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**Wicklow County Council,
Greystones Town Council and
Dublin Transportation Office**

**Greystones / Delgany Integrated
Framework Plan for Land Use
and Transportation**

Final Report

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PART A – THE INTEGRATED FRAMEWORK PLAN

1. INTRODUCTION

1.1 Study Background

1.1.1 The Department of the Environment and Local Government's Strategic Planning Guidelines for the Greater Dublin Area have outlined a strategy which seeks to consolidate development within the Metropolitan area, and in designated centres in the surrounding Hinterland (see Figure 1.1). The aim is to facilitate the provision of considerably enhanced local and regional public transport, alongside more sustainable settlement development.

1.1.2 The Integrated Framework Plans for Land Use and Transport (IFP) concept was introduced in "A Platform for Change 2000 – 2016"(2001), which sets out the Dublin Transportation Office (DTO) Strategy. It recommends that IFPs be prepared for all "development centres" identified in the Metropolitan and Hinterland Areas as defined by the Strategic Planning Guidelines (SPG) for the Greater Dublin Area, and confirmed by the National Spatial Strategy (2002).

1.1.3 In accordance with the Planning and Development Act, 2000 local authorities shall have regard to any regional planning guidelines in force for its area when making and adopting a development plan and other land use planning policy. There has been insufficient detailed information and guidance on this at local level, and the DTO in conjunction with the local authorities have instigated the process of IFPs to fill this gap.

1.1.4 Greystones has been identified in the SPG within the boundary of the Dublin Metropolitan Area as a Major Centre. The SPG highlights that the principle issues in the Metropolitan Area are related to pressure arising from rapid and intensive development such as severe traffic congestion, compared to the Hinterland Area issue of addressing overspill development pressure from Dublin. The Strategy for the Metropolitan Area, is outlined as follows:

- Consolidate development within the area;
- Increase overall densities of development; and
- Thereby facilitate the provision of a considerably enhanced public transport system and facilitate and encourage a shift to public transport.

1.1.5 At the strategies core is the stipulation that future development in the Metropolitan Area will be located so as to maximise the potential of the public transportation system, where a more compact urban form increases the potential to reduce the need to travel. It is stated that the additional population will be accommodated through (*inter alia*):

- The further development of Swords (in concert with improvements to public transport), and the Bray-Greystones-Delgany area of north Wicklow [where Bray is viewed as a node for the area];
- Re-development of brownfield sites; and
- Infill development, where possible, within the existing built up area.

1.1.6 However, while Greystones is located within the Metropolitan Area, it is also the southern most settlement within this area, and to some extent therefore peripheral.

1.1.7 Both Wicklow County Council and Greystones Town Council have advanced the objectives for the future planning and development of Greystones and Delgany through the 1999 statutory Development Plan. This plan identified Greystones / Delgany as a growth centre for residential, employment and retail development with an ultimate target population of some 17,000 persons. The Plan was varied by Wicklow County Council in 2001, to take account of higher residential density requirements within the SPG, with a subsequent increase in target population to 22,000 in 2016. The growth and development needs of the area must be carried out in a sustainable manner, as set out in the National Sustainable Development Strategy (1997).

1.1.8 Wicklow County Council (WCC) and the Dublin Transportation Office (DTO) recognise that land use and transportation are inextricably linked together and should, therefore, be studied in tandem. This has led to the decision to commission Colin Buchanan and Partners to undertake this IFP, to examine the proposals contained in the relevant Development Plan for the study area; the development likely to take place in the period up to 2016 in the context of the relevant strategic reports; and provide guidance in terms of land use and transportation in order to promote the sustainable development of Greystones and Delgany.

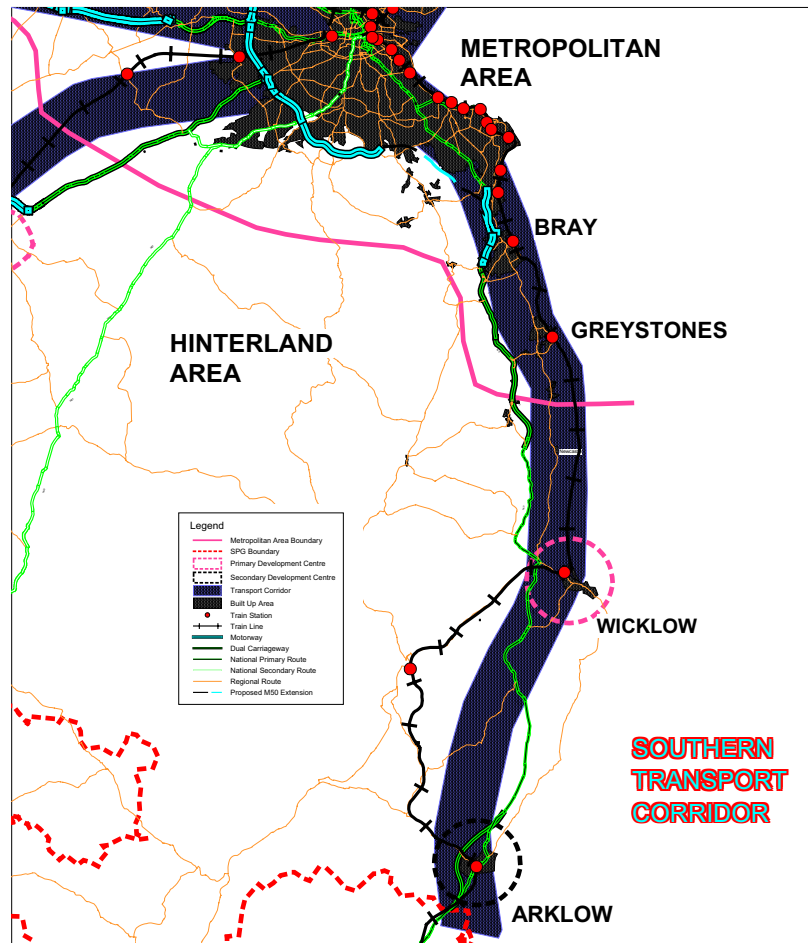


Figure 1.1 – SPGGDA: Southern Transport Corridor

1.2 Study Aim

1.2.1 The main target of the IFP is to review the current planning, development and transportation context as consolidated in the strategic and statutory plans covering the subject area. The IFP then endeavours to provide detailed land use and transportation proposals for the future development of Greystones / Delgany, having particular regard to land-use patterns that complement local public transport, walking and cycling.

1.2.2 The need for change is not only a matter of meeting statutory or strategic obligations. It is also a response to widespread concern about increasing congestion and the cost it imposes on accessibility, the environment, safety, the economy, and the general quality of life that can be enjoyed in all our towns for all sections of the community.

1.2.3 The principles of sustainable development are at the core of the Integrated Framework Plans. They are intended to be dynamic and flexible plans, that build upon the DTO Vision of a living city and region

on a human scale, accessible to all and providing a good quality of life for its citizens. The philosophy of the IFP is to put people first, not vehicles, and work towards an urban environment which is attractive to live, work in and visit. The IFP provides a long-term strategic vision for integrated land use and transportation development, supporting the implementation of the SPG and DTO strategy.

1.2.4 Towns have been developing spatially in ways convenient to car use, and less convenient for other means of access. As housing, jobs and other activities have moved further away from the town core, so too has the density and structure of built-up areas loosened, and use of the car increased. Greystones / Delgany and other towns in the Dublin Metropolitan area are typical of this scenario.

1.2.5 The ‘normal’ development plan zoning approach has, rather than encourage the organic integration of urban functions; imposed a segregation of the urban elements of housing, work, shopping, recreation, education and transportation.

1.2.6 The continuation of the ‘normal’ approach to growth in Greystones and Environs, would entail that the main constraint to the town’s growth is the 22,000 population target for 2016 (up from 11,913 in 2002¹). This may result in a considerable build out the settlement footprint over time in a generic suburban sprawl, resulting in longer travel distances, greater travel times and higher car usage.

1.2.7 It is accepted that much of the future provision of housing will satisfy a commuting population to major employment areas in the Metropolitan Area. Nevertheless, the role of the Integrated Framework Plan is to promote containment, higher densities, economic variation and a mix of uses with a choice of transport modes. This will help to formalise the essential links between land use and movement at a local level, and to support enhanced regional transportation between Greystones and Dublin.

1.3 Study Area

1.3.1 The study area is Greystones and the neighbouring village of Delgany. These villages fall mostly within two District Electoral Divisions (DED’s), Greystones and Delgany, with a small remainder being within the Kilcoole DED to the south. These areas are illustrated in Figure 1.3 below. Greystones DED has an area of 3.78 sq km, Delgany 12.24 sq km and Kilcoole an area of 23.94 sq km. With total populations

¹ Census of Population, 2002, Volume 1 – Population Classified by Area, Greystones and Environs

of 7,369, 4,502 and 4,058 respectively for the year 2002, this equates to population densities of 1949.5, 367.8 and 169.5 persons per sq km respectively.

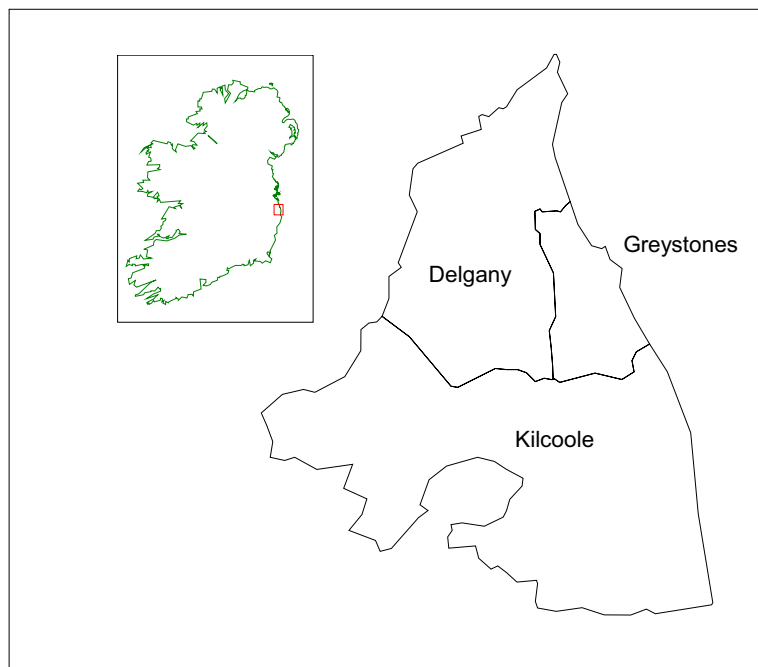


Figure 1.3 – District Electoral Divisions

1.4 Study Methodology

1.4.1 The methodology for this study as set out in the initial consultant's proposal has been refined over the course of the project to address the particular challenges of preparing an Integrated Framework Plan for Greystones/Delgany, as a designated growth centre within the Metropolitan Area, and with a Development Plan review pending. The methodology reflects the comprehensive nature of the IFP as a means for understanding the relationship between land use and movement. The key stages of the study are highlighted as follows:

Data Collection and Analysis

1.4.2 These stages established the land use planning (zoning, extant permissions etc.) transportation, socio-economic, traffic and urban design context for the study. The consultants had the opportunity to meet with the Client and Steering Groups, and discuss outstanding issues at an early stage. Presentations were also made to Greystones Town Council, Wicklow County Council, and pertinent community representatives in the area in order to explain the objectives and process. Ultimately this allowed the consultants to enter into the subsequent phases of comprehensive stakeholder and public consultation, against a well-informed background.

Consultation

1.4.3 Traditionally, transportation studies have been very strong in terms of quantitative analysis, through the use of traffic models, relating to issues of road capacity for example. However, this still leaves a substantial gap in the understanding of local movements, and the motivation for these movements. The Integrated Framework Plan (IFP) seeks to further this understanding between the way people move, the need to make trips and by what mode, as related to land use. If the IFP is to have any real potential in impacting upon local travel behaviour, this information is vital in a town of Greystones' scale.

1.4.4 Residents, businesses, property owners and groups with an interest in Greystones and Environs were therefore provided for in an all-inclusive, transparent and objective manner with regard to issues facing the area. Stakeholders who were consulted included Wicklow County Council, Greystones Town Council, Irish Rail, Bus Eireann, IDA, Greystones Chamber of Commerce and SPGGDA.

1.4.5 A Focus Group Event was held on Tuesday 4th March 2003 in the La Touche Hotel, to consult with groups and organisations active in the area. Some 60 representatives took part in the event, led and facilitated by CBP staff. Chapter 10 – The Consultation Process gives details the groups and organisations.

1.4.6 A Public Consultation Event was held on Saturday 8th March 2003 in the La Touche Hotel Greystones. The event was advertised in the Wicklow People, and the North Wicklow Times. Posters were also distributed throughout the area. East Coast Radio was also used as a medium for advertisement and the Director of Services of Wicklow County Council was interviewed on 6th March 2003 about the Plan and the consultation process. The exhibition boards were also displayed in Greystones Library from Monday 3rd to Friday 14th March with comment

sheets available for residents. A Consultation Report was submitted to the client group summarising the findings of this key stage in the process.

Development of Land Use Scenarios

1.4.7 In order to assess the impact of various forms of development upon public transport, pedestrian/cycle movement and vehicular traffic, a number of land-use scenarios were developed in order to assess the optimum solution that met the studies' objectives and principles. The consideration of future land use development options and alternatives for Greystones / Delgany was therefore a fundamental component of this study. This was achieved through the utilisation of several techniques comprising;

- Qualitative evaluation of 6 land use scenarios, to establish 3 scenarios to test;
- Quantitative analysis of impact of 3 scenarios on traffic network using PARAMICS modelling software;
- Testing of preferred land use scenario on public transport route options using bespoke spreadsheet;
- Feedback of public transport spreadsheet into PARAMICS traffic model.

1.4.8 An Interim Report was produced for the Client Group to consider the qualitative evaluation of future land use scenarios, to be tested in detail (using the traffic model). The selection or elimination of a scenario was undertaken within the context of particular criteria and principles, which determined its potential impact, which essentially were the proportion of trips undertaken on foot/bike, and those taken by public transport serving various travel markets (employment, shopping, leisure, and schools).

Modelling

1.4.9 The traffic model used is a PARAMICS model which represents all but the most minor roads in the study area, and the most strategic traffic movements from and through it. PARAMICS is a car-based modelling suite and was used as a comparison tool to evaluate the impact on the traffic network of the different land use scenarios.

1.4.10 The PARAMICS model compared three scenarios, which evolved out of the qualitative evaluation; namely *Do-Normal*, *Do-Spread* and *Do-Concentrate* for the years 2006 and 2016, in relation to the base year (2001). The effect of each scenario occurs between 2006 and 2016 and

this is where comparisons and conclusions are drawn. The scenario that produces the least amount of traffic growth is promoted.

