

INFRASTRUCTURE AND ECONOMIC DEVELOPMENT

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ABSTRACT.— 1989 was the year in which infrastructure provision became a very visible item on the political agenda. The Civic Trust felt impelled to «draw attention to the unreasonable and perverse lack of investment in basic infrastructure and decent civic amenities within our urban areas», and the C.B.I. published a report entitled ‘Trade routes to the future: meeting infrastructure needs for the future’, with recommendations for a massive roads programme. The Secretary of State for Transport responded with a promise to spend £ 14.000 million over the three years to 1993. Nor was argument over infrastructure provision limited to transport: school and college buildings, water management facilities, sewage works and power stations were all the focus of comment during the year. Behind this increasingly strident debate lies a deeply problematic area of public policy. How much infrastructure does the United Kingdom need? And is the current programme of provision optimal from an economic development perspective? This chapter reviews the difficulties that lie in the way of answering these questions and the diverse aspects of public policy that are involved.

Infrastructure: Principal Characteristics

No single definition of infrastructure seems to be generally accepted¹, but the term is usually associated with the diverse collection of public assets that underpins the economy —however provided and managed— and possesses three basic elements:

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¹ The term «social overhead capital» is often also used because it covers social infrastructure such as public health and human capital investment facilities, including training and education in addition to the assets traditionally regarded as infrastructure such as transport and communication networks, the public utilities, and basic public services such as the police and the judiciary.

— they are a *collective* input into production by local, regional or national state authorities because private and exclusive use by any individual firm would be either uneconomic or the benefits indivisible.

— large investments are involved, into *mainly physical but also human capital*, from which a long-term stream of benefits may be expected;

— they are *integrative* because economic agents are linked together, through transport and telecommunication networks and transactions between them.

The multiplicity of forms of infrastructure and their diverse funding characteristics means that the relationship of infrastructure to economic output is not only very complex but also very real. As a direct or indirect input into production and through the creation of external economies or diseconomies the cost structure of each and every firm is affected by the quantity and quality of infrastructure provision. On the other hand, infrastructure provision is often inadequately financed by revenue from use related sales, and consequently there exists a multitude of other financing mechanisms ranging from flat fees, rates and local taxes to national income and corporation taxes.

Infrastructure and economic development

In the 1960s and 1970s considerable amounts of public expenditure in Europe and in the developing nations of the Third World (under aid programmes) took the form of infrastructure programmes within regional development strategies. The belief that for example a dependable electricity supply, and efficient road network or a reliable telephone service would underpin economic development was visible in UK policies for economic development² and remains clearly visible in the present operation of the European Regional Development Fund. Such widespread conventional wisdom was based both on the argument formulated by R. O. Hirschmann³ that 'infrastructure is the provision of a base for directly productive activities' and on the extensive public sector involvement that was generally required.

In contrast to the apparent simplicity of this aggregate approach is the complexity of infrastructure/industry relations at the micro level. Infrastructure provision affects the cost structure of firms both directly in terms of user charges (gas, electricity) and indirectly, through public expenditure (e.g. roads, police etc.). The economic nature of the infrastructure contribution to production depends on its relationship to the other inputs in the productive process. Where it can be shown that the firm has very little or no possibility of substituting for an infrastructure input (e.g. clean water) and therefore a certain quantity and quality of provision is a necessary component in the production process, then important implications arise for economic growth. After utilisation of the whole capacity available, further

² Diamond DR and Spence NA, *Regional Policy Evaluation*, 1983.

³ See Hirschmann RO, *The Strategy of Economic Development*. 1958.

growth must create bottlenecks and give the firm, in theory at least, the option of moving to a locality where infrastructure is in surplus. (Alternatively it could seek to provide its own infrastructure). Both these options are difficult and the case for more infrastructure to maintain economic growth is clear, although there are some factors which complicate this broad conclusion⁴.

Current infrastructure provision

Two rather contrasting generalisations can be made at the present time, which taken together indicate some of the complexity and urgency that currently characterises public policy in this field. Also they provide an inescapable context for any survey of entrepreneurs' views.

The first generalisation is that, arising from the diverse nature of infrastructure provision, there has come into existence a multiplicity of agencies with differing responsibilities and a variety of separate policies. They have a wide range of highly variable stock, managed in quite contrasting economic and social contexts.

