example, the economists concerned with location theory and land rent—a significant variable in urban structure, addressed the problem primarily from a location point of view. That is, land economists examined urban real estate values as related to mechanisms of land rent. Empirical studies done by business research organizations focused patterns of retail trade in cities with special emphasis on the central business district. Some theoretical studies and their practical application to transportation needs and network development were also done. Recently, studies have included highway location and its effect on land use, origin destination, accessibility patterns, and resulting location of


urban activities. Most of the research has been theoretical in nature with little if any empirical studies done at the urban scale. Moreover, most of the work has been either on micro-economic problems of location of firms, or macro-economic location of industries within the entire economy of the region. 29

For a long time, location theory (which essentially accepts the idea of land use theory, but goes beyond identification of the forces involved and attempts to give insight to the emerging land use pattern) has been solely the concern of economists and geographers. Their major contribution is the convincing argument that the location of any economic activity is the result of an orderly process subject to measurement. 30

Before the turn of the Century, economists and other social scientists were primarily interested in analytical study of agricultural location. 31 In the beginning of the twentieth century their interest shifted to industrial locations. 32 The nature of studies related to location of activities were rather generic, often mere observations of land use and physical distribution patterns. These

30 Ibid., p. 189.
32 Ibid., p. 13.
observations could then be related to a geometric pattern—as in the case of concentric zone theory advanced by Ernest W. Burgess, a sociologist in the 1920's. This scheme was developed with particular reference to Chicago, but has been considered applicable to American cities in general. Burgess stated that the American city naturally tends toward a geometric form consisting of five concentric circles. The Sector theory postulated by Homer Hoyt and the Multi-Nuclei theory advanced by D. Harris and Edward L. Ullman, are two further examples of geometric ordering of urban physical form and location of various land uses. These studies could be termed as heuristic in nature and iconic in character, giving some indication of the analytical tools available at that time.

Haig, a land economist, is credited with the first extensive theory related to urban organization. His basic concern remained that of his predecessor's—discovering the essential order in the apparently haphazard arrangement of land use. In 1933 Chamberlin, related locational factors to his theory of monopolistic competition. Some of these early studies were underscored and expanded by Losch in 1944 and further developed by Isard in the 1950's. Studies that have followed reflect more mathematical approaches.

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34 Haig, op. cit., p. 602.
With the advent and usage of the computer, research was further grounded in symbolism. Mathematical models, physical models, and Markovian sequences simulated locational conditions and processes. This has often been called "mathematical extravaganza", and has demonstrated the capability of the computer software to simulate complex conditions in detail, impossible if done by human beings. However, this direction has sometimes neglected qualitative measurements, for example, the simulation technique developed by J. W. Forrester (capable of tracing the life cycle of an urban area for a period of up to 250 years).

Though the tools and techniques have become more sophisticated over the years, little has been done to cross-reference from one discipline to another, thus keeping the body of knowledge esoteric rather than generally pragmatic.

Haggett notes that, while game theory methods were being applied to both urban and rural locational problems (Stevens, 1961; Gould, 1963), Curry (1964) has gone still further in applying wholly random processes to the building up of settlement patterns with varying degree of industrial specialization. But the number yet developed in human geography is still regrettably small and investigation of some models (e.g., Markov-Chain models) has scarcely begun.

In most cases, the techniques used in the early

36 Haggett, op. cit., p. 186.
38 Haggett, op. cit., p. 27.
studies did not demonstrate the ability to find an order in spatial location, especially at the macro and meso-region level. Perhaps as Hanson points out, "There is more order in the world than appears at the first sight and not discovered till the order is looked for." Or perhaps what needs to be researched is not physical form but intangible relationships. Kohler's theory supports this by making order dependent "... not on the geometry of the objects we see but on the organization framework into which we place it ...".

In the 60's architects, planners, and urban designers concentrated on understanding urban activity location processes. They have made information available pertinent to activity location at the contextual level.

Also decision makers at the metropolitan level have begun to spend large sums of tax dollars to understand activity relationships and their future land use implications; for example, Larry Smith and Company, Inc.'s three part study for Indianapolis (Marion County Metropolitan Area). It covers retail activity, office space, transient housing, and quantitatively and qualitatively speculates about various needs of these activities for the year 1990.

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39 Ibid., p. 2.
40 Ibid., p. 2.
Otherwise, documentation of office-type development in the urban centers has been limited. Most of the recent literature that directly confronts this problem has been published by a handful of agencies including the New York Regional Plan Association and Urban Land Institute. Moreover, these few studies have seldom attempted to formulate general hypothesis on the subject.

In consideration of the growth potential of the office activity, its location alternatives and its role in the urban development process, there seems to be a need for examining the location pattern of office "industry" in the suburbs and the Central Business District.

One of the studies reviewed dealt with changing economic functions of the central city and investigates the location of office functions and their importance to the urban centers. It was written by Dr. Raymond Vernon, financed by the Committee for Economic Development, and published in 1959.  

To facilitate research two basic assumptions were made by Dr. Vernon. One was the association of the phenomenon of "clustering" with the phenomenon of attraction to the central city. The other was a willingness to generalize from the data of thirteen cities. The general unavailability of data on office types and the subsequent need for sufficient

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data forced Dr. Vernon to choose the thirteen cities that represented 19% of non-farm population in the United States and 23% of the national non-agriculture employment.

In order to understand the locational process of different activities, the cost of business was studied. The following types of costs suggest general reasons for location of urban activities:

1. Wage cost
2. Space cost
3. Transportation cost
4. Tax cost
5. Rent cost
6. Communication cost.

Dr. Vernon's report indicated that wage costs were lower at the central locations, possibly because of competition. On the other hand, wage costs were comparatively higher in suburbs because of the predominance of large plants. Insurance companies which require large but cheap clerical staff would locate in a center rather than a suburb according to Dr. Vernon's wage cost criterion.\(^{43}\)

As far as space cost, the report suggests that this issue is merely academic. Forces attracting offices to central locations are more powerful than high rental considerations. Moreover, rental savings gained by locating in the suburbs may not be of much significance compared to other

\(^{43}\)Ibid., p. 17.
considerations, such as, local zoning, prestige, parking space, non-productive space (cafeterias, banks etc.), and average space per employee. Together these considerations equal, if not exceed, the cost in central locations.

Transportation costs were subdivided into delivery of goods costs and cost of personal transportation. Time and distance affect both costs. The cost of personal transportation tends to keep certain kinds of jobs in central locations as long as the workers live within a reasonable transportation cost distance. 44

Dr. Vernon notes that local and state taxes may affect job distribution in the central city and the suburb. Due to the lack of national data his conclusions were derived from information on manufacturing firms located in the New York metropolitan area. Of course, these firms may or may not represent the national trends and may not be indicative of other land uses, namely office activity. However, the chart giving the tax rates has been included here because it is indicative of the varied tax structure in different cities.