1.4.11 The traffic model was also used to identify points on the network where traffic/transport measures may be required to mitigate the impacts of traffic congestion.

Local Bus Route

1.4.12 It is a fundamental objective of this study to analyse the optimum public transport service for the study area. This has been iteratively linked to the land use scenarios in order to ensure that the future development of the town does not promote by the nature of development, car borne trips, but gives people real choices in how they move.

1.4.13 A bespoke spreadsheet model was developed for this study to integrate with the traffic model, and provide robust analysis on the optimum bus route, its costs and benefits, and impact on the local road network.

1.4.14 The optimum Local Public Transport network was fed back into the traffic model to assess the impact on the traffic network, and make any subsequent recommendations.

Draft Framework Plan

1.4.15 The Draft Framework Plan has emerged from the foregoing methodology as the set of recommendations to cover a comprehensive guide for development and transport in Greystones up to 2016. This is detailed in following sub-section.

1.5 Study Output and its Relationship with Other Studies

1.5.1 The main objectives of the Integrated Framework Plan specific to Greystones / Delgany, under the joint auspices of Wicklow County Council and the Dublin Transportation Office are:

- To analyse the public transport requirements of the study area and identify distributor level transportation networks, for all modes of transport.

- To make recommendations for future zoning objectives to maintain consistency with the Strategic Planning Guidelines and the DTO Strategy (Final Report). This includes the indication of areas suitable for development with higher densities which will minimise the need for private car transport and maximise the potential for walking, cycling and public transport.
- To recommend a timescale and phasing for the measures proposed which will take account of the likely pattern of development in the Greystones / Delgany Area up to 2016.
- And finally, to consult with the major stakeholders to ensure that the Integrated Framework Plan has the widest possible acceptance.

1.5.2 The IFP does not exist as a stand-alone document. It is a strategic document that provides a practical long-term context and vision for statutory documents of a shorter life span. It is literally the framework for land use and transportation in Greystones / Delgany in the short and long term, whether it is statutory development plans, retail strategies, or the implementation of bus, rail or road proposals.

1.5.3 It is not intended to be a static plan where change at a certain time is fixed in advance, and depends on certain basic conditions. It is dynamic, as it deals with constant daily movement at all levels. It addresses the challenges of a multi-functional urban area rather than dealing with development as something that takes place in mono-functional zones.

1.5.4 As noted above, the IFP endeavours to identify and recommend appropriate detailed land use and transportation proposals for the future growth of Greystones/ Delgany, having particular regard to land-use patterns that complement local public transport, walking and cycling. Key areas that this IFP's can influence, are the forthcoming development plan for the area, and through the identification of transportation schemes and development principles that directly affect other proposals or reports.

1.5.5 The following documents are highlighted as of key relevance; the Wicklow County Council Development Plan, the Greystones / Delgany Development Plan, and the County Wicklow Retail Strategy.

1.5.6 The IFP strategy is particularly pertinent to the pending review of the Greystones/ Delgany Development Plan, and can be considered within the appropriate review period of the plan.

2. THE FRAMEWORK PLAN

2.1 The Basis for the Framework Plan

2.1.1 Under the Strategic Planning Guidelines for the Greater Dublin Area (SPG) Greystones/Delgany is defined within the 'Metropolitan Area' as a major centre. This role has been reinforced by two major infrastructural investments in the area with the extension of the DART to Greystones, and the upgrading of the N11 to dual carriageway at the Glen of the Downs. The programmed completion of the M50-South Eastern Motorway at the strategic level will further alter current perceptions of accessibility to the City from Greystones exacting potential development pressures on the town.

2.1.2 Between 1986 and 1996 the population increased by 18.6% from 8,455 and results from the 2002 Census shows that this population is now of the order of 11,871 persons. Existing planning permissions are estimated to provide for a further increase up to 17,000 in the short-term. The overall target population for the town is 22,000 by 2016.

2.1.3 Although Greystones lies within what is termed the Metropolitan Area, its peripheral location almost on the boundary of Metropolis and Hinterland, means that it is subjected to the advantages and disadvantages of being situated in neither and both distinctive areas. This is attractive for commuters who have the benefits of living in semi – countryside, but gives rise to traffic problems in the area. This has the consequence of Greystones continuing and reaffirming its role as a commuter town to Dublin. The SPG Strategy for the Metropolitan Area, is to:

- Consolidate development within the area
- Increase overall densities of development; and
- Facilitate the provision of a considerably enhanced public transport system and encourage a shift to public transport.

2.1.4 Greystones/ Delgany's metropolitan centre status will result in continued strong population growth. The target population for Greystones and its Environs is expected to be around 22,000 in 2016. Considering that the 2002 population for the same area is around 12,000, this represents an almost doubling of population.

2.1.5 Greystones does not provide the same range of services of some higher order settlements in the Dublin region. The town and the general area have a more limited range of commercial facilities than other settlements such as Bray.

2.1.6 Greystones is statistically recognised as one of Ireland's wealthiest towns. However, the economic development of the area does not reflect the success of Greystones as a residential area. There are few employment facilities within the area despite the identification of large areas for industry and enterprise in the Development Plan. With relatively few jobs located locally, long distance commuting trips are further located.

2.1.7 It will therefore be fundamental to promote employment facilities in the area and complement these with residential development, amenity / open space and community facilities such as crèches, schools, health centres etc.

2.1.8 The main issues for the development of the area as a Metropolitan Area Centre can be summarised as follows:

- High population growth (past and expected) in the area mainly due to net migration;
- Low employment generation in the area in relation to the population growth;
- Limited range of commercial facilities within the area;
- Significant construction of new road infrastructure (N11 and SAR Roads);
- Unreliable public transport provision;
- Infrequent and undependable local bus service;
- Increase in vehicular traffic on road infrastructure;
- Parallel growth in concern regarding road safety for non-mechanical modes;
- Development expansion exceeding infrastructure provision; and
- Significant expansion of settlement footprint away from town core.

2.2 Aims and Objectives

2.2.1 The following study Aims and Objectives were agreed at the Client Group meeting on 16th April 2003:

2.2.2 Aims

- i. ***Establish a relationship*** between land use development and transportation at a local level, and
- ii. ***Provide a blueprint*** for the future sustainable development of Greystones that maximises the use of walking, cycling and public transport, and is consistent with the overall DTO Strategy, SPG and

NSS, given the location of Greystones within the Metropolitan Area.

2.2.3 Objectives

- i. **Identify the views** of the local community and stakeholders on existing land use and transport issues and on opportunities for the future development of the study area (which are consistent with the Study Aims), and elicit reaction to any development scenarios proposed;
- ii. **Establish principles** on which future integrated sustainable transport networks and land use patterns will be identified and assessed;
- iii. **Recommend appropriate density and zoning objectives** to the Local Authority for residential development, employment uses, community and local services, and the linkages between them, that will inform the future development of the area, in particular (but not limited to) during preparation of the relevant Development Plan or Local Area Plan, to maintain consistency with the SPG, NSS and the DTO Transport Strategy 2000-2016; and
- iv. **Set out an implementation plan**, including recommendations on linked phasing of development and transport infrastructure and services, an itemised programme of traffic management measures on which future funding will be assessed and recommend appropriate mobility management and review mechanisms to support the long term strategy.

2.3 General Principles

2.3.1 The Land Use and Transportation development principles are grounded in the Strategic and Statutory guidance in the NSS, SPG, A Platform for Change (2000-2016), the Wicklow County Development Plan 1999 (as varied in 2001) and Draft Development Plan 2003, and at a local level, the Greystones / Delgany Development Plan, 1999:

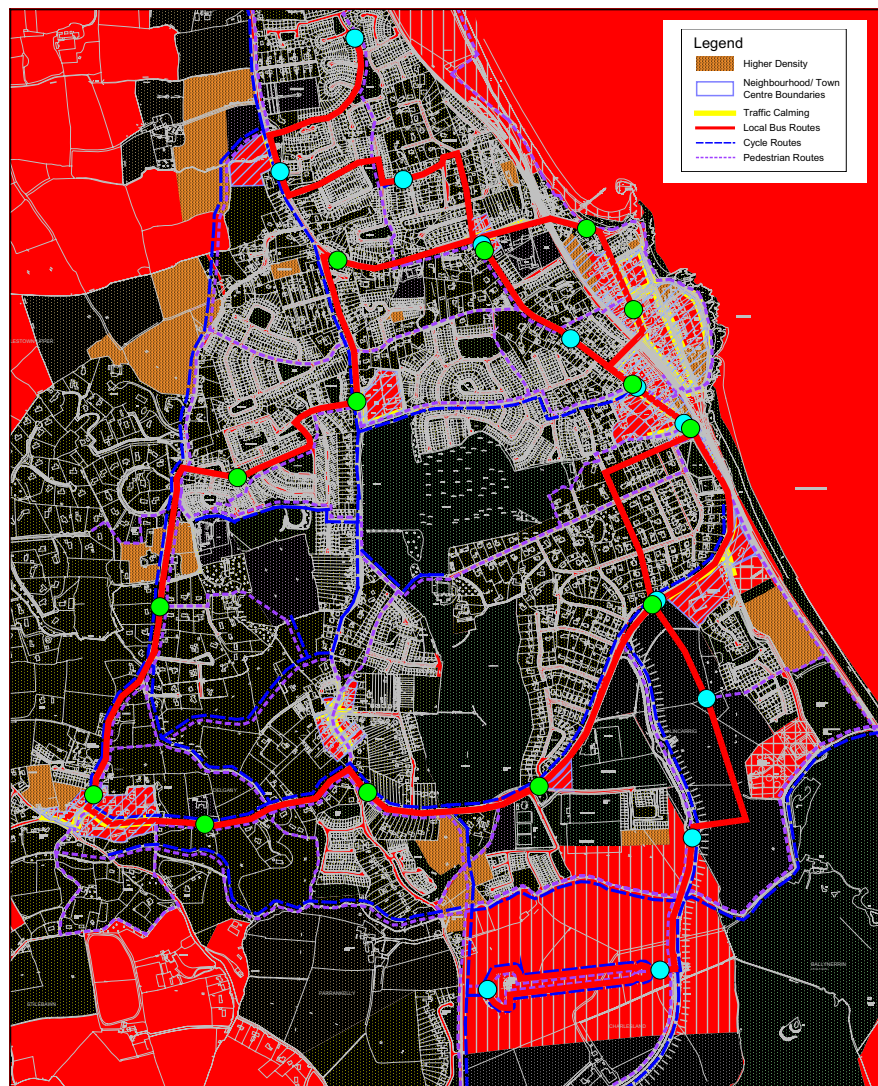
- Greystones / Delgany is a Major Centre within the Metropolitan Area, and is a Metropolitan Centre for the North Wicklow area;
- Development shall be consolidated within the Metropolitan area;
- The town's existing function is that of residential commuter settlement. Future development should seek to diversify this definition through utilisation of amenity / leisure potential of the

Town and its Environs, and an appropriate intensification of service / employment function;

- This IFP will facilitate the provision of a considerably enhanced public transport system and encourage a shift to public transport;
- Opportunities to connect transport modes will be exploited wherever possible in the creation of transport networks, e.g. positioning bus stops at confluences of walkways, providing cycle parking at bus stops / train stations, and serving train stations with bus routes.
- Increased overall densities of development should be promoted close to public transport nodes in order to lead to a more compact urban form relative to the size of the population and reduce the overall demand for travel;
- The most efficient use should be made of zoned and serviced lands by the avoidance of inefficient low-density development in order to prevent urban sprawl and promote efficiency in the use of energy, transport and natural resources;
- People-based employment activities should be located at appropriate existing and future public transport nodes, distributed throughout the Metropolitan Area;
- Mixed Use development should be encouraged;
- Re-development of Brownfield sites and Infill development should take precedence over Greenfield development;
- Neighbourhood centres should be located with good access to public transport, walking and cycling;
- Detailed layouts and design of developments which reflect the importance of walking and cycling as transportation modes by providing safe and direct access to local services (retailing, schools, employment and leisure) and public transport nodes;
- Pedestrian links should be encouraged within and between housing areas;
- Cyclerroutes should be integrated in new road design; and
- Traffic calming devices should be utilised so as to make pedestrian and cycle use more attractive.

2.3.2 Therefore, it emerges that Greystones / Delgany need to find a way to consolidate its growth within a more sustainable pattern of development capable of supporting public transport, bicycle/ pedestrian trips, and providing alternatives to car use for appropriate trips.

2.4 The Framework Plan



2.4.1 As stated in the previous chapter, the main target of the IFP endeavours to provide detailed land use and transportation proposals for the future growth of Greystones, having particular regard to land-use patterns that complement local public transport, walking and cycling. It is intended that a “major centre” will develop in the longer term, as more self-sufficient centre, with a better balance between commuting to the Metropolitan Area and local economic activity, with enhanced public transport links. This includes the proportionate development of all land uses, such as strong employment facilities, higher order shopping and a full range of social facilities in accessible locations, to complement the substantial residential growth.

2.4.2 A spatial strategy for Greystones and Environs has been proposed that encourages the concentration of development in locations where the land-use can be supported by local and strategic transport services. The spatial strategy recognises that there are a number of small village/neighbourhood centres within the study area², which play a vital role in providing services and facilities in close proximity to dwellings, and seeks to reinforce their status. In tandem with the key locational criteria, the IFP also promotes a built form that has the potential to reduce travel times and distances for walking/ cycling, so they can become a realistic alternative. The strategy contained in this part of the IFP evolved from the rigorous testing of a number of different land use scenarios and their implications for the potential future development of the subject area. The PARAMICS transport model has been used to test the impact of the different scenarios on the local traffic network. The scenario that performed best has been promoted as the sustainable integrated land use solution for the Framework Plan.

2.4.3 A transport strategy for the study area has also been proposed to promote sustainable movement within the town and to other strategic locations. The strategy contained in this part of the IFP evolved from the rigorous testing of a number of different bus route options with particular emphasis on the potential movement between different land uses. This process was carried out through a Spreadsheet Connectivity Matrix Model. The scenario that performed best has been promoted as the sustainable integrated local transport solution for the Framework Plan.

