INDUSTRIAL LOCATION PROBLEMS

Comparative Elements Between Two Activity Location Policies - U.S.A. and France

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INTRODUCTION

The responsibility for controlling urban growth for a long period of time leads the officials charged with planning (local, regional, and federal) to pay more attention to the implications of their policies of employment, location and reception structures of the secondary and tertiary activities.

Three "natural" phenomena contribute to the transfer of activity (chiefly those which are secondary) from the city:

a. Urban centers, where housing and activity densities are high, need available areas in which to locate housing, services, and roads, which will raise land values. Therefore, land values are higher in urban centers than in less dense areas. These two phenomena together - need of space and high land value - constitute a pressure for activities to move.

b. The activities, mainly secondary, have increasing problems as rivals from other urban elements compete for space occupation. Housing is badly adapted to industrial neighborhoods. Nuisances of all categories (noise, pollution, traffic congestion), engendered by a plant, are no longer accepted in cities, where now, public opinion can force the removal of the offending plants.

c. The space needs produced by productivity and production growth likewise lead the plant to investigate new locations due to want of adjacent space in which to expand, or due to the expense of nearby land. Besides, the service of the plant is negatively affected in the urban context because the roads are often overcrowded.

Thus, one finds three basic phenomena:
- rapid growth rate of the urban center
- economical imperatives (to limit the nuisance factors)
- economic improvement activities

When found together, they lead businesses to investigate new locations outside the urban center.

The new locations present important problems according to three points of view:

From the point of view of the relocated firm:
- possibilities of resettlement (available land, financial capacities in terms of investments)
- questions of survival in a new environment
  - economic: loss or preservation of customers, suppliers of parts and materials, subcontractors.
  - employment: problems in maintaining skilled manpower because of distance from the previous location or from the source of manpower.

From the economic point of view
- shifts or inter-firm economic relations network (i.e., loss of traditional markets in the case of long distance relocation).
- loss of revenue for the original area (unemployment resulting in the loss of income taxes as well as loss of tax revenue gained from the activity).

From the employment point of view
- possibilities of unemployment caused by job disappearance
- decline of commuters (necessity of improving the transportation network).
- possibilities for a new distribution of housing (relocation of housing closer to areas of possible employment).

The topics discussed above demonstrate that the relocation of business and industry creates a new urban structural distribution. The problems emphasized can be accompanied by multiple changes as well at
institutional level (policy power and action, planner power and action), as well as at the urban elements level (habitat, roads, and network location). The urban structural modification involves considerable risk (political, financial, sociological and economic).

This study will emphasize the different levels of the location of activities in the United States from the standpoint of experiments, either terminated or in progress, in several metropolitan areas. After having pinpointed the problem, we will try to establish the different levels of decision-making from land use to the creation of the industrial district and park and the establishment of various firms. This analysis will be illustrated by examples taken from certain metropolitan areas in the United States.

In the last section, we will discuss the ways in which this knowledge is being applied by town planners in the U.S. and in France, specifically in the Paris area.
DEFINITION OF THE PROBLEM

The old urban centers constitute one of the most important sources of industrial mobility. Urban centers in the United States and abroad have traditionally welcomed industry. Although the processes of industrialization have been different, they have given birth to a number of similar problems. The old order of industrialization was carried out without any logical order, i.e., the center was opened to factories, housing, businesses, etc. without any restriction.

Industry established itself along its own particular lines. In this aspect, Baltimore is a significant example. Here industrial activity relates to three major location criteria which explain the recent industrial structure of the metropolitan center.

- Harbor Location. The location of Baltimore City near the Chesapeake Bay has promoted the growth of businesses linked to the harbor. The glass industry, metallurgy, transportation, food and chemical industries have established several plants entirely dependent on the proximity to the harbor. In 1958, 7 percent of the plants, employing 22 percent of the manufacturing workers were completely independent. In 1970, the rate fell and was down to 5 percent and 19 percent.

- Rail Facilities. The railroad connection of Baltimore City has equally promoted plants location. Despite the graded disuse of railroads, in 1958, 19 percent of the firms, employing 67 percent of the manufacturing workers had direct rail access. The rate in 1970 was down to roughly 15 percent and 45 percent. However, the proximity to railroad facilities constitutes an efficient weakening factor.

- Urban Concentration. The growth of population and business activity explains why industries locate within an urban setting.
Warehouse and distribution functions have been taken up by factories located inside of the urban area.

The progressive growth of urban centers established a complex structure, isolating plants in residential areas. A more precise analysis of the scene shows industrial dispersion, except for the harbor area, which is more homogeneous (c.f. next map).

A comparison between urban growth requirements and industrial growth indicates that the former needs more space. Several factors contribute to the removal of industry from the urban center. Space need is common to industry and other kinds of urban elements (housing, business, utilities). This need leads to an increase of land value, but industry cannot compete with housing, which can afford high land prices. Moreover, the development and growth of industrial activity is becoming increasingly difficult in the urban center due to problems of pollution and nuisances.

Industry needs available space and space adjacent to the existing plant, access to highways (due to questionable railroad facilities). The rejection of industry by the inner city, space requirements and better transportation access make survival difficult in the traditional urban setting. It is now possible to list the major problems which make it difficult for industry to continue in urban centers(1).

