NorDubCo

Developing Sustainable Industrial Clusters in North Dublin

Module II - Examining the policy and infrastructural requirements

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Foreword

In recent years a major policy shift has taken place in terms of Irish economic development. Concerns over large-scale unemployment have largely given way to an emphasis on labour shortages. Traditional worries about the scale of emigration have been largely replaced by concerns over the country’s ability to manage immigration.

There have also been many other dramatic changes. Irish economic policy no longer has to address matters relating to monetary policy or the balance of payments and exchange rate policy. As a result the policy emphasis is now almost exclusively on competitiveness. Competitiveness is a key determinant of our attractiveness to foreign direct investment and here there has been an extraordinary change.

Part of this process of change involves Ireland moving to a more knowledge-based economy. The establishment of coherent and sustainable systems of innovation, improved inter-company co-operation and drastically increased university-industry collaboration must be the new hallmarks of Ireland’s economic development. The development and nurturing of coherent clusters must be a key ingredient of this process.

With regard to these new indicators of success, North Dublin’s profile is unusual. It is a region with significant areas of disadvantage situated alongside a mix of traditional and emerging industry sectors coupled with its access to substantial physical, educational and research infrastructure.

Our analysis of North Dublin’s industrial base indicates that relatively little of the economic activity in the region is embedded to an extent that would make it difficult for that activity to re-locate elsewhere. Indigenous innovation activity in the region, for example, is weaker than in other parts of the Dublin area. The challenge for the region is to provide an environment for industrial clusters to put down deeper roots in the region, as a result of advantages they gain from specialised skills and research expertise relevant to their sector, from relevant infrastructure, and from specialist suppliers and other trading partners. The main economic actors in the region need to work together to achieve this, and they also need to arrive at a shared view of which types of infrastructure, skills and knowledge should receive priority in future development.

It is hoped that this research will contribute to the process of devising solutions to the existing and emerging economic development questions facing North Dublin.

Deiric Ó Broin
NorDubCo
Executive Summary

Although spatial concentrations of related enterprises exist throughout North Dublin, the evidence for their classification as developed enterprise clusters is lacking. The principal example of a fully developed cluster is the International Financial Services Centre (IFSC).

Enterprise clusters can provide significant competitive advantages in North Dublin to local areas that often outweigh the higher costs in terms of salaries and rents that may be generated at such locations. These enterprise clusters can be developed by the inputs of public/private agencies and local government.

The geographic concentration of enterprises is explained by the external benefits generated by being located in specific locations, and in the North Dublin context, the availability of infrastructure.

Location-related factors for cluster initiation and development include access to specialised skills, the presence of educational and research institutions and service companies that meet business needs.

Spatial proximity enables the transfer of information and services and encourages technology spillovers that are critical for innovation.

Recognition of the important role clusters may play in the economic development in areas such as North Dublin is evident in all recent land-use planning and enterprise policy statements from the National Spatial Strategy through to local authority development plans.

Although strongly promoted in policy approaches, some confusion exists as to the interpretation of clusters in the Irish context and the role which various agencies might play in implementing cluster policies.

The creation of new business clusters is best exemplified in the successful development of the International Financial Services Centre and the difficulties which may be expected can be seen in the later development of the Digital Media Hub.

For North Dublin, the cluster form of development offers an opportunity for the region to capitalise on its infrastructure assets and provides locational advantages as an interchange node on all major transport systems.

The area identified in the study as offering the most opportunities in the North Dublin study area is the under-utilised land banks adjacent to Dublin Airport.

Due to infrastructural constraints, detailed research is required into the type of sectors suitable for cluster type development and the strengths of existing enterprise in North Dublin to determine potential complimentary activities.
1. Study Background

This study was carried out over the period January 2003 to November 2003 by Dr. Brendan Williams and Patrick Shiels of DIT Bolton Street as part of an ongoing research project on Developing Sustainable Clusters in North Dublin in co-operation with NorDubCo and Dublin City University. The project Steering Committee included representatives from the following institutions:

- Enterprise Ireland.
- Dublin City University.
- Ballymun Regeneration.
- IDA – Ireland.
- Aer Rianta.
- Fingal County Council.
- Dublin City Council.
- Blanchardstown Area Partnership.

The project originated through the ongoing research and development programme of NorDubCo (North Dublin Development Coalition). Having examined the potential for the development of public unused land and developed an analysis of the negative effects of certain peripheral development models on North Dublin, there was a significant lack of data on industrial/commercial “embeddedness” in the region. Without such analysis, it is difficult to develop and implement appropriate industrial and spatial policy to ensure the continued economic health of the region. The study examines the issue of developing potential enterprise clusters in North Dublin and the relationship between infrastructure, land-use planning and cluster development. The report is structured in the following order:

Section 1 Study Background and Key Findings
Section 2 Introduction and Context
Section 3 Profile of the Study Area and mapping of existing economic clusters
Section 4 Infrastructure as a Key Determinant of Cluster Development
Section 5 Enterprise Clusters in North Dublin and Housing Issues
Section 6 The Planning and Development Context
Section 7 Development Agencies’ Views on the Role of Clusters
Section 8 Conclusions and Recommendations
Objectives of the Study
A central aspect of the research was to examine the influence of infrastructure and the local factors behind the economic growth of businesses in the Fingal area (including the Airport/Swords region and the Blanchardstown/Mulhuddart area), such as:

- The physical location of identified economic clusters;
- The government policy framework within which the clusters operate;
- The dynamics of economic cluster development;
- Indirect policy and implications for cluster development (e.g. planning regulations, infrastructure provision, housing development, educational facilities, etc.);
- Infrastructure policy and land-use planning (i.e. Strategic Development Zones and provisions for specific industries/enterprises).

The study includes a series of interviews with key persons and agencies responsible for the economic development of West and North Dublin in terms of cluster type development.

Comparisons are made between the pre-existing concentrations of industry and services – that of the Swords/Airport/North Fringe axis and the Nodes of enterprise in West Dublin, along the M50 (Blanchardstown/Mulhuddart, Citywest, Tallaght, etc.).

There will be an examination of North Dublin within the framework of the Dublin to Belfast economic corridor (i.e. the location and pivotal role of Dublin Airport, the likely impact of the Northern (M1) motorway, currently under construction.

Research Strategy
As part of the study, DIT has examined current work in relation to enterprise clusters in North Dublin including such sources as:

- GAMMA IDS data and maps on economic clusters in the Dublin FUR (originally prepared for the GEMACA II Project).
- Dublin Airport Study.
- CSO data on the study area concerned
- Existing work on the emerging Dublin-Belfast Economic Corridor
- Existing County Development Plans

The study includes a combination of quantitative and qualitative analyses relating to known key trends and the views of participants in policy making and implementation. Key findings and trends were examined and structured oral interviews with key agency officials were used to identify policy and practice trends in terms of enterprise cluster policies over the medium-term future.

It is widely recognised that the existing provision of economic and transport infrastructure is the driver of economic development and particular attention is paid in the study to key aspects of infrastructure provision in North Dublin. Regular meetings with the project steering group were held during the study period. The review of such progress resulted in the study team prioritising particular issues including the importance of Dublin Airport and the critical role of housing provision in the economic development of North Dublin.
2. **Introduction and Background**

The context for economic competitiveness and the role of economic/enterprise clustering policies have been examined by the study authors in the related EU GEMACA II study on the economic performance of metropolitan areas in northwest Europe (2002)¹.

**Economic Competitiveness**
Metropolitan areas play a critical economic role at a National, European and Global level. They are the engines of growth and the nodes of innovation. The economic activity they foster and the benefits of that activity diffuse through hierarchy of lesser urban centres located within each country. In a wider context, the economic development of Ireland as a whole is directly linked to the relative competitive strength of its major urban areas.

**Agglomeration and Firm Clustering**
In many sectors of economic activity, firms tend to cluster together in order to achieve economies of scale and derive the benefits associated from complementarity and the use of a developed infrastructure. Major urban areas tend to offer a wide range of infrastructure support to businesses, including transport (roads, rail, airports, ports), telecommunications, educational-research institutions and ancillary services. In addition, the agglomeration process tends to be self-reinforcing, as new firms recognise the economic benefits offered to existing companies and locate near to them. Clustering together is a risk-minimisation strategy but firms also appear to learn from each other, use common services and suppliers and develop and innovate using common business sectoral knowledge.

This clustering phenomenon is much more important in some sectors than it is in others and seems to be as important for new and expanding sectors as it was in the past. One only has to look at the concentrations of firms working in the media, web site design, or information technology to see this. Yet the precise advantages clustering confers and the importance it has for the competitive position of the firms involved are not widely analysed. Public agencies, in both their land-use planning and industrial policies often miss its importance – especially in newly emerging sectors.

**Globalisation, Integration and Competition**
In the context of the globalisation of the world’s economy, businesses must of necessity be always improving their performance or face extinction. In the process of improving its performance every business is engaged in a constant process of cost reduction. Three tangible factors have a critical effect in the competitive position of any region:

¹ The GEMACA II Project was part-funded by the EU and involved four agencies, including DIT, based in the North Western Metropolitan Area of the EU and examined the competitive position and direction of the key metropolitan areas of Paris, London, the Rhine-Ruhr and Dublin. The project was carried between April 2000 and April 2002. The first phase of this study generated a set of comparable data on socioeconomic and demographic data on a wider number of cities with a population over 1 million.

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- The first is the quality of both hard and soft infrastructure. As well as obvious elements of infrastructure as the quality of the transport network, this also includes telecommunications and the accessibility of information. Access to information may be critically influenced by quite intangible assets such as local linguistic skills, cultural factors and historic links.
- The second factor is the availability of skills and the overall costs of labour, including labour overheads. Amongst those skills that are critical is the supply of entrepreneurship.
- Finally, the availability and costs of business premises as well as their suitability for the type of business most competitive in the city-region concerned are important.

All these factors are themselves influenced by the local policy environment and combine to form what might be described as the “regional economic environment.” The characteristics of this regional economic environment ultimately determine the region’s competitiveness and how successful the region’s economy is in developing viable new enterprises, growing its existing businesses and welcoming new enterprises or activities. It will be readily seen that the actions of government – both at a local, regional, national and supra-national level – have an important role to play in influencing the regional economic environment and hence, in the long-term, in influencing the competitiveness of regional economies.

The contribution of government to a city-region’s competitiveness is complex, both indirect and direct: both for the positive and occasionally the negative. The formulation of a coherent development strategy or the co-ordination of infrastructure provision, land availability and the improvement of the regional natural environment are all important potential contributions.

Along with globalisation of business, industrial and institutional activity, the increasingly integrated economic area of the European Union has promoted the concept of regional locations as a significant factor in national economic thinking. Parallel to the regional dimension, the study of the organisation and structure of industry within geographically bounded limits has seen an evolution of various models examining industrial location and development. Jacobson and Andréusso-O’Callaghan (1996) identify three models representing a European perspective on the market structure and location of industry:

- **Industrial Districts** – where a large number of independent firms within a region act analogously to a large firm and who often contribute to the production of the same type of product in a defined geographical area.
- **Filières** – this term refers to a chain of economic activities, ranging from the extraction of natural resources through production and distribution of an end product being carried out within a single economic or geographic space.
- **Clusters** – These incorporate elements of both industrial districts and *filières* which are often linked to the analysis of growing or successful economies. Clusters also refer to industries linked both vertically and horizontally, with common customers and technologies.
Michael Porter, as an exponent of the cluster concept, linked clusters to agglomeration economies and recommended that the process of clustering and the interchange among industries in potential clusters work best when the industries involved are geographically concentrated (Porter, 1998).

**Enterprise Clusters – Factors of Regional Competitiveness**

In recent years there has been recognition of the renewed importance of the local, territorial dimension to the redistribution of industrial activity and the significance of innovation for the dynamics of regional development. Analysis at the enterprise cluster level helps to identify regional economic specialisation differently from the traditional sector-based approaches. In this study the definition of enterprise cluster proposed by Michael Porter, a professor at Harvard Business School was used. To quote Porter: “an enterprise cluster is: “a geographically proximate group of inter-connected companies and associated institutions (universities, standards agencies or trade associations, for example) in a particular field, linked by competition and co-operation” (Porter, 1998).

The geographical size or scope of clusters varies according to the local context. Enterprise clusters also vary according to their level of development. The GEMAC II Project distinguished between three possible stages of development: embryonic (new), established (emerging) and mature (well-developed).

**The Proximity Factor**

The geographical/spatial concentration of enterprises in clusters can be explained mainly by the external savings they benefit from by being located in metropolitan areas. This explanation was developed as early as the late 19th century, often considered the “heyday” of capitalism. In 1890, the British economist Alfred Marshall has already identified the benefits of concentrating economic activities in what he termed “industrial districts.”

Today, the economic environment is very different from that of the late 19th century. In particular, enterprises are now engaged in worldwide competition. In this context, companies that locate or relocate to clusters related to their lines of business can benefit from several decisive competitive advantages. These are based on generic location-related factors, such as the level of qualification of the working population, the quality of governance, territorial infrastructure and local or regional research and development (R&D). Companies can make the most of specific location-related benefits of enterprise clustering when such benefits are available at cluster level. These specific benefits include the following:

- Access to specialised skills. The existence of a pool of qualified people whose qualifications fit those required by companies, and the availability of specialised local sub-contractors are significant advantages. Companies also often benefit from the local presence of institutions (such as research centres, universities, start-up incubators, chambers of commerce, etc.). non-profit organisations (local employer groupings, economic development agencies, trade associations, etc.) and service companies (business law firms, consultants, financial institutions, etc.) that meet corporate needs.
- By encouraging local actors to capitalise on, develop and cultivate links between the enterprises, research centres, non-profit organisations, chambers of commerce etc. that make up clusters, clustering is also a factor of regional differentiation.
• The existence of a cluster leads to the creation and development of specialised public and private sector facilities that benefit the community as a whole, such as, for example, technology resource centres, start-up incubators and vocational training units.