2.4.4 The main elements of the strategy can be summarised as follows:

- **Promote future growth and development of Greystones/ Delgany that restricts urban sprawl, contains the physical footprint of the settlement; and locates higher density residential developments proximate to services, schools, employment and public transport corridors/nodes;**
- **Consolidation of Greystones' main street (Church Road) as a commercial centre, and reinforcement of the existing commercial core to cater for projected increase in population;**
- **Support redevelopment proposals of Greystones Harbour area as a mixed-use area (including residential, commercial, retail, and services) that complements its central location, and promotes regeneration east of the railway line;**
- **Support for existing village centres at Killincarraig and Delgany, and new neighbourhood centres at North Charlesland and Blacklion, where services and facilities can be provided within walking distance of residential developments;**

² Ranging from village centres and neighbourhood centres, up to Greystones main street (district centre).

- **Improvement of strategic public transport access to and from Greystones, having particular regard to reliability and frequency of services;**
- **Provision of Local Public Transport Bus Routes;**
- **Improvement of Interchange facilities at DART station;**
- **Traffic Management – Promote measures that enhance village/ neighbourhood centre pedestrian environment and safety; and improvement of important cycle and walking routes to encourage modal transfer to non-mechanical modes for short local journeys;**
- **Provision, preservation and enhancement of new and existing cycle routes in co-ordination with land use and public transport measures;**
- **Provision, preservation and enhancement of new and existing pedestrian routes in co-ordination with land use and public transport measures; and**
- **Promotion of Greystones and environs as a leisure destination to take advantage of Greystones’ location between the Wicklow mountains, the sea and accessibility from Metropolitan area.**

2.5 Land use

2.5.1 The ‘do normal’ strategy illustrated in Appendix C represents the ‘preferred scenario’ and is the result of the qualitative testing of 6 initial land use scenarios, followed by the detailed assessment of three core transportation and land use scenarios of the study area.

2.5.2 The land use strategy’s aim is to promote the future sustainable development of Greystones/ Delgany, tied in with the provision of transport by generally restricting the physical footprint of the settlement to its current extent. Within that area it is proposed to facilitate the projected population target of 22,000 persons by 2016. This entails development at higher residential densities than there has been previously in Greystones/ Delgany, but only on the condition that the location of development gives people modal options in how they travel (i.e. bus, train or bike), supports existing facilities and centres (village facilities and local retail), and is supportive of the transport strategy (bus service). Key proposals include the proposed increase in density and activity on town centre lands to the east of the railway line, and the rezoning of open space to high density residential to the south of the park & ride site having regard to their proximity to the DART station, and the increase of residential densities to support village services at Killincarraig, Delgany, and on Chapel Road.

2.5.3 Physical restraints determine that the existing town centre can only be expanded through more intensive development of lands to the

east of the railway track, or development of lands off Mill Road near the Park & Ride site.

2.5.4 Greystones contains a hierarchy of village centres within the overall Environs area. The strategy therefore does not rely on a monocentric development approach, but recognises the importance of enhancing and developing nodal points within the area. Greystones district centre is the focal point for the settlement area in terms of function, character and transport nodal point.

2.5.5 Employment is one of the largest generators of trips and assurances should be made that employment zones are accessible by modes other than the car. The concentration of industrial, business or office type developments along the Southern Access Road (SAR) must be capable of offering potential employees a choice of modes by which to travel to work, whether they are travelling from within the study area or from origins outside the study area i.e. Kilcoole or the N11 (Kilpedder Interchange).

2.5.6 The reinforcement of Greystones town as the commercial and leisure core of the area is an important element of the strategy. There is scope for the promotion of leisure pursuits, such as water sports and golf, to reaffirm Greystones a leisure destination for the Greater Dublin Area. The town is also ideally placed to access the Wicklow Mountains.

2.5.7 The Draft County Retail Strategy (November 2003) highlights that Greystones has a relatively limited range and scale of retail floorspace, and asserts that local people are travelling out of the town for the majority of their shopping needs. It is asserted that the town requires considerable enhancement in the quantum, quality and range of its retail offer. The CIE station carpark, and lands east of the railway, offer the opportunity to facilitate expansion of the existing commercial area, and link with the proposed mixed-use harbour development.

2.5.8 The Draft Retail Strategy also identifies the 'sewage treatment plant site' on Mill Road as offering potential for supermarket facilities. This is consistent with the IFP strategy, offering the potential to complement the park and ride facilities, and for residential development on lands to the south of the Park and Ride site. The facilitation of daily/weekly facilities and services within walking distance of dwellings is central to the IFP neighbourhood philosophy. It is vital that the Development Plan supports this important principle, and allows neighbourhood centres to achieve practical and feasible developments.

2.5.9 The built form of developments, particularly in the layout of streets, and roads, have a significant impact on people's choice of travel mode. The form of development should encourage accessible, direct, and

attractive walking/ cycling routes that promote the integration of areas and uses. This should be a requisite to the consideration of any high density scheme.

2.6 Transport

2.6.1 A comprehensive and efficient transportation network with connections to the metropolitan and hinterland areas is an essential component in the future development of any urban area. This is particularly relevant in high growth areas like Greystones, where increased car travel demand has placed unprecedented pressure on the transport infrastructure.

2.6.2 Therefore, this strategy makes recommendations in order to enhance all levels of public transport in the area and interconnect these to other mechanical and non-mechanical modes. The transportation strategy draws a balance between facilitating private car use where appropriate, and promoting alternative means of transport. The car is an important mode of transport, but it should not have a dominant role in the urban transport system where it undermines the sustainable approach to the future development of transportation in Greystones and its environs.

2.6.3 Whilst the land use strategy of this study attempts to reduce the overall amount of car movement by encouraging development to locate either proximate to destinations or public transport routes/ nodes, the transport strategy aims to compliment the provision of alternative forms of transport to the private car and to improve the quality of movement for all modes. Both strategies will contribute to better land use and transportation sustainability.

2.6.4 The existing DART station and its surroundings require detailed improvements to make it the transport focal point for the town and environs. This urban design initiative should include improved visual and physical connections with the existing park and ride facility and proposed and bus facilities to create a transport interchange and to act as an integration node for external and internal public transport services. This transport node will also contain taxi ranks, and cycle storage facilities.

2.6.5 There is a weakness and under use of the current park and ride facilities, and it is considered that more sustainable means of transport would be encouraged through the development of lands in this area, to encourage walking/ cycling trips to the town centre, employment zone, and train station.

2.6.6 Two bus routes have been selected and identified as a feasible local public transport system for Greystones. The provision of local public transport is envisaged as being one of the fundamental elements of

the strategy. Increased bus usage will help to reduce generic travel times by helping to ease congestion.

2.6.7 Finally, a cycle-friendly infrastructure is required if cycling is to reach levels where it can become a genuine, attractive alternative to the private car. The fundamental prerequisite for making a town or area cycle friendly is lower traffic speeds and respectful driver (and cyclist) behaviour. A cycle friendly infrastructure is not simply synonymous with a network of cycle tracks and cycleways (while important in some areas), but addressing key issues of through-traffic, junction safety, general road maintenance, enforcement, and general speed. Improving the connectivity and legibility of the urban network in order to promote walking and cycling, should be positively addressed wherever opportunities are presented (i.e. new developments, village environmental improvement proposals etc.).

2.7 Implementing the Framework Plan

2.7.1 The implementation of an Integrated Land Use and Transportation Framework Plan may not be as straightforward as that of a development or transport plan. The fact that it involves the integration of the ideals of many professions means that it requires the commitment and dedication of all. It may also result in a change in policy by one profession to take more account of the other and vice versa.

2.7.2 The remit for an Integrated Framework Plan is to act as an advisory document so it does not have the powers of the statutory documents that must be adhered to by land use and transport planners. There may be further difficulties with implementation because it is only recently that transport and land use plans have been considered in the context of each other.

2.7.3 However, this IFP identifies a series of recommendations as part of the land use and transportation strategies, that must now be taken into account in the development plan review process, and for agencies responsible for implementing traffic and transportation measures.

2.7.4 Section 10 of Part B of this plan summarises all consultation events that have occurred since the plan's inception. The importance of consultation was stressed at an early stage and will be reaffirmed when considering the plan implementation. Despite the fact that Wicklow County Council supported by the Dublin Transportation Office are intending to lead the process, the various stakeholders involved in this IFP are also responsible for bringing the plan to fruition. This may include co-funding projects, adapting plans and coordinating efforts.

3. THE SPATIAL STRATEGY

3.1 Introduction

3.1.1 People usually travel because of a necessity to reach a place of employment, education, shopping or leisure. The location and proximity of such destinations are greatly influenced by the application of land use zoning within a local development plan. Local authority preparation of development plans has up until now paid little consideration to reducing the need and desire to travel. In fact, the typical zoning based planning system, through the segregation of activity, actually encourages more travel and a greater number of trips.

3.2 The Principles of Sustainable Integrated Development

3.2.1 Principles that must be adhered to for the sustainable integration of land use and transportation are stated in Sustainable Development, A Strategy for Ireland (1997) and include *inter alia*;

- Closer co-ordination between transport and land use planning;
- The promotion of higher residential densities in appropriate locations;
- Clear demarcation between urban and rural land use;
- Minimisation of potential growth in transport demand will be incorporated as a leading consideration in land use planning;
- Manage existing road networks more efficiently;
- Support and improve public transport systems and infrastructure with a view to increasing their market share;
- Provide more sustainable and environmentally acceptable alternatives to private car transport;
- Reduce Emissions from motor vehicles: - CO₂, NO_x, CO, VOC, sulphur, lead and particulate matter (PM); and
- Local Agenda 21 initiatives.

3.2.2 This chapter will examine how the final preferred land use scenario emerged from six scenarios tested for Greystones/ Delgany, to achieve the general principles outlined at Section 2.3, and the above principles of sustainable development.

3.3 Spatial Objectives and Transport Integration

3.3.1 The land use scenarios that were considered to be suitable to reflect sustainable integrated development are as follows:

- **Zoning land to support local transportation network;**
- **Zoning of land to make multiple trips and activities easier, reduce car dependency;**
- **Increase residential densities and concentration of development along the route of a proposed local bus service;**
- **Investment in creating attractive 'soft mode' walking and cycling networks; and**
- **Containment of development to prevent urban sprawl.**

3.4 Spatial Scenario Options

3.4.1 Various land use scenarios were identified to qualitatively test against the identified principles and objectives of the study. The traffic model PARAMICS was subsequently used to examine the impact of three consolidated scenarios in traffic terms. The following explains how each scenario evolved and the thinking behind each in terms of linking land use with transportation.

3.5 Initial Scenario Analysis

3.5.1 The core element of Integrated Framework Plan philosophy is the identification and comparison of different land use scenarios, which are analysed to allow the development of a preferred or recommended land use and transportation scenario. An Interim Report identified six possible scenarios providing for development;

1. into the surrounding greenfield in a low density form.
2. consolidation of the existing town centre;
3. along the existing rail corridor;
4. along the southern access route (SAR);
5. of the town golf course; and
6. in new and existing neighbourhood centres.

3.5.2 Although some of these scenarios or elements of them are unrealistic in terms of economic land use and transportation practice, their purpose was to identify the positive elements of each scenario, those

aspects which should be eliminated, areas requiring further investigation, and the elements of the scenarios that could be combined.

Scenario 1 – Development into Surrounding Greenfield in a Low Density Form.

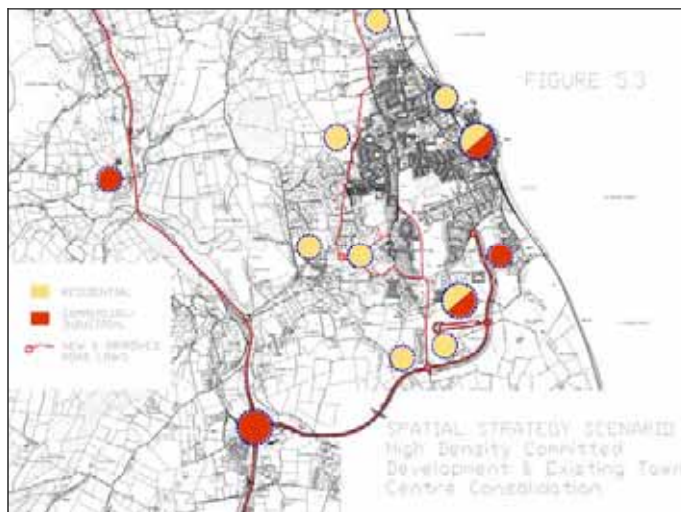


3.5.3 This scenario assumes that development will take place in a manner consistent with the expansion of Greystones over the last number of development plans. It assumes that the land currently zoned residential will be developed at densities similar to those of recent residential estates. This scenario represents the “non-interventionist” or “do-normal” approach where Greystones/ Delgany expands in a manner one would expect without there being a strong policy change.

3.5.4 Before the recent variation to the Wicklow County Development Plan, residential development was occurring at a rate of as little as 2.5 dwellings per hectare. Even at a rate of 10 dwellings per hectare, which could reasonably be assumed as average in recent years, an additional circa 500 hectares of land would have to be built upon for residential purposes only, when the target population increase is about 12,000.

3.5.5 This Integrated Framework Plan scenario was taken forward for further analysis in order to examine whether the IFP could be shown to provide a more rationale method of landuse and transport planning, than a typical ‘do-normal’ or ‘do-spread’ scenario.

Scenario 2 – Consolidation of the Existing Town Centre

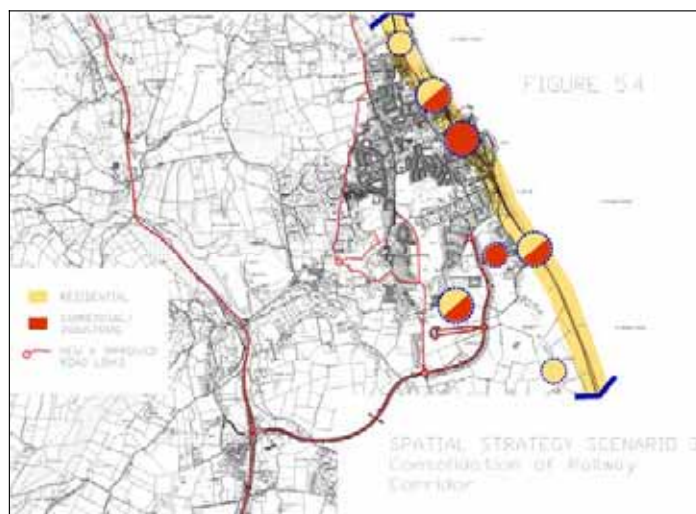


3.5.6 The concentration of development within the existing central area is favourable in land use/ transportations terms because Greystones is one of a small number of Irish towns that has its rail station situated in a central location. The obvious problem is that there is little land left to locate any significant increase in population.

3.5.7 Wicklow County Council has afforded the harbour area Action Area Plan status to build a marina and new pier. The new harbour plan will accommodate up to 290 boats, new slipways, restaurants and a boat yard. The scheme would be financed through public private partnership with contributions from the development of approx. 380 residential units.