1. Insufficient land available and suitable for industrial development in tracts of sufficient size to offer an adequate choice to prospective developers.

2. Lack of adequate potential industrial sites having the particular location characteristics needed by industry (i.e., sites having navigable water frontage [Balto.], sites close to central business districts).

3. Congestion in established industrial districts, both on the industrial properties themselves and in the public ways, resulting in inadequate vehicular access and service room as well as prohibiting needed on-site expansion by established firms.

4. Lack of suitable highway access providing direct connection between industrial sites and the inter-city express highway serving the area.

5. A substantial proportion of obsolete and obsolescent industrial plant buildings, physically deteriorated and/or no longer suitable for modern production methods.

6. Poor environment in the vicinity of established industrial districts, adjoined by run-down commercial and residential areas, depressing and frequently unsafe for employees to pass through and adversely affecting the prestige of the adjoining industrial occupants.

7. Failure to protect potential high value industrial land from encroachment by scattered incompatible uses which impair its usefulness for industrial development.

8. The need to consider and plan for minimizing the "journey to work" through an improved arterial highway network and public transportation, as well as by the location of industry within this factor as an objective.

9. Reduction of the adverse effects of industry upon other elements of the city because of air pollution, noise and industrial traffic on residential streets.

10. The need to evaluate the present nature of manufacturing activities in the city to determine whether current trends suggest a change in companies.

Manufacturing activities in Baltimore City have undergone considerable change since World War II through creation and abandonment of plants. Some move to points beyond the city limits and others relocate within the city. During the 1948-1958 period, 279 new manufacturing firms were created in the city, providing approximately 10,000 new jobs, but 320 firms were abandoned during the same period, eliminating about 19,000 jobs. The result was a net loss of 41 firms and approximately 9,000 jobs due to these changes.
During the 1948-1952 period, fifty established Baltimore manufacturing firms moved to locations outside the city, taking with them almost five thousand jobs. During the same period, factory employment in Baltimore City declined by 23,334. At the same time, manufacturing employment in the Baltimore metropolitan area increased by 11,706. Between 1929 and 1959, the city's share of metropolitan area factory employment declined from 84% to 55%.

Between 1958 and 1970, the trend increased from 0.4% each year between 1948 and 1958 and rose to about 0.7% per year from 1958 to 1970. A comparison of factory employment in Baltimore with that of two other major East Coast cities (Boston and Philadelphia) indicates that all three had approximately the same proportional loss.

The modification of the urban structure of the Baltimore metropolitan center is shown in the following examples. The following maps indicate the importance of real and projected disappearance (1957-1970) of industrial lots inside the Baltimore metropolitan center (1).

1957 - In 1957, industrial space covered approximately a quarter of the study area. The port area was relatively homogeneous with several extensions between Lombard Streets. A North-South tentacle followed the railroad. Elsewhere, several residual plants were enclosed in residential lots or in public spaces.

1957 - 1970 - Industrial locations declined in number between Lombard and Mulberry Streets with the construction of Charles Center. It also declined in the South of the port area and was replaced by railroad, public or open space.

(1) A report of the Regional Planning Council & the Baltimore City Department of Planning, 1970. (Part of the Comprehensive Plan)
1970 - 1985 - The transformations are important. The port area would be entirely released, becoming open space in the South and residential space in the North. The crossroad along Lombard and Pratt Streets would be converted to commercial use. In the same way, the North-South tentacle would lose 3/4 of its space. In 1985, the industrial area would cover no more than 1/15 of the entire metro center surface.

This example illustrates industrial decay in urban centers. The "natural" falling back of industry often occurs because of efforts by city government to reshape urban space.

The rejection of industries from urban centers leads them to investigate new locations, mainly in the industrial districts. These are spaces devoted to the industry inside a given area. Land use, from free land to the setting up of industrial districts and industrial parks involves the receipt of advice at the federal level and actual decisions at other levels.
1970 Generalized land use
1985 generalized land use based on all three probability phases of development
FEDERAL LEVEL

The federal level has mainly an advisory role in matters related to industrial location. The diversity and steady expansion of planned industrial districts in many parts of the United States drove the Federal government and mainly the U.S. Department of Commerce - Economic Development Administration - to help communities regarding new industrial site locations.

A guide was written in 1969 by Robert A. Podesta, Assistant Secretary for Economic Development, called "Formula for Growth - How to Make an Industrial Site Survey." This guide examines the different features of the U.S. policy in matters relating to industrial location. Moreover, the main interest of this guide is to present the different and successive levels leading from the employment needs felt by the community to the creation of an industrial district.

The Industrial Site Survey

"The value of a thorough industrial site survey for your community is perhaps best seen through the eyes of the industrial prospect himself (1)." This first sentence illustrates the policy difference for industrial location between France and the United States. In France, the industrial districts, in the Paris region for example, were located in terms of a coherent distribution of housing and employment. In the United States, however, the industrial sites must chiefly suit the requirements of the manufacturers.

Many local development organizations have a committee concerned with the needs of existing and potential industry. In areas participating

in the program of the Economic Development Administration, [Overall Economic Development Program (OEDP)] this committee helps to prepare the area. To organize and direct a site survey, it is desirable to obtain the services of people experienced in plant-site selection, who have skills for determining qualifications of land for various industrial uses. The ideal site survey team includes representatives of the local or county planning, zoning, engineering and tax assessment staffs; industrial land realtors; local chamber of commerce officials; area development representatives of utility and transportation firms serving the community; and officials of firms already located in the area. State agencies can also provide helpful information and guidance on industrial surveys.