The second generalisation is that despite the variety there are important common elements among the issues that face the infrastructure providers, and two aspects are particularly significant. The combination of urban history technical change has resulted in severe renewal and replacement needs in the period 1950-2000. This aspect is thrown into even greater significance by general economic policies to curtail and reduce public expenditure. There is little dispute that investment in infrastructure has declined in recent years both in total and as a percent of GDP and that despite, for example major motorway or hospital programmes, deterioration is accumulating⁵.

The need to co-ordinate the different facilities in time and place (e.g. houses with roads with sewers with schools etc.), which is a central feature of infrastructure provision, is even more challenging today than in the past. The derelict land and abandoned facilities in the 'docklands' of the British industrial city (e.g. Glasgow, Hull and Swansea as well as Liverpool and London) provide a striking current illustration of the complexity of changes in demand due to technological innovation and economic restructuring. The gap of some eight years between the completion of the first phases of the Canary Wharf office complex on the Isle of Dogs in London's docklands and the opening of the new tube line reveals a problem which in the case of the La Defence complex in Paris was not apparent, due to the effective co-ordination of its phasing with the introduction of the new *Reseau Expres Regional* (RER)⁶.

⁴ These include the growing importance of producer services and the concept of the firm as a multi-product and multilocation operation. These factors make the local economic benefit most difficult to assess. Another problem is that the willingness to pay for an extra unit of provision is not tested if there is no use-related price or if the marginal benefit does not accrue exclusively to one user.

⁵ *Investment in the Public Sector Built Infrastructure*. NEDO, 1985.

⁶ See Hall PG, *London 2001*. 1989 (p128).

Findings of recent research

A major survey was commissioned from the London School of Economics by the Department of Trade and Industry. Its object was to, «...assess the impact of local and regional infrastructure on the cost structure and hence the competitiveness of local companies», recognising three important facts:

- there is a generally high level of infrastructure provision currently existing in the U.K.;
- there is a need to examine a broad range of infrastructure because it is the mix of provision which is significant for economic development; and
- there is evidence that actual business expenditure on infrastructure is a small proportion of total costs and therefore its economic importance is poorly measured by actual expenditure.

In the survey three aspects were given emphasis, namely:

1. the importance of infrastructure - i.e. frequency of use, etc.;
2. the level of satisfaction with current provision;
3. the impact on costs and labour of improvements in infrastructure provision.

A full description of the survey of 190 establishments from twelve industrial sectors and in three regions is contained in the recently published report⁷, of which the following is a summary. The survey confirms that direct expenditure by establishments on transport and telecommunications-related activities is small but not negligible, at around 6.6% of operating costs - higher for service industries. Revenue generated by business use of these types of infrastructure through specific taxation, dues and user charges amounts to considerable sums and can be thought of as providing substantial contributions to such infrastructure provision. But for much infrastructure the real spending is hidden deep in the public purse and in this sense infrastructure is a *community provided factor of production*, financed by general taxation over many years. Despite the relatively small direct expenditure on infrastructure incurred, business does recognise the critical role of infrastructure in its operations. *Road transport and telecommunications* were found to be of paramount importance to the overwhelming majority of establishments surveyed. Around two-fifths of establishments considered expenditure on road transport (plus any indirect costs there may be due to delays) to have a major influence on operating costs. The survey repeatedly found indications of greater transaction activity, for example connected with marketing, among establishments drawn from the growing manufacturing sectors, the service industries and from the south east outer metropolitan area. The communication/information content of such activity is high and it must be concluded that a modern growth-oriented economy can only function efficiently with a up-to-date *transaction-facilitating* infrastructure. The survey reveals that British firms are highly aware of the qual-

⁷ Diamond DR and Spence NA, *Infrastructure and Industrial Costs in British Industry*. 1989.

ity of infrastructure provision past, current and planned, and despite the opportunity to express a desire for better facilities at little or no direct cost to themselves, their view of provision is reasonably favourable. But important perceptions of defects were also revealed. A high level of dissatisfaction was expressed with the nationwide motorway and public telephone service, three out of every four establishments encountering major problems due to congestion and delays on motorways. Nearly one-half suffered major problems due to a variety of inadequacies in telecommunications provision.