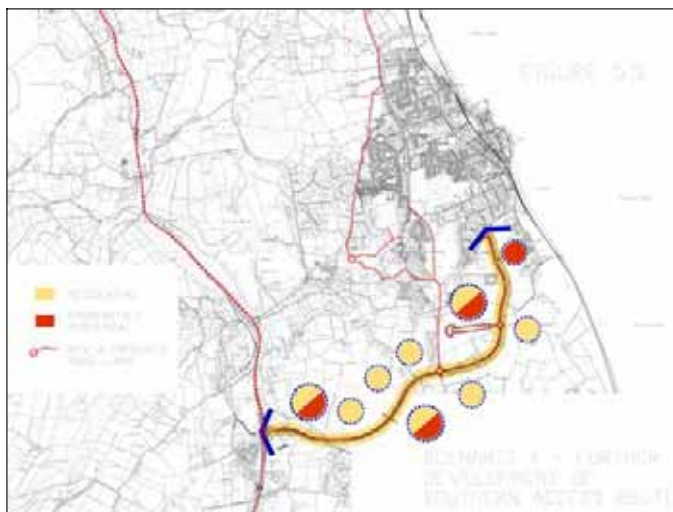
3.5.8 The railway line severs this part of town where the Action Area has been designated. The physical barrier of the railway also creates a psychological barrier for attracting people to one of the town's most attractive areas, along the sea front. The identification of any sites for development that will enhance this area and other town centre locations are vital to the potential of the focus of development in the existing central area.

Scenario 3 – Development Along the Existing Rail Corridor



3.5.9 Under this scenario it is assumed that development will occur on the lands running alongside the rail line and to the south of the station. The train station is considered to be the point of maximum accessibility in the town as the key nodal point on the transport network (bus, rail, cycling and walking) and with a pivotal location at the heart of the town. In terms of the tests applied regarding land use, this option emerged very strongly, and went forward for further analysis.

3.5.10 Linked to the development of these lands was the consideration of the idea of providing an alternative or additional rail station for Greystones. This was the subject of several comments at the stakeholder, focus group and public consultations, and it therefore became essential to consider this option further in association with land use options. However, analysis of this proposal, taken in conjunction with observations from Irish Rail, confirmed the unfeasibility of providing two stations in such close proximity, or moving the existing station from its favourable position.

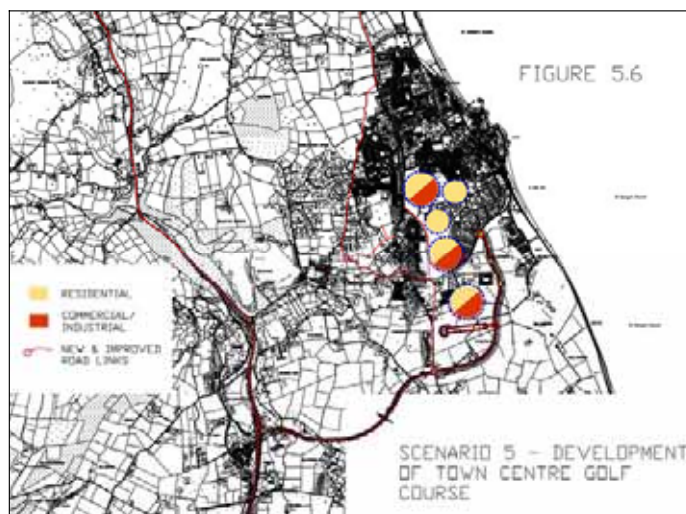
Scenario 4 – Development Along the Southern Access Route

3.5.11 This scenario focuses development adjacent to the proposed Southern Access Route (SAR). The road has already been a key land use stimulus in servicing the Killincarrig/ Charlesland Action Area Plan. It is therefore a reasonable assumption, that when the road opens there will be significant pressure under the next statutory Plan to develop the lands either side of the road - given their proximity to a new dual carriageway and the N11.

3.5.12 This scenario presented significant problems through the expansion of the Delgany/ Greystones settlement into green fields, segregated from existing services, facilities, and the town centre, thus increasing the need to travel.

3.5.13 Overall, it was considered that this option would give rise to the unsustainable expansion of the settlement, with significant loss of green belt lands. This scenario was not pursued further.

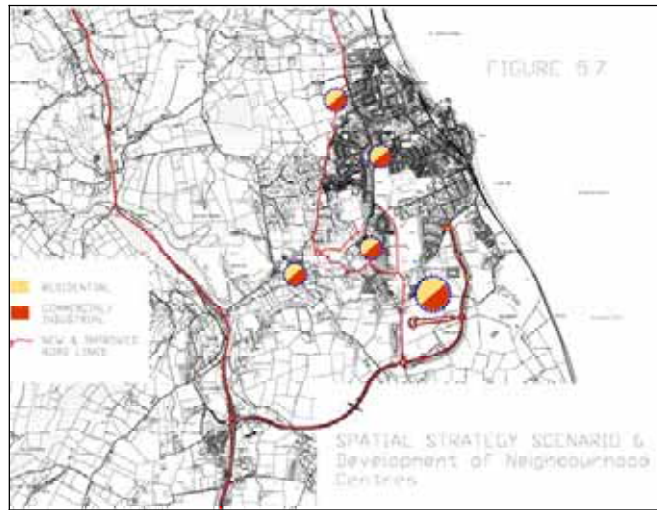
Scenario 5 – Development of the Town Golf Course



3.5.14 The reuse of golf courses as development land is not unprecedented in the Metropolitan area, as the rezoning of the Bray Golf Club lands north of the town centre, to residential, mixed use and amenity purposes illustrates. Given the golf course's central location, and proximity to the town centre, this scenario was therefore pertinent to consider in land use and transport terms. Not to do so would have represented a gap in the scope of the study.

3.5.15 It was recognised that there are no proposals before Wicklow County Council to rezone the lands at present. Given the controversial nature of such a proposal, with regard to the land's established nature and amenity, the advancement of such proposals through the IFP cannot be warranted. While this issue may resurface in future, there was little support to progress this scenario further, in the short term.

Scenario 6 – Development In New and Existing Neighbourhood Centres



3.5.16 Another development scenario considered is the consolidation of development in and around Delgany and Killincarrig - lands to the west of the R761. This scenario investigated the pros and cons of strengthening the roles of Delgany, Killincarrig, and Blacklion as neighbourhood centres. The intensification of use of lands between Delgany and Killincarrig was also considered in this option. However, the greatest problem with this scenario is that the potential of lands in this area is restricted given a number of extant planning permissions, some of which are under construction, or near completion.

3.5.17 Focusing development on neighbourhood centres has a positive effect on the traffic model testing process in that it helped to reduce the average distances of journeys. In this case existing centres were maintained in Greystones itself, Delgany and Killincarrig, and Tesco and new centres supported at Blacklion, and Sewage Works site on Mill Road (beside Council Offices). These centres have a good distribution throughout the study area, supporting short, direct journeys for everyday services and items (thus allowing modal choice).

3.5.18 This scenario contributed to the testing process to find the ultimate land use and transportation scenario to form the basis of this IFP.

3.6 Development of Scenarios to be Tested

3.6.1 From the above analysis three scenarios evolved, consolidating the primary characteristics of the various scenarios (including elements to be retained and new ideas to be progressed) into three scenarios to be tested using the traffic model, namely;

- **Do Spread** – Low density expansion of settlement, into surrounding countryside, typical of car generated development;
- **Do Normal** – Development would follow patterns of previous development plans, focussed on achieving population target, through spread of settlement at reasonable densities; and
- **Do Concentrate** – Development growth would be focussed at key points on network to support local transport services.

3.6.2 The vital role of the Integrated Framework Plan is to compare each of these scenarios in terms of land use and transport integration, where analysis compares how each land use scenario complements a new local bus service.

Population

3.6.3 A detailed population analysis comprises an important initial step in analysing the growth of the town. Establishing the following is therefore fundamental:

- 1 What is the existing population?
- 2 What population can zoned land and planning permissions accommodate?
- 3 What is the target population?
- 4 How much additional land needs to be zoned to achieve the population target?

3.6.4 The population of Greystones as per the 2002 Population Census, Volume 1, Population Classified by Area is 10,303 within the legally defined boundary of Greystones. There is an additional 1,610 persons in an area that is known as Greystones Environs.

3.6.5 The theoretical capacity of the zoned residential lands in the current Greystones/ Delgany Development Plan (not including Killincarrig/ Charlesland Action Area) is 15,762 (based on an average household size of 2.8). This population is extremely unlikely to be achieved within this zoned area because all infill development and zoned

residential lands will not necessarily be developed. Therefore, it is estimated that a population of around 12,000 will be accommodated in these lands.

3.6.6 The target population for the residentially zoned land within the Greystones Development Plan was originally set at 17,000. Included in this are the existing population (10,303), the remaining zoned lands with permission to be developed (housing for approx. 2,000 persons), the Charlesland development which shall accommodate approx. 4,000 people, and the Marina Area with an estimated population potential of 1,000. The target population of the Development Plan was varied upwards to 22,000 in 2001, and this is the figure to be achieved by the Integrated Framework Plan deadline in 2016.

3.6.7 Each chosen scenario therefore illustrates the required land take in order to house an additional 5,000 people. This additional population is what is required on top of the development plan population of 17,000 to reach the target population of 22,000.

Do-Normal Scenario

3.6.8 This scenario identifies the required uptake of land, at a density of 30 dwellings per hectare, required for an additional 5,000 people. This includes undeveloped land that was previously zoned at a lower density, infill development and extra land outside the residential zoned area, which is currently zoned for agricultural purposes. The extra land was chosen as close to the town as possible and account was also taken of various constraints such as topography, the town boundary, greenbelt and forested areas.

3.6.9 This is the likely form of development to take place in future without the influence of an Integrated Framework Plan. No consideration has been given to the placement of development in proximity to a local public transport route at this stage. Residential densities are higher than those proposed in the current development plan, due to the An Bord Pleanála ruling that development at Charlesland could not be granted without regard to the provisions of the Residential Density Guidelines.

Do-Spread Scenario

3.6.10 This scenario will represent the likely form of development if past and current trends continue to the target population year and do not take cognisance of the Development Plan variation to enable increased

residential densities. All undeveloped zoned land is allowed to continue at the originally zoned density. Assuming that this will bring the population up to the original development plan target of 17,000, additional land outside the zoned residential area will be identified to accommodate an additional 5,000 people.

3.6.11 It is assumed that land will develop at a density of 10 dwellings per hectares, which is close to or above the average density that has been occurring in recent years. The first additional lands to develop will be those presently zoned for agricultural uses. These lands would accommodate a population of 1,471 at a density of 10 per ha and an average household size of 2.8 persons per dwelling. Therefore, an additional 126 hectares of residential land would be required to reach the target population. This would require a considerable physical expansion of the town. For the purpose of this scenario, northwest and southern expansion beyond the existing town boundary were considered most likely. The natural way for the town to expand is westwards but it is constrained by Delgany Golf Course, Bellevue Demesne with extensive tree plantations and Kindlestown Wood. As with the Scenario 'Do-Normal', no consideration is given to the placement of development in relation to public transport.

Do- Concentrate Scenario

3.6.12 The third scenario is probably the most favourable in terms of land use and transportation integration. This scenario encourages residential densities of up to 60 dwellings per hectare in locations proximate to public transport routes. Locations close to the existing transport node (Greystones DART) were identified and their population capacity calculated. Then other suitable locations were identified near to the main road network likely for a town bus route with a similar high density being applied in accordance with the SPG. Additional land required to make up the 22,000 target population was then identified and a residential density of 40 dwellings per hectare was applied due to the relative remoteness from Greystones central area (Church Road/DART station). Consideration was also given to the development of neighbourhood centres and the concentration of populations in proximity to them.

3.7 Testing the Traffic Implications of Spatial Scenarios

3.7.1 The first of two major land use and transportation exercises within the IFP was carried out to determine which of the above spatial scenarios performed best with regards to minimising traffic growth. The process undertaken compares the scenarios by estimating the number of

additional vehicle trips that would be generated by the additional population, with the total numbers of vehicle trips varying slightly as a result of development density (ie a given area of land will generate different numbers of trips according to the number and type of dwellings built on it) and the trip patterns varying due to the different locations for trip origins and destinations. The resulting vehicle trip matrices were then assigned to the highway network using the Paramics traffic model in order to establish if the development pattern alone has a significant effect on congestion levels.

3.7.2 This process tested the traffic implications of each scenario, but did not allow for potential mitigation measures that potential public transport initiatives would provide (this was examined at a later stage).

3.7.3 The scenario that generated the least amount of traffic growth shows also to be the scenario which creates the most compatible conditions for the implementation of efficient local bus operations and a more pleasant and safe network for walkers and cyclists. Details of the modelling process and methodology are provided at Section 10 of this report.

3.8 Summary of Future Growth

3.8.1 The existing population of Greystones and Delgany is in the region of 11,800 (2002) persons and is expected to reach around 22,000 by 2016. Naturally, with increased population comes an increased demand for travel.

3.8.2 The effect of this in terms of traffic will be an annual increase between 2001 (the base year) and 2006 of **9.4%**. The three proposed scenarios produce the following annual increase in traffic:-

- Do-Normal, 6.5%;
- Do-Spread, 6.4%; and
- Do-Concentrate, 6.13%.

Note: the above growth also includes the area of Kilcoole and its surrounds but excludes the effects of growth on the N11.

3.9 The Chosen Scenario

3.9.1 The traffic forecasting exercise assisted in identifying which land use scenario should be promoted within the IFP as the location for the required increase in population to achieve the target population of 22,000. The model has identified the **Do Concentrate** growth scenario as the form of development that will generate the least amount of traffic growth (6.13% in comparison to 6.4% and 6.5% for the Do Spread and Do Concentrate scenarios respectively).

3.9.2 This chosen scenario entails development at higher residential densities than there has been previously in Greystones/ Delgany, but only on the condition that the location of development gives people modal options in how they travel (i.e. bus, train or bike), supports existing facilities and centres (village facilities and local retail), and is supportive of the transport strategy (bus service). Key proposals include the proposed increase in density and activity on town centre lands to the east of the railway line, and the rezoning of open space to high density residential to the south of the park & ride site having regard to their proximity to the DART station, and the increase of residential densities to support village services at Killincarraig, Delgany, and on Chapel Road.

3.9.3 Physical restraints determine that the existing town centre can only be expanded through more intensive development of lands to the east of the railway track, or development of lands off Mill Road near the Park & Ride site.