Finally, Dr. Vernon emphasized that communication costs were critical for printers and publishers (manufacturer's producing "unstandardized" products who must consult authors, consultants, artists, and production specialists).

44 Ibid., p. 20.
INDEX OF LOCAL AND STATE TAX LEVELS FOR MANUFACTURING FIRMS AT SIXTY-FOUR LOCATIONS IN THE NEW YORK METROPOLITAN REGION 1955. (All Local and State Taxes Except Workmen's Compensation Taxes Were Included)

<table>
<thead>
<tr>
<th>Category</th>
<th>Index</th>
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<tbody>
<tr>
<td>All 64 Locations</td>
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</tr>
<tr>
<td>New York State Locations</td>
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</tr>
<tr>
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<td>129.6</td>
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<tr>
<td>Bronx, Brooklyn, Queens</td>
<td>122.3</td>
</tr>
<tr>
<td>Other New York State Locations</td>
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</tr>
<tr>
<td>New Jersey Locations</td>
<td>96.2</td>
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<td>Other New Jersey Locations</td>
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<td>Connecticut Locations</td>
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<td>Bridgeport</td>
<td>133.8</td>
</tr>
<tr>
<td>Other Connecticut Locations</td>
<td>114.7</td>
</tr>
</tbody>
</table>

These costs also effect specific types of sales offices. For example, 90% of all garment showrooms in New York are located in a four block area in Manhattan. More generally, sales offices in Merchandise Marts tend to congregate elsewhere in the U.S. Vernon's explanation for this clustering phenomenon is that,

. . . buyers must see their products in order to buy; and they must see a great deal in the briefest possible time. As a result, their disposition is to shop where the most concentrated clusters of sellers may be; and the disposition of the seller is to join the cluster wherever may be it may exist. 45

Thus, physical clustering eases communication between buyers and sellers, and lowers communication costs in a city center.

The report identifies other factors that tend to mass the headquarters of financial institutions, manufacturing and utility:

1. Speedy and suitable communication
2. Negotiations
3. Face to face communication
4. Information related to
   a. Credit of individual
   b. Affairs of enterprise
   c. Condition of trade
   d. Policies of the nation
   e. Market, technology and finance

5. Prestige

6. Contact with other firms

7. Availability of other services

Thus need for good communications has helped office space preempt other landuses as office functions are insensitive to space rent (a small fraction of total cost).

The report utilizes an interesting method (cost criteria) of analyzing the location process. Also the technique of substantiating intuitive reasoning with statistical data from a certain area (New York region), makes the study a more valuable contribution.

In 1962 Richard B. Andrews also contributed to knowledge about location of urban functions. A chapter of his book traced the physical growth of the central city and the changes in the economic functions of the central business district.

This chapter also examined trends in non-retail and office type uses. It suggested that these activities have been growing in absolute numbers in the past decade or so (1950-1960). In comparison, retail establishments have declined in number, though this trend has not been reflected in the dollar turnover which has been increasing. Andrews also mentioned a study done in the city of Madison, Wisconsin by Haward Lowe. Lowe's study emphasized that,

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46 Andrews, op. cit.

47 Ibid., p. 88.
Little is known about the relative importance of retail and non-retail functions in the central district and whether non-retail functions downtown are gaining or losing importance. . . . With a fundamental part of the analysis of the CBD virtually missing, there is no perfect assurance that proper conclusions have been reached regarding the deterioration of the central district not how it might be remedied.

Five causes of office activity concentration in the central city were related to locational advantages and are enumerated below:\(^{48}\)

1. Information about economic and commercial trends.
2. Negotiation possibilities for business deals, and possible face to face contact, i.e. sellers in close vicinity to the buyers.
3. Prestige, best address and "right" firm.
4. Inner office linkages which include close association in the production of goods and services of technical variety.
5. Negative aspects of alternative locations, some of which are mentioned in Andrew's words:\(^{49}\)

Suburban location representing very substantial dollar investments occasionally at a scale comparable with downtown. Cheaper suburban land, lower construction costs and taxes are offset by such factors as extra investment in large parking areas, cafeterias, elaborate landscaping and maintenance subsidized buses and additional cars for maintaining downtown contracts.

F. Stuart Chapin, Jr., Professor, Department of City and Regional Planning, University of North Carolina,

\(^{48}\)Ibid., p. 89.

\(^{49}\)Ibid., p. 91.
discussed some experimental work on activity systems and the locational models in an article published in *Planning Outlook*50 and in his book.51 His main concern was to retool the professionals thereby enabling the planners to deal with the changing urban scene.

He suggested four main lines of research and development, regional economics, urban activity systems, use of locational models, and livability of the city.52 He goes deeper into urban activity systems and use of locational models when he argued,

The locational decision of residents, firms or institutions seen as the means by which these entities optimize their day-in-and-day out activity requirements—given, the existing land use pattern of an urban area; and given information concerning future public improvements.

The essential notion here is a very simple one, namely that activity needs influence location decisions which in aggregate serve to modify the landuse pattern. . . . Research on activity systems, therefore seeks to perfect techniques for determining how these systems evolve in time and what factors create spatial variations and therefore have significance for locational behaviour. It seeks to bring activity analysis to a stage of development commensurate with the stage that trip analysis has reached in traffic studies.53

He identifies interaction between activities and


52Chapin, *op. cit.*, p. 9.

53Ibid., p. 10.
movements and trade-offs between the needs of the two as reasons for locational decisions of firms, households, and institutions, and the like. He suggests planners should become as familiar with "activity bases of interaction" as with movement bases for analysis of landuse planning. He affirms the need to replace intuitive and subjective bases with analytical approaches.

To sum up Dr. Chapin has brought out clearly the need for research and development of methods that expose the implicit activity relationships and suggests the use of this knowledge to understand the complexities at work in urbanization, growth development and redevelopment processes. The study fails to go beyond the experiment conducted in Durham, North Carolina. It lacks direction about tackling various other landuses, by labeling locational simulation of residential development as the least researched.\textsuperscript{54}

In November, 1967 John Goddard, a graduate student in the Department of Geography at the London school of Economics, published a paper related to changing office locations in central London.\textsuperscript{55} Although the study investigated office 'clusters' in central London, it raised some issues that are germane to the location process. For example, when he traced the changing locations of office types within a delineated

\textsuperscript{54}Ibid., p. 10.

area (while mentioning the in and out movement of certain functions), he affirmed the difficulty of identifying different office functions as they appear in a certain urban context.

In order to study the relocation process of firms, he suggested plotting different office activities and their location for all firms in the same general field of activity for several years. He speculated that these maps would give "some assessment of the changing degree of spatial cohesion between component offices."^56

Goddard realized the implications of a "parcel of functions," (defined by Haig in 1926 as the complex pattern of functions performed by any firm) when he wrote, ^57

Even within such finely labelled group as general book publishing, one firm's parcel of functions may vary considerably from that of another and so might be attracted to a different location. Furthermore, the contents of the 'parcel' and the organizational structure of the firm may change considerably over time.