These explanations are very important because they emphasize that a site survey is not only the domain of town planners and politicians, but also that of other groups, even officials of the firms themselves.

The goals held both in the Paris Region and in the United States are apparently similar: to provide employment where it is needed. But the United States pays more attention to filling the industrial districts than does France, and to suiting the requirements to manufacturer specifications by asking them to participate in an industrial site survey. Knowing the needs of their firms seems to be the best way to satisfy the manufacturers and therefore to assure occupation of the planned industrial districts.

Basic tools for site identification are given by the guide. Maps and areal photographs are helpful in indentifying potential industrial sites accurately and in compiling pertinent data on them that prospects
will want to know. First of all, it is essential to obtain as large a scale base map as is practical. All available sites including such features as industrial zoning boundaries, road, rail, air and water transportation networks; and major utility lines (water, sewage, disposal, gas and power) should then be identified. As individual sites are identified separate maps covering the above items in detail, together with topographic features, notation of areas subject to flooding, direction of prevailing winds, character of adjacent land uses, and similar data helpful to manufacturers in selecting a plant site should be depicted.

Particular attention should be given to the location of existing industrial buildings or other buildings which could be converted to industrial use. The following list indicates where the different maps are available.

<table>
<thead>
<tr>
<th>Map</th>
<th>Where Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoning Maps</td>
<td>Town or County Zoning Office</td>
</tr>
<tr>
<td>Street &amp; Road Maps</td>
<td>Municipal Engineer's Office</td>
</tr>
<tr>
<td>State Highway Maps</td>
<td>County or State Highway Depts.</td>
</tr>
<tr>
<td>Railroad Maps</td>
<td>Office of Railroads or Municipal Engineer's Office</td>
</tr>
<tr>
<td>Utility Maps</td>
<td>State Public Service Committee or Local Planning Commission</td>
</tr>
<tr>
<td>Areal Photographs</td>
<td></td>
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</tbody>
</table>

In France, the government and local jurisdictions give financial aid to those firms which must move (decentralize or, to the contrary, tax industrial firms which relocate (dissertation) in the Paris Region.
The federal government in the United States does not interfere in financial matters except in some particular cases, such as business, not industrial, relocation.
REGIONAL LEVEL

The competent authority in matters of town planning at the regional level, is generally called the "Regional Planning Council." For example, the Maryland Regional Planning Council elaborated on a general development plan and published it in 1972. It indicates the stages of the Baltimore regional development until 1990 and emphasizes what it considers to be the desirable or necessary goals. It is divided as follows:

- Regional setting
- Regional development framework
- Regional human resource development
- Regional planning and implementation.

The first part called "regional setting" establishes the objectives in terms of population, employment and environment. From those three general criteria, it fixes the goals in matters of industrial development. "The ability of the region to realize its housing, health, transportation and other goals is dependent in large measure on an economy capable of generating and sustaining high levels of private income and public fiscal resources." This first sentence shows the importance given and the attention paid to the economic development.

General Objectives Concerning Employment

The Baltimore region was considered to have 2.426 million inhabitants in 1970 (double the population of 1940). It is projected to have 2.8 million inhabitants by 1990. In 1970, the jobs in the region numbered 870,000 (f), which compared with the active population (AP) - 1.07 million - gave a job ratio \( \frac{f}{p} \) within the region of 0.81 using the following formula:
This employment rate is relatively favorable if it takes into account the job focus of Washington, but certain distinctions among the counties are not evident.

The major concentrations of commerce and industry and the institutions of government, education and medical care help define the physical configuration of the region. Less than 60% of the area's workers have jobs in the same jurisdiction as their place of residence. About 2/3 of Baltimore City's resident workers have employment within the city. The corresponding figures for the suburban counties ranges from 69% for Harford County to 33% for Howard County. The fact that an individual may live in one jurisdiction and hold a job in another has several implications for the regional public economy. For example, that portion of the States' income tax which is rebated to the local subdivisions is based on a worker's place of residence. Thus, while one unit of government must provide public facilities and utilities required by business and industry, another local government may derive at least a portion of the taxes levied on a worker's earnings. The resulting inequities are heightened if the employment is a region-serving public facility which does not contribute to the local property tax base.

In order to reduce the inequities between jurisdictions, the underemployment of some groups and to increase family income, some suggestions can be made:

- to redistribute jobs by:
  - removing old and unproductive industrial pockets
  - helping to relocate profitable industries (creation of an industrial land bank)
- bring the source of labor closer to the job market
- improving public transportation systems
- increase the number of jobs by
  - training labor for the jobs that are available
  - creating industrial districts which meet specific needs and follow market trends (slowing market for clothing, aircraft, electrical machinery, basic steel, durable goods, manufacturing industries with an increase of construction, transportation, communication and public utilities).

In 1990, the Baltimore region will have about 2.8 million inhabitants and a labor force estimated at 1.23 million persons. In order to improve the general employment situation, the mass of the jobs then available would have to be between 1.115 and 1.2 million. The job ratio would fluctuate between 0.90 and 0.97, i.e. a notable improvement.