3.9.4 The strategy recognises the importance of enhancing and developing village/ neighbourhoods centres within the area. Greystones district centre is the focal point for the settlement area in terms of function, character and transport nodal point.

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3.10 Built Form

3.10.1 This Framework Plan recognises the following strategic context at Section 2.1, as the basis for the study:

- Consolidate development within the area
- Increase overall densities of development; and
- Facilitate the provision of a considerably enhanced public transport system and encourage a shift to public transport.

3.10.2 The consideration of Built or Urban Form is integral to the relationship of development and transport, and the maximisation of the use of walking, cycling and public transport (as set out in the Aims of IFP at Section 2.2.).

3.10.3 The preferred land use development scenario is based on addressing these aims of the IFP in terms of the location of new development. This is in turn supported by the public transport strategy, which seeks to support the land use strategy by serving the key origin and destination points in the study area (including proposed residential growth areas).

3.10.4 The built form of a town has a significant influence on how people move, and their choice of mode in undertaking daily activities.

Various street/ road networks and residential layouts have different impacts on travel.

3.10.5 Towns have been developing spatially in ways convenient to car use, and less convenient for other means of access. As housing, jobs and other activities have moved further away from the town core, so too has the density and structure of built-up areas loosened, and use of the car increased.

3.10.6 In particular, the motor car has had a particular influence on urban areas by, on the one hand loosening the urban structure, and on the other introducing a highly segregated road hierarchy, where the functions, character, and form of streets have been typically subordinated to traffic.

3.10.7 The rigidity and standardisation of most recent housing layouts are partly the result of the dominance of motor vehicles. Layouts have been based on the geometry of vehicle movement, with the result that residents find it easier to sue their car than any other form of travel. In these circumstances the car is immensely convenient. But there are many journeys made by car which, with better planning, could be made by walking, cycling or public transport³.

Accessibility Principles

3.10.8 The following five principles (5 Cs), are a useful benchmark when analysing whether layouts are pedestrian/ cycle friendly:

- | | |
|------------------|--|
| Connections – | Do good pedestrian routes connect the places where people want to go? |
| Convenience- | Are routes direct, and are crossings easy to use? Do pedestrians have to wait more than 10 seconds to cross roads? |
| Convivial- | Are routes attractive, well lit and safe, and is there variety along the street? |
| Comfortable – | What is the quality and width of the footway, and what obstructions are there? |
| Conspicuousness- | How easy is it to find and follow a route? Are there surface treatments and signs to guide pedestrians? |

³ Department for Local Government Regions (DLRG)/ Commission for Architecture and The Built Environment (CABE) (2001) *By Design, Better Places to Live*, Thomas Telford. p.24.

The Neighbourhood

3.10.9 In order to support the aims and objectives of the IFP, urban form must contribute to the reduction of the number of miles travelled per person per day between workplace, home, school, shops and leisure activities. Due to the commuting character of Greystones, the influence of urban form on work place trips will be somewhat limited in the short-term (other than providing for direct links to public transport). For other destinations however, urban form remains highly relevant.

3.10.10 Ideally, the pedestrian should be able to access all the usual daily and weekly urban functions (i.e. school, crèche, shops) within ten minutes walking distance, without recourse to transport. This typically correlates to a 10 minute walking distance.

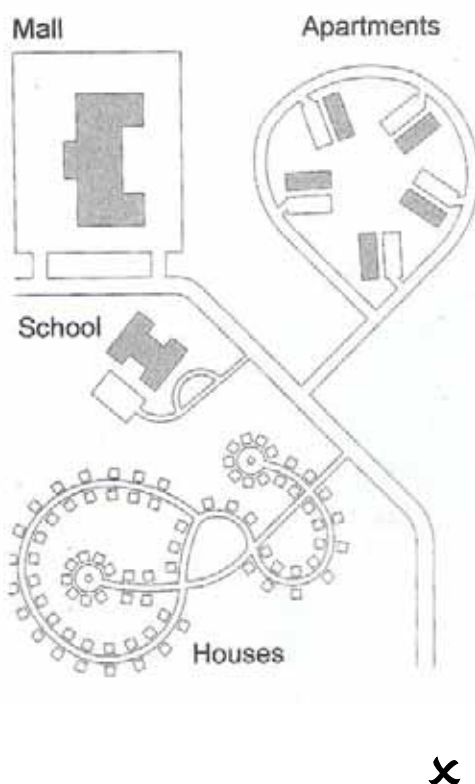


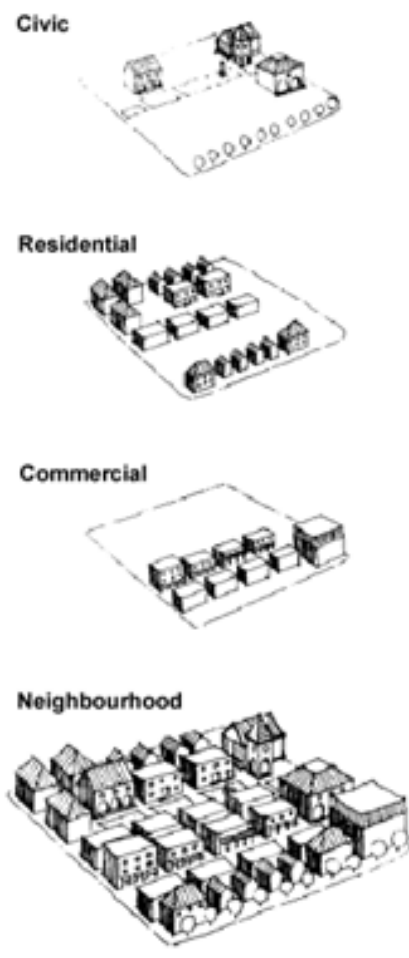
Fig. 3.10.1. Typical 'pod' development⁴

3.10.11 However, suburban areas have typically developed as 'pods'⁵, where separate uses (i.e. mall, apartments, residential) have been developed as separate and segregated physical elements, each with their own access to a main distributor road.

3.10.12 The other notable outcome of this form of development is the significant waste of land, and loosening of urban footprints.

3.10.13 Development of this nature is thus introverted, focussed on the road network and car parking provision, rather than focussing on providing links between places.

⁴ Carmona/Heath/Oc/Tiesdell (2003) *Public Places Urban Spaces*, Architectural Press, p.78



3.10.14 The integration of planning and transport as espoused under this IFP, seeks to break down unnecessary barriers to movement.

3.10.15 Many activities of daily living should occur within walking distance, allowing independence to those who do not drive, especially the elderly and the young.

3.10.16 Interconnected networks of streets should be designed to encourage walking, reduce the number and length of automobile trips, and conserve energy.

Fig. 3.10.2. Mixed-Use Neighbourhood Development⁶

3.10.17 The integration of uses seeks to encourage and linkage between areas, in order to support neighbourhood, village and district centre facilities in the study area by:

- encouraging layout design that promotes walking, cycling and the use of public transport and
- promoting linkage to basic local facilities (schools, shops, crèches, workplace, public transport stations/ stops)

⁵ Ford 2000, quoted in Carmona/Heath/Oc/Tiesdell (2003) *Public Places Urban Spaces*, Architectural Press, p.77

⁶ Leon Krier sketch

Residential Layout

3.10.18 Cul-de-sac residential developments, or indeed gated apartment schemes are typical of ‘pod’ developments that prevent ease of movement. Their layouts entail that journeys are generally more convoluted, and do not allow for easy pedestrian access to neighbouring facilities. Pedestrian routes introduced to overcome poor connections often result in routes which are not overlooked and are unattractive (see Fig. 3.10.3 below).

3.10.19 It must be noted that encouraging high-density development in itself does not support sustainable transport. On the contrary poorly laid-out high density schemes increase congestion.

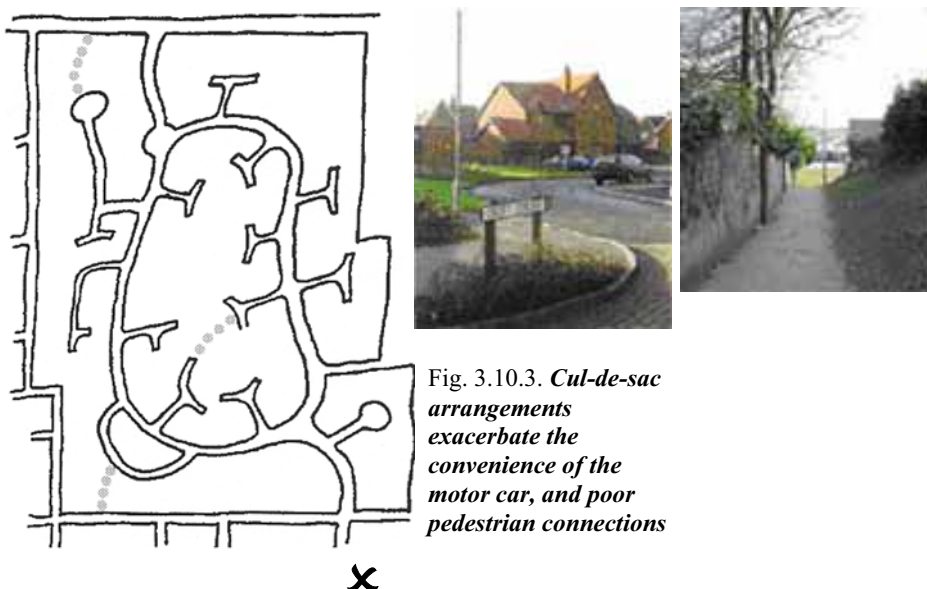


Fig. 3.10.3. *Cul-de-sac arrangements exacerbate the convenience of the motor car, and poor pedestrian connections*

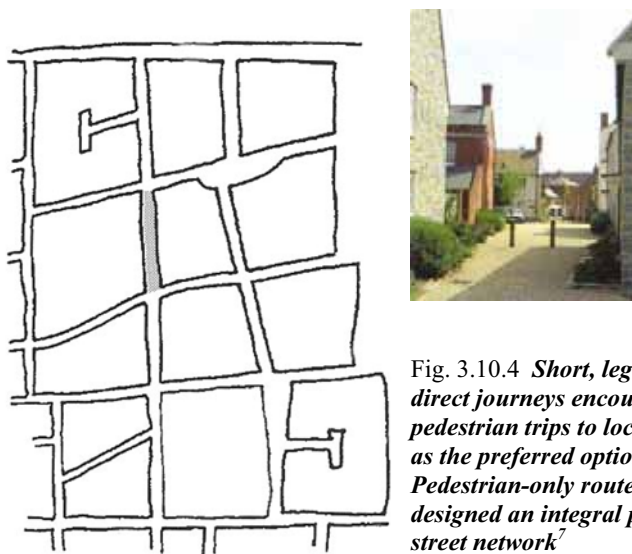


Fig. 3.10.4 *Short, legible and direct journeys encourage pedestrian trips to local facilities as the preferred option. Pedestrian-only routes should be designed an integral part of the street network⁷*

Built Form Recommendations

3.10.20 The foregoing highlights some of the key issues pertaining to movement, mobility, and built form. This IFP does not attempt to provide a blue print for urban design in the study area, but highlights principles and objectives that developments should adhere to. The following recommendations should be incorporated into any large development scheme or masterplan occurring in the study area.

- **Developments should adhere to neighbourhood development principles and seek to promote mixed use development, and the provision of daily/ weekly activities within 10 minute walking distances (approx. 400m-450m).**
- **Development proposals should be able to satisfy the 5 C's of the Accessibility test.**
- **The layout of all schemes should provide for short, legible and direct journeys and encourage pedestrian trips to local facilities as the preferred option.**
- **Cul-de-sacs and one way streets should be avoided, as they create holes and blockages in the street network, making absorption of all types of traffic difficult thus overloading the rest of the network through increased congestion leading to gridlock⁸.**

⁷ DTLR/ CABA(2001) *By Design, Better Places to Live*, Thomas Telford. p.25

⁸ Leon Krier (1998) *Architecture Choice or Fate*, Anreas Papadakis, p.128

- **The public character of roads and streets within the town should be safeguarded, particularly within housing estates, and ensure that wherever possible, one street leads into another street.**
- **Buildings should be laid out so as to create continuous frontages around the perimeter of a block, wherever appropriate. This makes a clear distinction between private spaces on the one hand, and streets and public spaces on the other. This avoids the creation dead areas of land which no one uses or cares for.**
- **Buildings and places should be capable of being used for a range of activities at different times of the day. The occupation of ground floors by uses that relate directly to pedestrians in town and neighbourhood centres, should be also be encouraged.**
- **Consideration should also be given to ways of improving access through existing cul-de-sacs for pedestrians, cyclists and public transport.**
- **New residential areas, should be easy to serve by bus, either by providing direct walking routes to bus stops, or by allowing bus operations to penetrate the residential development.**
- **High density development should only be permitted if it can be demonstrated that the development's layout encourages ease of pedestrian access and movement**

4. THE TRANSPORT STRATEGY

4.1 Introduction

4.1.1 A comprehensive and efficient transportation infrastructure is an essential component in the future development of any urban area. This is particularly so in high growth areas like Greystones, where increased car usage has placed unprecedented pressure on transport infrastructure.

4.1.2 The DTO “A Platform for Change” document states “Framework Plans for Development Centres will be developed, to ensure that land use and transportation objectives are sufficiently integrated. Within these frameworks, Local Transport Plans should focus on the improvement of bus-based accessibility to local services, minimise car use for local trips and ensure interconnection with strategic public transport networks ...”.

4.1.3 This Framework Plan presents an opportunity to consider the provision and integration of alternative transport infrastructure for all modes. It is now widely recognised that the provision of car-based infrastructure only, is not a sustainable solution for the future transportation needs of a community.

4.2 Concept

4.2.1 This Plan outlines a strategy based on the following levels of movement and the integration between them.

- Strategic Movement to/ from the rest of Dublin Metropolitan Area.
- Movement to other destinations within the County.
- Local Movement within Greystones.

4.2.2 At present, private car is the only realistic mode of transport that encompasses the above three levels of movement. Congestion, parking restrictions and relatively low ownership support a medium patronage of public transport despite the clear disadvantages of the existing public transport system.

4.2.3 Improvements in the strategic road infrastructure around the Metropolitan Area and within Greystones, increases in out-of-town retail and employment uses and a continuous increase in car-ownership have

established a trend of car-dependency despite recent improvements in public transport.

4.2.4 It is therefore an objective of this IFP to proposed an integrated transport system that will be able to provide an attractive alternative to the private car in order to connect Greystones as a Major Centre to the rest of the MetropolitanArea.

4.2.5 At a local level, the car-based suburban structure of Greystones, makes cycling a marginal mode of transport. Therefore, it is an objective of this plan to propose measures that will help to address this.