• Spatial proximity facilitates the transfer of information, tacit knowledge and expertise through formal and informal exchanges. It also enhances the possibility of face-to-face contacts, which favour technology spillovers that are critical for innovation.

• The sharing of cultural norms, standards and codes is also very beneficial. By joining the same trade bodies, using the same leisure facilities etc. the people who are part of a cluster create and develop a system of local standards. This system enhances the quality of professional relationships and discourages opportunistic behaviour because people have to preserve their reputations.

• Faster and better understanding of market demand. To meet the needs of partner enterprises and buyers, companies are driven to be more innovative.

**Irish Economic Development Policy**

Since the Irish government embarked on a strategy of economic development through inward investment during the 1960s, policy in relation to developing enterprise clusters has been inconsistent and sporadic. In the 1960s, the central objective was to industrialise the economy that until the 1960s was largely stagnant and dependent on agriculture. Policy towards economic development tended to focus on marketing Ireland to industry based in other countries, most notably the USA, UK, Germany, France and Japan. The government offered an extensive package of incentives for industry to locate in Ireland, including low corporation tax rates, remission of local authority rates and in many instances, the provision of advance accommodation. Despite the success of these early strategies, however, new industry locating in Ireland at the time was non-specific to any particular sector and government agencies did not discern between economic sectors – the priority was to create employment at almost any cost. In addition, the benefits of economic clustering, whereby linkages would develop between enterprises of related sectors, was largely unrecognised and despite the creation of a large tax-free export-oriented industrial zone adjacent to Shannon Airport in the Southwest of the country. Industrial location policy was essentially one of widespread dispersal throughout the country for political reasons.

During the 1980s, the failure of previous economic policy became apparent. Multinational firms which set up in remote rural areas tended to cease operations as a result of market changes and the uncompetitive position of their location, characterised by low skill levels in the local labour force, poor telecommunications and transportation infrastructure. Compounding the emerging difficulties was the branch-plant nature of foreign firms, with their operation in Ireland characterised by low-skill assembly and low wages. Competition for emerging economies in Asia and other locations severely compromised the economic viability of many traditional manufacturing sectors, including textiles and the assembly of basic components. Policy analysts began to recognise that in order for Ireland to capture new investment, new strategies would need to be formulated which encompassed a broader range of sectors than assembly-based manufacturing activity. In addition, the importance of inter-firm linkages and spatial proximity to high quality infrastructure and higher-level educational facilities was recognised as a critical prerequisite for attracting new inward investment. At the
beginning of the 1990s, the publication of the highly influential Culliton Report (1992) was followed by major policy changes toward enterprises, including the following:

- Re-focusing of emphasis in marketing Ireland to industry at a higher level on the value-added chain, in particular sectors characterised by rapid growth and high skill levels (e.g. ICT, Pharmaceuticals and Financial Services).
- Recognition of the importance in attracting new growth sectors to Ireland in order to maintain and enhance its competitive position.
- Recent economic policy has targeted companies at each stage of the supply chain to foster vertical clustering (forward and backward supply linkages). The agglomeration effect, whereby companies invest in locations where their competitors have been successful, promotes horizontal clustering (companies involved in similar activities but using a common pool of skilled labour).
- Development of state support for the Small to Medium Size Enterprise (SME) sector in Ireland, in order to this sector to gain from multiplier effects and “spin-off” benefits from FDI firms.
- Recognition of the vital importance of a reliable and efficient telecommunications and transportation infrastructure in attracting new investment and the importance of the proximity of new industry to third level educational institutions.
- Repositioning Ireland in the global marketplace as a high skill, low taxation, low cost gateway for FDI to European Union markets with minimal regulatory and planning restrictions.

The success of the policies adopted are clearly evident in the rapid economic growth of Ireland’s economy during the 1990s. It is only in recent years that policy makers have recognised the importance of economic clustering in terms of creating self-sustaining economic growth and the fostering of innovation. Strategists have begun to identify the importance of developing strategies that facilitate the creation of enterprise clusters through a variety of mechanisms including telecommunications development, IDA inward investment policy, the National Development Plan and strategic regional planning guidelines. Current enterprise policy attempts to discern changes in global trends and responds to changes by accommodating the requirements of industrial firms and other enterprises (innovation, media, etc.). Policy in relation to developing physical clusters of similar and related economic activity, therefore, has been essentially pro-cyclical and market-driven in character.

**The Importance of Maintaining Economic Competitiveness in North Dublin**

The successful development of sustainable economic clusters in North Dublin is dependent on the continuation of robust economic health of both Dublin and Ireland as a whole. Without general economic growth and facilitative policy measures, economic clusters cannot develop. The economic success enjoyed by Ireland during the 1990s and into the first decade of the 21st Century was built on a range of strengths that enabled the Irish economy to successfully compete on a global level. These strengths are widely recognised and included the following:

- A favourable fiscal environment, with low corporation tax acting as a particular incentive to foreign direct investment (FDI).
- Central government agencies which facilitated investment through the minimisation of bureaucratic obligations on the part of the FDI sector.
• A skilled and mobile labour force with the added advantage of returning emigrants that were trained and gained critical employment experience in foreign economies.
• Ireland’s position as an EU member to allow uninhibited access to European markets.
• Adequate level of infrastructure provision.

The challenge over the next decade is to maintain the economic competitiveness of the Irish economy and in particular the economic strength of the North Dublin study area. The Forfás Annual Competitiveness Report 2002 warns that Ireland’s competitive position is being eroded by a number of factors. These include wage costs which have been rising above inflation, which itself is very high by EU standards. EU data estimates that average nominal Irish wages were 3.6% above the Eurozone average in 2001 and forecast Irish wage level to rise to 13% above the Eurozone average by 2003. This is an area of serious concern. Consumer price inflation itself is over twice that of the Eurozone average and feeds into demands for further unsustainable wage increases, in a “wage-price” spiral that will damage the competitiveness of the Irish economy.

Infrastructure bottlenecks remain a serious constraint on further economic development and add to business costs, reducing competitiveness. A particular concern for the medium to long-term is the fact that many of the EU pre-accession countries possess a superior transport infrastructure to Ireland. Finally, the level of investment into Research and Development remains very low in Ireland by OECD standards. The recent GEMACA II study found that Ireland does not perform to any significant degree in terms of the filing of patents and scientific publications in Europe. In particular, investment in R&D remains largely confined to large FDI companies engaged in “downstream” innovation to further their own commercial position. There is a greater need for government investment into “basic” innovation capacity. The emergence of a strong biotechnology cluster is critically dependent upon the support by Government of small firms spun-off by the third level sector.

This report examines the relationship between infrastructure and strategic and land-use planning and the potential emergence of economic clusters in the North Dublin Study Area (defined below). The key themes examined include:

- Transportation infrastructure.
- Housing issues.
- Strategic and land-use planning.
- Government policy towards economic clusters, innovation and general economic development.
3. Profile of the Study Area and Economic Clusters

The area selected for the remit of this study comprises all of County Fingal and Dublin City north of the River Liffey, but excluding the area within the Royal canal ring (i.e. the north City Centre) with the exception of the International Financial Services Centre and the north Dublin Port. The study area is therefore comprised of the contiguous built-up area of North Dublin, most of which is located within Dublin City and the Blanchardstown-Castleknock area in South-west County Fingal. The Sutton-Howth area, which also forms part of metropolitan Dublin, is located in the South-east of Fingal and the remaining urban areas comprise of the expanding town of Swords in central Fingal, Malahide, Balbriggan and an extensive rural hinterland with an array of smaller settlements.

Population Trends

According the preliminary results of Census 2002, the study area contains a population of 452,350, of which 256,127 (or 56.6%) reside in North Dublin City\(^2\) and the remaining 196,223 (43.4%) are located in County Fingal (CSO, 2002). The study area accounts for 40.3% of the Dublin Region population and 29.5% of the Greater Dublin Area population. Between 1996 and 2002, the population in North Dublin grew by 5.9%, slightly below the overall Dublin growth rate of 6.1% and the National rate of 8%.

The overall growth rate for North Dublin, however, belies the strong differences in population change in a sub-county basis and masks a marked divergence in population trends between North Dublin City and County Fingal. Population grew by 17% in Fingal between 1996 and 2002, a reflection of the extensive housing development that took place in this county during this period. In contrast, population in North Dublin City declined by 1.3% during the 1996 to 2002 period, the consequence of an ageing population and the lack of available development sites in the northern suburbs of Dublin. The population of DEDs (District Electoral Divisions) which experienced widespread housing development grew rapidly, exemplified by growth in Swords-Lissenhall and Blanchardstown-Blakestown of 89.1% and 61.9% respectively. Conversely, locations with an older housing stock and experiencing little new development are losing population, exemplified by population loss rates in Whitehall D and Finglas South D of 15.5% and 17.5% respectively. The rapid rate of population growth (45.8%) in North Dock C between 1996 and 2002 can be explained by urban renewal development directly related to the IFSC economic cluster (see charts on following page).

\(^2\) The area defined as North Dublin City in the report excludes the inner city DEDs within the Royal Canal Ring but included the IFSC and North docks area.
Figure 1  Population Change in North Dublin Study Area 1996-2002

Source: DIT analysis of 2002 Census preliminary data.

Figure 2  Population Change 1996-2002 for Seclected EDs in North Dublin Study Area

Source: DIT analysis of 2002 Census preliminary data.
Within its regional and national context, the North Dublin study area is located within the following areas:

- The NUTS 2 designated Southern and Eastern Region.
- The Dublin to Belfast Economic Corridor.
- Greater Dublin Area.
- County Fingal and North Dublin City.

**Enterprise Clusters and the Provision of Infrastructure in North Dublin**

It is widely recognised that the provision of infrastructure, both "hard" and "soft" is a critical prerequisite to the development of enterprise clusters (Castells and Hall, 1994).

Hard Infrastructure includes the following:

- Transport Infrastructure including roads, rail, airports and ports.
- Telecommunications networks, including fibre optic high-bandwidth DSL lines, co-axial cables and microwave relay points.
- Energy infrastructure (including power stations, power transmission lines and gas pipelines and the international gas inter-connector pipe with Scotland).
- Water supply and drainage/sewerage infrastructure including the recently completed North Fringe Interceptor Sewer and the Dublin Bay Project.
- Advance accommodation for inward investment and incubator facilities for emerging “start-up” enterprises.

Soft infrastructure includes the following:

- Educational facilities, including universities with a strong research focus and close linkages to the SME sector.
- The existence of both formal and informal networks of businesses, employees, entrepreneurs, trade unions and other groups involved in emerging sectors.
4. **Infrastructure as a Key Determinant of Cluster Development**

A considerable body of work links the importance of infrastructure to the development of enterprise clusters (Porter, 1998; Castells and Hall, 1994). Within the study area of North Dublin, there exist two transportation nodes of critical national importance, namely Dublin Airport and Dublin Port. In addition, the N1/M1 corridor bisects the study area and forms the transportation backbone of the emerging Dublin to Belfast economic corridor. This critical transportation artery is currently in the process of being significantly upgraded to full motorway status from Dublin to Dundalk, due for completion in Summer 2003 (NRA, 2002). It is apparent that the pending completion of the M1 motorway will enhance the accessibility and importance of North Dublin to the national economy, and thus the infrastructure under construction offers a major opportunity to the economic development of the study area. The Dublin to Belfast rail line forms the second artery along the Dublin to Belfast economic corridor and was extensively upgraded in 1997. Maps indicating the location of concentrations of particular sectors and supporting infrastructure are found in Appendix D (page 60).

The infrastructure resources of critical importance to North Dublin includes the following:

- Dublin Airport.
- Dublin Port.
- M1/N1 Dublin to Belfast route (also designated Euro route E01) which is being upgraded through the provision of the Dublin Port Access Tunnel (2005) and the Airport to Balbriggan section of the Northern motorway (opened June 2003).
- Dublin to Belfast Rail line.

Additional planned infrastructure includes:

- Dublin Airport to City Centre Rail link (as part of the proposed Dublin METRO).
- The proposed outer orbital route from Tallaght to Swords (as identified in the 1999 Strategic Planning Guidelines and confirmed in the DTO Strategy *A Platform for Change*).

**Dublin Airport**

Dublin Airport functions as the principal international gateway to both Dublin and Ireland and is the single most important resource in the North Dublin Study Area in terms of transportation infrastructure. The airport is of critical importance to the national and regional economies of Ireland and Dublin respectively. As Ireland is an island nation and the only EU nation without a direct land connection to the core EU states, the importance of Dublin Airport to the economies of Ireland, the Greater Dublin Area and North Dublin cannot be overstated.

Facilities at Dublin Airport have recently undergone a series of extensions to cater for rapidly increasing passenger traffic, which reached 15.1 million in 2002. According to Eurostat figures, Dublin Airport ranked 13th in terms of passenger traffic in the European Union in 1999 (Eurostat, 2001).
Dublin Airport acts as the largest single employer in the Study Area. It is estimated that approximately 14,000 persons are employed at the airport complex in administration, aviation activities ancillary services and that the Airport generates €295 million of annual income locally (Aer Rianta, 2003). Dublin Airport, therefore, acts as a significant generator of economic activity for both North Dublin and the Greater Dublin Area. The number of scheduled and chartered air services operating from Dublin Airport has increased dramatically in recent years and by autumn 2002, scheduled and chartered airline services offered to 114 destinations. Dublin Airport offers direct services to most major cities in Western Europe, seven destinations in the USA, one in Canada and an extensive number of UK regional locations and several domestic Irish destinations. The Dublin to London air route, in particular, has been identified as the busiest intra-EU air route with over 4.5 million passengers carried annually (Eurostat, 2001). The pre-eminent position of the Dublin to London route reflects the use of the major London Airports as international hubs for destinations not served by Dublin Airport (i.e. Asia and Oceania).