We must notice that these hypotheses seem very optimistic. They suppose that the actual trend which shows a progressive decline of the job ratio (growth of the population higher than growth rate of jobs) will not only stop, but will be reversed.

The General Development Plan concludes that land for industrial use should therefore be contemplated far in advance of need. Within the next twenty years, it is estimated that about 10,000 acres in the region will be required for industrial use (at least 4 to 5 times this amount of industrial land will be necessary in order to meet industrial needs and specific requests). The comparison between industrial needs and actual development will be analyzed later in the paper. However, the first conclusions can be drawn about the Regional Planning Council action in terms of industrial location:
1. It provides an analysis of present and future development and gives an overview of what they consider to be desirable:

   - defining trends
   - enumerating needs
   - fixing objectives

2. The Regional Planning Council has no decisive power. However, it integrates officials of local planning authorities and receives a moral guarantee that the choices of the whole development and the urban coherence will be honored.

On the other hand, little or no information is given regarding

   - financial support for the proposed objectives

   - how the population and job projections are calculated (optimistic hypothesis).

Moreover, the R.P.C. mainly makes recommendations and then, the local authorities within their jurisdictions may or may not heed them.

The availability of industrial land (which is eight times more than what is needed) lessens the struggle insofar as speculation is concerned. On the other hand, this allows the developers and the local authorities to make decisions as to where industries should be located. But this does not seem to be an efficient way to redistribute jobs (tendency to disperse jobs) or to save money (tendency to overinvest in industrial parks).

The difficulty for U.S. authorities in keeping the land market in check constitutes a serious handicap. For example, to reduce industrial space to meet only projected needs - 10,000 acres - promotes land speculation and imposes high land prices for industry and "discourages" it from relocating. On the other hand, an increase of industrial space decreases speculative results, but increases the dangers of:

   - random distribution of industry and employment

   - overinvestment (convenience of the industrial district plus the network of highways, utilities, etc.)
In the Paris Region, the entire amount of available industrial land is limited for each Plan to twice the usable surface. Moreover, the land prices can be stabilized by procedures such as "zones d'aménagement différé" or by purchase of the land by expropriation by a public agency or a municipality.
LOCAL LEVEL

Local authorities who are in charge of land-use within their territory usually make use of a planning commission. Baltimore is an example of this. The Planning Commission, particularly in 1970, prepared detailed reports about the future of three industrial areas of Baltimore City and a fourth which is both residential and industrial. These reports discussed location and design considerations, zoning changes, development controls, cost benefits, etc.

Allied to these efforts in joint development planning, the Department began preparing applications for Economic Development Administration Grants in 1970. A city that qualifies as a Special Impact Area is eligible for grants paying 50% of industrial site development costs (roads, utilities grading). In addition, private developers are eligible for Business Development Loans, paying up to 65% of capital costs. As with the joint development proposals, the EDA grants help expand a city's industrial base, thereby increasing employment opportunities and tax revenue.

The Department was instrumental in formulating the $3 million economic development loan referendum, approved by the voters on November 2. The loan funds will be used to acquire properties, to construct access roads, and to install necessary public utilities so that the properties can then be sold to private investors for industrial development. The revenue from the sale of the improved properties will be used to replenish the fund so that more underutilized land can be acquired, improved and sold. Conservative estimates indicate that the industrial development resulting from each $3 cycle will create almost $1 million
in additional tax revenue for the city and 2,000 jobs." (1)

These facts demonstrate the interest borne by local authorities regarding industrial development and job growth. These authorities, moreover, have several financial tools. Relations with regional levels are close and often, as was the case for the Baltimore Metrocenter, the RPC was very concerned and assumed part of the work of the survey. The job of local planning agencies is not only to decide what the assignment of each part of the territory will be, but also to make decisions as to the physical use of the land.

The reasons for this are explained in the General Plan for Howard County (Maryland):

"The policies established to guide the development of industrial and basic employment activities are intended not only to provide a viable taxable base and employment guarantees for the residential work force, but they are also designed to enhance the physical quality of the work environment and to minimize air and water pollution which has become one of the major byproducts of industry.

"All basic employment functions that locate in Howard County would be subject to stringent site design and land use review before approval. The County will require architectural drawings for all buildings, including landscaping and buffering in order to insure that industrial development is both functionally and attractively designed. Moreover, industrial performance and space standards will be imposed on all industrial activities to prevent nuisances and harmful effects caused by pollution, noise, smoke, odor, traffic congestion and excess building coverage."

(1) Baltimore Plans, Department of Planning, May, 1972.
These previous explanations are very important. They show that the Planning Agency at the local level becomes increasingly interested and concerned not only with the employment growth but also with the physical transformations caused by that growth.
THE DEVELOPERS

The developers who establish industrial parks, are generally private persons or companies linked to large banks, as in Chicago where the Continental Bank controls almost one quarter of the industrial transactions in the area. Sometimes the developers are local jurisdictions, railroad companies, or even Chambers of Commerce.

The Baltimore region, for example, reveals a wide variety of developers. Among the 95 industrial parks in the Baltimore region:

- 86 have been or are being promoted by private developers such as "Industrial Realty Corporation", which is developing 5 industrial parks consisting of 189 acres and Albert Landay with 5 industrial parks and 64 acres.