4.3 Objectives

4.3.1 Table 4.3.1 shows figures supplied by DTO for the percentage modal share on 2002 and the projected figures from Platform for Change for 2016. The total trips figure is based on the assumption that the proposed transport strategy included in this document is fully implemented. The factored change for each mode is shown in the last column.

4.3.2 It is important to note that the total number of Am peak trips have more than doubled with growth of some 5,710 trips between 2002 and 2016. The last column indicates that there will be an increase in usage for all modes, but most notably by train with a factored increase of 4.1 - 2141 trips. Car usage shows a continued significant numerical increase but this is mitigated by greater growth in other modes.

Table 4.3.1 – Existing modal share and future modal share

	2002		2016		2002-16
Mode	%	Am peak trips	%	Am peak trips	Δ factor
Walk	16.90%	949	12%	1359	1.43
Cycle	1.40%	79	3%	340	4.32
Bus	10.60%	596	15%	1699	2.85
Train	12.30%	691	25%	2832	4.10
Car	50.40%	2,831	40%	4531	1.60
Other	8.40%	472	5%	566	1.20
	100%	5,618	100%	11,328	2.00

4.4 Strategy

4.4.1 In order to provide practical recommendations, the strategy is sub-divided into the following 7 headings that will take into account existing and proposed modes of transport.

- A. Improvement of strategic public transport access to and from Greystones, having particular regard to reliability and frequency of services;**
- B. Provision of Local Public Transport Bus Routes;**
- C. Improvement of Interchange facilities;**
- D. Traffic Management Measures – improvement of safety focused on the village cores, and important cycle and walking routes, to encourage modal transfer to non-mechanical modes for short local journeys;**
- E. Provision, preservation and enhancement of new and existing pedestrian routes in co-ordination with land use and public transport measures; and**
- F. Provision, preservation and enhancement of new and existing cycle routes in co-ordination with land use and public transport measures; and**
- G. Promotion of Greystones and environs as a leisure destination to take advantage of Greystones's location between the Wicklow mountains, the sea and accessibility from metropolitan area in co-ordination with the County Wicklow Rural Transport Strategy.**

4.5 Strategic Public Transport

4.5.1 This section addresses the connection between Greystones and other destinations in the Metropolitan Area, primarily Dublin City, by train and bus.

IRISH RAIL

4.5.2 The current weekday DART service provides around 85 services per day in each direction between Bray and Dublin, of which 26 start

from Greystones. The service to and from Greystones is somewhat irregular, averaging one train per hour, except during the morning peak period when it is twice per hour.

4.5.3 The main constraint in the current operation is the limitation of track capacity. The track is single between Bray and Arklow, with passing places only at Greystones, Wicklow and Rathdrum. This obviously reduces the frequency of service, which can be operated.

4.5.4 The 4.8-mile section between Bray and Greystones is a particular problem because of the limitations of the single track serving both long distance and suburban services. Occupancy of this section is over 66% of the maximum possible at several times of the day, and these are not confined to the peak periods.

4.5.5 The public consultation exercise informed the consultants that people in Greystones are extremely frustrated by the unreliable nature of the service.

4.5.6 Therefore, it is recommended to construct a double track from Greystones to Bray that will enable more frequent DART services to operate to and from Greystones and allow Arrow services to run more frequently.

4.5.7 In the interim period until this infrastructure is provided, it is an objective to provide at least an additional passing loop between Bray and Greystones.

4.5.8 Irish Rail's short-term proposals to upgrade the current services to a peak-hour Arrow commuter service included in Section 7.3.2 certainly represent an improvement. However, this does not address existing deficiencies in the off-peak service. Therefore, the full extension of the DART services to Greystones should be seriously considered.

4.5.9 Another potential long-term improvement for rail commuting to Dublin would be the extension of the St. Stephen's Green to Sandyford LUAS line as far as Shanganagh DART station. This would provide commuters from Greystones with the opportunity of switching modes at Shanganagh to get a direct LUAS link to such destinations as Sandyford, Dundrum and Harcourt Street.

4.5.10 By 2016, if all these measures are put in place it can be envisaged that 25% of peak hour trips will be made by train.

BUS EIREANN

4.5.11 Bus Eireann Route 133 provides a limited stop link from Wicklow, Rathnew and Ashford to Dublin via Newcastle, Newtownmountkennedy, Kilpedder and Bray. Two to three journeys run south to Arklow via Rathdrum and Avoca. Bus Eireann Route 2 provides an express link between Dublin, Arklow, Gorey, Wexford, and Rosslare. Bus Eireann Route 5 also provides an express link between Dublin, Tullow / Gorey, Enniscorthy, New Ross and Waterford.

4.5.12 At present none of the above services enter Greystones. They do however, bypass on the N11 and stop at Kilpedder and Kilmacanoge.

4.5.13 More information on existing Bus Eireann routes is included in Section 7.

4.5.14 Various options have been considered such as the creation of a transport interchange at the junction of the N11 and the SAR or the bringing of services right into Greystones DART.

4.5.15 Another option that could be considered is to bring services into the ZAPI development where they can integrate with the L.P.T. without the need to go right through to the DART station. Delay on the Bus Éireann services will be minimised because they will only have to travel a distance of 7 kms, adding approximately 10 minutes to the service.

4.5.16 If this is the case, it seems reasonable to serve the proposed IDA business park and the newly created employment in the ZAPI area as well. This will add an extra 10 minutes to the service. Removing one or more of the existing bus stops on the N11 can offset this time delay. This is likely to be an attractive service to any operator.

4.5.17 Therefore, it is recommended that Bus Eireann consider altering their existing services in order to serve both ZAPI and IDA development areas. The extension of these services to the park and ride facility and to the DART station is desirable to achieve the objective of modal integration.

4.5.18 In order to make this a viable option, it would require Bus Éireann to divert from the established direct service on the N11. Therefore, there has to be a strong incentive, both employment and residential based, to make this happen. It is recommended that Bus Éireann explore the possibility of maintaining the direct service on the N11 in the form of an 'A' route with a combined initiative to service the IDA and Charlesland residential areas by way of a 'B' route to be eventually extended to an interchange at the DART.

DUBLIN BUS

4.5.19 Routes 84 and 84X serve Greystones from/to Dublin and Route 184 serve Greystones to/from Bray. More information on existing Dublin Bus routes is included in Section 7.

4.5.20 These routes provide a valuable service in the absence of a reliable suburban rail service from Greystones. In the interim period until this gap is addressed, these services remain fundamental to achieve the IFP objectives.

4.5.21 The N11 Quality Bus Corridor is already operational as far as Foxrock. It is the intention to extend this infrastructure as far as Bray. This will potentially offer timesavings for the 84 service from Eden Quay to Newcastle, presuming it will as successful as the already operational section of this QBC. The N11 QBC has seen significant increases in patronage and may also have an effect on commuting patterns as far as Greystones with the completion of the corridor.

4.5.22 Therefore, it is recommended that Dublin Bus increase the frequency and reliability of their services. In addition, the continued provision of the key link between Bray and Greystones DART stations is encouraged as part of the objective of modal integration. See section 4.6.10.

4.5.23 The IFP recommends that all bus services be complementary and feed into each other. Further liaison is therefore recommended between Dublin Bus, Bus Éireann and any private operators.

4.6 Provision of Local Public Transport Bus Routes

4.6.1 The main objective of a local public transport route is to accommodate local trips in the Greystones/Delgany area serving all-day uses, and not just peak hour demand. In addition, the service will act as a feeder of the proposed upgraded train services.

4.6.2 A fixed local bus route is recommended that is frequent and reliable as part of a “system”. The road network within Greystones presents a good opportunity to sustain a fixed route. While a demand-responsive system, is sometimes desirable in low density and also poorly laid-out areas, it does not fulfil the objectives of the framework plan. The level of uncertainty and unreliability would discourage modal shift from private to public transport.

4.6.3 In principle, the service would aim to:

- Give good accessibility to residential areas;
- Operate via main shopping street in the town centre, retail, employment, key health, leisure and educational facilities;
- Serve Greystones DART Station;
- Connect with regional Bus Éireann routes to provide connections with the interurban services described above; and complement the existing or altered Dublin Bus services.

4.6.4 Seven local public transport routes have been analysed and compared in order to maximise the catchment of the route and minimise or even eliminate any need for subsidy to run it in the medium-short term.

4.6.5 A basic gravity model has been created in order to identify and distribute the travel demand along the proposed local public transport routes. In addition and based on the results of this model, a feasibility study has been carried out in order to find the optimal route. More information on the analysis and comparison of these seven routes is included in Section 8.

4.6.6 The output of this study identifies the combination of routes F+G. as the preferred option. More information on these routes is included in Section 8.

4.6.7 Route F is a linear route that will commence within the Zapi site and continue along the path of a newly constructed link between the SAR and Mill Road. It then passes the DART station along Church Road and into Rathdown Park at New Road. It continues through the aforementioned path through Rathdown Park, back onto Rathdown Road and then takes a right turn east into Redford Park onto a newly constructed turning circle at Redford Court. It then follows the same route back to Zapi. The total length of a single journey from Zapi to the Redford Court turning Circle is 5.5kms, which takes 14.8 minutes. This route can therefore provide four services in either direction per hour using only two buses.

4.6.8 Route G is a circular route that starts from the DART station, proceeds through the Burnaby via Kilincarrick Road and St Vincent's Road, before joining Mill Road until it reaches Killincarraig where it continues straight on to Delgany. At Delgany the route takes a right turn north and continues until it makes a right turn east into Beechwood Park onto Riverdell Grove and Lower Grattan Park. The route then makes a left turn north onto Church Road (R761) at Tesco. The route turns right at Blacklion, down Rathdown Road, Victoria Road, onto LaTouche Road, before linking back to Church Road (R762) and back down to the DART station.

4.6.9 This route has a total length of 7.5kms and takes a time of 20 minutes. This route can therefore provide three services in either direction per hour using only two buses.

4.6.10 Finally, a combined sensitivity analysis against both ticket fare and modal share has been conducted. A suggested ticket fare of €0.80 combined with an estimated 11.5% modal share results in a profitable route, where no subsidy is needed to run the service and a provision of 68 trips per person per year is catered for. A final 41% profit against costs by 2016 deems this to be the preferred service. The commencement service date would be 2006.

4.6.11 All these routes are based on the assumption that Greystones will enjoy an improved DART service. In the absence of this improvement, it is recommended that the existing Dublin Bus routes from/to Bray are altered to accommodate the identified routes. Dublin Bus Route 184 could be easily readapted to cover proposed Route F. However, proposed Route G will not be easily adapted to Dublin Bus Route 184 nor to Dublin Bus Route 84/84X due to its circular nature. In order to accommodate the objective of providing a reliable local service, the frequency of the 184 Dublin Bus Services should be improved from the existing frequency to 15 minutes with an absolute maximum of 20 minutes for off-peak services.

4.7 Improvement of Interchange facilities

4.7.1 This IFP has the objective to promote the integration of land use and transportation. The integration of various transport modes is an important element of achieving genuine integration, and promoting public transport. There are various measures that can be promoted to encourage this, such as through ticketing, co-ordinated timetabling and legible mapping. However, the provision of an infrastructure to facilitate the attractive integration of services and modes should be put in place.

4.7.2 This IFP recommends changes in existing public transport services, the establishment of a new local bus service, the promotion of walking and cycling networks and the encouragement of park and ride. The implementation of all of these measures will create informal interchange points, but they can be made more efficient, attractive and comfortable if identified and planned for in advance.

4.7.3 Extended Bus Éireann services have been forwarded as serving the area as far as the ZAPI/IDA developments. This could be co-ordinated with the L.P.T. Route F, and a small interchange facility should

be provided at this location, such as a shelter with seating, timetabling and route mapping information. Cycle stands may also be incorporated.

4.7.4 A central interchange should be provided at Greystones DART station. This should include stopping cages and flags for buses, taxi ranks, indoor waiting areas and information for all modes within the existing train station; outdoor waiting areas/ seating/ shelters; secure cycle parking; and the promotion of an attractive walkway to the existing park and ride facility to include better access, good signing, wide and attractive surfaces, landscaping, overhead shelter where possible; and street lighting. This should be the subject of a detailed design scheme.

4.8 Traffic and Parking Management

4.8.1 Private cars have an important role to play in areas like Greystones. Proposing a transport strategy without taking into account the convenience of such mode of transport would be unrealistic. However, a transport strategy based only on private cars has been proved to be inefficient and ultimately unsustainable. A balance between the private car and walking, cycling and public transport is essential to any realistic transport strategy.

4.8.2 The main objective of traffic management measures is to mitigate the impact of both existing and forecast traffic in order to accommodate other means of transport such as walking, cycling and public transport.

4.8.3 An essential part of the traffic management strategy is to provide bus priority measures at locations where traffic is likely to delay public transport services.

4.8.4 Several new highway infrastructure schemes are likely to be in place by 2016. These have been included in the model and are as follows:-

- Dualling of the N11 for its entire length;
- The closure of the median at the southern part of the N11/ R762 junction;
- The construction of the Southern Access Route (SAR), between the N11 and the R761 and the R761 and the R762,
- The construction of the Killincarrig Bypass (south of Mill Road), which realigns the R761 to the east of Killincarrig, incorporating a roundabout where it joins the R762;
- A new road running from the current alignment of the R761 just north of the Killincarrig, southwest to the new road as described above;
- Realignment of Chapel Road at the school to take a more direct route; and

- A new road running from the junction of Chapel Road and Applewood Heights, north to the first junction of the R761 south of the cemetery.

Model Run Observations

4.8.5 As might be expected, with the potential growth for Greystones/Delgany there are a number of potential problems on the highway network where vehicles experience delay. It is not the intention of the modelling process to find engineering solutions to alleviate these queues but rather to highlight the potential problems, as it is the overall aim of this study to draw a balance between facilitating the private car where appropriate, and promoting alternative means of transport

4.8.6 Generally the three spatial scenarios generate the same problems, although with differing levels of severity. Observations from the model clearly show that extensive queuing occurs on the proposed section of road running from the junction of Chapel Road and Applewood Heights, north to the first junction of the R761 south of the Cemetery (Redford Park). The junction would benefit from a set of signals which if linked to the existing signals at Chapel Road/ R761 and Rathdown Road/ Church Road would minimise delay to traffic on the R761.

4.8.7 The Southern Access Road is heavily trafficked both sides of the R761. Eastbound traffic approaching the roundabout with the R761 experiences delays as a result of the circulating traffic on the roundabout itself. Queues also form southbound from the R761 at this junction. East of the roundabout, on the SAR traffic is very heavy but constantly moving.