Establishments located in the outer metropolitan south east seem to be much more actively concerned with issues related to infrastructure provision and appear to face more problems and bottlenecks than their counterparts elsewhere. The survey does not find evidence that industry in the south east thinks of itself as relatively well provided with infrastructure and, for example, many businesses are acutely aware of housing difficulties being experienced by their workforce.

In the north east there seems to be a general level of satisfaction with infrastructure, with few problems or bottlenecks cited. Certainly this seems not to be an infrastructure-poor region, although there were mentions of training/educational inadequacies affecting the quality of the workforce.

The survey confirms that businesses find difficulty demarcating the specific effects of infrastructure provision on their well-being. However establishments on the whole are well aware of developments in infrastructure provision which have had a general effect on their operations and this is one of the best measures of general impact.

Sectoral variation in the assessment of the impact, of infrastructure provision is slight. However there does appear to be clear regional variation, which is at its most extreme for roads in the south east and the west midlands. The regional variation is at its least extreme for telecommunications developments.

Road transport improvements in recent times have most certainly led to some reductions to some businesses, and this has directly contributed to some business expansion. But it should also be noted that inadequate infrastructure has delayed rather than prevented business expansion in most cases. The number of jobs affected in this way is relatively small but when considered over the whole country is certainly significant.

Businesses find it extremely difficult to identify the directly discernible job generation effect of infrastructure provision. However even the small percentage identified in the survey has important implications for the economy, perhaps involving between one and two hundred thousand jobs. On the other hand there is a sense in which all jobs are dependent on the general economic well-being of establishments, and the survey shows this to be partly a function on wide-ranging infrastructure provision.

Outstanding questions and policy implications

Because the economic importance of infrastructure is real and large but at the same time extremely difficult to quantify, there remain important challenge for the public policy maker.

First, how to recognise and then respond appropriately to the rapidly changing nature of infrastructure demand and in particular the greatly increased significance of transaction facilities. Even if publicly regulated private monopolies are responsive to market pressure and consequently can be expected to cope reasonably with the consequences of structural change in the economy, there remains a clear need to recognise the inter-connected nature of most infrastructure provision if it is to serve its clients well. The current compartmentalized approach to public expenditure combined with a near total absence of medium and long term thinking about infrastructure, (once called regional planning and now referred to as strategic guidance) results in one-dimensional approaches to public economic problems that demand more comprehensive or integrated solutions. Rolling back the economic borders of the state has considerable implications for policy arenas like public transport or the environment, where the integrated nature of the resource concerned demands a coherence in public policy making (by regulation if not by ownership) that is immensely difficult to achieve in the multi-agency competitive context that is normally the outcome of privatisation.

Second, the economic importance of local public services-education, training, housing, public order and leisure facilities - is currently rather overlooked. Local or community infrastructure of this kind consistently as the second priority in the LSE research, after roads, but rated above telecommunications or utilities. This somewhat surprising finding is perhaps a reflection of what is called the quality of life factor in the debates about metropolitan rivalry and inner-city regeneration. It is currently fashionable to claim that the location of the rapidly expanding producer-services section is primarily determined by the need to recruit and retain expensive staff who have strong views not only about the internal office environments in which they work but also about the external environment. The extension of the Royal Opera House, the new wing of the National Gallery and the new British Library (£ 300 m) are illustrative of this theme in London, if rather less dramatically than the bicentennial equivalents in Paris. It remains to be seen if the economic effect of public expenditure on culture can be assessed in some way but it is already clear that this aspect should not be ignored. However those firms often in inner city locations, who rely on private security agencies to combat vandalism and other more serious crime can calculate very precisely the impact of what they call the inadequate level of local services.

The third issue is how government can ensure that, as the decline in public investment in infrastructure slows and then reverses (as the lessons of Japan and France become better understood and as obsolescence dictates), the pattern and volume of expenditure is as beneficial to economic development as possible? How are the local, regional and national scales to be effectively related to each other? The local and regional implications of the Channel Tunnel provide a dramatic case study of what is a much more common problem. And one becoming more significant as the single European market actually comes into existence. The first obstacle to overcome is the appalling absence of data on the actual provision, its quality, location and capacity. This issue was addressed in 1985 by NEDO but little progress has since been made and consequently decisions on priority must

be made in the absence of relevant and reliable information. Current ideas about a «green» policy in which environmental costs are priced and passed onto users of every transport system makes this absence of a national inventory even more serious if rational decision making for infrastructure provision is to be achieved.