**Economic Importance of Airports**

Airports act as the chief asset of regions seeking to attract new industries. A region cannot be marketed as a centre for establishing major new businesses without an efficient air transport infrastructure (ATAG, 1997). Airports tend to act as magnets for various service and industrial enterprises, with many businesses locating adjacent to airports in order to derive the benefits of the role of airports as major transport nodes and the rapid transport of products by air (Palmer, 1998). Airports generate direct economic benefits by providing employment in various activities at the airport and their ancillary services. Indirect and “spin-off” benefits from airports include the local economies of the areas in which the airport employees reside. Aside from the direct economic benefits of an airport facility, airports have become poles of economic development and serve as gateways for growth for their airline customers and the regions they serve (ACI, 1998). In this regard, Dublin Airport acts as a gateway pole within the emerging Dublin – Belfast Economic Corridor.

Airports serve to provide an initial focus around which a significant industrial hinterland can develop. For example, the development of the aerospace industry in the Los Angeles basin following World War II was largely initiated by the presence of a number of civil and military aerodromes in the region (Castells & Hall, 1994). The development of the Shannon tax-free industrial complex during the 1960s adjacent to Shannon Airport was made possible by the presence of the airport facility, and helped to usher in the era of industrialisation in Ireland.

Dublin Airport has acted as a major catalyst for the rapid development of both the national and the regional economy it serves. A significant proportion of enterprises, particularly those sectors in emerging clusters (Financial Services, IT and Pharmaceuticals) locating in the Greater Dublin Area have functions that are heavily reliant on the proximity of international airports such as the transport of key business personnel and high value cargo.
Air passenger trends at Dublin Airport
Air passenger traffic growth at Dublin Airport has occurred at a very rapid rate in recent years. The growth in passenger numbers using the airport reflects the deregulation of commercial aviation activity within the EU and the recent surge in economic growth in Ireland. Over the ten year period between 1992 and 2002, passenger traffic volumes at Dublin Airport have increased by 160%, or an almost threefold increase in volume, from 5.8 million passengers per annum in 1992 to almost 15.1 million in 2002. This rate of growth is unprecedented at Dublin Airport, and makes Dublin Airport one of the fastest growing airport facilities on a global basis.

Figure 3  Passenger Traffic at Dublin Airport 1972-2002:

Source: DIT analysis of Aer Rianta Statistics

Most of the growth in passenger traffic at Dublin Airport, has taken place between 1986 and 2002, coincident with a period of national economic recovery and the deregulation of the aviation industry within Europe.

Air Cargo Operations at Dublin Airport
Airfreight is a sector that has been enjoying rapid growth rates for the past decade. This growth is not related solely to the general growth in aviation but also to the increasing tendency for businesses, particularly in the developing cluster of IT and Pharmaceuticals, to use air as a means of freight transport and reflects the increasing globalisation of industry, trade and commerce. The era when only very high value and low volume goods were transported by air has been replaced by a situation whereby firms, especially those involved in Information Technology and Pharmaceuticals increasingly rely on rapid delivery times for Just In Time (JIT) manufacturing processes – demands which air freight services can meet.

The vast majority of cargo agents are situated in the vicinity of Dublin Airport, located in industrial estates such as the Airport Business Park (Cloughran), Airways (Santry), Swords, Ballydine, Raheny and Finglas. A sizeable number of cargo agents are located
along the M50 C-Ring motorway corridor and the remainder are located in the city centre and the south city. This spatial pattern of cargo agents suggests that physical proximity to Dublin Airport is a highly important factor in their operations in terms of speed and efficiency. Indeed, there is evidence that logistics operations have developed into a cluster in their own right, servicing adjacent industries.

In terms of surface access to the cargo facilities at Dublin Airport, traffic uses the same entrance as that used for passenger terminal bound traffic, and the same internal road network. The situation whereby heavy goods vehicles vie for road space with passenger cars at the airport entrance only serves to compound the major problem of traffic congestion in this location. Ideally, passenger and cargo surface traffic should be separated, each being catered for with its own access point to the airport, with the various operations involved in air freight located adjacent to each other (ATAG, 1993). This arrangement would facilitate the inter-linkages between the various cargo agents, the cargo handling operations and the airlines, and would reinforce the reliability and efficiency of air cargo operations. The air freight industry is becoming a chain of many links, with any weak link in the air cargo chain – whether in surface transport, cargo handling or air transport capable of compromising the service capability of the entire air freight chain (TIACA, 1998).

**Air Cargo Trends at Dublin Airport**
Freight traffic at Dublin Airport has grown rapidly during the past several years. Such growth is largely attributable to the corresponding rapid growth in the Irish economy during the same period. Much evidence exists that growth in air cargo volumes closely mirrors the overall growth of a given nation’s economy (Durkan and Reynolds-Feighan, 1997).

![Figure 4  Freight Traffic at Dublin Airport 1972-2002](image)

The volume of cargo processed at Dublin Airport during 2002 is estimated to be 116,739 metric tonnes, compared to 62,806 metric tonnes processed in 1992 but
representing a decline by 28% on the 2000 figure of 150,023 metric tonnes. This represents a 86% growth rate over this ten-year period.

The fact that many large multinational information technology firms located in the Greater Dublin Area during the 1992 to 2002 period (a sector which is heavily dependent on air freight transport for light, high value electronic components) can hardly be a coincidence. Indeed, the ability of Dublin Airport to respond to the demand for increased air freight transport has been a major factor in the continuation of the location pattern of large foreign firms into the Dublin and Mid-East Regions.

Global Trends in Air Freight
Airfreight traffic is expected to grow by an average annual rate of about 5% between 1996 and 2010 (ATAG, 1994), significantly in excess of the global GDP growth rate at 2.9% (Boeing, 1998). Much of this expected growth will take place between continents, as well as within continents themselves. Already, many key airports in Europe, the USA and East Asia are emerging as major hubs of air freight activity, acting as regional gateways for intercontinental air cargo traffic and as hubs for intra-regional air freight traffic. One major global trend is the emergence of cargo “superhubs”, located at strategic points across various continents. The traditional secondary position of air cargo is beginning to change as the air freight industry expands in response to the growing demand for air cargo transport from such sectors as IT, Biotechnology and the overall globalisation of industry and services. The 1990s have witnessed an emergence of a greater degree of competition between various airports within regions in order to attract an increased share of air cargo business.

The ability to develop a major air cargo processing zone within an airport with sufficient land to expand operations in the long-term is a critical factor in maintaining a competitive edge over other airports. Long-term capacity is seen as a major attraction to cargo related businesses and manufacturing firms highly dependent on air cargo. Many airport authorities in Europe are embarking on a range of joint ventures with cargo operators and integrators in order to accelerate the development of dedicated cargo facilities, aimed at both attaining or maintaining their status of major cargo hubs and regional gateways (Gethin, 1998). Major international airports in Europe such as London Heathrow, Paris Charles de Gaulle, Frankfurt and Amsterdam Schiphol have embarked upon major air freight facility projects in order to maintain their status as key hub gateways for intercontinental and regional air cargo traffic.

Dublin Airport cannot compete directly with airports of this scale, but the long-term plans advanced by these airports and the partnership arrangements between airport authorities and cargo operators could serve as an example of the potential for maintaining efficient cargo operations and long-term expansion capability. Growth in air services has in turn contributed to attracting new firms to Ireland, who in turn require a better, more efficient range of services. This provides a further attraction to inward investment to Ireland – in essence, it acts as a positive feedback cycle (Durkan and Reynolds-Feighan, 1997). Therefore, the ability of Dublin Airport to maintain its current level of cargo facilities is of critical importance and the development of a long-term strategy for air cargo in Ireland is now required (Williams and Shiels, 1999).
Air Cargo Issues

During the Dublin Airport Study carried out by the Faculty of the Built Environment in 1999, a number of individuals directly involved in freight operations at several prominent multinational and indigenous manufacturing firms took part in a series of interviews for the purpose of gleaning current opinion on the air freight operations at Dublin Airport. Among the findings of this research was that the presence of adequate cargo facilities at Dublin Airport has been a major factor in the decision of several multinational firms to locate in Ireland and specifically the Greater Dublin Area. The development of the road network, with the M50 C-Ring in particular, was also important in terms of the accessibility of the various operations to Dublin Airport. The speed of delivery and reduced transportation costs are important to manufacturing firms using air cargo facilities, and therefore an adequate standard of road network to Dublin Airport was seen by the interviewees as being of critical importance.

Manufacturing firms interviewed for the 1999 study into Dublin Airport were relatively satisfied with the current cargo handling operations at Dublin Airport. However, most companies interviewed believed that several improvements need to be carried out in order to increase the efficiency of cargo operations at Dublin Airport:

- Full Boeing 747 capacity was seen as highly desirable, as many firms use containers customised for upper deck 747 storage. In addition, many interviewees would prefer increased dedicated cargo services. Currently, some firms have to fit the schedule of their cargo movements around the schedules of passenger air services, but would prefer if the cargo schedules were independent of passenger travel times to suit the manufacturers.

- The range of destinations served by the air cargo services directly from Dublin Airport was identified as limited. There is a need for additional direct cargo services from Dublin to key hub locations in the US apart from New York and Chicago, and to the US West Coast in particular.

- A need exists for greater competition between various cargo services operating from Dublin Airport.

- Security issues, bureaucratic delays and delays in cargo handling operations at Dublin Airport have been noted as problems in relation to cargo shipments by the interviewees.

- One of the most serious problems identified in terms of cargo transport was the worsening traffic congestion of the road network in the Dublin area. The resulting delays in surface cargo transport to and from Dublin Airport were affecting production schedules, according to some of the companies interviewed.

Surface Access Issues at Dublin Airport

Surface access has been identified as an element of critical importance to Dublin Airport in term of its overall development. The rapid rates of passenger and freight traffic experienced at Dublin Airport has taken place in a period of time during which no major surface access improvement occurred. This has resulted in increasing traffic congestion problems in the vicinity of the airport.

There are two public road access points to Dublin Airport on its eastern side – a T-junction from the old Swords Road and further north, a roundabout linking the
National Primary Route N1 and M1 motorway to the airport. The N1/M1 route plays a key role as the Dublin to Belfast road and therefore traffic using this route has increasingly come into conflict with traffic accessing the airport. No rail link currently serves Dublin Airport and the only form of public transport serving the airport are Dublin city buses, with a dedicated direct “Airlink” airport to city centre service which has commenced in recent years and a private “Airbus” service. The only alternatives to the bus services for passengers and airport users are taxis and private cars. The construction of the M50 C-ring motorway has greatly increased accessibility to the airport from western and southern parts of Greater Dublin, but has also compounded the traffic congestion problem. The recent opening of the M1 motorway to Dundalk has relieved pressure on the access roundabout to the airport, although the lack of a dedicated high speed rail link to the airport remains apparent.

**Current Development Proposals for Dublin Airport**

In the decade prior to 2002, many aspects of the physical infrastructure of Dublin Airport were upgraded, including:

- The extension of the existing passenger terminal to handle 20 million passengers annually
- The Pier C boarding area
- Refurbishment to Pier A and the air side of the Old Terminal
- Addition of Multi-storey and long-term car parks
- Extension of aircraft aprons.

Major proposed elements of the future expansion of Dublin Airport reflect the necessity to maintain the ability to accommodate further growth in passenger numbers, which are expected to exceed 20 million by the end of the current decade with 30 million passengers projected for 2020. In order to meet expansion requirements, Aer Rianta is preparing a new development programme for Dublin Airport. Major proposed infrastructure developments include:

- Pier D, a low-cost boarding facility for budget air operators which will accommodate 12 aircraft stands and project from the Old Terminal building. Despite receiving planning permission for An Bord Pleanala, the development of Pier D remains uncertain due to proposals for a new terminal.
- A new passenger terminal, the most likely location of which is to the North of the existing terminal, is currently proposed although currently uncertainty exists as to whether the terminal will be operated by Aer Rianta (currently being re-organised) or an independent body.
- The METRO rail link between Dublin Airport and the City Centre. The current budgetary climate has served to postpone this facility, although new legislation is being proposed by the Department of Transportation that would significantly reduce the time and cost of design and construction of the link.
- A new east-west runway, constructed to the same category as the existing east-west runway remains a medium-term objective. An Environmental Impact Statement has been carried out for the proposed runway, with completions scheduled for 2008.
Dublin Port

Dublin Port is located 3 kilometres east of the city centre of Dublin and functions as the principal commercial sea port in Ireland. Dublin Port is considered to be the second critical asset in transportation terms for the study area, after Dublin Airport. The principal role of Dublin Port is the handling of commercial freight, with roll-on/roll-off (Ro-Ro) and lift-on/lift-off (Lo-Lo) container operations dominating freight processing activity.

Passenger ferry services, in the form of conventional ferry and high-speed catamarans to the UK are also located at the port. In 2001, 1.4 million passengers used Dublin Port (Dublin Port Company, 2002).

In the past decade, the volume of freight processed at the port has increased at a dramatic rate, mirroring the growth in the Irish economy during this period. Between 1991 and 2001, the volume of freight traffic increased by 170%, from 7.7 million metric tonnes in 1991 to 21.8 million metric tonnes in 2001.

![Figure 5: Freight Traffic at Dublin Port 1971-2001](image)

Source: DIT analysis of Dublin Port Freight statistics.