- 6 promoted by cities or counties:
  cities - Baltimore - 2 industrial parks - 1 covering 89 acres
  1 covering 25 acres
  
  counties Baltimore County - 2 industrial parks covering 180 acres each
  Anne Arundel County 1 industrial park covering 240 acres
  Harford County 1 industrial park covering 180 acres.

- 1 promoted by a railroad company
  Penn Central Railroad Company - 1 industrial park covering 300 acres

- 2 proposed parks with developers as yet unknown.

The distribution of kinds of developers in the Baltimore region can be compared with other metropolitan areas (1).

The diagram on the following page indicates for four metropolitan areas the proportion of developers from public groups (cities, counties), railroad companies, private developers, and Chambers of Commerce:

- (1) indicates in each metropolitan area the number of industrial parks.
- (2) gives the total surface in acres
- (3) indicates the number of industrial parks promoted by each kind of developer
- (4) indicates in relative value the proportion of parks promoted by each developer

(1) Information obtained from Chambers of Commerce of Baltimore, Atlanta, Dallas and Chicago
<table>
<thead>
<tr>
<th>METROPOLITAN AREA</th>
<th>BALTIMORE</th>
<th>DALLAS</th>
<th>CHICAGO</th>
<th>ATLANTA</th>
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<tr>
<td>(1)</td>
<td>93</td>
<td>92</td>
<td>329</td>
<td>64</td>
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<td>(2)</td>
<td>13,403</td>
<td>13,834</td>
<td>48,209</td>
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<td>CITIES - COUNTIES</td>
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<tr>
<td>(3)</td>
<td>6</td>
<td>2</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>(4)</td>
<td>6.5%</td>
<td>2.2%</td>
<td>1.5%</td>
<td>1.6%</td>
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<tr>
<td>(5)</td>
<td>830</td>
<td>160</td>
<td>1389</td>
<td>500</td>
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<td>(6)</td>
<td>6.2%</td>
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<tr>
<td>RAILROADS</td>
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<td></td>
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<tr>
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<td>1</td>
<td>10</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>(4)</td>
<td>1.1%</td>
<td>10.9%</td>
<td>6.1%</td>
<td>10.9%</td>
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<td>300</td>
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<td>4821</td>
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<tr>
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<td>2.2%</td>
<td>18.0%</td>
<td>10.0%</td>
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<td>86</td>
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<td>12,273</td>
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<tr>
<td>(6)</td>
<td>91.6%</td>
<td>80.8%</td>
<td>87.1%</td>
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<tr>
<td>CHAMBERS OF COMMERCE</td>
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</tr>
<tr>
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<td>-</td>
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<td>6</td>
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<tr>
<td>(2)</td>
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<tr>
<td>(3)</td>
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<td>-</td>
<td>1025</td>
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<tr>
<td>(4)</td>
<td>-</td>
<td>-</td>
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</tr>
</tbody>
</table>
- (5) indicates the total surface in acres by each kind of developer
- (6) gives the relative proportion of surfaces by each kind of
developer compared with total surface for all developers.

Relative values indicated in parts (4) and (6) were significant, permitting
the following observations:

- Public groups, excluding Baltimore City are generally little
involved in the final processes of industrial park creation.

- The railroad companies, as in Chicago and mainly in Atlanta and
Dallas where they promote more than 10% of all the industrial parks, take
an important part in industrial development.

- Chambers of Commerce are only represented as developers in Chicago.
However, among the 6 promoted industrial parks, five are directed by the
same group: the Joliet Chamber of Commerce.

- As for private developers, they control in all cases more than 80%
of industrial parks; sometimes (Baltimore and Atlanta) more than 90%
and more than 80% of the entire industrial surface. Their influence is
therefore preponderant. The developers, in many cases, decide themselves
what will be the characteristics of their industrial park. This advantage
constitutes a risk for the local authority who has no guarantee as to
the quality of the park and the kind of firms which will locate within it.

Moreover, the developer, until the industrial zone is entirely
occupied, is responsible for the internal organization of the park. He
is the person to whom businessmen and local authorities come for all
problems related to the park. But when the park is completed, the
developer can retire (which is frequently the case) and the firms become
responsible for its day to day operation.
PARTICULAR CHARACTERISTICS OF INDUSTRIAL DISTRICTS

1. Baltimore Metropolitan Area

The General Development Plan established by the Regional Planning Council fixed the goals related to industrial space: 10,000 acres in 1990. Already, the surface counted in existing or short term projected industrial parks is about 13,703 acres. Until 1990, the available land will be about 45,000 acres (General Development Plan).

