

Conf-920430--71

ENVIRONMENTAL AMENITIES AND THE LOCATION OF INDUSTRIAL ACTIVITY*

by

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ANL/CP--75152

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ABSTRACT

Discussion of the impacts of perceived risk on decisions to locate business activity in areas likely to host noxious facilities has become an important part of socioeconomic impact analysis. The paper reviews the literature and presents empirical evidence, and shows that amenities are only a significant location factor for certain types of business activity. Policies to offset the potential loss of businesses through perceived risk in communities hosting waste facilities, should, therefore, carefully consider the sensitivity to environmental amenities of the types of business activity present or likely to locate.

I. INTRODUCTION

The evaluation of perception-based impacts of hazardous waste facilities has become an increasingly important part of socioeconomic impact assessment in recent years (see Decision Research and Mountain West 1989). One area in which there has been discussion of the potential economic impacts of changes in perceptions of risk and stigma has been business location decision making (see Opinion Research Center 1988). This paper evaluates the importance of environmental amenities (broadly defined to include natural, cultural and recreational features, environmental quality, and other indices of quality of life) to decisions made to locate both manufacturing and business service activities. The sensitivity of decisions made to locate a range of industrial activities to perceptions of risk in regions or communities hosting noxious and unwanted facilities also discussed. (Not included in the discussion is an analysis of decisions made to locate consumer service, retailing activities and other commercial development).

II. THE EMERGENCE OF AMENITIES AS A BUSINESS LOCATION FACTOR

Amenities have often been cited as important to industrial location decisions (see, for example, Smith 1971; Kale and Lonsdale 1979; Ballard and James 1983; Keeble 1989), and promoted by planners and local authorities as a means of attracting new industry (Burgess 1982; Raitz 1988). Significantly less empirical work, however, has been done in this area.

At the regional level, studies of the importance of amenities are often limited by the type of data available that can be used to represent the level of amenities in a location; climatic variables are used most frequently. The lack of plant-level data also limits analysis to the use of regional industrial growth variables as proxies for trends in the location of individual manufacturing plants and business service establishments (see Wheat 1973, 1986; Keeble 1980, 1989; and Plaut and Plaut 1983). At the metropolitan level, access to recreational amenities has been considered as a factor in the growth of office space and employment (Ihlanfeldt and Raper 1990). Although results from these studies show amenities to be somewhat significant to both industrial and office growth, some doubt must be cast on the validity of the results for policy analysis, given the often proxy nature of the variables chosen.

More meaningful analysis of the role of amenities to industrial location decisions would place them within the broader context of changes in the orientation of the U.S. economy toward light manufacturing and business services, and changes in the spatial organization of firms. These changes have placed a

*Work supported by the U.S. Department of Energy, Office of Civilian Radioactive Waste Management, under contract W-31-109-Eng-38.

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different emphasis on which factors are important to the location of industries and employment. In many cases, manufacturing and business service firms have become more flexible with regard to the location of material inputs, and changes in transportation technology and telecommunications have reduced the costs of marketing many manufactured goods and business services. As a result, labor costs have often emerged as the single most important factor in determining where to locate new industrial activities. Increased locational flexibility has allowed many firms, especially large corporations, to separate specific activities (such as headquarters, research and development facilities, support services, sales offices, and production facilities) and choose cost-minimizing locations for each activity on the basis of a consequently smaller number of minimum locational requirements. Accordingly, separate functions have developed their own locational patterns.

Corporate headquarters, for example, and other high-level business services (such as finance, insurance, legal, advertising, and consulting services) have located in the centers of a small number of large cities. The economics of agglomeration dominate the location of headquarters and their associated service functions, with in particular the need to minimize the costs of face-to-face contact between high-level executive functions. Part of the decision on where to locate headquarters facilities may be based on amenities found in metropolitan areas. Schmenner (1982), for example, surveyed headquarters in New England to establish which factors were important to site selection and found that when choosing between regions, markets and labor (wages and labor skills) were most frequently ranked as important; amenities (aesthetic quality) were only important to a smaller proportion of respondents. At the local level, where firms were required to choose specific sites for a facility, however, amenities assumed more significance. Burns and Pang (1977) found that amenities were important to decisions to relocate corporate headquarters from central city and suburban locations for 38 headquarters facilities surveyed, with cultural attractions, university facilities, entertainment and residential environment, found to be important. Research and development activities also tend to be located at the peripheries of larger urban centers, where proximity to scientific and technical labor and headquarters facilities are the most important location factors (Malecki 1989).

A limited amount of evidence has been collected on the role of amenities in the choice of location for office activities in general, as distinct from headquarters functions. Rhodes and Kan (1971), for example, conducted a survey of 60 commercial offices that had moved from central London, either partially or completely. Managers surveyed placed considerable

value on the quality of the area surrounding their new location, particularly its lack of a manufacturing base or the likelihood of one developing in the future.

