Interstate Freeways Attract New Office Sites

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Introduction

COMPLETION OF THE INTERSTATE highway network in American metropolitan areas has opened a wide variety of locational options for urban land uses. New office sites have been salient among these developments. The purpose of this study is to compare Interstate radial freeway corridors with other spatial units in Omaha and six other metropolitan areas to determine their differential attraction for new office sites in the period 1970-1976. The seven metropolitan areas studied were Atlanta, Dallas, Denver, Louisville, Minneapolis-St. Paul, Omaha, and San Jose.

Definitions

For this study an office site is one in which the prime functions of the units which occupy it are the creation, storage, and dissemination of information regarding services performed, goods held or transferred, and personnel employed. A site may comprise a single office building, an office park of several buildings, or a complex of buildings built by the same developer within a limited time period. A service may be performed at the same location; e.g., physicians see patients and insurance agents sell policies, but rarely are the goods for which the records are surrogates present at the office location. No steel ingots, for example, are found in the U. S. Steel headquarters building.

The study included office sites which were both renter-occupied and owner-occupied. It excluded all office sites that were wholly occupied by Federal, state and local government agencies whether these buildings were leased from the private sector or not. This was done because most government office location decision makers were assumed to operate under a different set of constraints from those in the private sector. The study also excluded corporate headquarters located at the site of production facilities. Buildings with less than 25,000 square feet of gross floor area were excluded from the study. This allowed the establishment of a manageable universe of sites within each city's metropolitan area. It also permitted the study to make maximum use of some existing public and private agency inventories which provided relevant data only on office sites in their cities that contained at least 25,000 square feet of gross floor area.

An Interstate radial is defined as a federally funded Interstate highway anchored at or near the central business district (CBD) of that metropolitan area. It extends outward from the CBD like a spoke of a wheel and, in most cases, intersects the Interstate circumferential highway. A non-Interstate radial has the same geographic pattern as the Interstate radial, but it is not necessarily a limited access route. A radial corridor is defined as that area which lies within one mile on either side of a radial highway and extends from the CBD to a point four miles beyond the Interstate circumferential. A corridor two miles wide is also developed along the Interstate circumferential in each metropolitan area.

Between 1970 and 1976 the largest proportion of office site growth in seven metropolitan areas occurred in Interstate radial freeway corridors.

Each of the metropolitan areas under study contains a cluster of downtown office sites that are roughly coincident with the CBD. In no case, however does this cluster extend more than 1.4 miles linearly, and in most it is less than one mile. Consequently the downtown cluster in every metropolitan area can be enclosed with a circle whose radius is .7 mile. The CBD as defined in the Census of Retail Trade might be used as the base for some metropolitan areas, but in others it is not spatially coincident with the cluster of downtown office sites. In this study the term core rather than CBD will be used to designate the downtown office area.

The non-corridor area comprises all space inside a line four miles from the Interstate circumferential, space not included in one of the types of spatial units described above. The number and types of the spatial units described above and the square miles they contain in each metropolitan area are shown in Table 1. They also appear individually on Maps 1 through 7.
The period from 1970 to 1976 was selected for study because, for most of the metropolitan areas, it marks both the completion of the Interstate system and a sharp increase in office site development (Table 4).

Selection of Metropolitan Areas

The seven metropolitan areas studied were selected from among SMSA's (Standard Metropolitan Statistical Area) that met the following criteria: (a) central city population of at least 100,000 but fewer than one million inhabitants, (b) a central city with at least one core anchored Interstate radial that was in place, and (c) the existence of a comprehensive and accurate office site inventory. An attempt was made to provide a good regional distribution as possible. Selection from diverse geographical areas allowed for the inclusion of metropolitan areas of differing ages with differing regional functions and sizes. Their distribution represents most of the large regions of the United States. San Jose represents the West Coast, Denver, the West, Dallas, the Southwest; Omaha and Minneapolis-St. Paul, the Midwest; and Louisville and Atlanta, the Southeast. This aggregate of the seven metropolitan areas under study encompasses the core urban areas of seven metropolitan areas that witnessed greatest increase in growth as percent in number of sites in the non-core area (Figure 4). The non-core area, on the other hand, experienced growth of over 20 percent in the number of sites and more than 170 percent in gross square footage. The growth rate differentials between number of sites and gross square footage resulted from the fact that non-core sites tended to be smaller than those in the core. Two areas with strong and active urban redevelopment programs, San Jose and Louisville, had more than doubled their pre-1970 square footage during the 1970-1976 period. Nevertheless, non-core growth in these two areas exceeded 200 percent. In every metropolitan area the number of sites in the non-core area more than doubled in the past decade. This was the single most important growth area in the metropolitan area, for, regardless of the square footage involved, these new sites represented an aggregate of individualized location decisions.