1.1 Size of Existing Parks

The following diagram sums up the size of industrial parks:

<table>
<thead>
<tr>
<th>Acres</th>
<th>Number Industrial Parks</th>
<th>% Value of Industrial Parks</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ 1,000</td>
<td>2</td>
<td>2.1%</td>
</tr>
<tr>
<td>500-999</td>
<td>3</td>
<td>3.1%</td>
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<tr>
<td>200-499</td>
<td>15</td>
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<td>100-199</td>
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<td>50-99</td>
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<tr>
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<td>42</td>
<td>44.3%</td>
</tr>
<tr>
<td>total</td>
<td>95</td>
<td>100.0%</td>
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</tbody>
</table>

The industrial parks whose size are more than 500 acres are not numerous and represent only 5.2% of all the industrial parks in the Baltimore metropolitan area. However, they cover more than 36% of the whole industrial surface (4,960 acres). The more numerous parks are those having less than 50 acres. Among these 18 have less than 20 acres (19%). The result of this distribution shows an average size that is relatively low, about 144 acres.
1.2 Location of Industrial Parks

The map showing location indicates three types of industrial park concentrations:

a. The higher density is situated between the town center and the Baltimore-Washington International Airport, formerly Friendship Airport, with two extensions:
   - one along the railroad leading to Washington
   - the second along Interstate 95 toward Washington.

b. The second concentration is found on the railroad line connecting Baltimore - Philadelphia - New York, and on the Pulaski Highway, as well as along the Kennedy Memorial Expressway.

c. The third concentration which is less important than the preceding two, follows Interstate 83 toward York, Pennsylvania and follows the Penn Central railroad toward the North.

The other locations are dispersed, the more numerous being to the North in Harford County.

The following map shows:

a. That a highway-railroad concentration is the most attractive for industry. For that matter, 50 out of the 95 parks are connected to railroad lines. The proportion seems important in comparison with other regions or with France.

b. That the role of the Beltway is not very important as a location factor, for the industrial parks located on this beltway are not very numerous and are in general of small size. More important seems to be the North-South axis (Washington-New York) along which are located about 80% of Baltimore metropolitan area parks. The comparison between Baltimore industrial development and regions such as Dallas can offer useful elements
for analysis.

2. Dallas County

2.1 Surfaces

The following table indicates the surfaces occupied by the 92 industrial parks of Dallas County:

<table>
<thead>
<tr>
<th>Classification</th>
<th># Parks</th>
<th>% E Parks</th>
<th>Surface Acres</th>
<th>% E Acres</th>
<th>Av. Size Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Industrial</td>
<td>23</td>
<td>90%</td>
<td>13,076</td>
<td>95%</td>
<td>157</td>
</tr>
<tr>
<td>Zoned All Industry</td>
<td>4</td>
<td>5%</td>
<td>421</td>
<td>3%</td>
<td>105</td>
</tr>
<tr>
<td>Commercial</td>
<td>1</td>
<td>1%</td>
<td>27</td>
<td>-</td>
<td>27</td>
</tr>
<tr>
<td>Heavy Industrial</td>
<td>2</td>
<td>2%</td>
<td>176</td>
<td>1%</td>
<td>88</td>
</tr>
<tr>
<td>Lt. Ind, Office Commercial</td>
<td>1</td>
<td>1%</td>
<td>20</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Research</td>
<td>1</td>
<td>1%</td>
<td>125</td>
<td>1%</td>
<td>125</td>
</tr>
<tr>
<td>Total</td>
<td>92</td>
<td>100%</td>
<td>13,834</td>
<td>100%</td>
<td>150</td>
</tr>
</tbody>
</table>

The light industrial districts cover the major part of reserved activities space in Dallas County. Ninety percent of the industrial parks are reserved for light industry and cover 95% of the surface devoted to such activities.

We must take note of the importance of other kinds of parks in Dallas such as heavy industry, research and commercial parks, indicating that the activity of these parks is very specialized. The average size of industrial districts - 150 acres- is relatively low (higher than the average of the Baltimore region, but lower than that of Chicago and Atlanta, which is 357 acres). The above, however, disguises the differences which are indicated in the following table.
<table>
<thead>
<tr>
<th>Size of Industrial Parks</th>
<th>Number of Parks</th>
<th>% E of Parks</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ 1,000</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td>50-999</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td>200-499</td>
<td>10</td>
<td>11%</td>
</tr>
<tr>
<td>100-199</td>
<td>19</td>
<td>21%</td>
</tr>
<tr>
<td>50-99</td>
<td>19</td>
<td>21%</td>
</tr>
<tr>
<td>- 50</td>
<td>38</td>
<td>41%</td>
</tr>
<tr>
<td>Total</td>
<td>92</td>
<td>100%</td>
</tr>
</tbody>
</table>

More than 80% of the industrial districts have less than 20 acres and 41% less than 50 acres. It is therefore composed largely of small-sized districts. The six parks having more than 500 acres represent almost 41% in proportion to the entire industrial surface.

2.2

The industrial areas are grouped into two major centers which are relatively dense. The most important with 49 industrial districts (53% of all districts) is located between Preston and Fort Worth Roads, which is the quarter Northwest of the County between the city center and the new Dallas-Ft. Worth Airport. The 49 districts cover 7,197 acres, or about 52% of the entire industrial surface.

The second center is located in the Northeastern quarter and is heavier in the Garland area with 26 industrial districts and 28% of all the industrial parks in Dallas County. The others are equally distributed, but scattered among all the other parts of the county.

The explanatory elements of the major industrial district location can be formulated in terms of the particular distribution explained earlier. An analysis of land prices brings out the following information:
The concentration of highway and railroad networks is a vital element in attracting industry:

- 82% of the industrial districts are connected to or close to the railroad facilities
- 93% of the industrial districts are located within less than 2 miles of a highway connection or a primary road.