The author thus makes the reader aware of the dangers of categorizing firms and using this list for planning purposes without taking into account that two corporations under the same heading may not have needs or "parcel of function" at any one time.

The Urban Land Institute Technical Bulletin number 65 entitled "Business Parks" concerns itself with the growth of

^56 Ibid., p. 283.

^57 Ibid., p. 283.
business and office parks in the suburbs. This bulletin included an extensive inventory of projects located throughout the contiguous United States. Each of the forty-one cases submitted were examined with regard to their location, restrictive covenants, land prices, cost of site preparation, type of tenants, level of accessibility, and other data pertinent to developer's needs.

The study traced the history of suburban office, technology, and business parks and labeled them as off-shoots of the industrial park. The study pointed out that this type of development began in the late 1940's and early 1950's when big corporations began looking for space for their headquarters.

The Bulletin reported the application of the park concept to offices as the prime feature for their success. The possibility of locating a number of small offices in a suburban office park attracted offices that were looking for better environment, but could not afford to pay the price alone.

The questionnaire survey technique was used by the Urban Land Institute to find out the factors that influenced location decisions. The report lists nineteen factors in order of frequency in which the items appeared in the


59 Ibid., p. 9.
questionnaire. Cumulative condition of factors listed below has been summed up by the report as "greater business achievement potential."  

1. Accessibility—ease of access  
2. Convenient driving from homes  
3. Pleasant surroundings  
4. Nearby prestige residential areas  
5. Good land uses—beauty and design of the development  
6. Image and prestige in the environment  
7. Nearness to regional shopping center  
8. Orientation to national companies  
9. Controlled tenancy  
10. Expansion possibility  
11. Prestige and identification with building ownership  
12. Ample parking—free parking  
13. High quality areas attracted  
14. Employees are close to homes  
15. Transportation  
16. Nearness to downtown  
17. Exposure to Interstate Highway  
18. Lower land prices for lot sales  
19. Proximity to airport.  

The report also included lists of facilities and services within the offices or within the office park facilities other than offices that improved the cumulative conditions for location of offices in such parks. These  

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60 Ibid., p. 35.
conditions were described by the developers in response to the questionnaire and are given below:61

FACILITIES AND SERVICES INCLUDED WITHIN THE OFFICE PARK STRUCTURE

1. Employees lounge
2. Executive dining rooms
3. Electronic data processing
4. Conference rooms
5. News stand
6. Central mail room
7. Travel agency

SPECIAL FEATURES OF THE AMENITIES

1. General landscaping
2. Special planting
3. Fountains
4. Decoratives pools
5. Statuary and outdoor sculptures

SPECIAL FEATURES THOUGH RARELY PROVIDED

1. Recreational facilities
   a. Swimming pool
   b. Tennis court
   c. Putting green

FACILITIES OTHER THAN OFFICE BUILDINGS

The supplementary facilities provided within the

61 Ibid., p. 34.
office and business parks are mentioned below. Apart from parking facilities, the next most frequently found facility in separate structures are:

1. Eating facilities
   a. Restaurant
   b. Food carryout
   c. Cafeteria

2. Retail shops and food centers

3. Services
   a. Barber Shop
   b. Beauty Salon
   c. Gasoline/service station

4. Motels
   a. Meeting rooms
   b. Dining rooms

5. Banks

6. Post Office

7. Product display

8. Product distribution service

9. Research and development operations

10. Light industrial warehouse

11. Central power plant

12. Apartment and townhouses.

The New York Regional Planning Association has researched the growth and location of office jobs in the United States with special reference to the New York region. Since its report has not been completed, only a brief
The summary reviews the office 'industry', indicating when it came into existence and how growth occurred. It also speculates on the trends of the 'industry' giving statistical references and projections for the year 2000.62

Being of a descriptive nature, part of it follows the history of office activity in the United States (with detailed reference to vertical hierarchy and hierarchial relationships). It mentions the twenty-four largest metropolitan areas in the U.S. and catalogs their functional orientation.63 Concepts related to export of office services are introduced. Statistics and facts related to decentralization of offices in both large and small metropolitan areas, and growth of office employment and manufacturing jobs in major metropolitan areas are discussed in light of the nation as a whole and then with particular reference to the New York region. It mentions that headquarters in the New York region have, "about one-tenth of the nation's non-agriculture employment put in one-sixth of the office space, one-fifth of its headquarters type office jobs, and one-third of its top 500 industrial corporation headquarters."64 Obviously the New York region leads in office pursuits.

However the report adds, though Manhattan, New York

62Armstrong, op. cit., p. 22.
63Refer National Patterns of Office Location, Chapter 1.
64Armstrong, op. cit., p. 10.
has been clearly dominant in the region, there has been a relative decline in the number of office jobs. Of course, the absolute number of office jobs is still increasing since Manhattan offers a favorable location and environment for headquarters.

The summary report also attempts to relate firm types with location factors, and mentions that consumer orientated firms (non-durable product firms--firms that deal in inter-industry purchases) need face to face contact with other firms. In contrast, offices of industries involved with food, electronic equipment, and pharmaceuticals that need freedom for creative supervision and thus locate in the suburbs.

The summary is one of the most comprehensive, descriptive studies on office activity. However, the information lacks general application, as the concern of the report was focused on headquarter offices and a greater amount of its information was pertinent only to the New York region. That is the study took an overview of office industry in the nation with the intention of forecasting the future of office industry in the New York region.

To sum up, recent studies have been generic in nature often merely commenting on office development and its growth. Some authors have supplemented insufficient statistics with intuitive judgment and speculated on the prevalent conditions. Others have pointed out the difficulty of classifying office functions, given the statistical data available today.
Studies have also served the function of problem identification rather than problem solving. Dr. Chapin, seems to have contributed considerably to establishing research parameters in an attempt to understand the linkage patterns in and between residences.

Most other research papers end by enumerating factors pertinent to a specific location (typical of site or of activity). This study has attempted to identify the factors and then narrow down the list in an attempt to make it applicable to varied situations. Thus planners can substitute extensive data collection and intuitive judgment by a simple tool.
CHAPTER III

PROCEDURE FOR ANALYSIS

A procedure for analysis of office activity must be formulated to understand the existing linkages between them. This will be dealt with essentially in two parts: part one, leading to the identification of types and levels of office activity and part two, dealing with locational factors (as indicated in previous studies and research references cited elsewhere). A set of matrices follows which contain interactive values between office types and locational factors. These values are subjective and therefore somewhat questionable. They are given by the author to demonstrate the ability of the matrix technique to determine the relationships rather than to indicate specific existant linkages.