4.8.8 The junction with the SAR and the N11 runs smoothly with no undue delay to traffic. As a result of a previous study, undertaken by CBP, it was found that a set of signals on the northbound slip would be required to ensure traffic does not block back further than the length of the slip thus causing delay on the N11 carriageway⁹.

4.8.9 The public consultation exercise revealed that road safety is a significant deterrent for the use of non-mechanical transport. This particularly apparent with regard to the school run, where parents feel compelled to drive their children to school rather than allow their children on to what is held to be a dangerous road network for

⁹ It is notable that the Do-Spread scenario creates an additional challenge in terms of junction delay. Under this scenario a large proportion of additional housing would occur along the existing unclassified road running south from the Wicklow arms on the R761 to the R761 South of Prettybush. It is essentially single lane its entire length, and would require substantial upgrading as would the junctions with the R761 and R762.

pedestrians and cycle users. Therefore, traffic calming measures are required to encourage a modal shift for regular local journeys, and general improvement of the built environment.

4.8.10 It is recommended that measures be focused on the following locations.

Delgany Village

4.8.11 Delgany village suffers greatly from through-traffic, that is unsafe for other road users, and detracts greatly from the potential environmental and urban quality of the village. The following self enforcing speed reduction measures are proposed:

- Define gateway treatment at entry to village;
- traffic Calming/Speed Reduction in village;
- parking control;
- widen paths and reduce carriageway width, which is likely to require one way width with paving areas;
- to impose a 3-Tonne Ban (Post SAR implementation);
- to require priority pedestrian/cycle links to new estates surrounding village;
- to link from Delgany to Primary School and
- to introduce a speed camera.

Killincarrig Village

4.8.12 A Killincarrig by-pass was introduced in the current Development Plan arising from the 1997 traffic study of the town with the aim of improving the village environment.

4.8.13 It is the philosophy of this IFP that transportation measures should support land use, and it is in the interest of supporting village services that potential customers should not be diverted away unnecessarily. Therefore, rather than promote investment in a by-pass it is recommended that funds be refocused on traffic calming measures associated with village streetscape improvement.

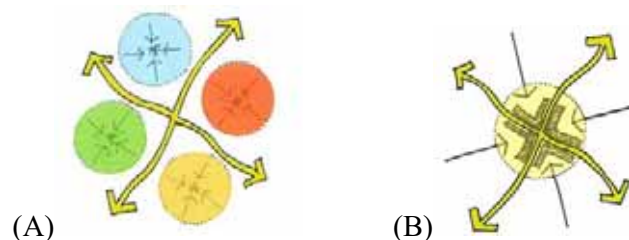


Fig. 4.8.1 Positioning local centres away from main routes (A) deprives them of life and passing trade. The alternative (B) is to create pedestrian and public-transport orientated centres at key focal points¹⁰

4.8.14 There is an immediate need to physically define where the village begins in terms of road space. At present there is no distinction between the tarmac road surface areas and a safe pedestrian environment. It is therefore recommended that the following measures are implemented in the short-term, and the need for a by-pass reassessed in the long-term:

- Define gateway treatment at entry to village
- Traffic Calming/Speed Reduction in village
- 30kph limit
- Parking Control
- Widen Paths, and reduce carriageway width, which is likely to require
- Require priority pedestrian links to new estates surrounding village

Greystones

4.8.15 Parking on Church Road was held as being problematic by many attending the public consultation events. A proposal for a one way system was also brought to the consultants attention for this area. However, while somewhat unsightly, parking is important for many of the stores on the main street and actually serves to calm traffic. Long traffic queues were not observed on the model or on site in this vicinity, and buses were able to get through. The following measures are recommended:

¹⁰ Llewelyn Davis (2000) *Urban Design Compendium*, English Partnerships, p.42.

- Provide clear and legible transport interchange facility at the DART station, with the removal of on-street parking at this location. (See Section 4.7)
- Undertake detailed review parking arrangements on Church Road, as part of transport interchange measures, with a view to considering detailed design proposals for improvement of the pedestrian environment, of the main shopping area.
- Provide secure and sheltered cycle parking facilities to encourage use to DART. (See Paragraph 4.7)
- Improve lighting/surface on the main street.
- Improved pedestrian link between Park and Ride site and DART station
- There is not an obvious rationale for Marine Road to be one-way, and it is recommended that this be made two-way given the special amenity value on the coast

Chapel Road from Delgany to St. Laurence's school

4.8.16 The following is recommended on this important route, which at present does not provide a secure pedestrian environment:

- Signage
- Speed Camera
- Provide street furniture
- Suitable location for 'safe routes to school project'
- Improve and widen footpaths

Blacklion

4.8.17 Blacklion will be an important neighbourhood centre in the northern part of the study area. Neighbourhood shops and services should integrate physically with the surrounding residential areas. Rather than introduce speed reduction mitigation measures, upon completion of development, the layout of adjoining developments and properties must be considered comprehensively, as a single neighbourhood area.

4.8.18 A neighbourhood area does not end where the shops stop, as illustrated by the existing traditional neighbourhood/village centres in the Greystones/Delgany area. Therefore, layouts that encourage segregation of activity and uses should be discouraged. In particular, the new road (under construction) from the R761 to Chapel Road should be addressed and engaged by new development as a street, rather than segregate uses

as a mini-bypass. This is discussed further under Urban Form (see section 3.10).

Burnaby Heights Junction

4.8.19 There are two main problems associated with this junction:

- (i) Exiting by car / motorbike / bicycle from Burnaby Heights onto R761 is difficult due to the high speeds of vehicles on the main road, the poor visibility onto the main road, the gradient of the Burnaby Heights exit and sharp angle at which Burnaby Heights meets the R761.
- (ii) Pedestrian facilities are completely inadequate at this junction – there are no footpaths at the western end of Burnaby Heights, and there is no pedestrian crossing facility to facilitate the movement across the main road. This is in spite of the fact that there are pedestrian movements from Bellevue Heights to the West to Burnaby Heights to the East. Pedestrians continue on through the lane crossing the golf course onto Whitshed Road and Burnaby Park and onto the Main Street.



Figure 4.8.2. *Looking South along the R761 on exiting Burnaby Heights – Vehicles from the south travel at speed making exiting difficult*



Figure 4.8.3: *Looking North along the R761 on exiting Burnaby Heights*

4.8.20 The following measures are recommended to address the problems outlined above.

1. Address inappropriate speeding on the R761 by:

- painting more “SLOW” signs on the road, more roundels
- when, the speed limits are metricised, that a 30kmph speed limit is applied to the appropriate stretch of the road

2. Improving Visibility at the corner.

Given the location of the house on the southern corner of the junction and the fact that the wall and trees on the northern corner have already been moved back, there is little scope for improving visibility by opening out the junction. Given the curvature of the road to the south, the placing of a convex mirror on the western side of the road would not make much difference to visibility..

3. Improving Pedestrian Facilities and Signalising Junction

The footpath on the southern side of Burnaby Heights running up to the junction needs to be extended as far as the R761. A pelican crossing should be provided at this point to allow pedestrians to link with steps on the west side of the road to link with the Bellevue Heights estate, and to provide exiting vehicles with a phase to get onto the R761.

4.9 Improvement and Integration of the Pedestrian Network

4.9.1 A well-designed urban structure has a network of connected spaces and routes for all modes of transport. Streets, footpaths and public spaces are safer by laying them out so that passers-by and people in nearby buildings overlook them.

4.9.2 It is recommended to create a network of walking routes by improving and preserving existing walk links, and by opening up new footpaths on existing roads, as well as increasing the widths on existing footways where they are currently too narrow. The closure of existing walkways should be a last resort as it undermines the basic principles of a walking design network.

4.9.3 A deterrent to the promotion of walking as a mode of transport is the issue of safety, especially with regards to more vulnerable groups. Many services and facilities are within walking distance in a town of Greystones's size. More direct walking routes should be created with the provision of conveniently located pedestrian crossings; appropriate signage; rest benches; and effective lighting with interesting features along the way. The separation of pedestrians and vehicles at different levels should also be discouraged.

4.9.4 The primary network as illustrated in Appendix 18a, is intended to improve connections between settlements within the study area, as well as existing routes that are frequently used, and highlights that they should be protected and enhanced.

4.9.5 Proposals for the closure of public rights of way should not be permitted. All existing public rights of way should be regarded as an integral part of the overall movement network and therefore they should be maintained and improved where necessary;

4.9.6 Listed views around Greystones should be included in a primary network for leisurely walkers. Not only should these improvements be made to encourage people to walk but also to accommodate the significant numbers who already do.

Rights of Way

4.9.7 Pedestrian Rights of way are considered to be a vital and integral part of the movement network of Greystones. However, the soft-mode network requires investment and maintenance as much as the road network to encourage use, with particular regard to safety, lighting and

surface. There are some rights of way in the study area have drawn particular attention as follows:

Golf Course – Burnaby Heights

4.9.8 Right of way across the Golf Course is a case in point where developments to the west of the R761 can be linked to Greystones by an attractive pathway. It is recommended that this stretch be developed to:

- Preserve Character
- Allow 24 hour use
- Widen and improve surface/ lighting but maintain country feel through careful design and signage.

Laneway linking Hillside Road into the Bellvue Estate.

4.9.9 The first lane links the older, more mature part of Greystones – Hillside Road - with the newer estate to the west - Bellevue. During the course of this study, this laneway was subject to statutory procedure to close the lane, on the basis of anti-social activity in the vicinity of the lane. It was recommended that this right-of-way should not be extinguished for the following reasons:

- (i) this lane provides a direct pedestrian link between the Bellvue estate to the west to the town centre via Hillside Road. If this link is closed off, then pedestrians will be obliged to use a longer and more traffic-dominated noisier route.
- (ii) The extinguishment of an existing right-of-way, which corresponds closely with a desire line between residential areas and the town centre, is inconsistent with the IFP philosophy of improving the links within the study area for slower modes. Therefore the extinguishment of this right of way is inconsistent with the wider DTO strategy of providing the conditions to allow for a modal shift in favour of walking and cycling.

4.9.10 It was recommended that the issue of anti-social activity in the lane should be addressed by the following measures to make the lane more attractive.

- (i) The short section of wall partially separating the older and newer residential areas could be removed and the hedges /

trees overlooking the east end of the lane could be pruned back. These two measures would open up the lane giving it a less “dingy, dark and enclosed” atmosphere, and improve the sight lines east towards the village.

- (ii) Bright materials could be used in any hard landscaping of this lane to give it a more attractive appearance, with suitable soft landscaping alongside the wall on the north side of the lane. The appearance of the lane could be further enhanced by suitable lighting, possibly at low heights

4.9.11 Therefore it could be expected that more residents would be inclined to walk and cycle through the lane thus producing a “passive policing” effect which would in turn increase the perceived and actual safety.

4.9.12 Wicklow County Council adopted a proactive approach to addressing this situation and have undertaken works at the laneway taking account of the above recommendations.

Lane linking Church Lane to Hillside/Bellvue Residential Area

4.9.13 This lane links the narrow Church Lane with Hillside. A pedestrian route continues southwards onto Bellvue Road. On the occasions where the lane was visited, the lane was used by several pedestrians and cyclists.

4.9.14 There is clear evidence of “anti-social” behaviour with the east wall covered with graffetti and the lane strewn with broken glass and other litter.

4.9.15 It is recommended that the right of way to use this lane should not be extinguished as;

- (i) it currently provides a direct link to the Church. The alternative route is much longer and is along busier roads. Therefore, as with the other lane, it is inconsistent to close this link while at the same time trying to take on board the principles of sustainable transport underpinning the Integrated Framework Plan.



Figure 4.8.4. *Looking South into Hillside/Bellvue showing graffetti on the wall and bank*

4.9.16 Measures to address the problem should include:

- construction of a wall between the existing path and the existing western boundary of the lane
- improved lighting
- trimming of hedges to brighten up the lane and improve sight lines.

4.10 Improvement and Integration of Cycling Network

4.10.1 Why provide for cyclists? Cycling is a healthy, non-polluting, inexpensive, energy-efficient, space efficient, and sociable mode of transport. It is the embodiment of sustainable transport and sustainability – the core concepts of the Framework Plans. It is particularly suitable for trips under 5 miles (taking under 30 minutes) and the cost of providing for cyclists is marginal compared to other modes of transport. Cycling can become an important means by which to travel to work, school, shops, leisure sites and other destinations. It is also an important leisure activity in itself – of particular relevance in an area of high amenity value such as Greystones. The promotion of cycling is consistent with the DTO's policy as indicated in "Platform for Change".

4.10.2 Infrastructure for moving bicycles. A cycle-friendly infrastructure is required if cycling is to reach levels where it can become a genuine, attractive alternative to the private car. The fundamental prerequisite for making a town or area cycle friendly is for there to be lower traffic speeds and respectful driver (and cyclist behaviour). This cannot be done through physical measures alone. A cycle friendly infrastructure is not simply synonymous with a network of cycle tracks¹¹ and cycleways¹². The term *cycle-friendly infrastructure*¹³ has a broader meaning which emphasises (in descending order of priority) the following:

- (i) address through-traffic volumes and the movements of heavy goods vehicles in areas shared by cyclists (and pedestrians);
- (ii) enforce low traffic speeds, and in particular the need to review speed limits in residential areas, on routes to schools, and in other areas used by the more vulnerable road users;

¹¹ A "cycle track" is defined in the Road Traffic (Traffic and Parking) Regulations as meaning part of a road, including part of a footway or part of a roadway, which is reserved for the use of pedal cycles and from which all mechanically propelled vehicles, other than mechanically propelled wheelchairs, are prohibited or restricted from entering. A cycle track may be provided: (a) on the roadway (in which case it is often referred to as a "cyclelane"; or (b) physically segregated from the roadway by means of a grass verge, raised kerb, or other similar means. P. 4. of the DTO and Department of the Environment and Local Government "Provision of Cycle Facilities – National Manual for Urban Areas".

¹² A "cycleway" is defined in Section 68 of the Roads Act, 1993 as a public road reserved for the exclusive use of pedal cyclists or pedal cyclists and pedestrians. As previous reference.

¹³ Guidance on the meaning of a "Cycle-friendly infrastructure" is provided in the 1996 Institute of Highways and Transportation document entitled "Cycle-Friendly Infrastructure – Guidelines for Planning and Design".

- (iii) cycle-friendly junction design (where ~75% of cycle accidents take place¹⁴)
- (iv) carriageway redistribution to give more space to cyclists, perhaps in conjunction with buses – eg. Wide inside lanes.
- (v) cycle lanes and tracks (off-road type).

4.10.3 Cycleways, with alignments separate from the main roads, and for the exclusive use of cyclists (and pedestrians in some cases), are also very important in providing safe routes for cyclists.