Increasing and Centrifugal Movement of Office Sites and Gross Area

The 1976 pattern of office sites in the seven metropolitan areas is a product of seven years of growth that might well be referred to as an office "boom" in some areas. The 480 sites developed during the 1970 to 1976 period represent a more than 90 percent increase over the number of sites developed prior to 1970. (Maps 1 through 7 and Tables 2 and 3) More than 2.5 million gross square feet of space were put in use in this period, increasing the pre-1970 footage by 85 percent. By 1976, San Jose, Denver, and Louisville had more than doubled the number of their pre-1970 office sites, and Atlanta nearly did so. A similar pattern held across the seven metropolitan areas for increases in gross square footage. Among the seven only Omaha and Minneapolis-St. Paul could be described as showing but modest growth during this period. Increasing and centrifugal movement of office sites is all the metropolitan areas under study and in the aggregate the cores of these metropolitan areas witnessed modest growth of 33 percent in number of sites and 23 percent in gross square footage (Table 4). The non-core areas, on the other hand, experienced growth of over 20 percent in the number of sites and more than 170 percent in gross square footage. The growth rate differentials between number of sites and gross square footage resulted from the fact that non-core sites tended to be smaller than those in the core. Two areas with strong and active urban redevelopment programs, San Jose and Louisville, had more than doubled their pre-1970 square footage during the 1970-1976 period. Nevertheless, non-core growth in two of these areas exceeded 200 percent. In every metropolitan area the number of sites in the non-core area more than doubled in the past decade. This was the single most important growth area in the metropolitan area, for, regardless of the square footage involved, these new sites represented an aggregate of individualized location decisions.

Channelling of the Centrifugal Movement

Office site growth outside the cores was however, evenly distributed among the core and the non-core area. The largest proportion of growth in the seven metropolitan areas in the 1976-1976 period occurred in Interstate radial freeway corridors (Table 5). In Atlanta, Dallas, Denver, and Louisville Interstate radial corridors ranked first among all non-core spatial units in office site growth. In San Jose the Interstate radial corridors ranked second, but the proportions of the metropolitan increase were unusually well distributed among the three non-core spatial units. This was not the situation in Omaha where the Interstate radial corridor (Dodge Street) absorbed the bulk of the increase, and the Interstate radial corridor was thus a distant second. Nor was it the case in Minneapolis-St. Paul where the Interstate circumferential ranked first in non-core growth and the Interstate radial corridors second. On the basis of the increase in gross square footage, Interstate radial corridors in Atlanta, Dallas, Denver, and Louisville repurposed the site rankings and led all core non-radial spatial units in this metropolitan area. The largest proportion of office sites in the San Jose Interstate radial corridors contributed to raising the total number of units to a few rankers. Interstate radial corridors in Omaha and Minneapolis continued to lag behind the non-Interstate radial corridor and the Interstate circumferential, respectively, in their proportion of the total metropolitan growth in gross square footage in the 1970-1976 period.
Role of Accessibility Factors

The role of the Interstate freeway as an attractive force encouraging office development can be traced through several variables usually found in industrial location theory. Primary among these is accessibility. This concept of accessibility, however, is most useful in explaining the impact of an Interstate freeway—or any other linkage in the transportation network—when it is differentiated rather than generalized into a single measure.

At a minimum the accessibility of a site can be viewed from several different levels. Macro-accessibility relates the office development site to other important activity nodes within the metropolitan area. These nodes should be differentiated. Accessibility to the CBD or core, the traditional center of office and governmental functions, is important.

Accessibility of the site to potential employees (i.e., white collar workers) should also be examined, especially since labor supply is a prominent variable in industrial location models. The realities of the travelers' time and the proximity of the core influence whether white collar workers can and will commute. Whether the office is situated on a freeway or an outlying, non-freeway road has an important impact on accessibility. The service center of suburban Dallas is closer than seven miles to the core, and only one office development in the 1970's. This in tum may contribute to the backbone pattern of office development location, because the speed at which a development is occupied influences other investors and developers who may not adequately make decisions on adequacy of the reasons for failure.