Planning tools in the past have been geared to conduct remarkably accurate surveys thus generating indicators about the future which were based on the assumption that people will behave in the same manner as in the past. Tools like "origin-destination study", "desire lines", and "traffic trees" are good examples. As research and development has made progress in this field little has been done to study changing human behavior and its social context. In the past, home based interviews have been incorporated as part of the facts in transportation studies to develop an understanding of the
implicit rational behind human behavior patterns, the sample being taken on a particular day. Locational patterns of urban functions need a thorough investigation which should indicate how these functions are related to each other and should give a schematic view of the spatial relationships. This would be an improved basis for developing a land-use plan compared to the traditional methods used by urban communities in the 50's and 60's.

To go a little deeper into the subject one must first understand what the term interaction implies. Chapin describes it as having two components (the activity and the communication component), both having a close interrelationship. The first component refers to interaction within a certain activity, whereas the second implies interaction between activities. This within and without interaction has special reference to movement of people, messages, and goods. The same or similar phenomena have been referred to as "linkages" by Mitchell and Rapkin. It has been expressed as "Inner Linkages" and "Between Linkages" by the Summary Report.

Essentially a landuse plan attempts to balance the two components. Thus the planner needs a comprehensive understanding of these interactions or linkages and their

\[65\] Chapin, op. cit., p. 221.


continuous evolution. In Chapin's words, ⁶⁸ "... the nature of interaction at any particular moment being reshaped by the feed-back effect from interaction immediately preceding."

Thus not only should urban designers and planners understand urban activity location and their linkages, but also the dynamic process of changing linkages caused by technological innovation and change in urban economic base and the social context. As all constituent elements of urban activities are not subjected to similar phenomena effectuating change and in similar amounts at any given time, the rate of evolution varies for different activities. This influences the planning criteria and solutions in different proportions which the planners and urban designers must be aware of and plan for as part of the continuous process. Though phenomena of relative change and evaluation are important, the main impetus of this study attempts to understand urban activities that influence the spatial pattern of urban areas and thus influence land-use, just as the transportation modes influence proposed transportation network configuration.

To develop a list of office types that would represent a major percentage of office employment, the following typology of activity systems were considered and are given below. ⁶⁹

⁶⁸Chapin, op. cit., p. 223.
⁶⁹Ibid., p. 226
<table>
<thead>
<tr>
<th>Activity Agent</th>
<th>Activity Types</th>
<th>Activity Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forms</td>
<td>Production Activities</td>
<td>Goods-producing activities. (extraction processing, communication, distribution.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Source activities (to form institutions, households and individuals.</td>
</tr>
<tr>
<td>Institution</td>
<td>General Welfare Activities</td>
<td>Human development activities. (education, religious, recreation)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Basic Community Source activities (Police, fire, water, waste disposal, etc.)</td>
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<td></td>
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<td>Activities for welfare of special groups. (labor, social, etc.)</td>
</tr>
<tr>
<td>Households and</td>
<td>Residential Activities</td>
<td>Spiritual development activities, Social activities, Recreation and relaxation,</td>
</tr>
<tr>
<td>Individuals</td>
<td></td>
<td>Club activities, Community service, political activities; Activities associated</td>
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<tr>
<td></td>
<td></td>
<td>with food, shopping, health, etc.</td>
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One method of studying "Between Linkages" of office activity which falls under production activity is to check the input-output tables for a particular urban area (a table using the aggregate economic activity as a measure of a transaction between firms). However in real world situations the data is not only difficult to obtain, but its accuracy is questionable.

The list mentioned above does not constitute a complete list of urban activities. However it sufficiently delineates the existing typologies for the purpose of this
research. The following list explains in greater depth the categories of different activity types involved with production and supply of goods and services. This detailed listing can identify and categorize the firm activities both at theoretical and practical levels. The activities are divided into two types, goods and services: the first dealing with office activity related to extraction, processing, communication, and distribution of goods, whereas the second concerns itself with offices catering to the needs of industry, business, professional, and personal service.

The criteria used in choosing office activity types for analysis was to include maximum percentage of office employment. Thus the following list was chosen, which covers 90% of all office employment in the New York region.

1. Manufacturing
2. Transportation
3. Communication
4. Utilities
5. Government
6. Services
7. Insurance
8. Real Estate

A three level vertical hierarchy was used as it was considered simple, yet sufficiently complex to bring out the

70 Ibid., p. 232-233.
71 Armstrong, op. cit., p. 17.
FLOW CHART SHOWING RELATIONSHIPS - I

- GOODS
  - EXTRACTION
    - PROCURE
      - RAW MATERIALS
    - REFINING
      - FABRICATION
  - PROCESSING
  - DISTRIBUTION
    - WHOLESALE
      - TRANSPORT
      - REDISTRIBUTION
      - STORAGE
    - RETAIL
      - ASSEMBLY
      - DISPLAY
      - DELIVERY
  - COMMUNICATION
    - TRANSPORTATION
    - COMMUNICATION
    - UTILITIES
FLOW CHART SHOWING RELATIONSHIPS - II

SERVICES

- INDUSTRIAL
  - REPAIR
  - MAINTENANCE

- BUSINESS

- PROFESSIONAL
  - FINANCE
  - LAW
  - MEDICINE
  - ENGINEERING
  - ARCHITECTURE
  - ACCOUNTANTS
  - FIRMS
  - INSTITUTIONS
  - HOUSEHOLDS

- PERSONAL SERVICE
  - INDIVIDUAL
  - HOUSEHOLD
  - AMUSEMENT
  - HAIR DRESSER
  - PHOTOGRAPHER
  - LAUNDRIES
  - FUNERAL SERVICE
essentially minute differences between the levels. The levels are:

1. Headquarter office
2. Middle office
3. Local office.

FIGURE SHOWING THREE LEVEL VERTICAL HIERARCHY OF OFFICE ACTIVITY

The criteria differentiating one level from the other is the physical domain of each level. Headquarters operates at national or international levels, "exporting" some of their services out of the metropolitan area in which they are located. Downtown Houston office of Humble Oil Company and Royal McBee Corporation office in Manhattan, New York are examples of this level. On the middle market level is the office which performs population serving functions at metropolitan, regional level and service headquarters. The southwestern headquarters for the Prudential Life Insurance Company of America located on Holcombe Street in Houston
falls into this level. Lowest in the hierarchy are the better known local offices that are generally located in or close to residential areas. Services generated by these offices are consumed within the community. Its activities generally do not demand a central location. Neighborhood branches of saving and loan association offices are examples. The accompanying sketches explain the relationship—the higher the office the greater its jurisdiction.