The principal constraint on the development of Dublin Port is the difficulty with surface access, which is sub-standard by international comparison. Heavy Goods Vehicles servicing the Port must currently traverse Dublin City Centre, compounding traffic congestion, principally along the Liffey Quays and resulting in environmental deterioration. The completion of the Port Access Tunnel in 2005 will alleviate most of the surface access problems but issues remain over the height of the tunnel tubes and of some HGVs of exceptional height which may not be able to use the tunnel.
Dublin Port has been identified as a critical bottleneck in terms of international connectivity in the National Spatial Strategy (NSS, 2002). The NSS points out that the port faces a shortage of capacity, giving rise to the need to reclaim additional land for its expanding operations. The Strategy adds that in the medium to long-term, additional port locations should be promoted to take pressure off Dublin Port. Some of the advantages of pursuing such a strategy would be:

- To constrain the long-term growth of operations at Dublin Port. It is apparent that many transport-related activities at the port, including the use of Heavy Goods Vehicles act as negative externalities from an environmental viewpoint. A lessening of the need for continual land reclamation would also ease environmental tensions.

- In a wider context, the corridor between the UK and Ireland through Dublin Port is already congested, as identified in the National Spatial Strategy. Spreading port activity to other locations would reduce pressure on the primary transportation corridor, thus reducing the scope for greater congestion in the future with its associated delays and increased transport costs for enterprises.

- Two possible alternative port locations are Loughshinny, County Fingal and Greenore in County Louth. The potential of developing Loughshinny as an alternative port for Dublin was suggested in a report commissioned by ESB some years ago. Greenore has existing deep water port facilities in place and is located mid-way between Dublin and Belfast on the economic corridor, allowing it to serve both cities. In addition, its geographic proximity to Dundalk which has been designated a Gateway in the NSS would further reinforce its gateway function.

Taking the cargo and passenger figures into account it appears that Dublin Airport and Dublin Port perform complementary functions:

- Dublin Airport acts as the principal international gateway to the Study Area for passengers and Dublin Port is the primary gateway for freight.

- Policies which impact on the development of both facilities will play a major role in the direction of economic competitiveness of North Dublin, such is the vital function of these two transportation nodes in both a regional and national context.

- In particular, the issue of surface access quality to both Dublin Airport and Port will continue to shape future policy responses, as it is of paramount importance to the functioning of these facilities.

**Surface Transport Infrastructure**

Ireland is widely perceived to possess a weak internal surface transport infrastructure, particularly with respect to roads. On the European Union level, Ireland has joint lowest density of motorway (with Finland), although motorway provision has expanded by a factor of 3.6 between 1990 and 1999 (Eurostat, 2002). The high dependence on road transport for both passenger and freight transport in Ireland, coupled with the relatively under-developed state of the road network, acts a major constraint on the economic competitiveness of the Irish economy (Forfás ACC, 2002).
The present lack of high-quality motorway infrastructure beyond the Greater Dublin Area impedes the spread of inward investment and economic development beyond a zone approximating 60 kilometres from Dublin Airport. This leads to a concentration of investment into Dublin and its hinterland, a trend beneficial to the potential development of economic clusters in the North Dublin area. The completion of the first long stretch of motorway in the Republic of Ireland, between Dublin and south of Dundalk, in June 2003 will strengthen the Dublin to Belfast economic corridor and will reinforce the accessibility of North Dublin. Despite the provision of new infrastructure, congestion will continue on several key routes within the Study Area, compounded by the unsustainable dispersal of population from Dublin to an expanded commuter belt resulting from housing affordability difficulties (see section of housing).

Road Infrastructure:

M1 Northern Motorway
The M1 Northern Motorway forms a critical transport artery on the Dublin to Belfast economic corridor and is nearing completion with only the Dundalk to Border and Dundalk Bypass sections yet to commence. With the recent opening of the Drogheda bypass and the Dublin Airport to Balbriggan sections, 72 kilometres of continuous motorway from Dublin to south of Dundalk now exists with obvious positive consequences for the economic development of the North Dublin Area. In particular, the completion of the motorway will act to reinforce areas of existing economic activity including Swords, Balbriggan and Dublin Airport and will also open up new areas for potential long-term development. The provision of the M1 several years in advance of other key motorway routes further increases the location advantage of North Dublin.

M1 Dublin Port Access Tunnel
The Dublin Port Access Tunnel, currently under construction, will be a central element within the Dublin transportation system and aims to remove Heavy Goods Vehicles using Dublin Port from Dublin City Centre. Construction on the Port Access Tunnel began in early 2001 and is expected to be completed by early 2005. A number of important issues arise from the provision of the Port Access Tunnel:

- Height of the tunnel tubes – some HGVs may be too high to safely use the tunnel. The Dublin Port Authority maintain that the proportion of HGVs exceeding the maximum safety height limit will account for no more than 1.5% of total Heavy Goods Vehicle traffic passing through Dublin Port.

- Additional HGV traffic on the M50 – existing proposals to upgrade the M50 from four to six lanes by 2006 will be delayed due to recent fiscal restraint.

- Safety issues – concern has been heightened following the vehicle crashes and resulting fires in the Channel Tunnel and Mont Blanc Tunnel, the latter causing a number of fatalities.

- The issue of rising construction costs. The Port Access Tunnel was estimated to cost in the region of €165 million during the planning phase but the current estimated cost of the project is estimated at €650 million. The sharp increase in
costs is indicative of steep construction price inflation affecting the roads programme of the National Development Plan and additional complications with tunnel construction and unresolved compensation costs for affected residents adding to initial cost estimates.

M50 Capacity Enhancement
The Dublin Transportation Organisation strategy 2000-2016 *A Platform for Change* calls for the upgrading of the M50 C-Ring motorway through the addition of an extra traffic lane on each carriageway and the complete grade separation of the junctions with the National Primary Routes radiating from Dublin city. The Westlink toll bridge was doubled in capacity through a public-private partnership arrangement and was completed in September 2003. The recent announcement by the NRA that work will commence in 2005 on upgrading the Red Cow Interchange and adding a third lane in each direction on the M50 between the N4 and N7 junctions has resolved some of the uncertainty with the schedule of M50 capacity enhancement work. However, no indication has been given in relation to upgrading the M1 to N4 section of the route, which will experience the greatest increase in traffic due to HGVs routed through the Dublin Port Tunnel. Any delay in upgrading the M50, particularly taking into account the additional HGV traffic generated by the opening of the Port Access Tunnel, will compromise the transportation efficiency of North Dublin and thus the area’s economic competitiveness.

The Dublin METRO and the Dublin Airport to City Centre Rail Link
Dublin is one of the few Western European capitals without a direct rail link between the airport and the city centre. The lack of a rail connection means that surface access to Dublin Airport is solely road-based, which is subject to frequent congestion. Current proposals indicate the completion of the city centre to airport rail link, to form the first stage of the planned METRO system for Dublin, by 2007. However, given the scale of the recent cutbacks in public expenditure, this time schedule would appear to be jeopardised. Currently, the Department of Transport plans to introduce legislation that would expedite the planning, consultation and construction phases of the METRO system with the aim of significantly reducing expenditure for its provision.

The DTO strategy, *A Platform for Change*, also proposes extending the Dublin Metro to Swords and Blanchardstown. The provision of a Metro would offer many opportunities in the way of supporting a large employment base in locations that it is proposed to serve, namely Blanchardstown and Swords. The opportunities include:

- The location of a wide array of economic sectors, including specialist and professional services, creative enterprises and cultural/social facilities which currently tend to agglomerate strongly in Dublin city centre.
- Diversifying the economic base of Blanchardstown, Swords and other locations in North Dublin served by the Metro.
- Facilitating the provision of mixed land uses, including the integration of commercial activity, employment and housing with the objective of reducing commuting.
- The provision of “landmark” office buildings that are only supported by high capacity public transport.
Telecommunications Infrastructure
A high capacity telecommunications system is a critical component of the overall infrastructure requirements of high-technology industry clusters. The importance of the world wide web as a communications medium is underlined by the number of companies that have adopted an e-business strategy. Current trends indicate that the use of the internet will continue to grow, with increasing emphasis placed on high-speed broadband capacity with the ability to deliver a range of services to customers.

In this regard, the North Dublin study area is relatively well placed in terms of its telecommunications infrastructure with the main issue being uneven local access to high capacity systems. North Dublin City and Fingal have a broadband infrastructure in the form of 15-80 Gbit/s Dense Wavelength Division Multiplex (DWDM), 2.5 Gbit/s Synchronous Digital Hierarchy (SDH) access to broadband and a primary rate Integrated Services Digital Network (ISDN) system. The study area also possesses an A1M (Asynchronous Transfer Mode) switch system and DSL (Digital Subscriber Line) capability. The lack of an operational PoP (Point of Presence) server in the study area places it at a relative disadvantage to locations elsewhere in Europe with this facility but on a par with other regions in Ireland. A complex network of broadband cables are positioned in the northern part Dublin city, with a significant line running from Clonskeagh Industrial Estate to Stephen’s lane in the city centre. Four SDH lines traverse County Fingal, using the existing transport routes of the Dublin-Sligo and Dublin-Belfast rail lines and the N1 and N3 routes.

Energy Infrastructure
The provision of a reliable and competitively-priced power supply are vital to inward investment and development. Demand for electricity in Ireland has grown rapidly since the early 1990s, reflecting the strong economic performance of the country during the past decade, with peak demand for electricity increasing form 2,460 megawatts in 1990/1 to 3,800 in 2000/1 (NSS, 2002). Currently, it is believed that power demand on a national basis is close to matching supply, with little scope for spare generation capacity. This bottleneck in electricity generation may impede the future competitiveness of the North Dublin Study area if it is not addressed.

Electricity
The electricity generation and supply sector in Ireland has traditionally been carried out by the state-owned Electricity Supply Board (ESB), which enjoyed a monopoly on supply and distribution from its inception in 1927 until the beginning of the present century.

In 1999, the electricity market in Ireland was liberalised and opened up to competition under the EU liberalisation programme. The Commission for Energy Regulation was established to regulate the Irish energy sector. In 2002, the remit of the Commission was extended to cover the natural gas market. Despite the liberalisation of the energy sector, only two independent energy companies have entered the Irish market – the Viridian group and Eirtricity.

The North Dublin study area is currently served by a wide network of 220 kV and 110 kV overhead transmission lanes and subterranean cables with a major transmission
sub-station located at Kildonan, close to finglas. Currently, there is one power
generation facility in the study area at Huntstown. The Huntstown facility is operated
by the Viridian-owned Huntstown Power Ltd. and is a Gas-fired 343 megawatt power
station. The power station began full operation in November 2002. Planning
permission exists for a second generation unit but this project is currently on hold. The
second private power company operating in Ireland is Eirtricity, which operates wind
power facilities in Ireland. Eirtricity have commenced construction of a very large 500
megawatt wind farm located off the County Wicklow coast which is scheduled for
completion in 2006, with operations coming on stream on a phased basis. A third
company, EPower, withdrew from the Irish energy sector in 2001, citing problems
with the regulation of the sector as a reason for doing so.

Reasons for the relative lack of interest in the Irish energy market include:

- The very small size of the customer base (less than 4 million persons) which makes
  the provision and distribution of power expensive relative to other EU nations such
  as the UK and Germany, where energy companies can benefit from greater
  economies of scale.
- Ireland is characterised by a dispersed population with a relatively low rate of
  urbanisation by EU standards. These factors increase the cost of power distribution
  and mitigate against the economic use of energy infrastructure.
- The lack of a sizeable presence of independent power companies in Ireland means
  that the dominance of the ESB will continue in the short to medium-term. High
  generation and distribution costs are reflected in recent increases in electricity
  prices, with the business sector having to absorb increases to the order of 3% to
  8%. In particular, the Small to Medium size sector (SME), viewed as important in
  terms of its central role in cluster development, absorbed an increase of over 8%,
  thus adding to operating costs and eroding competitiveness.
- The National Spatial Strategy has identified the corridor between Dublin and
  Dundalk as in need of further power network strengthening, with the method of
  reinforcement to be determined. It is important to re-assess the structural
difficulties of the Irish energy market with a view to increasing competition in the
medium to long-term. A competitive energy sector will contribute to a competitive
economy.

Natural Gas
Ireland has been a producer and consumer of natural gas since the 1970s, when gas
reserves were discovered off the Cork coast and subsequently developed and exploited.
Natural gas is a very clean fuel and its use has rapidly increased in the industrialised
world in the past 40 years. In addition to its use in domestic and commercial settings,
an increasing proportion of electricity power generation is based on gas as a source of
fuel (including the new Huntstown power plant). Currently, the North Dublin study
area is in a central location in the Natural Gas network, with the two international gas
inter-connector lines (from Scotland to Ireland) coming ashore in Ireland in County
Fingal. The Pipeline to the West, which links Galway and the Midlands to the natural
gas network, is nearing completion. Despite the prospect of the exhaustion of the
existing gas field at Kinsale, the commencement of commercial exploitation of the
adjacent Seven Heads field, the planned exploitation of the Corrib field and the gas
inter-connector ensures the continuation of an adequate natural gas supply.
Water Supply and Drainage Infrastructure
The North Dublin study area is currently served by water mains from the river Liffey water treatment plant at Leixlip, which has undergone extensive expansion to cater for rapid population growth. In order to cater for extensive new housing development planned on the North Fringe of Dublin City, the North Fringe Water Supply Scheme is proposed. This scheme will abstract water from the existing mains facilities at Ballycoolin, Blanchardstown and comprise of 36 kilometres of new water mains to service land designated for development between Ballymun and Baldoyle. The scheme will also feature a reservoir and high level water tower at Sillogue, Ballymun. Construction of the scheme is expected to commence in June 2003 and take two years to complete. Management of the project is being overseen by the North Fringe Project Office, which is jointly operated by Dublin City Council and Fingal County Council.