Accessibility for White Collar Workers

Accessibility of office developments to residences of white collar office workers is highly related to the attractiveness of a freeway corridor for office development. In general, office development occurs in the vicinity of the primary concentration of the residences of white collar workers. For instance, the largest concentration of white collar workers' residences in the metropolitan Louisville area occur in the eastern portions near I-64.

Similarly, in the Dallas area, the white collar commuting areas are located north of the CBD, and recent population trends support a continuation of this concentration of white collar workers. Because the office development since 1970 has been north of, or inside, the CBD. A Dallas leasing agent expanded on this "intercept theory" explaining, "This activity ratio of 4.5 to 1 means that if you can put a building close to where the decision makers live, you will lease it. In fact, in Dallas in 1974, a concentric zone four to five miles from the core contained 43 percent of all floor area, but the zone was only one to two miles wide. Houston and Garland house the largest concentration of white collar workers, corporate managers are more likely to live northwest of the CBD, and this location of the office development has been concentrated.

This factor becomes especially important for office location decisions because those located too close to the CBD are much less likely to suffer from an increase in the core's "low bid" price, whereas a building located more distant from the CBD may enjoy fewer competitive pressures. Because white collar workers, corporate managers are more likely to live northwest of the CBD, and the office development has been concentrated.

In summary, distance from the core is of virtually no importance in the location of office development. Access to the core, however, is still important, office developers and rental agents still boast "only minutes from downtown" by the freeway. The additional five to ten minutes spent as a result of a location nearer to the core become rarer.

Role of Distance Costs

The second broad category of variables potentially useful in explaining office development location patterns is dollar costs, some of which are translatable from the accessibility measures just noted. Several types of costs are theoretically relevant for the office location decision maker. For the developer, price of land and construction may be crucial, and these costs are in turn based on the cost of labor, taxes, and local land use regulations. For the owner, the cost of labor, taxes, and the total burden of property taxes to the city; in University Park, an enclave surrounded by Dallas, the same building would pay $5,720 in city real property taxes. This $4,743 difference may seem large, but when it is proportioned over the typical size for a $1,000,000 building, the difference is approximately 10 cents per square foot. Additionally, the saving in taxes is worth over $100 per year per $1,000,000 office building, the difference in the core is $40 per hour per year per $1,000,000 office building, the difference in the core is approximately 10 cents per square foot. Additionally, the saving in taxes is worth over $100 per year per $1,000,000 office building, the difference in the core is approximately 10 cents per square foot.
added that differences in the "sophistication" of criteria in the development process may be more important; a city such as Denver may be better prepared than some of the satellite communities to aid a developer by cutting time delays in granting permits, thus reducing the developer's front-end costs.

Any evaluation of the impact of tax (or other cost) differentials upon office development patterns should include the fact that office occupancy rates are more sensitive to quality considerations than is substituted for garden-type such as Denver may be better prepared in the fact that office occupancy rates are more considered prime space.

**Price of Land**

The relationship of the price of land to attractiveness for office development is not a simple one. At a minimum, as the land becomes more attractive (e.g., when accessibility is improved through improvements to the transportation network), its price increases.

The price of land may not be a critical factor for development because the higher price of a land parcel can be compensated for through more intensive development. When high-rise development is substituted for garden-type development, the core in the study cities is still a viable site for office development, even though land costs in the core are as high as $25 to $75 per square foot. However, the lower price for land farther away from the core enables the development of larger parcels that can provide ample space for free parking. This is an important inducement for firms currently located in the CBD. One observer sees it as the equivalent of a $30 per month salary increase.7

The use of larger parcels of land also permits the use of cheaper garden-type development or lower-density construction. Less expensive land and less expensive construction combine to contribute to cheaper office space than can be found in buildings of comparable age in the core.

In summary, if all other factors are equal, cheaper land will attract office development, but all other factors are rarely equal. Therefore, one must conclude that within limits, the price of land is not a determinant of where offices are developed.