The impetus for economic development introduced by the new Dallas-Ft. Worth Airport and by the city center is undeniable. More than half of the industrial districts are located between these two poles and in a space utilizing 10% of the county surface.

2.3 Land Prices

Land prices for industrial districts vary with the location of the district (from $0.10 to $6.00 per square foot) and vary within the same district ($1.00 to $6.00). In Cedar Hill, a zone located to the South of the county and the furthest from the city center and new airport, the average cost per square foot is about $0.10 - $0.15. Land prices are the highest in Brookhollow and Trinity as both are located between the city center and the new airport.

We must notice that while Cedar Hill only covers 40 acres and is half filled, Brookhollow and Trinity cover more than 1,000 acres each and are 90% filled. The analysis of an industrial park such as Brookhollow allows one to appreciate the elements involved in establishing a successful and economically viable park.

Brookhollow

The industrial district of Brookhollow was established relatively recently. Plans were announced in September 1953; the first occupants
moved in in mid-1954. Brookhollow Industrial District is located on both sides of the Leslie A. Stemmons and Carpenter Freeways at a point where they merge to form a multi-lane artery to downtown Dallas. As an adjunct to its 1100 acre industrial district, Windsor Properties, Inc., the developer, began development of Empire Central, an office building center in 1957.

This was a new concept for office and commercial functions and currently has half a million square feet of office building space occupied by 23 firms. Also included in the office center complex is the Empire Central Community Center and recreational area for use by employees of the development.

Moreover, recognizing the importance to industrial firms of keeping employment turnover to a minimum, the developer gave special attention creating an environment conducive to attracting and holding workers. An important feature of the plan is the district's service area (cafeteria, club with dining room and lounge located on a landscaped four acre site within convenient distance of all district industries, service station, barber shop, laundry, office furniture and supply stores, post office, physician's and industrial psychologist's office, motels, grocery store, etc.).

In Brookhollow, three capital factors to attract industry were merged:

a. excellent location (connections between two highways between the city center and the major airport)

b. existence of office buildings

c. good internal organization (district services).
The distribution of average industrial land costs permits one to quantitatively and qualitatively measure the value of different locations. Land prices increase according to the location itself and according to the amenities provided. But the speculative factor is most important. The purchase price of land is subject to speculation and influences the final price more than the existence of utilities, etc.

The following drawing indicates the average land prices according to the location of major industrial districts, the major railroads and highways, the urban center and airport. The area where land prices are highest is not in the urban center but between it and the new international airport.

In the Paris region, the most valuable land is between La Defense (a new business center of Paris to the West) and the old center of Paris.

The following map indicates the 150 price curbs of the major industrial districts of Dallas County.
SYNTHESIS OF DIFFERENT KINDS OF INDUSTRIAL LOCATIONS IN THE U.S.A. 
AND FRANCE

The analysis of different types of activities concentration in the 
Baltimore and Dallas regions and also in main industrial parks of the U.S. 
provide for us information about general industrial location factors.

What are industrial requirements?

1. Availability of manpower

2. Enough space, cheap and offering the required utilities

3. Efficient ways to supply and distribute

Added to these needs are those related to internal amenities, local 
tax rates, etc.

1. Vicinity and availability of manpower

The industrial park must be easily accessible to the urban center, 
which is the main supplier of manpower. The accessibility of the center 
reduces problems of competing for the same skilled manpower. The 
necessity for firms to make use of manpower has been recognized by the 
Baltimore Planning Commission which decided in 1970 to investigate means 
by which to improve the connections of public transportation between the 
city and the industrial centers of the outskirts.

In addition to public transportation, which is used only by a 
fringe of the population, an excellent highway network is necessary. 
The fact that most industrial parks are located on radial roads can be 
explained by economic needs, supply and distribution, and also by the 
transportation needs of the workers.

The U.S. industrial parks are usually chosen according more to 
economic needs than to the availability of manpower. Because of this,
roads must be built to enable transportation to flow smoothly to the parks. This characteristic belongs to a more general policy which considers the industrial park to be a tool - one of economic development power.

In France on the other hand, the industrial park is considered to be more an element of the urban balance. It is mainly an employment supplier. This consideration permits the Paris region to locate the "activities zones" close to housing without attention to the economic needs of firms and the economic role of industrial parks.

2. Space Arrangement

The Land. One of the main needs when an industry is created or has to relocate, is the need to find the most land at the cheapest price. Moreover, the land must offer the guarantees of industrial designation in order to avoid a new relocation. There must also exist possibilities for later expansion. According to the type of business, the size and shape of the land can vary. A solution, such as division into lots according to need, is preferable.

Arrangement. The other needs concern the activity exertion itself. The firm must find all the networks (water, gas, sewer) which it requires.

- Water Supply. The availability of a public water supply usually determines the location of the districts as well as the type of industrial activities that can be conducted in it. Prospective development of self-contained industrial communities in unincorporated areas is frequently discouraged because existing water resources are controlled by adjacent or nearby municipalities. Cooling processes and air conditioning require considerable water. Moreover, fire services have water needs which determine what kinds of firms the park can receive. For, a plant which presents a high fire or explosion risk (i.e., a cartridge plant)
will be discouraged from locating in a zone where water supplies are inadequate (specifications of the National Board of Fire Underwriters).