In relation to sewage infrastructure, the North Fringe Project Office has just completed the North Fringe Interceptor Sewer Project, which will enable the development of over 15,000 dwelling units on the North Fringe of Dublin City. The project involved the construction of 27 kilometres of new sewer between Finglas and Sutton. The North Fringe Interceptor Sewer Project replaces an older sewage system that had reached its capacity and involved the outlet of raw sewage into the Irish Sea at Howth. In order to comply with EU directives of sewage treatment, the North Fringe Interceptor Sewer empties into a pumping station at Sutton, where sewage is piped under Dublin Bay to the expanded treatment works at Ringsend. The latter infrastructure forms part of the major Dublin Bay Project, which was also recently completed and aims to end the outlet of raw sewage into the Irish Sea and provide Dublin with Blue Flag standard beaches by the middle of the present decade.
5. Enterprise Clusters in North Dublin and Housing Issues

The provision of an adequate and affordable housing supply is central to the economic competitiveness of a given region. High housing prices reflect a housing supply/demand imbalance which is, in turn, caused by a successful regional economy and a high level of economic competitiveness.

The absence of affordable housing will detract from the future economic competitiveness of the study area and the Greater Dublin Area generally. Ireland has already slipped in the world competitiveness ranking, partly as a result of inflationary pressures in which housing affordability difficulties have played a significant part.

Housing supply deficiencies have significantly impacted on the urban development pattern, which is based on outward dispersal of both housing and population and which is not a sustainable development option. The preliminary results of the 2002 Census confirm the accelerated dispersal trend from Dublin to an extended functional hinterland.

The supply of housing in the Dublin Region is not accommodating natural growth in population and is even more significantly under-providing for housing needs represented by inward migration resulting from the strong employment growth of recent years. Recent government actions controlling funding for local authority housing programmes may impact upon the ability of local authorities to increase supply. In the absence of detailed data from Census 2002, precise housing data is unavailable for the study area but a combination of Dublin City and Fingal can be used as an estimate.

As long as housing supply production levels remain at 10,000 units per annum, annual demand of 15-20,000 units will continue to support rising house price levels in the Dublin market and the relocation of Dublin housing demand into the Mid-East Region and Outer Leinster counties. The table below outlines the housing strategies of the two local authorities operating in the study area and also County Meath, which is included because of the dormitory function much of its housing plays for workers employed in the North Dublin study area.

The housing supply difficulties are most acute in the Dublin Region, where housing supply has essentially remained static since 1996 at a level of between 9,000 and 10,000 dwellings completed per annum, well below the level required to service demand. The surrounding counties of Kildare, Meath and Wicklow have accommodated the demand for housing in the Greater Dublin Area to a certain extent, with housing output in these three counties increasing by 140% between 1994 and 2001, from 2,870 dwellings to 6,893 during this period (DoELG, 2002). It has now spread further afield than the Greater Dublin Area into the surrounding “Outer Leinster” Counties where annual new housing completion levels have increased by almost four-fold between 1994 and 2001, from 2,726 dwelling units to 8,148.
<table>
<thead>
<tr>
<th><strong>Local Authority Area</strong></th>
<th><strong>Dublin City</strong></th>
<th><strong>County Fingal</strong></th>
<th><strong>Meath</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity for number of housing units 2001-2007 (^3)</td>
<td>34,782</td>
<td>53,647</td>
<td>23,401</td>
</tr>
<tr>
<td>Location of indicative major existing land resources (housing capacity in number of units)</td>
<td>Docklands (c.7,000) North Fringe (c.6-7,000) Palletstown (c.3-4,000)</td>
<td>Balbriggan (c.8,000) Blanchardstown (c.8,400) Swords (c.6,600) Portmarnock (2,100) Rush (1,800) Malahide (1,200) South Fringe (1,200)</td>
<td>Drogheda Environs (4,120) Ratoath (2,536) Dunshaughlin (2,210) Navan Environs (2,012) Ashbourne (1,236)</td>
</tr>
<tr>
<td>Social/Affordable housing mix under Part V provisions</td>
<td>10-15% social 5-10% affordable 20% affordable in areas with high proportion of social housing</td>
<td>Social/Affordable mix will take into account existing concentration of social housing in particular areas.</td>
<td>Initially 3% social and 17% affordable rising to 5% social and 15% affordable</td>
</tr>
</tbody>
</table>


The extent of population deflection into the wider hinterland of Dublin has been dramatically confirmed in the 2002 Census, where the population of Dublin increased by 6.1% between 1996 and 2002, less than the national rate of 8%. In the surrounding Mid-East Region, population grew by 18.8% between 1996 and 2002, three times the growth rate of Dublin in the corresponding period. In particular, counties Westmeath and Louth experienced dramatic increases in new housing output between 1994 and

\(^3\) Includes the capacity of existing serviced development land and zoned developed land likely to be serviced by 2007.
2001 to the order of over 400% and 200% respectively, driven by the under-supply of housing in Dublin (DoELG, 2002).

From a housing supply perspective, the North Dublin study area is clearly divided into two halves:

- Dublin City, where an acute shortage of development has translated itself into an inadequate housing supply.
- Fingal, which contains a large quantity of development land and thus has experienced the most robust level of housing output in the GDA in recent years.

Within the Dublin Region, housing production has been weakest in Dublin City and Dun Laoghaire-Rathdown, reflecting their more developed character with a consequent lack of development land. Between 1994 and 2001, housing output declined in Dublin City and Dun Laoghaire-Rathdown by 20.1% and 6.3% respectively. County Fingal, characterised by a large amount of open rural area, experienced the largest increase in new housing production between 1994 and 2001 at 139%, from 1,510 units to 3,602. South County Dublin follows Fingal with a 22.3% increase in housing production over the corresponding period, from 1,428 to 1,746.

The correlation between the level of housing completions in the local authority areas is closely matched by population increases between 1996 and 2002, with counties that experienced robust growth in housing production also experiencing large population increases. This trend is evident in Counties Fingal, Kildare and Meath, where strong levels of housing production were matched by rapid population growth rates of 17%, 22% and 22% respectively between 1996 and 2002. Likewise, local authority areas, which performed relatively weakly in recent years in housing production, experienced low levels of population growth between 1996 and 2002. Prime examples include Dun Laoghaire-Rathdown and Dublin City, where population increased by only 0.7% and 2.7% respectively.

Housing construction data for 2001 indicates that a modest increase of 2.1% in housing production in the Dublin Region was achieved, with 9,605 units built compared to a corresponding figure of 9,405 units in 2000. This still falls far short of overall demand, despite improvements in some local authority areas.

**Housing demand in the Greater Dublin Area**

It is apparent that a supply/demand imbalance in relation to housing exists in the Greater Dublin Area results in rising house prices and a deflection of housing demand from Dublin City to both the Mid-East Region and the “Outer Leinster” counties. Using Strategic Planning Guidelines projections of housing demand, it is projected that 259,549 additional households will be created during the period 1996 to 2011 in the Greater Dublin Area (SPG, 2000). To sufficiently accommodate the additional households, an average of 17,303 new housing units will need to be produced on an annual basis between 1996 and 2011. As the actual cumulative housing output in the GDA between 1996 and 2001 is 73,502 dwellings, representing an average production level of c.14,700 units per annum, it is clear that a major backlog of demand exists in relation to housing supply. 186,047 new dwellings are required to meet SPG projections between 2002 and 2011 inclusive, which equates to 18,605 new houses per
annum in the Greater Dublin Area. Therefore, an annual shortfall in production of c.6,000 dwellings exists and construction capacity must increase housing supply further to meet demand.

**House Price Trends 1994-2002**

A direct consequence in the shortfall in housing supply is high house prices in Dublin, which has forced first-time house buyers to purchase properties further from the capital in more affordable locations. Between 1994 and 2001, new house prices increased by almost 197% in Dublin, from €81,883 to €243,095 compared to a national rate of increase of 151.4% during the corresponding period. By the second quarter of 2002, the average new house price in Dublin was €252,657, 28% higher than the national average of €196,905 (DoELG, 2002).

Second-hand house prices in Dublin in the second quarter of 2002 were over 30% higher than the national average at €297,723, with a price inflation rate of 223% between 1994 and 2001, producing a greater rate of increase than for new houses during this period. During the second and final quarters of 2001, house prices for new dwellings declined both in Dublin and the remainder of Ireland by 6.7% and 5.6% respectively. By the first quarter of 2002 the decline reversed, with increases of 4.8% nationally and 5.7% in Dublin taking place (DoELG, 2002). The house price decline during 2001 was attributed to the sharp slowing down in economic growth between 2001 and 2002 and the uncertain economic conditions following the September 11th 2001 terrorist attacks.

It appears, however, that the house price decline in 2001 was only a temporary feature in an upward but moderating trend. The latest DoELG house price data indicates that the resumption of price inflation in the Irish housing market has intensified, with price increases for new houses of 5.1% and 3.7% in Dublin and for Ireland as a whole respectively during the second quarter of 2002 (DoELG, 2002).
6. The Planning and Development Context

Government Policy towards Enterprise Clusters in Ireland

Introduction
In recent years, the Irish government has recognised the necessity for the country to remain competitive on a global level if the recent gains are not to be lost. In maintaining and enhancing Ireland’s competitive position, policy-makers have identified the importance of fostering and enhancing economic development at national, regional and local levels by developing a critical mass of economic activity in various identified sectors for the purpose of achieving self-sustaining growth. In addition, the government departments responsible for enterprise believe that Ireland must adopt a robust culture of innovation in order for the country to retain its competitive position on a global scale. Current policy mechanisms aim to achieve the creation of a critical mass of economic development in specific locations through the targeted provision of support infrastructure including:

- Hard Infrastructure – Physical infrastructure supporting economic development (roads, rail, telecommunications, provision of serviced land for industry, etc.).
- Soft Infrastructure – Less tangible forms of infrastructure which are nevertheless vital for the creation of millieux of self-sustaining economic development, as indicated in the National Spatial Strategy. Such infrastructure includes third level educational facilities and links between such institutions and private sector industry, training and upgrading existing skill levels in the labour force, developing linkages between multi-national FDI firms and smaller local enterprises.

The Role of Land-Use Planning in developing Enterprise Clusters
Planning acts as an indirect policy measure in terms of facilitating the development of enterprise clusters. Cities develop forms that are functional for the spatial location of industry and services and land-use planning regulations that ignore the reality of market behavioural tendencies are not likely to succeed (Hall and Pfeiffer, 2000). Effective planning emerges when it seeks to shape basic economic and social trends with the objective of making these operate more efficiently and in a more sustainable manner than they would on their own.

Land-use and transportation planning has been identified in a number of studies as acting to facilitate the development of clusters through the provision of critical elements of economic and social infrastructure, including the Strategic Planning Guidelines for the Greater Dublin Area (1999). However, spatial planning in itself is insufficient to foster the development of clusters. Successful cluster development requires a complex range of economic factors and targeted economic policies (Sainsbury, 1999). Spatial planning, therefore, acts as a secondary factor in cluster development, playing a facilitative rather than a causal role (GEMACA II, 2002).
Figure 6  
Spatial Planning and Enterprise Policy towards Enterprise Clusters in North Dublin

Spatial Planning Policy

Legislative Framework
- Planning and Development Act 2000
  - Strategic Development Zones

National
- National Spatial Strategy 2002-2020

Regional
- Strategic Planning Guidelines for the Greater Dublin Area
  - New Institutional Arrangements for Land-Use and Transport in the Greater Dublin Area

Local Authority
- Dublin City Development Plan 1999-2004
  - Fingal County Council Development Plan 1999-2004

Local (sub-county)
- Local Area Action Plans

Enterprise Policy

- National Development Plan 2000-2006
  - Technology Foresight Ireland

- Forfás and Enterprise Ireland Policy
  - IDA Regional Policy

- Dublin City Council Economic Development Unit
  - Fingal County Council Economic Development Department

- Dublin City Development Board
  - Fingal Development Board
The role of spatial planning in the development of enterprise clusters

There are a number of ways in which spatial planning can assist the development of economic clusters:

- Through the provision and siting of an adequate quantity of land zoned for industrial and commercial purposes. The potential for development increases if this land is located in close proximity to major transport routes, airports and third-level educational institutions.
- By providing economic infrastructure (roads, drainage, electricity and telecommunications) to the locations designated for development.
- In certain cases, planning legislation can enable local authorities to establish selected locations for an accelerated planning process, thus reducing delays and appeals which may cause uncertainty and deter potential inward investment. In the case of the Study Area, the relevant legislation is the Planning and Development Act 2000 and its provision for Strategic Development Zones.
- Spatial planning can enhance the development of economic clusters in less direct ways, including the allocation of sufficient zoned land for housing purposes and thus increasing the attractiveness of locations to labour markets required by inward investment. In addition, by providing for enhanced social, recreational and cultural amenities, spatial planning can further assist cluster development in an indirect manner. These elements of spatial planning are particularly necessary for a selected or targeted form of economic development such as enterprise clustering.

National Spatial Strategy

The National Spatial Strategy (NSS), published in November 2002, aims to strongly influence the spatial pattern of economic development in Ireland for the period 2002 to 2020. The central ambit of the NSS is to distribute economic development on a more spatially even basis in centres designated “gateways and “hubs” to attract new investment into the lagging Border, Midlands and Western regions of Ireland in particular).

The role of urban areas in promoting economic development is recognised in the NSS in line with international policy experience identifying the importance of agglomeration of economic activity. The role of enterprise clustering and innovation is debated and the requirements of potential counterweights to the East Coast are discussed in terms of developing areas with a critical mass of population, skills and innovative capacity. Of particular importance for identified growth areas including Dublin and potential alternative growth centres are:

- Quality of infrastructure.
- Educational attributes.
- Cultural, social and environmental assets.