Face to face discussions between businessmen whose offices are located in close proximity, the need for a large skilled labor force, and the existence of physical improvements like parking facilities all make certain locations more attractive for firms that need these facilities. Such factors that influence decisions related to choosing a site or an office space are generally understood to be locational factors. In order to prepare complete inventory of these locational
factors both office types and levels will be examined since their needs differ, i.e. the world headquarters of a construction company and a local office of the same company have a completely different set of indicators that influence their location. Although both offices are in the same business, the inner linkages and between linkages are completely different. The headquarters may locate in the central business district of a metropolitan area and spread to contracts throughout the nation, whereas the second type essentially deals with local work in the immediate vicinity of the office. Factors that attract a certain type of activity to a particular area may be typical of its location, or typical by the nature of the activity itself. Location of working headquarters of Shell in downtown Houston comes close to type one (location), whereas headquarters of Imperial Sugar Industries in Sugarland, Texas is an example of the second type (activity).

To understand the locational phenomenon the first to be considered is the vertical hierarchy of office levels and their locational needs. Because a headquarter office is dependent on market forces and the sensitivity of the firm to centripetal forces, it generally locates in an office orientated or production office oriented CBD of a metropolitan area. In Armstrong's words these offices "have the greatest need for the external economics of a business district and for the scale economics of a large city." 72

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72 Armstrong, op. cit., p. 3.
following considerations the headquarters generally locate in the central business district (these factors are not listed in order of their importance):

1. Face to face negotiations
2. Up to date information pertaining to the economic market, technology and finance
3. Prestige center of the enterprise
4. Daily surroundings and contact with other firms
5. Availability of related services, such as
   a. Advertising
   b. Employment agencies
   c. Management advisory services
   d. Address and mailing service
   e. Banks
6. Availability of labor (skilled and clerical)
7. Availability of professional services
8. Transportation facilities
   a. Parking
   b. Accessibility
   c. Easy access to airport
9. Board and lodging
10. Noon time activity
    a. Shopping
    b. Banking
    c. "Clash of wits"

The middle office performs functions for the urban area, the region, and sometimes the service headquarters.
Branch offices of insurance companies such as Prudential Life Insurance Company in Houston have strong ties with the CBD. Locational considerations for these offices are given below:

1. Transportation facilities
   a. Parking
   b. Accessibility
   c. Transportation of goods
2. Availability of related services
3. Availability of clerical workers
4. Noon time activity
5. Expansion and growth
6. Prestige center

Local offices which "chase the residential areas" and locate to serve a threshold population (essential for economies of scale) generally locate close to residential areas. The same locational factors as the ones mentioned above are applicable here.

A second way of examining locational factors is by discussing the location needs of each type of activity and identifying those typical of certain activities. Manufacturing, transportation, and utility companies have grown in the past, and now locate their offices in separate establishments. As office space costs amount to fraction of the total production cost, other location considerations have become more important. In other words the above mentioned office activities have been drawn to the center by the same forces that brought the financial institutions to the central business
district. The forces are:

1. Prestige, corporate image
2. Contact with other firms
3. Knowledge of trade currents
4. Business negotiations
5. Availability of services

Government offices that require major amounts of office space are also generally located in the central business district. Federal, state and city offices are found in the heart of the city, close to each other and to other important activities. This is due to both inner and between linkages. These offices are visitor orientated and require large amounts of parking space, which is generally the problem of the visitor as this facility is not provided for, unlike many other types of offices where parking facilities is a must and built at high cost. However, access to these offices both from within the CBD and the suburbs is important and is generally good due to inner freeway loop and mass transportation terminals. Secretarial help, is essential for government establishments and is readily available in the downtown area. Another factor that reinforces the downtown location is the indifferent attitude of government agencies to appearance and environment.

Financial institutions (banks, security dealers, and related institutions) are information hungry thus locate in the center. This fact also induces major insurance offices to locate in downtown areas. Lately some types of financial
activities have become community orientated and locate near residential neighborhoods because of population distribution and consumer credit. 73

After reviewing the locational factors by activity, attention now turns to the advantages of different locations. For the sake of simplicity, and to keep the subject within the scope of the thesis, only central business district and the suburban office park will be considered.

ADVANTAGES OF CENTRAL BUSINESS DISTRICT

In the last decade this tertiary "industry" has tended to locate in the central business district because of the following advantages:

Information

An up to date knowledge of market, technology and finance both at national and international level are becoming important inputs for the decision making process.

Negotiations and Communications

Business deals between top executives are one of the reasons for concentration of administrative offices in the CBD. At the same time face to face contact and understanding of facial expressions while negotiating is considered essential. The use of telephone, closed-circuit television, picture phone, and other technological innovations have not

73 Vernon, op. cit., p. 57.
taken care of this need and thus physical concentration of offices in the business district is continuing.

**Prestige**

Prestige increases by a cumulative process, the more reputed offices that concentrate, the greater the prestige of the area and therefore the greater the drawing power of the total group.

**Accessibility**

Generally the central business district is accessible by train or subway and the inner loop system, making the center accessible to anyone using either mass transportation or the automobile.

**Availability of Support Services**

Office activity and support services are closely associated in the production of goods and services. Support services such as advertising agencies, employment agencies, management advisory services, addressing and mailing service, and other legal professional services are located in the central area and are therefore easily tapped by offices.

**Board and Lodging**

Downtown areas have an abundance of transit residences. Thus businessmen from other cities or countries can be conveniently located near the office of the firm they are visiting.
Noon Time Activity:

Banks, retail stores, and eating places cater to the noon time activity of office workers. Thus lunch break can be used for shopping, visiting beauty salons et cetera, or even for socializing.

Availability of Secretarial Help

Secretarial and semi-skilled female help is generally available in the downtown area, at competitive wages.

Problematic Aspects of Alternative Locations

To compete with the central location and to make the environment attractive to the employees suburban office, business and technology parks need the following:

1. Substantial dollar investment at a scale occasionally comparable to the CBD. Sometimes dollar investment is offset by cheaper land, lower construction costs and lower tax rates.

2. Large parking areas

3. Cafeterias

4. Elaborate landscaping and maintenance

5. Subsidised buses and additional company cars.

Suburban locations at times need long commuting time, which can be offset by relocating the residence, but is expensive and involves the high costs of suburban living. Noon-time contact is reduced to a bare minimum. Main libraries housing an inexhaustive wealth of books are generally located in the CBD, whereas the suburbs enjoy the
rather limited wealth of the branch libraries.

To conclude, the positive aspects of the central business district encourage concentration of top administrative offices and headquarters of firms. These in turn preempt other activities, leaving behind retail trade and support service facilities.

ADVANTAGES OF SUBURBAN OFFICE PARK

To determine the locational advantages of the office park a survey was conducted by the Urban Land Institute. It sent a questionnaire, to the developers of forty-one office, technology and business parks throughout the country. The elements that attracted tenants are listed below in order of their frequency. This list is considered comprehensive enough as a description of the advantages of the suburban office park.