Other activities have been located in more peripheral areas and may not be influenced by locational amenities. Routine manufacturing production activities of larger corporations, for example, are often located on the basis of geographic variations in production labor costs, with the extent of local material and information linkages and costs of product transportation being relatively unimportant (Kale and Lonsdale 1979). Similarly, routine data processing functions (back offices), often follow a similar pattern, with labor costs being the primary locational determinant. Often these functions are tied to other corporate locations by telecommunications links, through which they receive and send relevant inputs and outputs (Moss and Dunau 1986).

For smaller manufacturing firms, the importance of amenities seems to vary according to the spatial scale at which the location decision is made. Spooner (1973), in a survey of key workers and managers in industrial facilities that had moved into southwestern Britain, found amenity factors to be more important to the regional compared to the local search. Stafford (1974), in a survey of manufacturing relocation in Ohio, found that firms conducting a regional search placed more emphasis on amenities when choosing a new location. For firms conducting only a local search, amenities were not as important as personal contacts, labor factors, transportation and markets. Amenities specifically installed to attract new firms were not found to be significant.

Smaller business service firms, on the other hand, are more locationally footloose than manufacturing firms, and in some cases more emphasis is placed on locational amenities. Improvements in telecommunications and the growth of contact networking have allowed an increase in subcontracting of services by larger manufacturing and service firms to smaller service firms, allowing these firms to locate in more peripheral areas that may also offer a richer amenity base.

Structural changes have also been accompanied by significant shifts in the occupational structure of employment, with a larger proportion of the manufacturing labor force now involved in service occupations than in occupations directly associated with production. Significant growth has also occurred in independent business service firms. The separation of activities within many firms and the specialization of functions at each location has also led to a spatial division of labor with different functions supporting certain specialized occupations at

different locations. At locations likely to require highly educated labor, decisionmakers often give careful consideration to the level of amenities. This has been the case in particular for the location of high-tech manufacturing and service-related activities, including electronic data processing equipment, telecommunications equipment, and consulting services (Markusen et al. 1986; McGregor et al. 1986; Hall et al. 1987; Keeble 1989). Hall et al. (1987) also found that the importance of amenities depends on the type of firm. Favorable housing costs and availability, cultural and recreational facilities, pleasant environment, and social relations with others in the same industry were much more significant for branches of multi-site and multinational firms than for single-site firms.

Amenities may also be important to success in recruiting and maintaining staff at new and existing locations for office-based firms. Pacione (1981), for example, considered the effect of residential desirability on interregional office relocation decisions, and found cultural and recreational amenities to be an important part of the decision to choose a new office location. Ley (1985) assessed how amenities affect employee satisfaction at two metropolitan locations, one downtown and one suburban, and found cultural and recreational amenities to be a more important consideration at the downtown location, and environmental amenities more important at the suburban location.

It would appear that sensitivity to environmental considerations, cultural and recreational amenities and the quality-of-life in particular, has become important to location decisions for some firms and business activities. The next section reports the results of a recent survey of firms that specifically considered the importance of amenities, by size and type of firm, and also discusses the influence of occupational structure on the valuation of amenities in the location decision.

III. SURVEY OF FIRMS IN COLORADO AND UTAH

We examined the role of environmental factors compared to other factors thought to influence the location behavior of different types of manufacturing and business service activities through telephone surveys of firms in Colorado and Utah. These states were chosen because of their proximity to Nevada making them competitive business locations, and the cultural, recreational, physical and environmental similarities they have with Nevada. The survey considered factors in five major groups, labor (cost and quality), communications, market access, taxes, incentives to new businesses, and amenities (including natural features, cultural and recreational facilities,

environmental quality, and other indices of quality of life).

Respondents ranked a total of 27 location factors according to how important each would be to both their local and regional search for a new location. Responses were therefore pre-move rather than post-move, reflecting their current evaluation of present locations. Responses also indicate the geographic scale at which each amenity characteristic is likely to influence the location decision. Both manufacturing and business service establishments were surveyed, with information on type of plant (headquarters, single-plant establishment, multi-plant establishment, research and development facility, back office, etc.) also being collected. Response rates were 31.8% for the manufacturing survey (209 plants) and 42.1% for the business services survey (214 establishments).

IV. FINDINGS

Preliminary results show that for the establishments in the survey, choosing a location for a manufacturing plant or business service establishment would include some consideration of the level of environmental amenities. This would include a comparison of both point sources (cultural and recreational facilities, noxious facilities) and non point sources (quality of life, pollution, crime, housing quality, and schools) of both amenities and disamenities present in a location.

Significant differences seem to exist between manufacturing plants and establishments providing business services, with the latter being much more sensitive to amenity considerations. For all manufacturing plants, low business taxes cost and availability of suitable premises, and the attitude of state and local government toward business, were the most important factors. Quality of education and physical environment also featured in the top ten most important factors. Plants with less than 20 employees rated amenities as more important than did larger establishments, with cost and quality of housing an additional factor important to smaller establishments. Across all business service establishments, quality of life was the most important location factor, with lack of crime, natural environment, schools, climate and housing also ranking in the top ten, after access to markets. After quality of life and markets, larger establishments placed more emphasis on premises, government attitudes, and taxes than smaller firms. For smaller establishments, the emphasis was almost entirely on amenities, with only markets, premises and government attitude also included in the ten most important location factors.