Rationale for a National Strategic and Regional Approach:

- Human life functions (housing, working, transport, education etc.) are carried out at regional level rather than local level.
• Environmental problems - do not stop at local authority boundaries and are best
dealt with at national and regional level.
• Balancing of advantages and burdens within regions which offers synergy effects.

**Balanced Regional Development**
Detailed attention is given in the NSS to levels of development in the GDA and its
impact on quality of life. In terms of settlement strategy the strategy promotes a focus
on existing settlements and the concept of compact urban form. The need for balanced
regional development is accepted in the strategy and is strongly linked with the need to
develop alternative growth centres with a critical mass necessary to act as a
counterbalance to Dublin. Gateways selected as urban or polycentric urban regions
have a present or projected population of 100,000+. Such urban areas which include
existing cities such as Galway and Cork along with areas selected for future growth
such as Dundalk are regarded as having or are intended to have an appropriate level of
services, facilities and linkages to act as international gateways for Ireland.

Hubs, which are the next level of areas selected to assist regional development are
significant urban areas intended to act as local and regional service and development
providers linked to the hubs. Through the selection of such centres and the
encouragement of concentrations of economic activity the expectation is that a critical
mass can be achieved which will aid sustainable development regionally with a more
cost effective provision of services and a reduction of present trends towards excessive
sprawl particularly in the GDA.

The primary objectives of the National Spatial Strategy include the following:

• A more efficient Greater Dublin Area.
• Strong Gateways in other regions.
• Hubs to link Gateways to other areas.
• County and other towns to capitalise on local and regional roles - linked to hubs
  and gateways.
• Vibrant and diversified rural areas.

**Role of the Greater Dublin Area in the NSS**
The National Spatial Strategy recognises the primacy of the Greater Dublin Area in the
urban structure of Ireland and aspects of its role as the primary engine of the country’s
economy include:

• Dublin’s vital national economic role recognised.
• Interaction with Belfast and the cross-border economic corridor.
• Consolidation of GDA - Strengthening other regions.
• Need for Effective land-use policies.
• Target vacant and underused land.
• Urban extensions along public transport corridors.

**Specific Issues for the North Dublin Study Area**
Existing settlement trends in the Dublin region are unsustainable with commuting
activity spreading up to 100km from the city. Consistent analysis has shown that these
trends are linked to the long term under-supply trend in the housing market with
demand estimated in recent years at 15,000 units per annum and supply levels static at 9-10,000 per annum. Congestion, housing affordability and social problems and weakened economic competitiveness result from the absence of a sufficient response. The population of Dublin City and County area shows growth of 6.1% in the 2002 census. The deflection of Dublin population into the Leinster area is evidenced by levels of growth in Kildare and Meath of over 20% and Westmeath of 13.8%. In the Dublin urban region, city-centre regeneration has reversed the previous population loss, however decline is occurring in many parts of suburban Dublin. Examples include a 12% loss in Beaumont, 17.5% decline in Finglas South D and 12.3% loss in the Luford DED of Ballinteer. This involves a considerable wastage of existing public and community infrastructure while attempts are made to provide similar schools, roads and other requirements at enormous cost for new dispersed communities.

The economy in the GDA has grown considerably over the period since 1990 with over 150,000 new jobs and 40% of the national economies Gross Value Added (GVA) created in the region and major investment is required to sustain this level of activity. Some specific issues identified in the NSS and other strategy documents as requiring immediate actions rather than discussion to maintain competitiveness include:

- Surface access to Dublin Airport.
- The level of broadband capacity throughout the region.
- Capacity limits at Dublin Port and alternative options.

General transportation problems continues to be a major issue for the region’s future. The review of the National Development Plan in 2003 will result in inter-regional lobbying to ensure prioritisation of major projects and intensification of competition for funds will ensue. Past tendencies are that the more forceful and successful pursuit of regional political/economic objectives are from regions outside Dublin.

Tensions exist in the promotion of the concept of diversion of development from Dublin to other regions on the basis that balanced regional development is being encouraged. In fact the combined population of Cork, Limerick, Galway and Waterford is approximately 38% of Dublin's. Therefore the reality is that the main competition in respect of mobile investment for Dublin are alternative medium sized European centres such as Amsterdarm and Manchester. The problem of retaining Dublin's competitive position while simultaneously addressing regional development priorities will present considerable political difficulties. Industrial Development Policy is already moving towards a system of regional specialisation and clusters. The promotion of FDI favours locations outside Dublin through the incentives and supports available. A fact often missed in such discussions is that the majority of most disadvantaged areas in the country are located in Dublin. Despite population and employment growth, Dublin remains a medium sized urban area by international standards requiring improved management of development rather than diversion of such development. Essential to such improved management must be a reformed urban governance system.

**Consolidation of Development in the Greater Dublin Area**

The framework for planning envisaged in the NSS is similar to the existing Strategic Planning Guidelines (SPG) which will be updated in line with the NSS. It involves a
more compact urban form with additional development being channelled along the main transportation corridors.

In many respects the most influential elements of the NSS on development patterns in the GDA may be the combined effect of NSS housing policies and its prioritisation of urban consolidation. If acted on this would represent a strong policy and planning shift away from extensive sprawl type patterns as experienced in recent years and towards infill and compact development forms. Measures suggested include:

- Identify options for re-use of under-utilised, derelict and undeveloped land within existing built-up areas.
- **Realise** options for re-use of land using legislation (Derelict Sites Act, land acquisition).
- Identify urban **extension** options if sufficient development opportunities within towns are not available.

**Strategic Planning Guidelines for the Greater Dublin Area**

The **Strategic Planning Guidelines for the Greater Dublin Area**, published in 1999 guides the land-use and transport development pattern of the Functional Urban Region of Dublin from 1999 until 2011. These guidelines intend to curtail the dispersal of the development of Dublin by intensifying development patterns in the inner designated Metropolitan Area, and to focus new development into designated centres or “nodes” located along transportation corridors in the outer Hinterland Area of Dublin. The Strategic Planning Guidelines (SPG) are of the utmost relevance to the FUR of Dublin, as they outline the broad pattern of Development for the entire Functional Urban Region.

The Guidelines indicate that economic activities, and therefore employment, tend to locate at places that offer a specific economic advantage. Development strategies can thus create the conditions for the facilitation of economic activities through the concentration of future development into locations well-served by economic infrastructure. A key recommendation of the Guidelines is “to investigate and introduce measures (e.g. dedicated land, advance factories, service provision, tax incentives, etc.) to secure employment activities in the identified development centres in the Hinterland area of Dublin.” (SPG, 1999). The Guidelines intend to concentrate employment activities into the designated development centres in order to provide a local employment base for the population of the centres and to reduce the necessity to commute to Dublin for work. In addition, the Guidelines recommend that new data on employment, patterns in the Greater Dublin Area should be generated for the purposes of monitoring the implementation of the Strategic planning Guidelines and future planning in general. The Guidelines also recommend that measures to encourage teleworking practices from the home in order to reduce commuting be implemented.

The Strategic Planning Guidelines offer obvious development implications for the North Dublin Area, namely:

- The designation of the N1 route as a principal transportation corridor, along which economic development is to be concentrated. Additionally, this corridor forms the southern section of the emerging Dublin to Belfast economic corridor.
• The western section of the study area is traversed by the Dublin to Navan N3 route, which is designated as a future transportation corridor in the Strategic Planning Guidelines.

• The areas of current economic and industrial activity in North Dublin, including the North Dublin City Fringe, Blanchardstown and Swords, are located within the Metropolitan Area designated in the SPG with Swords and Blanchardstown designated as major centres within the Metropolitan Area. The principal strategic objective for the Metropolitan Area is to consolidate existing development, increase development densities and facilitate the provision of an improved public transportation system to service the additional travel demand generated by consolidated development.

• Within the Hinterland Area of the SPG, Balbriggan is designated as a primary development centre and the Rush-Lusk area is designated a "secondary development centre. Future development, therefore, is to be concentrated into these towns with significant economic and industrial activity to be located in Balbriggan. Drogheda, although located just outside both the Greater Dublin Area and North Dublin, functions as both a dormitory town and an employment centre for the Greater Dublin Area. The SPG recognises this through its designation of Drogheda as a primary development centre in order to reinforce its current function.

• The SPG proposes an outer ring route from the Swords/Airport area, through Lucan to Tallaght. The purpose of this route would be to facilitate local traffic and relieve pressure on the M50 for long-distance journeys. The Guidelines note, however, that the potential of this route to generate additional traffic will have to be examined. The cost of this proposal is estimated to be in the order of €100 million and is a long-term project. Although the provision of this route would open up additional lands for commercial and residential development, local authority development plans in the study area do not fix a detailed route nor has any additional land been re-zoned to reflect the proposed route.

New Institutional Arrangements for Land-Use and Transportation in the Greater Dublin Area
It is proposed to reform the existing situation with regard to the organisation and regulation of land-use planning and transportation in the Greater Dublin Area. A consultation paper outlining the proposals was published in March 2001 but the government has yet to advance the proposals and their implementation now seems highly unlikely. These include the creation of a new strategic land-use and transportation body with statutory powers for the Greater Dublin Area, and in effect the new body would implement in the objectives of the Strategic Planning Guidelines. The principal functions of the proposed body include the following:

• The preparation of and review of an integrated long-term land-use and transportation strategy for the Greater Dublin Area (i.e. The existing Strategic Planning Guidelines and future follow-up strategies).

• Monitoring the implementation of the strategy using appropriate performance indicators.
Recent Irish Enterprise Policy and its role in developing clusters

National Development Plan 2000-2006
The National Development Plan 2000-2006 has been influenced by a number of key policy recommendations prior to its formulation in 1999. In the case of enterprise clusters, a significant contributor to policy under the plan is the aforementioned Technology Foresight Ireland publication. Under the National Development Plan 2000-2006, the Irish Government plan to develop the concept described as Regional Innovation Systems, at a cost of €22 million in order to encourage regions in Ireland to bring together elements of the innovation system (industry, third-level institutions, agencies and financial institutions) with the objective of building strategies related to local; industrial or research strengths. Funding will be made available for both the preparation and implementation of regional innovation plans, and the proposals will incorporate regional technology parks, taking existing technology parks in Ireland as an model for future strategies. The National Development Plan, however, makes no specific reference to Dublin in this regard and it is widely believed that the proposed Regional Innovation Systems will be created in peripheral regions of Ireland which currently have a weak or non-existent innovation culture.

Technology Foresight Ireland
Current policy through the National Development Plan 2000-2006 was heavily influenced by the Technology Foresight Ireland (TFI) report (1999). This report essentially devised possible scenarios in relation to the development of the IT and Biotechnology sectors in Ireland and recommended certain courses of action for implementation at policy level. Specific referencing is made to facilitating the development of a Biotechnology Cluster, which would be based on the development of strong links between the third level colleges and industry, agriculture and the financial services sectors. The report states that the creation of Biotechnology clusters has been successful in other countries such as the USA, UK, Germany and Denmark. Most research on clustering in the biotechnology sector has led to the conclusion that the following conditions are necessary:

- A strong academic base with high quality R&D output, some of which is world-class.
- The right environment for translation of research output to innovation to company to product to market stages.
- An adequate labour and knowledge pool.
- An adequate base of ancillary firms that can support and service the biotechnology sector.
- An appropriate industry infrastructure.
- A positive government policy towards the sector.
- Protection of intellectual property rights.
- Availability of equity and finance (TFI, 1999).

The Technology Foresight Ireland Report recommends that the above factors be implemented for the successful development of a biotechnology cluster in Ireland. The report also notes that if a critical mass of activity is achieved, the cluster will become self-sustaining and the necessity for positive government intervention will recede.
through time. The report notes, however, that positive and targeted government intervention is vital in acting as a catalyst in the creation of a biotechnology cluster in Ireland.

The GEMACA II Project can be classified as one of the first attempts to examine and analyse enterprise clusters in Dublin, as relatively existing little work has been carried out to date. The study has found a number of significant spatial concentrations of enterprises in Dublin, including the ICT sector, Financial Services, Creative/Media and Tourism. The Pharmaceutical and Innovation sectors remain under-developed in the Functional Urban Region of Dublin and there is no evidence for clusters of these activities. Current government policies aim to continue support for all of the sectors examined in this report under the current National Development Plan 2000-2006. Government strategy aims to develop the Innovation and Biotechnology sectors in Dublin, through the creation of induced clusters and therefore continue the movement of Dublin up the value-chain in terms of international importance and competitiveness. From the relative scarcity of specific data relating to clusters in Dublin, the DIT study team would recommend the collection of data at DED level in order to track economic sectors n the FUR basis and a more thorough investigation into the trends and dynamics affecting cluster development.

Telecommunications Policy and Clusters
The accessibility of broadband telecommunications networks by industry and services is considered essential to maintaining the competitive position of Ireland in the global marketplace. The Information Society for Ireland: Strategy for Action report has informed current telecommunications strategy and recommended the establishment of a limited number of designated broadband service areas across Ireland with guaranteed service availability at internationally competitive prices. Telecommunications strategy has also involved the acceleration of a programme of “rolling-out” optical fibre networks to high-density areas of manufacturing and services (i.e. economic clusters). Two locations of concentrated investment in telecommunications for the facilitation of sector clustering in the Greater Dublin Area are the National Digital Park and the Digital Media Hub, neither of which is located in the North Dublin study area.

Innovation Policy in Ireland
Innovation policy in Ireland is directed by Forfás, the enterprise agency and is formulated by the Irish Council for Science, Technology and Innovation (ICSTI) which is an agency operating under the aegis of Forfás.