1. Accessability--ease of access
2. Convenient driving from homes
3. Pleasant surroundings
4. Nearby prestige residential areas
5. Good land uses--beauty and design of the development
6. Image and prestige in the environment
7. Nearness to regional shopping center
8. Orientation to national companies
9. Controlled tenancy
10. Expansion possibility
11. Prestige and identification with building ownership

McKeever, op. cit., p. 35.
12. Ample parking--free parking.
13. High quality areas attracted
14. Employees are close to homes
15. Transportation
16. Nearness to downtown
17. Exposure to Interstate highway
18. Lower land prices for lot sales
19. Proximity to airport

The following matrices aid in understanding of interactive relationships; a one-way matrix develops the "in" and "between" linkages of office types, and two two-way matrices show the relationship of office types and levels to locational factors. Of the two-way matrices, matrix number two is the general, it uses office types delineated on the basis of their vertical hierarchy, whereas matrix number three uses a more specific and detailed list of office types. The reason for including both matrices was to suggest various possible ways of understanding relationships, and to keep the technique simple, flexible and comprehensive.

A scale system (ranging from 0 to 5) has been used to establish measurable relationships. In it, 0 indicates "no interaction" and 5 suggests a "must." The values given in these matrices are subjective and do not represent the linkages and relationships of a specific context.

Yet relationships between different activities represented in the matrices geneal interactions which otherwise may be concealed (observe the relationships between
One Way Matrix Showing Relationships, 'in' and 'between' Linkages
Of Different Office Types
government functions). In this case there seems to be little interaction between the post-office and the county courthouse, whereas the courthouse and federal offices are more closely linked. But the case of "between" linkages (specifically government and insurance), there is little interaction. At the same time, finance and manufacturing have closer "between" linkages.

This one-way matrix aids in discovering relationships between different office functions under one heading (for example "government") and any other office type (namely "utilities"). Thus the matrix can be used to determine interaction between activity types, between types and sub-types, and between sub-activity types.

The second matrix shows scaled relationships between office types and different locational factors. To give an example, the headquarter's office of a communication firm needs a healthy amount of information pertaining to the market, technology, and finance. At the same time, it does not necessarily need to locate on a site that provides unusual access from the interstate highway or good accessibility to the airport. The third matrix shows interaction between locational factors and office types (also office sub-types).

Thus matrices (specially number 2 and 3), when used together effectively, determine locational needs of a certain activity, and the degree to which these needs are satisfied by a particular site.

Before the final conclusions are made and discussed,
<table>
<thead>
<tr>
<th>Location Factors</th>
<th>Communication</th>
<th>Transportation</th>
<th>Finance Centers</th>
<th>Government</th>
<th>Insurance</th>
<th>Manufacturing</th>
<th>Real Estate</th>
<th>Services</th>
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<tr>
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<tr>
<td>Exposure to Interstate</td>
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</table>
Two way matrix giving value based relationships between office levels and locational factors

<table>
<thead>
<tr>
<th>Office Types</th>
<th>Communications</th>
<th>Transportation</th>
<th>Finance Centers</th>
<th>Government</th>
<th>Insurance</th>
<th>Manufacturing</th>
<th>Real Estate</th>
<th>Leasing Company</th>
<th>Development's Office</th>
<th>Management Service</th>
<th>Title Company</th>
<th>Services</th>
<th>Medical</th>
<th>Legal</th>
<th>Engineering Consultants</th>
<th>Contractors</th>
<th>Architect</th>
<th>Interpreter</th>
<th>Public Accountants</th>
<th>Advertising Agency</th>
<th>Utilities</th>
<th>Head Office</th>
<th>Local Office</th>
</tr>
</thead>
</table>
three observations pertinent to the output of the matrices should be mentioned. First, matrices two and three do not show any definite interaction between activities producing only goods or only services, rather there seems to be a mixture of interactions. Second, there is little "in" interaction between service type activities, although when located in the same vicinity they compliment each other by centralizing the services required by headquarters offices. However, mutual interactions encourage headquarters clustering which results in a cumulative condition and adds to the prestige of that particular location.

Third, to find out how well the relationships developed on the matrices related to the City of Houston, firms involved in communication (T.V., radio, newspapers, and magazine publishers) and the first 100 headquarters in Houston were plotted on a map. The result seems to be a considerable amount of choereence between the scaler values in the matrix and the physical locations in Houston.
CONCLUSION AND DISCUSSION

The intention of this study was to understand the process of office location dependent on the "in" and "between" linkages. To accomplish this end, the actual work incorporates a history of office activity, identification of office types and location factors, and development of matrices. The study brings out two interesting phenomena; first that different office types have different "in" and "between" linkages; and that sometimes similar office types may not essentially have the same "parcel of functions", and second, that different office types and levels demand various locational needs which can be articulated by the matrix technique.

As a tool, the matrices turned out to be useful in determining linkages, locational needs, and a profile of locational factors. The matrices can be used in two ways: to determine locational needs of office types, and to find out alternative uses for a particular site.

At this stage it is appropriate to speculate about the usage of this technique for general urban analysis. Just as the office function was analyzed in this study, so can other urban activities be analyzed. Once the "in" and "between" linkages of various functions are established, individual matrices (similar to matrix number one in this study) can be
combined into one master matrix to develop "between" linkages. After this cumbersome process is completed, the computer software can be used to optimize the relationships and plot them on paper. These relationships can then be studied in light of the physical form of the urban area under consideration, possibly indicating how the urban functions can be rearranged in response to their linkages. Thus information collected bit by bit can be used to understand the pattern of change, activity relationships, and the urban process.

The data collected for this study is not to be considered complete. Thus the observations made are tentative and have to be further tested before definite conclusions can be made. However, the data and information seems to be sufficient to indicate that the method is promising and further research could use true statistical samples.

The study demonstrates the need for continued re-examination of the phenomena of growth and change, private response, and public policy. At the same time it has become obvious that future office activity will remain one of the most significant urban functions, and will be significant to both tertiary and quaternary activities. Therefore it is of value to understand the process of location of office activity.

Change in technology over the years has affected location but in a limited way, possibly in the future this change may be accepted by the users, which may render clustering of offices in the center unnecessary.

Throughout the Post-war era American cities have also
developed office centers outside the central city possibly because of the success of industrial parks and planning policies permitting the use of suburban land for higher landuses. The reverse has been the case for cities in other countries such as England where the landuse policies have restricted development of higher landuses to the center. If the technical innovations are accepted, there will be extensive shuffling of urban functions. As automation increases, office activity will be free of labor needs thus would have greater freedom of location.

The above mentioned observations are tendencies and can be used as guidelines for policy making but may never happen.
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Hanson, N. R. Patterns of Discovery. Cambridge, 1958.


Losch, August. *The Economics of Location*. New Haven, Conn: Yale University Press (Translated from German), 1954.