**Availability of Land**

Another variable that may be considered a "necessary" condition before development can occur is a supply of available land. An analysis of the impact of freeways upon the location of office development should examine this variable. Freeways play an important role in making land available for development by providing access to it for potential users. An analysis of the location pattern of new office development must consider the role of available land in shaping the patterns. For instance, one freeway can pass through vacant land that, when combined with improved accessibility, attracts new development to the area, while another freeway is routed through an already developed area that may serve to inhibit new development despite the added accessibility.

This is one explanation offered for the lower price for land in the southwestern portion of I-494 in Minneapolis and the virtual lack of new development along I-94 linking Minneapolis and St. Paul.

An examination of vacant land in the seven cities studied leads to the conclusion that available land may be a necessary condition but is not sufficient to attract development. For example, large tracts of vacant land are found along the southern terminus of I-35 in Dallas, and yet the new development is along the portion of I-35 north of the CBD (Stemmons Freeway). Similarly, a large area of vacant land is located near the northern leg of the I-635 circumferential than near its northern leg, and yet the latter is considered the "hot" area for development in the Dallas metropolitan area.

Even the conclusion that available land is a necessary condition for office development must be tempered by raising the question of what constitutes available land. The concept cannot be limited to vacant lots or larger parcels, because much of the new development in "suburban" areas occurs on land converted from agricultural use (e.g., much of San Jose's office development is in former fruit orchards). If land is devoted to another use—whether it be agricultural, residential, or commercial—it may still be considered available for office development if the cost of purchasing and clearing it is no higher than the price of "vacant" land elsewhere and if zoning and other land use restrictions permit it. The availability of land, therefore, is a function of price and zoning and not of current land use.8 It may also be a function of the size of the parcels available for development: are they more likely to be available in large parcels, whereas already developed land may be divided into smaller parcels spread over broader ownership, which makes the aggregation of a sufficiently large land package in a difficult process.

The importance of zoning and other land use restrictions (e.g., building height or setbacks) will vary with the ease with which they may be amended in any city. Increased concern for the environment and increased citizen participation have made hardships more difficult to acquire, especially if residential land is affected.

1 In some of the metropolitan areas the circumferential is not composed entirely of interstate routes. The short segments of state routes used to close the circumferential are included as part of the Interstate circumferential.

2 Pre-1970 sites include only those that were developed before 1970 and that were still in place in 1976.


8. According to data supplied by the Dallas Association of Building Owners and Managers in September, 1976, the variation in cleaning service costs was more than 50 cents per square foot even when the most extreme rate at each end of the cost range is ignored.

9. Although tax differentials are usually relatively small, two of the metropolitan areas studied in this report (Minneapolis-St. Paul and Atlanta) had tax rates two to three times higher in the central city than in some of the outlying suburbs. Developers in Minneapolis-St. Paul were especially strong in their claims that higher taxes in the two central cities were an important factor in the suburbanization of office space in that metropolitan area, despite the provision of the Metropolitan Development Act of 1971 which redistributes a small portion of commercial property taxes to all cities in the metropolitan area.

10. This is not to say that adjacent land use is unimportant. The lack of development along much of I-80 in Omaha is attributable to the attraction of industrial and warehousing land uses to this area because of the Union Pacific railroad tracks which are adjacent to and parallel with the freeway. Similarly, the pattern of office development locations shown on Maps 1-7, indicates some agglomeration of similar units, as it is rare for an office site to be isolated from other office developments.

### STAFF ACTIVITIES


- The CAUR staff is assisting the City of Norfolk with a pre-application to the Department of Housing and Urban Development for housing and community development block grant funds.

- Ethel Hill Williams is helping the North Omaha Community Development Corporation in planning a Midwest regional convention on neighborhood issues to be held in October, 1980.

- Murray Frost and Peggy Hein are conducting a survey of the public's knowledge of poison control procedures for the Poison Control Center at Children's Memorial Hospital.

- Jack Ruff presented a report on builders' and lenders' attitudes toward the Nebraska Mortgage Finance Fund at a meeting of the NMFF board of directors in Lincoln on October 12.

### DEPPE GOES TO WASHINGTON

Don Deppe has resigned as director of the Center for Applied Urban Research to accept a position as program officer in the Office of Regional Programs of the U.S. Commission on Civil Rights in Washington, D.C.

He will be working with regional program directors and their staffs throughout the United States in developing and evaluating civil rights programs.

Jack Ruff, housing coordinator at CAUR, has been named acting director while a search for a new director is instituted.

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