As Ireland is a small, open and export-oriented economy, the nation is heavily dependent of foreign direct investment and the existence of a solid base of competitive industry. The industrial and economic future well being of Ireland is heavily dependent on the development of an innovation-driven economy. Investment in research, related human resources and the application of new technology would enable Ireland to attract high quality foreign direct investment (FDI). The current National Development Plan 2000-2006 aims to significantly upgrade the innovation capacity of the Irish economy through the provision of both hard and soft infrastructure and generate key linkages between existing Third Level institutions and industry engaged in innovation (ICSTI, 2000). In recent years, research and innovation performance in Ireland has been moving towards the European average from a low base at the beginning of the 1990s.
Total spending on research and development (R&D) in Ireland currently stands at 1.4% of Gross Domestic Product, compared with a European average of 1.9% (ICSTI, 2000).

Investment in Research, Development and Innovation in Ireland 1989-1999
A clear link is recognised between the strong economic growth in Ireland during the 1990s and the performance of the high-technology sector. Between 1990 and 1996 manufacturing output expanded by 76%, with the highest performing industrial sectors being Chemicals (157.8%) and Electronics and Engineering (92.4%) over this period. These high-technology sectors have been the primary driving force in the growth of the manufacturing sector in Ireland during the 1990s and thus these sectors are of vital importance to the Irish economy. The high-tech sector and sub-sectors are also among the highest investors in R&D in Ireland. Compared to a national R&D spend of 1.7% of sales, the high-tech sectors invest as follows:

<table>
<thead>
<tr>
<th>Sector</th>
<th>R&amp;D as a percentage of sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computers/Office Machinery</td>
<td>4.3%</td>
</tr>
<tr>
<td>Software</td>
<td>9.6%</td>
</tr>
<tr>
<td>Electronics/Communications</td>
<td>2.0%</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>4.6%</td>
</tr>
</tbody>
</table>

Source: Forfás Survey of Innovation 1993-95

During the period from 1989 to 1999, the total estimated public and private expenditure in R&D investment programmes in Ireland amounts to €787 million. This programme of investment was achieved through a number of measures. The first round of measures were introduced between 1989 and 1993 (the duration of the first Operational Programme for Industrial Development under the EU Structural Funds programme) and involved €254 million. The second Operational Programme (1994-1999) involved an expenditure of €533 million and the four primary policy measures consisted of the following:

<table>
<thead>
<tr>
<th>Policy Measure</th>
<th>Total Programme Spend (Public and Private Sector) in €</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Industry R&amp;D Initiative</td>
<td>227 million</td>
</tr>
<tr>
<td>2 Industry/3rd Level Co-operation</td>
<td>259 million</td>
</tr>
<tr>
<td>3 Training for Innovation</td>
<td>19 million</td>
</tr>
<tr>
<td>4 3rd Level Research Support</td>
<td>28 million</td>
</tr>
<tr>
<td>Total</td>
<td>533 million</td>
</tr>
</tbody>
</table>

Despite developing a programme to create innovative capacity during the past decade, examination of some of the principal R&D investment indicators shows that in many respects investment in R&D still lags some way behind competing countries. Even in the case of business spending on R&D, which has seen the greatest degree of convergence towards EU average levels, the apparently better comparative performance reflects the fact that a higher proportion of industrial firms in Ireland operate in high tech sectors, including IT, chemicals and pharmaceuticals. It should also be noted that this convergence toward EU average levels of investment in R&D has to an extent been driven by a small proportion of firms and by incentives introduced as a result of the availability of EU Structural Funds.

Proposals for Innovation Policy under the Irish Council for Science, Technology and Innovation

The primary functions of the Irish Council for Science, Technology and Innovation include:

- Providing advice on science and technology policy-related issues in response to requests from the Government (through the Minister for Science and Technology) or from the Board of Forfás.
- To advise the Minister for Science and Technology, the Office of Science and Technology and the Board of Forfás on policy for science and technology and on related matters.
- To advise the Minister on the strategy for the preparation and implementation of national programmes in science and technology.
- To advise the minister on the strategic direction for State investment in science, technology and innovation.

The ICSTI believes that simply catching up with the EU average will be insufficient to maintain the competitiveness of the Irish economy on a global scale. Current policy aims to increase the level of innovation and research to reach the levels of investment by what is defined as the “leading and progressive” R&D nations which spend in the region of 2.5 to 3% of GDP on R&D activities and continue to develop their respective R&D sectors in an aggressive manner. The ICSTI have identified such nations with a heavy emphasis of R&D activity as:

- Sweden.
- Finland.
- Israel.
- Taiwan.
- Singapore.
- New Zealand.
- Malaysia.

The ICSTI has recognised that much of the growth on spending on innovation activity in Ireland during the 1990s has originated from businesses rather than Government itself, and thus new policy measures aim to redress this imbalance by significantly increasing expenditure on R&D activity by Government. The strong growth in
innovation activity during the past decade can be attributed to the high proportion of industrial firms in Ireland that operate in the high-technology sectors, including IT, chemicals and pharmaceuticals.

In order to maintain growth in business R&D and to foster a higher proportion of firms to engage in innovation activity that will sustain future economic competitiveness; greater public support will be required. The level of public investment in innovation lags considerably behind the EU average and has failed to keep pace with the growth in business spending in R&D. In addition, the relatively low level of public investment in R&D is heavily dependent on EU Structural Funds (ICSTI, 2000).

Proposed Strategy for Innovation in Ireland
The Irish Council for Science, Technology and Innovation recommends that future innovation policy should include a new programme of Government investment which aims to substantially increase the R&D base of the country as a means of enhancing innovation and competitiveness through a series of policy measures.

The new programme of investment in innovative activity will include the following:

- Assistance to firms to develop new products, services and processes which will help them to maintain and increase their market share.
- Increasing the number of companies performing R&D in Ireland.
- Encouraging firms to access and exploit R&D and technology from international sources.
- Increasing the number of persons engaged in research activity.
- Reinforcing the research capability in the third-level and State research institutions, with respect to meeting the R&D and skills needs of the economy.
- Increasing the quality and quantity of R&D linkages between institutions and companies.
- Increasing the amount of public investment in R&D in areas that have been identified as priority areas for national economic, and employment development through the allocation of State and EU support for these areas on a competitive basis.
- Promoting private investment in R&D and in new technology-based firms.

In addition to direct Government support for the innovative capability of Ireland, the ICSTI recommends that the new EU supported investment programme focus on four primary areas:

1. Support for R&D in industry.
2. Develop an environment of collaboration between industry, third-level institutions and public research institutes both in Ireland and other countries.
3. Investment in R&D infrastructure, including public investment in key technologies, skills and research facilities to strengthen the national research capability.
4. Development of R&D in natural resource sectors, in order to maintain competitiveness.
The ICSTI believes that in making decisions in the balance of investment in the aforementioned policy measures, a strong emphasis should be placed on developing the performance, capability and skills of the business sector in terms of R&D and innovation and promoting industry/institution collaboration.

The ICTSI is of the opinion that R&D performance in Ireland must not only be benchmarked against other EU countries, but also increasingly be benchmarked against nations that are global leaders in investing in innovative capacity such as Sweden, Finland, Israel, Taiwan and others. The ICTSI believes that public expenditure or other forms of State support, targeted at underpinning the needs of indigenous firms and attracting and sustaining high-technology multinational companies, in addition to stimulating new firms into engaging in R&D activity, must keep ahead of private sector demand. The aforementioned policy measures currently being introduced will act to redress the historic imbalance between private sector and public sector funding of innovative capacity and will adopt a more strategic and targeted approach to developing R&D activity in Ireland.

Examples of Innovative Cluster-type approaches in Ireland:

International Financial Services Centre

The International Financial Services Centre (IFSC) is a distinct economic cluster in the North Dublin study area with a concentration of financial and other internationally-traded service companies. The development of the IFSC is an exercise in integrated urban renewal and economic development with the objective of the creation of a cluster of financial service activity. The successful development of this sector is regarded as a flagship project in general urban renewal in the Dublin Region. With a total of c. 15,000 persons now employed in this economic cluster, its importance to the city in terms of both the levels of employment generated and increased tax revenues is critical. The Dublin IFSC experience is of particular interest as it represents an induced development process which is now maturing and shows signs of having attained a strong critical mass needed to sustain the long-term future of the sector/cluster. The future development of the IFSC remains a primary component of the Integrated Master Plan of the redevelopment of the Dublin Docklands.

Over one third of the jobs at the IFSC are involved in funds administration. Investment decisions continue to be primarily made in London and New York, with Dublin functioning as a back office and support centre. The financial services sector displays continued strength in spite of the international recession with certain sectors, particularly exposed including international aircraft leasing operations.

The International Financial Services Centre is located on the north quays of the River Liffey immediately east of the central business district of Dublin and special planning arrangements and incentives apply to this area. In 1986 the Custom House Docks Development Authority was established and granted flexible planning and financial powers in order to secure the re-development of the area. The original defined site consisted of a large derelict port area formerly owned by Dublin Port and Docks Board and two further expansions have occurred to the IFSC since the commencement of its development.
Following an international competition, a Master Plan for the comprehensive redevelopment of the area was drawn up with a consortium of private developers establishing the Custom House Docks Development Company to develop the site. A pivotal component of this development plan was the creation of the International Financial Services Centre (IFSC) along with office, residential, retail, hotel and museum facilities costing an originally planned total of €508 million. The major stimulant to the development of the IFSC has been the making available since 1987 of a special corporation tax regime for occupiers involved in international financial services conducted in non-Irish currencies. Instead of the normal corporation tax rate of 40% applying to the profits of such business a 10% tax rate applies.

Development at the IFSC by 1992 involved the completion of the IFSC and ancillary office space totalling 40,000m² at a cost of €152 million. Following a period of little new development, a second, more rapid and sustained phase of development took place at the IFSC after 1994 and by 2000 over 8,000 persons were directly employed in over 485 international financial companies and a further 8,500 employed in related firms, with mutual funds under management valued at €387 billion.

The state has a role as a participant in the development process and resulting profits. Under the confidential master agreement, the development is funded by the developers who are guaranteed a specified minimum economic return. Surplus development profits are then shared between the developer and the state on a 60/40 basis in favour of the state with the developers also paying a lump-sum premium to the state. Interviews with participants in the development process indicate that re-negotiations had occurred on the above arrangements with subsequent alterations in favour of the development consortium. Details of such arrangements and premiums paid are not made officially available and are therefore difficult to quantify.

The direct costs to the state of the scheme can however be estimated. The site was purchased and the development authority established with €16.5 million provided by the government. Essential infrastructural development to the site, including local authority improvements and housing the telecommunications centre and power supplies are estimated to have cost the public bodies involved in excess of €25.4 million. The cost of the property development incentives at the site are high relative to other developments in Dublin due to the availability of the full rate of Capital Allowances of Custom House Docks. The provision of incentives, in particular the low rate of corporation tax on profits, has undoubtedly been a critical factor in the success of the IFSC.

National Digital Park
A National Digital Park has been designated which acts as the primary node for interconnection between high bandwidth telecommunication cables between the USA and Ireland and the Irish high bandwidth network, also known as the “Global Crossing.” Government policy intends the creation of a cluster of both indigenous and overseas telecom content companies, such as internet service providers and other telecommunications activities at the Digital Park. Policy aims for the cross-fertilisation of ideas and skills between the companies at the Park by virtue of their close spatial proximity and sharing of a common telecommunications infrastructure. The National Digital Park is sited at the City West Business Park, located 16 kilometres south-west
of the centre of Dublin. The location of the National Digital Park at City West gives firms in the park a distinct telecommunications advantage over other locations in Ireland. Of particular note is the fact that Eircom (the national telecoms provider) has located their network operations centre at the site. The creation of a National Digital Park was recommended in the Information Society for Ireland: Strategy for Action report.

Digital Media Hub

The government has designated a section of the inner city of Dublin to be the location of an area of innovative activity with respect to telecommunications and information technology. The development of a digital media hub in Ireland was recommended in the Technology Foresight Ireland report and the earlier Information Society for Ireland: Strategy for Action report and is an objective of the National Development Plan 2000-2006. The objective of the Digital Media Hub project is to facilitate the development of a local cluster of creative media and innovation enterprises whilst acting as a catalyst for physical, economic and social renewal of a derelict inner city area. The Digital Media Hub is intended to be a flagship scheme of the Integrated Area Plan programme being carried out by Dublin Corporation to regenerate areas of economic deprivation and social exclusion. To carry out the development, the government established a company, Digital Media Development Ltd. (DMD), to develop the sites for the Media Hub. The core area to be developed by DMD comprises an area of 2.76 hectares including c.18 existing buildings. Policy makers intend that the key facility located in the Digital Media Hub, MIT MediaLab Europe, will act as a catalyst for the subsequent development of creative media and innovation firms in the area with the primary objective being the creation of a critical mass of self-sustaining economic activity and the transfer of concepts and skills between firms.
7. Views of the Planning and Development Agencies

The primary purpose of interviewing representatives from government agencies and local authorities involved in enterprise development was to establish the views of the key participating public agencies on the present and future role of cluster-type policies in economic development. As part of the process, a structured series of questions dealt with respondent's views in the cluster concept, its advantages/disadvantages and public policy implications, particularly relating to the planning and infrastructural areas.

The Role of Participating Policy Perspectives

The agencies selected for interview reflected the Planning and Development Policy Framework discussed in Section 6. The National Spatial Strategy perspective is particularly relevant in terms of future policy direction. The NSS acts as a framework, bringing together and integrating a full range of policy inputs at national, regional and local level. In terms of enterprise clusters, this concept is identified as essential in the policy aspiration of balanced regional development in Ireland. Essentially, economic clusters are seen as a vehicle by which emerging urban regions may develop a complementary range of activities which have the ability to assist in lifting economic performance in selected areas.