**PERIODICALS**


NEWSPAPERS

APPENDIX

An attempt was made to collect data of the City of Houston pertinent to actual location of office activity. The data obtained is listed as follows:

1. Names and addresses of the headquarters of first 100 firms in Houston
2. Ten biggest construction companies
3. Ten largest banks
4. Ten insurance companies
5. List of firms involved in communications
6. Location of office parks, announced/built.

This information has been located on a map of Houston to show the relative location of different types of office activity and to find out if this empirical data fits in with the observations and generalizations made earlier in the study. By any measure, this data is not considered complete but has been included to compliment the main body of the thesis.
<table>
<thead>
<tr>
<th>Name of Firm</th>
<th>Location, Contract</th>
<th>Address</th>
<th>Sales (000’s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humble Oil &amp; Refining Co.</td>
<td>1200 Exchange Office Park</td>
<td>5000, 500 Allen Parkway</td>
<td>120,000</td>
</tr>
<tr>
<td>Tenneco Inc.</td>
<td>2000 One Allen Plaza</td>
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<td>100,000</td>
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<td>Panhandle Eastern Pipe Line Co.</td>
<td>4000 One Allen Plaza,</td>
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<td>Southern National Bank Bldg.</td>
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<td>Lockwood</td>
<td>2000 Louisiana</td>
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<td>Imperial Sugar Co.</td>
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<td>The Offshore Co.</td>
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<td>31</td>
<td>Jefferson Chemical Co.</td>
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<td>32</td>
<td>Hudson Engineering</td>
<td>70,000</td>
<td>5900 Hillcroft</td>
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<td>8651 Lockheed</td>
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<td>Big 3 Industrial Gas Corp.</td>
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<td>The Crispin Co.</td>
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<td>Telecom Co.</td>
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<td>Wilson Industries</td>
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<td>1st. City National Bldg.</td>
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<td>Oil and Gas Bldg.</td>
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<td>Gulf Interstate</td>
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<td></td>
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<tr>
<td>61</td>
<td>Ducommun Metals &amp; Supply</td>
<td>20,000</td>
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<tr>
<td>62</td>
<td>American Commercial Lines, Inc.</td>
<td></td>
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</tr>
<tr>
<td>63</td>
<td>Baroid Div. National Lead Co.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>Coca-Cola Co.--Food Div.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>Continental Carbon Co.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>Continental Oil Co.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67</td>
<td>Cleco Industrial Tool Div.</td>
<td></td>
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</tr>
<tr>
<td>68</td>
<td>Dresser Atlas Div.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>Dresser Controls Div.</td>
<td></td>
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<tr>
<td>70</td>
<td>Dresser MacCork Div.</td>
<td></td>
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<tr>
<td>71</td>
<td>Dresser Nami. Div.</td>
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<tr>
<td>72</td>
<td>Dresser Minerals Div.</td>
<td></td>
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<tr>
<td>73</td>
<td>Dresser SIE Div.</td>
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<td></td>
</tr>
<tr>
<td>74</td>
<td>Dresser Systems Div.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>Unitized Compressor Div.</td>
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<td></td>
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<tr>
<td>76</td>
<td>Fluor Ocean Services, Inc.</td>
<td></td>
<td></td>
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<tr>
<td>77</td>
<td>Gulf Oil-U.S.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>78</td>
<td>Hanke Div. the Kroger Co.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>79</td>
<td>Hughes Tool Co.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>INC Drilling Mud</td>
<td></td>
<td></td>
</tr>
<tr>
<td>81</td>
<td>Mandrel Industries, Inc.</td>
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<td></td>
</tr>
<tr>
<td>82</td>
<td>Mosher Steel Co.</td>
<td></td>
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<tr>
<td>83</td>
<td>National Supply Co.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>84</td>
<td>Getty Oil Co.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85</td>
<td>Occidental Chemical Co.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>86</td>
<td>Parker Brothers &amp; Co, Inc.</td>
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<td></td>
</tr>
<tr>
<td>87</td>
<td>Petroleum Services Group of AMP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serial No.</td>
<td>Name of Firm</td>
<td>Sales (000)</td>
<td>Address</td>
</tr>
<tr>
<td>-----------</td>
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<td>-------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>88</td>
<td>Schlumberger Well Services</td>
<td>6000</td>
<td>Gulf Freeway</td>
</tr>
<tr>
<td>89</td>
<td>Shell Pipeline Co.</td>
<td>1121</td>
<td>Walker</td>
</tr>
<tr>
<td>90</td>
<td>Standard Oil Co of Texas</td>
<td>2708</td>
<td>S.W. Freeway</td>
</tr>
<tr>
<td>91</td>
<td>Stran-Steel Corp.</td>
<td>2909</td>
<td>Wayside</td>
</tr>
<tr>
<td>92</td>
<td>Teledyne Exploration Co.</td>
<td>5825</td>
<td>Chimney Rock</td>
</tr>
<tr>
<td>93</td>
<td>Texstream Co.</td>
<td>320</td>
<td>Hughes</td>
</tr>
<tr>
<td>94</td>
<td>Tex-Tube Div.</td>
<td>1503</td>
<td>N. Post Oak</td>
</tr>
<tr>
<td>95</td>
<td>Union Texas Petroleum</td>
<td>3009</td>
<td>Richmond</td>
</tr>
<tr>
<td>96</td>
<td>Uniroyal Merchandising Co,Inc</td>
<td>3333</td>
<td>Fannin</td>
</tr>
<tr>
<td>97</td>
<td>U-Tote'm,Inc.</td>
<td>5300</td>
<td>W. Loop South</td>
</tr>
<tr>
<td>98</td>
<td>W-K-K Valve Div., ACF Industries,Inc</td>
<td>5252</td>
<td>Richmond</td>
</tr>
<tr>
<td>99</td>
<td>Western Geophysical Co. of America</td>
<td>8100</td>
<td>West Park</td>
</tr>
<tr>
<td>100</td>
<td>Wyatt Division-U.S. Industries</td>
<td>13000</td>
<td>Katy Freeway</td>
</tr>
<tr>
<td>Serial No.</td>
<td>Name of Firm</td>
<td>Sales (000)</td>
<td>Address</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td>1</td>
<td>Brown &amp; Root, Inc.</td>
<td>1,768,600</td>
<td>1100 Clinton Drive</td>
</tr>
<tr>
<td>2</td>
<td>M. W. Kellog Co.</td>
<td>620,000</td>
<td>Greenway Plaza</td>
</tr>
<tr>
<td>3</td>
<td>S. I. P. Inc.</td>
<td>73,000</td>
<td>5604 Old Spanish Trail</td>
</tr>
<tr>
<td>4</td>
<td>The Litwin Corp.</td>
<td>53,000</td>
<td>2300 W. Loop South</td>
</tr>
<tr>
<td>5</td>
<td>H. A. Lott, Inc.</td>
<td>52,300</td>
<td>6115 Gulfton</td>
</tr>
<tr>
<td>6</td>
<td>Houston Contracting Co.</td>
<td>47,100</td>
<td>2807 Buffalo Speedway</td>
</tr>
<tr>
<td>7</td>
<td>Jetco Contracting Co.</td>
<td>32,000</td>
<td>6239 Richmond Ave</td>
</tr>
<tr>
<td>8</td>
<td>W. S. Bellows Construction Co.</td>
<td>31,200</td>
<td>7124 N. York St</td>
</tr>
<tr>
<td>9</td>
<td>Delta Engineering Corp.</td>
<td>27,900</td>
<td>2121 San Felipe Road</td>
</tr>
<tr>
<td>10</td>
<td>Linbeck Construction Co.</td>
<td>23,400</td>
<td>3801 W. Alabama</td>
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</tbody>
</table>