Significant differences also seemed to exist across the

business activities surveyed, depending on whether the manufacturing plant was a single-plant firm, part of a multi-plant firm, or on whether the business service establishment was a single establishment firm, part of a multi-establishment firm, a headquarters, a research and development facility, or data processing facility. Our results show that branch facilities of multi-establishment manufacturing and business service firms are much less sensitive to environmental considerations than are single-plant manufacturing or service firms. We found that this result was related to occupational structure in each type of plant. Activities that required higher levels of scientific and technical support seemed to rate amenities as a more significant consideration to expansion or relocation. This was particularly true for headquarters facilities and a significant number of single-establishment service firms.

Follow-up interviews with managers and key personnel at both manufacturing and business service firms yielded more information on the role of amenities in the location decision. Our results suggest that although some firms may be attracted to certain amenity-rich locations (particularly locations with a high level of amenities in the natural environment), many see a potential new location primarily in terms of the need to minimize contact or proximity to certain disamenities, with the need to maximize access to amenities being secondary. The latter is typically the case in situations where non amenity location factors can be satisfied only in a limited number of locations, applying in particular to manufacturing and business services requiring specialized highly educated labor resources.

V. CONCLUSIONS AND IMPLICATIONS FOR HLW DISPOSAL PROGRAMS

A growing amount of empirical evidence has been collected on the importance of amenities in decisions to site or relocate businesses or business activities. From this literature it is clear that not all business activities consider amenities in their location decisions. Amenities do seem to be considered by firms that are large enough that they can separate different functions and choose separate locations for each, and by a limited number of smaller manufacturing and business service firms. Headquarters facilities, and other activities requiring high-order executive and white-collar functions (such as finance, insurance, legal, services, advertising, research and development activities) are likely to primarily consider the need to minimize the costs of face-to-face contacts between clients, customers, and other parts of their firm, and may consider amenities found in larger metropolitan areas as a secondary factor. Smaller firms that market specialized business services

have often also chosen to locate in larger urban areas close to their customers, where similar amenities might also be an additional consideration.

Growing evidence suggests, however, that smaller specialized business service firms (such as engineering, management and computer consulting, architecture, marketing, and financial services), might also be able to compete from smaller regional centers. Improvements in conventional mail and telecommunications, together with the increasing use of contact networks to access potential customers have all encouraged decentralization. It is unclear, however, how cultural and recreational amenities (and absence of disamenities found in larger urban centers) associated with smaller cities have influenced the location decisions of smaller business service firms. Some firms may choose amenity-rich locations if they can also attract the necessary staff from elsewhere, while others choose locations that have already attracted highly educated, highly mobile occupations. In the latter case, amenities are only an indirect influence on the location decision. Amenities may also influence the decision whether or not to remain in a particular location for a number of smaller business service and specialized manufacturing firms started by staff members originally employed locally by larger firms.

Amenities are much less likely to influence the location of the majority of manufacturing activities. Within large manufacturing firms, amenities may indirectly influence the location of facilities producing products in their early stages of development, through their need to be located closer to headquarters and research and development facilities that provide initial support. When production becomes routine and does not require substantial scientific and technical backup, however, it is located in more peripheral areas, where the cost and availability of production labor is the prime locational determinant. Here amenity considerations are much less likely to be important with there being few executive and scientific and technical occupations at the majority of manufacturing branch plants. The same locational processes also apply to the office functions of manufacturing and service firms.

Manufacturing activities undertaken by smaller firms may show slightly different locational patterns to those of the larger firm, with the individual preferences of the entrepreneur, (particularly local knowledge of markets and suppliers, and preference for hometown locations), also important factors. For the small firm, therefore, local cultural preferences may provide an amenity basis for the decision to choose a location, and perhaps to remain there in the event of the siting of a noxious facility.

As it is likely that sites for HLW facilities will be found in predominantly rural areas, or possibly in the vicinity of smaller metropolitan areas, from the evidence presented, it seems that only a limited number of industrial activities are likely to be subject to perceptions of risk. Of the various types of industrial activity found in larger firms, only manufacturing branch plants and back office functions are located in communities likely to be chosen to host HLW facilities. It seems likely that the decision to site noxious facilities would not significantly alter perceptions of risk in corporate decisionmakers or key personnel, their being situated in facilities located in larger metropolitan regions.

Smaller manufacturing firms have often chosen to locate in rural communities and smaller regional centers. However, in many cases these are businesses established in the hometown of the entrepreneur, where cultural amenities may be more important than environmental quality. Cultural factors that tie smaller manufacturing firms to the local community may well outweigh perceptions of risk associated with the siting and operation of noxious facilities.

The impact of perceptions of risk associated with the siting and operation of HLW facilities on industrial location decisions is likely to be much less significant than has often been predicted. Policies designed to offset the negative effects of noxious facility siting, therefore, clearly need to determine which activities are influenced by amenities in locations likely to host these facilities, and consequently those activities most likely to be affected by perceptions of risk of environmental degradation.

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