- Other Utilities. The availability of gas and electric power is another vital consideration in the location of industrial districts, as well as the availability of sanitary sewer service and telephone. But these utilities, in order to constitute attractive factors, must exist not only in the plans, but in reality. The arrangement of land is an expensive investment, mainly because to reduce the whole cost it is preferable to set up the entire park rather than proceed piecemeal. But there is no guarantee that when the land is ready to be occupied, industries will come and the entire enterprise will be viable.

This has led the U.S. use the Block Planning system which permits a park with large successive pieces to be flexible in the amount of land they can offer a customer. It limits the investment risk by beginning one development at a time. The industrial park is established as a sequence of individual but continuous parks.

The industrial parks in the U.S. are designed to meet industrial needs. The land is then cut into super blocks which permits division of the land into unequal parts, but in keeping with industry's requirements. Moreover, the extension possibilities are often taken into account. Firms can buy a lot larger than their actual needs or can extend the plant into the next block which is the case in Dallas.

There are few differences with regard to utilities (water, gas, electricity) between the U.S. and France. In France, the industrial zones rarely offer extension possibilities. The super block is becoming more widely used, but the old-fashioned "lotissements" are more prevalent.
#. Accessibility

The need to assure supply and distribution of products makes the firms dependent on an efficient transportation network: highways, railroads, airports.

a. Highway accessibility. Easy accessibility to a main thoroughfare is a major consideration in the location of an industrial district. More important than the transportation of products and manpower is the fact that the highway has an excellent advertising potential. We must notice that in France, except the official advertising bulletin boards (prevention routiere), no private advertising exists. However, in the U.S., a few industrial parks are adapted to the advertising potential. It is more frequent in Canada where the parks take a linear shape along the highway (industrial parks along the expressway between Montreal Airport and the city). Moreover, the linear solution offers the further advantage of dividing traffic access. This seems more useful than to limit cars and trucks to two or three exits.

Sites along or convenient to circumferential Beltways (such as Boston's Route 128) are considered choice locations by some industries, particularly those serving the metropolitan market area. But that type of location (i.e., the Baltimore Beltway) is less preferable than the location with proximity to the exchanges and the location with links to highways and railroads.

b. Rail Service. In the past, the availability of railroad transportation has been a major requirement for industry. Most of the large industrial districts in the U.S. established after 1950, do not connect with railroads. It is evident that there is a decline in the
importance of railroad links particularly for parks specializing in such things as research. Firms as those in the electronics industry or other related industries do not require rail service, but the rail presence seems necessary for the following reasons:

1. Although the initial tenant may not require railroad links, subsequent occupants of the site (or building) may need them.

2. Even though an industrial district occupant may not ordinarily require rail service, its availability assures the industry of continuous service in the event of a widespread strike in the trucking industry or in the case of a fuel shortage (i.e., December, 1973).

3. The immediate availability of rail service gives the industrial district occupant a stronger bargaining position with other transportation media than he would have without it.

4. In some cases, industrial buildings with a railroad link may be easier to finance than those without it.

5. While the railroad's proportion of total industrial shipments has been falling off rather steadily over the past 20 years (and the trucking industry has been gaining correspondingly), should this trend level off, or reverse, those districts without rail would be at a competitive disadvantage.

To summarize, the availability of railroad links provides one more measure of flexibility and flexibility is vital to successful industrial district development. After the 1950-1965 period which saw the decreasing role of the railroad, the actual trend in the new parks is to assure rail connections even if they are underused (Baltimore and Dallas regions).

c. Airports. Recently there has been a tendency toward accelerated industrial development in the vicinity of major commercial airports. The major factors influencing this location are as follows:

- High quality, high capacity highway access. The airports require a high capacity and quality accessibility. The industrial location nearby takes advantage from this position.
- Availability of air transportation. Some businesses using company planes locate near an airport facility. This facility is good only for a number of industries, for example, an electronics firm of high precision industry. But the location of an airport is rarely required for the majority of industries.

- Prestige location. Most important of all the factors is the prestige location offered by the proximity of an internationally-known airport. Besides, natural services linked to larger airports (hotels, motels, restaurants) can be used by a nearby firm.

We can summarize the differences regarding the means of transportation between the U.S. and France in this way:

Highways. The U.S. recognizes the necessity of the proximity of an industrial park to highways and interchanges. On the other hand, the highways are considered as an advertising potential and are recognized as an attractive element which has not yet been promoted (linear development). In France, the highway plays a utilitarian role and is used mainly for the convenience of workers and less for the delivery of products.

Railroads. In the U.S., there is an apparent decline in the use of railroads, although its use continues to be important with a tendency to connect more and more parks even if the rail is underused. (i.e., in Baltimore more than 50% of industrial parks are connected to railroads). In France there is a tendency to use railroads less and less and to reserve them for the obvious needs (maximization of utilization). Firms are dissuaded from purchasing land near railroads because of the high costs involved.
Airports. The U.S. recognizes the economic and attractive role of airports (prestige location) and tends to promote industrial parks in their vicinity. In France, however, strong land use laws exist in the vicinity of new airports (i.e., l'Aéroport de Ruissy). There is a ban on building plants nearby, except public industrial parks, in order to avoid traffic congestion, overemployment and noise problems.
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