Houston's 10 Largest Banks (based on deposit as of June 30, 1970):

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Name of Bank</th>
<th>Deposit (000)</th>
<th>Location Central</th>
<th>Northwest</th>
<th>North-East</th>
<th>South-East</th>
<th>Single-Story</th>
<th>High Rise</th>
<th>Office Park</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>First City National</td>
<td>1,010,713</td>
<td>McKinney &amp; Fannin</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>2</td>
<td>Texas Commerce Bank</td>
<td>647,521</td>
<td>Rusk &amp; Travis</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
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<tr>
<td>3</td>
<td>Bank of the Southwest</td>
<td>605,065</td>
<td>McKinney &amp; Milan</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>4</td>
<td>Houston National</td>
<td>234,576</td>
<td>Tenneco Rd</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
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<tr>
<td>5</td>
<td>Houston Bank &amp; Trust</td>
<td>113,317</td>
<td>Galhoun &amp; Main</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
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<tr>
<td>6</td>
<td>Southern National</td>
<td>105,883</td>
<td>McKinney &amp; Main</td>
<td>o</td>
<td>o</td>
<td>o</td>
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<tr>
<td>7</td>
<td>Capital &quot;National&quot;</td>
<td>103,933</td>
<td>Rusk &amp; Folk</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
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<tr>
<td>8</td>
<td>Continental Bank &amp; Trust</td>
<td>90,521</td>
<td>Fannin &amp; Rusk</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
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<tr>
<td>9</td>
<td>Sharpstown State</td>
<td>81,345</td>
<td>Sharlestown</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
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<tr>
<td>10</td>
<td>Bank of Texas</td>
<td>78,618</td>
<td>800 Travis</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Serial No.</td>
<td>Name of Firm</td>
<td>Sales (000)</td>
<td>Address</td>
<td>Location</td>
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<tr>
<td>1</td>
<td>Prudential Life Insurance Co. of America</td>
<td>10,243,300,000</td>
<td>1100 Holcombe</td>
<td>Central</td>
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<tr>
<td>2</td>
<td>American General Life Company</td>
<td>9,500,000,000</td>
<td>2727 Allen Parkway</td>
<td>South-West</td>
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<tr>
<td>3</td>
<td>Great Southern Life Insurance Co.</td>
<td>2,220,431,073</td>
<td>3121 Buffalo Speedway</td>
<td>North-East</td>
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<tr>
<td>4</td>
<td>Tennessee Life Insurance Co.</td>
<td>1,179,558,413</td>
<td>Travis &amp; Walker</td>
<td>South-East</td>
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<tr>
<td>5</td>
<td>Lincoln Liberty Life Insurance Co.</td>
<td>695,516,829</td>
<td>711 Polk</td>
<td>North-West</td>
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<tr>
<td>7</td>
<td>Ranger National Life Insurance Co.</td>
<td>316,893,021</td>
<td>3118 Richmond Ave.</td>
<td>South-West</td>
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<tr>
<td>8</td>
<td>American Capitol Insurance Co.</td>
<td>116,827,699</td>
<td>8399 Buffalo Speedway</td>
<td>North-West</td>
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<tr>
<td>9</td>
<td>Great Southwest Life Insurance Co.</td>
<td>152,922,264</td>
<td>121 Buffalo Speedway</td>
<td>Central</td>
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<tr>
<td>10</td>
<td>First Continental Life &amp; Accident Ins Co.</td>
<td>102,195,845</td>
<td>2303 Smith</td>
<td>Central</td>
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</tr>
</tbody>
</table>
Houston & Environs
Location of Insurance Companies
Houston & Environs

Location of Radio Stations

Radio Stations

T.V. Stations

Newspapers

Magazines
LIST OF HOUSTON AREA OFFICE, BUSINESS, AND TECHNOLOGY PARKS WHICH HAVE BEEN ANNOUNCED OR ARE UNDER CONSTRUCTION AS OF March 1, 1971

1. Brookhollow Business Park
   Location: West Loop, Interstate 610 at Northwest Freeway

2. Corporate Square
   Location: Southwest Freeway at Kirby Drive

3. Cullen Center
   Location: Jefferson Street (southwest of downtown)

4. Executive Plaza
   Location: Southwest Freeway at Newcastle Street

5. Galleria Post Oak
   Location: Westheimer Road at Post Oak Street

6. Greenway Plaza
   Location: Richmond at Buffalo Speedway

7. Houston Center
   Location: 32 block area west of Highway 59 in downtown

8. Manned Space-craft Center
   Location: NASA Road at Space Center Blvd.

9. Northwest Plaza One
   Location: Northwest Freeway between Dacoma and Mangum, across from Brookhollow Business Park

10. Number One Post Oak Place
    Location: Fronting on Post Oak, Park Drive and San Felipe, east of Loop 610 in the Magic Circle area

11. Office City
    Location: 7007 Gulf Freeway

12. Office Park Development
    Location: On Katy Freeway between Echo Lane and Bunker Hill Road

13. Office Park
    Location: Westheimer at Fountainview

14. Park West Plaza
    Location: Southwest corner of Westheimer and Fondren
15. Pine Hollow Office Park  
   Location: Loop 610 North at T. C. Jester Blvd.

16. Plaza De Ore  
   Location: South Loop near Astro World

17. San Felipe Green  
   Location: Southwest corner of San Felipe and Yorktown

18. Smith Office Park  
   Location: 610 Loop and Westheimer Road

19. The Citadel  
   Location: Loop 610 West

20. University Park  
   Location: Nassau Bay Area

21. Westway Business Plaza  
   Location: Harwin Drive a block west of Fondren and 
             a block south of West Park Drive

22. Wind Swept Office Park  
   Location: Bonhomme Drive between Claremont and 
             Bellerive Streets in Sharpstown

23. Wood Lake Office Park  
   Location: 9650 Westheimer