The Strategic Planning Guidelines input is essentially to guide the resulting physical and environmental results of economic development to achieve sustainable development priorities within the region. The guidelines rely upon the work of agencies such as the IDA, Enterprise Ireland and others and assess, in research and policy terms, the results of consequent development, particularly with respect to transportation and infrastructure provision. In reviewing policies towards clusters, particular regard would be made to the transportation implications of such trends and their wider economic, social and environmental impacts.

The role of the Industrial Development Authority is specific in that it develops and supports foreign direct investment in Ireland in the manufacturing and services sectors. Its role is particularly important in North Dublin as the role of both existing and new overseas business investment is a substantial influence on the area. The cluster type approach of the IDA is seen as its most advanced in sectors such as financial services and telecommunications/IT/software development, where the need to integrate businesses with related activities, suppliers and services is critical.

Local Authorities are obviously primarily concerned with local economic development. Their role in this area often involves making land available at specific locations for users such as industry and services and for small and medium size enterprises (SMEs). The concept of partnership is particularly relevant in terms of such developments. Large scale developments of industrial/business parks often involve the combined action of the IDA, Forfás, local authorities and other agencies in the identification, negotiation and development necessary for the provision of physical facilities. In practice, the Irish industrial development policy in the sense that it is moving towards cluster type policies is client-driven. The ability to deliver services, particularly for new and specialised sectors, often involves making directed strategic
investment in infrastructure. In terms of cost-efficient delivery and satisfying potential users of these facilities, a selected or concentrated process emerges in, for example, the provision of broadband telecommunications infrastructure. While partnership and cooperation was viewed as desirable and achievable by most respondents, some concern was expressed as to the multiplicity of agencies involved in economic development issues complicating effective delivery of policy by individually reporting to separate government departments and ministers.

The Cluster Concept
The concept of economic clustering has emerged as a significant input in all planning and development policy. For many respondents, the economic cluster in its Irish form is particularly associated with new or incoming industry which needs specialised supports and services to locate in any region. Such supports and services are of growing importance as Irish industry moves up the value chain and away from older assembly-type activities. Also noted was the significance of an anchor or major businesses in particular sectors as promoting the development of clusters providing support services. Another form of cluster in, its purest sense, was noted by respondents as industries directly or indirectly linked which feed off specialisation and strengths of the existing business sector. Examples of this nationally were noted as including the pharmaceutical industry in the Southwest (around Cork harbour in particular) and software industries in Dublin. The absence of functional specialisation in the older industrial profile of North Dublin, other than logistics in the vicinity of Dublin Airport, was commented upon by the majority of those interviewed.

Advantages/Disadvantages of Clusters
The potential advantages of cluster type approaches to economic development were identified as including the ability to develop further complementary activities in more sustainable manner whilst benefiting from the more efficient use of available infrastructure. This attainment of additional leverage in encouraging economic development also offered the opportunity for the creation of a strong interest in sectoral value chains allowing upward movement. This, in turn, is seen as creating a platform for future economic development which is viewed as potentially more embedded or integrated by being part of a cluster. As a sectoral cluster develops, the opportunities for small and medium sized enterprises to develop and profit from the synergies provided by the cluster are seen as enhanced.

Disadvantages of cluster type policies are seen as related to adopting too narrow a definition of a geographic cluster. Respondents stated that many enterprises, whilst benefiting from physical proximity, do not want development too close to other firms. The corporate need for individual identity even within a cluster results in pressure for larger green field development sites, perhaps within an edge city development pattern rather than within a concentrated node. Over-specialisation in strategically selected areas could potentially lead to the suppression of other strengths by dominant sectors and produce a negative branding/perception of individual districts and regions.

Individual companies may also find difficulties arising in terms of competition for specialised staff. In physical planning terms for North Dublin, particular issues arise in terms of cluster type policies and the settlement pattern. The combination of a dispersed labour force with concentrated nodes or clusters of employment may
increase transportation usage with a negative impact on sustainable development objectives. The dispersed pattern of the residential location of the labour force is partially attributable to housing affordability difficulties in Dublin (as discussed in Section 5). This can be compared with policies that promote mixed-use development combining economic, residential and infrastructure elements with the objective of reducing commuting times and transportation demand. Previous studies have indicated the scope for increased density development on under-utilised land in North Dublin (Williams and Shiels, 2001).

Locating employment in mixed-use areas situated on public transportation routes is a radically different land-use form than the edge city employment and dispersed residential development pattern seen in the Greater Dublin Area in recent years. Potential disadvantages associated with dispersed, functionally separated land uses include the following:

- Over-specialisation and the risk for market shift.
- Spatial isolation of potential cluster type developments and commuting problems.
- The lack of local and community facilities in mono-functional areas focussed largely on business users.

**Infrastructure**

The critical role infrastructure plays in all economic development and especially cluster forms was evident in all the interviews. Clusters or concentrations of activity provide both the opportunity to use existing infrastructure in an effective manner and the problem of capacity constraints. Obvious importance was attached by respondents to the issues of access, telecommunications and the general environment. Some respondents stressed the resulting reduction economic competitiveness of the North Dublin study area resulting from congestion issues while the necessity of upgrading telecommunications networks to facilitate business needs which may develop rapidly towards enhance interactive IT requirements in the future were also highlighted.

On the positive side, the infrastructural advantages of North Dublin in terms of its international airport, under-utilised land assets and planned transport improvements including LUAS and the Metro were suggested as offering opportunities for growth. Heavy water and electricity users were not regarded as suitable for development in the region. The potential for clusters situated along public transportation interchanges throughout North Dublin were promoted by the respondents. Particular importance was attached to the availability of major land banks around Dublin Airport by those interviewed.
8. Conclusions and Recommendations

Evidence of spatial concentrations of particular economic sectors exist across North Dublin, although the only fully developed example of a functioning enterprise cluster of high-skill activity remains in International Financial Services Centre.

The stimulation of clustering can be an effective means the better to encourage an efficient allocation of limited resources available for urban and regional economic development. According to research carried out for the GEMACA II project and the literature on economic clusters (for example, Charles and Benneworth, 2001) three sets of policy concepts can be distinguished:

<table>
<thead>
<tr>
<th>The creation of awareness and a constructive debate</th>
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<tr>
<td>The support of clusters by indirect intervention measures- the provision of high quality transport infrastructure, especially public transport, appropriate land-use planning and affordable housing with a diversity of tenure options.</td>
</tr>
<tr>
<td>Enterprise clustering, which is supported by direct (low-cost) government intervention measures.</td>
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The creation of awareness

There is no magic recipe for the success of cluster policies, it is a constant process of learning and improving. Most important for the cluster approach is to create awareness and a constructive debate. The concept of enterprise clusters is of recent origin in Ireland (since the late 1990s) and remains relatively poorly understood among policymakers. An important thing for the ‘cluster approach’ and cluster policy is to understand and be able to identify the conditions which give rise to an activity or a particular set of activities enjoying economic advantages from ‘clustering’, rather than adopting the simpler approach of designating geographically proximate enterprises on similar sector as a “cluster”. The cluster policy process can be described by means of a so-called process cycle. Derived from recent studies, Benneworth & Charles argue (2001) that the greatest policy value can be added if the cluster policy style is congruent with the cluster policy cycle (see Figure 7). National and loose clusters fit best with long-term policy cycles which in turn need a bi-partisan commitment to the approach in order to ensure their long-term adoption. Local/tight clusters can be promoted locally, and indeed there can be problems with governments promoting particular local clusters because of the requirements of impartiality. Thus, one best starting point for cluster policy-making lies in identifying from the outset the style of the clusters which agencies are interested in promoting, and tailoring the length of the policy cycle appropriately.
Dublin-Belfast Economic Corridor Strategy
A spatial planning and economic development strategy needs to be prepared for the emerging Dublin to Belfast corridor. To date, a number of studies and reports, including the Northern Ireland Regional Development Strategy (RDS) and the National Spatial Strategy (NSS) have identified the presence of an emerging economic corridor between Dublin and Belfast (Price Waterhouse-Coopers, 1998; DRD, 2000; DoELG, 2002) but little detailed research has been carried out on the nature of the corridor nor of the policies required to enhance its competitive position. The main objective of such a strategy would be to ensure that local authority development plans would be co-ordinated and duplication of resources and infrastructure required to support economic development would be minimised.

- Identify locations on the corridor conducive to the development of enterprise clusters with an emphasis on reinforcing existing economic development and fostering emerging clusters. If required, a Strategic Development Zone designation could be used where the fast-track planning of essential infrastructure is required.
- Under the revised Section V (Planning and Development Act 2000) legislation, introduce levies on both residential and commercial development in specific locations along the corridor that have been identified as having the best opportunity for cluster development. The purpose of these levies would be to raise finance for essential infrastructure to support the clusters.

Figure 7  Stylised representation of the cluster policy process cycle

![Diagram showing the cluster policy process cycle]

Source: GEMACA II Project, after Charles and Benneworth (2001)

In practice, the cluster approach has proven to be a useful framework for developing and applying new forms of governance, moving away from direct intervention towards forms of indirect inducement.
This approach focuses upon facilitating networks and creating the institutional setting that provides incentives for market-induced cluster formation and for the revitalisation of existing clusters (Hertog et. al. 2001). Cluster policy entails the following critical actions:

- Creating the right framework conditions of innovation.
- Identifying barriers to innovation.
- Building relationships and networks.

As such, policy requires an appropriate mix of analysis and action. Cluster studies can in practice be used as a working method for systemic innovation policy-making.

Clusters are useful frameworks for co-ordinating policies and reducing complexity. The cluster approach provides an integrative knowledge and innovation management tool or framework for spurring innovation in clusters and customising all policies affecting innovation in clusters. Clusters provide policy makers with a way of dealing with increased complexities and better targeting policy by addressing particular systemic failures that hamper innovation. Thus, the role of governments may be seen as one of providing selective response to the needs of innovative clusters. In other words, leveraging innovation in clusters is in itself a challenge, calling for appropriate policy mixes to be designed in pragmatic ways.

**Indirect measures in cluster development**
Such measures includes:

- Creation of a favourable business environment.
- Urban planning.
- Education and training.
- Soft and hard infrastructure provision.
- Streamlining regulation.
- Public office / safety / crime reduction.
- Access to capital.

**Direct intervention measures**
Some clusters have been created or developed by policy makers (Regional development agencies, planners, etc.). These Cluster policies focus on developing a strategy that will encourage an efficient allocation of limited resources available for urban and regional economic development.

- State investment.
- Public services.
- Entrepreneurship.
- Subsidies / Incentives

**Key Recommendations for North Dublin Study Area**
Infrastructural constraints, including water and waste management, continue to constrain development in the North Dublin Study Area. Resources should be directed at infrastructure constraints.
In order to address the critical issue of traffic congestion, prioritisation should be given to address critical transportation constraints, including surface transportation at Dublin Airport and the absence of orbital public transport services. Orbital transportation services could service key transportation nodes that could provide a stimulus for economic development at such locations. Compliance with the Strategic Planning Guidelines objectives should be ensured to manage the sustainable development of the North Dublin Fringe and surrounding areas.

Consideration should be given to the establishment of a science and technology park linked to the existing academic and research institutions in the North Dublin area.

Regeneration of selected older suburban districts is becoming necessary. An increased economically active population provides the basis for enhanced economic and social development.

It would be beneficial if enhanced co-operation was achieved by the statutory authorities with responsibility for the North Fringe area.

**Limits of cluster-oriented policies**

Policies aimed at clusters should strike a balance between creating and sustaining innovative clusters. Indications from previous research including the GEMACA II Project (2002) was that it was preferable to build on existing strengths - even if these are in so-called low-tech clusters - and not to overly concentrate on creating new clusters from scratch. An argument for increasing the level of innovation of low-tech clusters is the importance of their ‘weight’ in the national or regional cluster blend. Even within individual clusters, a focus on high technology and R&D is no guarantee that innovation will be supported most effectively.

Policies which try to create clusters in cases in which no particular benefits arise are damaging to the wider economic interest because they consume resources but produce no definitive return.

Policies which try to impose a particular form of clustering – a specific ‘approved’ location for example – may be damaging if that location is not selected in the light of an understanding of the particular conditions favouring clustering in that/those activities.

Equally policies which apparently address other issues – frequently infrastructure or land use regulation – may impede clusters from developing or reaching their potential.

The **fundamental requirement** for successful cluster policy is a better understanding of the source of the advantages clusters may generate, in terms of:

- The initial identification of sectors.
- Support and development.
- The role of the state agencies.
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Appendix A: List of agencies interviewed for the study

Economic Policy

IDA

Enterprise Ireland

Aer Rianta

Fingal County Council - Economic Development Dept.

Dublin City Council - Economic Development Unit

Spatial Planning Policy

Dublin City Council

Fingal County Council

Department of Environment, Heritage and Local Government Spatial Planning Unit:

- National Spatial Strategy.
- Strategic Planning Guidelines.
Appendix B: Structure of Interview Questions with relevant Local and Central Government Agencies responsible for Economic Development and Infrastructure Provision

1. What is the role and function of your agency in relation to economic development?

2. What is your/your agency’s understanding of the economic cluster concept?

3. The economic cluster concept – what are the advantages/disadvantages in terms of your policy towards clusters, if any?

4. Could you discuss the implications of cluster development for infrastructure provision? In terms of:
   • Transportation
   • Telecommunications (especially broadband capacity networks)

5. Could you elaborate on the role of public policy and the strategic direction of development and clusters of economic activity? (i.e. the IFSC)

6. Could you assess the impact of recent economic policy on:
   • The locational decisions of inward investors
   • Existing economic sectors and local economic interests

7. Could you list the four key priorities of inward investment and existing economic interests?

8. What problems have arisen for existing and potential cluster-type development in North Dublin, and the Dublin Region as a whole?