4.10.4 In addition to the above, proper maintenance of the road infrastructure used by cyclists and cycling specific signage are important elements of the infrastructure. *See sections 4.10.7 for the application of these points to Greystones.*

4.10.5 Infrastructure for stationary bicycles. Besides the provision of cycle-friendly infrastructure for moving cyclists, the provision of plentiful, conveniently-located, secure, sheltered and attractive cycle parking is necessary to accommodate *stationary* bicycles. Locations which require bicycle parking include residential developments such as apartment blocks, employment centres, schools, shops and leisure sites. Public transport interchanges also require secure cycle parking to facilitate multi-modal trips (i.e. transfer from bike to train). *See sections 4.10.8 below for application of this idea to the Greystones area.*

4.10.6 In addition to physical infrastructure, a cycling friendly environment or culture is one where there is active promotion of cycling (and safe driving) by the local authority (and partner organisations) through communication and educational measures. Such measures would include initiatives to improve the image of cycling in the Greystones areas, campaigns to provide cycle training and education to school children (as part of “Safe Routes to School” projects), projects to encourage local employers to provide for current and potential cycling employees (providing company bicycles, mileage allowances for trips taken by bike etc). Other target groups which the local authority can focus efforts on include those commuting to leisure sites (football pitches, tennis clubs etc.), shoppers and families.

¹⁴ Cycle-friendly Infrastructure – Guidelines for Planning and Design, p. 56; IHT, 1996

4.10.7 New developments. As referred to in section 3.10, new developments should be designed from the outset to be cycle friendly. Layouts should enforce lower traffic speeds and respectful driver behaviour. Mitigation measures such as ramps for example are a sign that the layout design has failed in this respect. Development layouts should provide for ease of movement and connectivity and permeability. Convenient, attractive, safe and direct routes, reduce journey distances, and inconvenience for cyclists/pedestrians, and encourage trips to be made by non-car modes thus reducing congestion.

4.10.8 Mixed use developments enable for shorter movement distances, between points of origin (i.e. housing) and destinations such as shops and facilities and which favours cyclists and walkers. New developments adjacent to older developments should be accessible on foot or by bike directly, rather than requiring the cyclists or pedestrians to use busier arterial roads.

Cycle Recommendations

4.10.9 The following measures are proposed for the study area, which should be read in conjunction with the Map in Appendix F. There is inevitably a degree of overlap with other traffic measures. The creation of a safe cycling environment in Greystones / Delgany will involve the design and implementation of items (i) to (vii).

- (i) **Through traffic and HGV restrictions:**
 - The implementation of the Southern Access Road will enable the reduction of through-traffic from Delgany
 - Introduce 3 Tonne limit in Delgany village (upon opening of SAR to N11)
- (ii) **Speed restrictions / general traffic calming:**

For those roads marked yellow in Figure 2.4, it is advised that traffic calming measures, cyclelanes or cycle tracks are introduced. The most appropriate element can only be decided following more detailed investigation.

 - Delgany village
 - Killinacraig
 - Church Road to Killinacraig
 - It is recommended that consideration should be given to the provision of speed cameras at locations marked SC¹⁵.

¹⁵ It requires the co-operation of the Gardaí – for example with respect to speed camera and the general enforcement regime. The identification of possible locations for speed cameras to be done in consultation with the Gardaí.

- (iii) **Junctions:** Introduce cycle safety measures such as tightening of junction geometry and speed reduction, as part general traffic calming improvements at:
 - Delgany village
 - Killincarrig Roundabout
 - All roundabouts on the SAR to be reviewed to assess cycle-friendliness (ie. narrowed circulatory carriageway, increased deflection, reduced flares)
 - (iv) **Carriageway redistribution** to provide dedicated space for cyclists, including cyclelanes: Few stretches of road in Greystones/Delgany are sufficiently wide to accommodate carriageway redistribution.
 - (v) **Cycle lanes (on road):**
See (ii) above. Few roads in Greystones/Delgany are sufficiently wide to accommodate a segregated cycle lane.
 - (vi) **Cycletracks (off road):**
See (ii) above. Few roads in Greystones/Delgany are sufficiently wide to accommodate a segregated cycle track.
 - (vii) **Cycleways** (separate from the main alignment of the road):
 - Delgany village via Three Trouts stream route coast linking with residential estates along the way, down to the coast.
 - Provide direct link from ZAPI to R761
 - Upgrade Bray-Greystones coastal walk to enable general cycling
- 4.10.10 Locations requiring conveniently located, secure (and if possible sheltered) **cycle parking** (Existing + Future)
- Employment Centres:
 - Schools
 - Shops
 - Leisure Sites
 - Residential Apartment Buildings
 -
- 4.10.11 Planning applications for new development within the subject area, must provide for cycle parking in the above locations.
- 4.10.12 Finally, in order to implement these policies, the importance of liaising with relevant organisations, including Slí na Sláinte, The Irish Cycling Federation, the Safe Routes to Schools Initiative and disabled representatives, to promote their interests in an overall transport strategy is recognised.

4.11 Promotion of Greystones as a Leisure Destination

4.11.1 Greystones is unique in terms of amenity value in that it is closely located to both the Wicklow Mountains and the sea. Also, its proximity to the Metropolitan area provides the town with a large enough catchment for it to be promoted as a leisure destination for the region.

4.11.2 The completion of the new marina will present opportunities to promote water sports, such as sailing, wind surfing and fishing. There may also even be the possibility of promoting another mode of transport to the Metropolitan area via the sea.

4.11.3 There is scope for the enhancement of land-based activities. Golf is rapidly becoming a major tourist attractor to Ireland and Greystones is ideally placed with two quality golf course, a driving range and a National Golf Academy.

4.11.4 The Wicklow Mountains is the largest mountain range in Ireland and Greystones could act as a base for the serious hiker or for those wishing to appreciate the county's scenic value. Access to the mountains may be encouraged through the integration of the proposed local bus service with other tourist coaches or the Wicklow Rural Transport Strategy.

5. IMPLEMENTATION PROGRAMME

5.1 Introduction

5.1.1 The programme and implementation of an Integrated Land Use and Transportation Framework Plan may not be as straightforward as that of a development or transport plan. The fact that it involves the integration of the ideals of two professions means that it requires the careful coordination of both land use and transport policies. It may also result in a change in policy by one profession to take more account of the other and vice versa, something which may not have been so common in the past. The remit for an Integrated Framework Plan is to act as an advisory document so it does not have the powers of the statutory documents that must be adhered to by land use and transport planners. There may be further difficulties with implementation because it is only recently that transport and land use plans have been considered in the context of each other and as yet there is no template to follow.

5.1.2 This section puts together recommendations on how the IFP can influence policy so as to encourage sustainable integration between land use and transportation. It aims to encourage and develop a form of thinking amongst both sets of professionals to take account of a broader picture of what causes us to move around, how far we presently move and how we can both minimise and distribute movement by influencing the placement of certain activities in certain places.

5.2 Framework Plan Programme

5.2.1 The tasks covered in the previous chapters have been gathered in the table at the end of this chapter. This summarises the key tasks identified in both land use and transportation strategy. It also reminds us of the objectives for each task, specifies who has responsibility to implement it, the timescale for implementation, and the conditions for implementing each task. To facilitate the cross-reference between text, plans and this table, page and plan references have been included as well.

5.2.2 The framework plan can be summarised in the following headings:

- Improvement of Transport links to the Metropolitan Area.
- Containment of Urban Sprawl and increase of densities along public transport corridors.
- Provision of Local Public Transport and associated priority measures.
- Development of walking and cycling networks.
- Interconnection between all modes of transport.

- Ensure employment opportunities to the south of Greystones are potentially well connected to the town for all transport modes.
- Reinforcement of Greystones Town as a commercial and leisure centre.

Table 5.3 below highlights the recommendations contained in the IFP strategy, and the agencies or groups responsible for implementing the various measures.

5.3 Developer Contributions

5.3.1 In order to secure the necessary facilities and services along with public transport provision to ensure that areas are developed in an integrated and sustainable manner, the Council will seek to secure benefits for the community from planning permissions via development contributions. It is of vital importance that each of the areas are developed in a balanced and integrated manner, accommodating the necessary basic services and facilities for the community and as such, the imposition of requirements for contributions will help to secure this orderly integrated development.

5.3.2 Sections 48/ 49 of the Planning and Development Act 2000 provides the basis for securing development contributions. These contributions to public infrastructure can include but are not limited to: car parking, roads, public open space and other amenities, foul sewerage, surface water drainage, water and acquisition of land.

5.3.3 The Development Contribution scheme will set out the basis for the determination of contributions and the payments required in respect of different classes of development. In addition to the development contribution scheme, the Council may require the payment of a Special Contribution where specific exceptional costs not covered by the scheme are incurred in respect of public infrastructure that benefits the proposed development.

5.3.4 In addition under Section 49 of the Act, the Council can also apply a supplementary Development Contribution Scheme as a condition to a planning permission where the public infrastructure benefits the development to which the permission relates.

5.3.5 The planning permission for the ZAPI development (through providing for a local bus service via planning condition) has set precedent for support of local transport in the area.

5.4 Management and Monitoring

5.4.1 The management and overseeing of the implementation of the strategy is crucial to its success. As the area of Greystones develops so too should the strategy. Decisions about when to implement certain parts of the strategy may be better made over the course of the study period based on the development within the area.

5.4.2 It is suggested that a *Framework Plan Committee* meet every six months to review progress and assess such progress against the timetable for the strategy. The *Framework Plan Committee* may also need to decide on variations to the strategy in terms of phasing based on the situation within the area at the time of the meeting, and also in light of the possible impacts of impending developments.

5.4.3 It is suggested that the *Framework Plan Committee* be comprised of representatives from the organisations which sat on the steering group for the study. This would be the most effective way of progressing the strategy, as having undergone the process of developing the strategy, all parties now have an excellent understanding of each other's positions, abilities and restrictions and this understanding will be the key to implementing a successful and comprehensive strategy for the area.

5.4.4 It is also recommended that a representative from WCC be nominated to monitor and oversee the implementation of the various elements of the strategy, the DTO should nominate a member to work in conjunction with the WCC representative in order to ensure that the plan is implemented successfully. It is recommended that a monitoring and review study be carried out every two years throughout the life of the strategy.

Table 5.3 IFP Recommendations and Implementation

N	TASK / SUBTASK	OBJECTIVE	REQUIRES COOPERATION OF:	TIMESCALE	BASIC CONDITIONS	ADDITIONAL CONDITIONS	IFP REFERENCE
1	Scenario Do Concentrate	Restrict urban sprawl; contain development; locate higher density residential developments proximate to services, schools, employment & transport nodes, and routes.	WCC & GTC	2004+	IFP objective should inform Development Plan Review		3.6.12, 3.9
1.1	Increase of residential densities for selected town centre mixed use zonings	Location of people close to public transport and local services	WCC & GTC	2004+	IFP objective should inform Development Plan Review		Appendix C
1.2	Rezoning of open space zoning for high density residential to the south of park & ride site	High density residential development close to public transport corridor as employment zoning	WCC & GTC	2004+	IFP objective should inform Development Plan Review		Appendix C
1.3	Increase of residential densities at Killincarraig and Delgany	Location of more residents close to a neighbourhood centre. Increased residential densities on L.P.T. corridor and industrial zoning	WCC & GTC	2004+	IFP objective should inform Development Plan Review		Appendix C
1.5	Increase of residential densities on Chapel Rd (adjacent to Kindlestown Castle)	Location of more residents close to schools & community facilities	WCC & GTC	2004+	IFP objective should inform Development Plan Review		Appendix C
1.6	Increase of residential densities - Kindlestown Upr	To support L.P.T. with high density residential.	WCC & GTC	2004+	IFP should inform Plan Review		Appendix C
1.7	Rezoning agricultural land & increase of residential densities at Blacklion	To support a new neighbourhood centre & L.P.T. with high density residential.	WCC & GTC	2006+	IFP should inform Plan Review		Appendix C
1.8	High density dependent on good urban/built form	Development proposals should provide for permeable and attractive pedestrian/cycle environments encourages walking and cycling.	WCC	2004	IFP should inform Plan Review	and Development Control guidance	3.10

N	TASK / SUBTASK	OBJECTIVE	REQUIRES COOPERATION OF:	TIMESCALE	BASIC CONDITIONS	ADDITIONAL CONDITIONS	IFP REFERENCE
2	Consolidation of Greystones Town Centre as a commercial centre	Reinforcement of existing commercial core to cater for increase population	WCC, GTC & Chamber of Commerce	2004+	Incorporation of County Wicklow Retail Strategy		Appendix C
2.1	Creation and consolidation of new & existing neighbourhood centres at Killincarraig, Delgany, North Charlesland & Balcklion	Reduction of travel distances to convenience stores. Reduction of congestion in Greystones town centre.	WCC, GTC & Chamber of Commerce	2004+	Incorporation of Retail Strategy		Appendix C 3.10.9
2.2	Enhance Greystones town centre facilities services & functions	Reduce the need for journeys to larger neighbouring towns and the metropolitan area	WCC, GTC & Chamber of Commerce	2004+	Incorporation of Retail Strategy		Appendix C
3	Promotion of Greystones and environs as a leisure destination	Take advantage of Greystones's location between the Wicklow mountains, the sea and the metropolitan area to encourage it as a leisure and tourist destination	Bord Fáilte, WCC, GTC & County Development Board	2004+	Incorporation into a countywide tourism strategy		4.4.88, Appendix C
4.	Improvement of Rail Services	To encourage the use of public transport for essential journeys between Greystones and the Metropolitan area	DTO & IR	2004			4.5.2
4.1	Increased number of DART services	To fill in existing gaps between existing services	DTO & IR	2004			4.5.2
4.2	Provision of a morning peak service from Dublin to Greystones	To create public transport access to employment zoning	DTO & IR	2006	Before employment zone development		4.5.2
4.3	Provision of an hourly off-peak Arrow service from Wicklow Town to Dublin	To improve connections between Greystones, Dublin and Wicklow Town	DTO & IR	2004	Condition of Wicklow Town & Environs IFP		4.5.2
4.4	Construction of dual track to Bray or passing loop at Greystones North, and passing loop at Newcastle	To facilitate passing and crossing alongside the single track zone	DTO & IR	2005+	Condition of Wicklow Town & Environs IFP		4.5.2

N	TASK / SUBTASK	OBJECTIVE	REQUIRES COOPERATION OF:	TIMESCALE	BASIC CONDITIONS	ADDITIONAL CONDITIONS	IFP REFERENCE
5.1	Provision of Local Public Transport Routes	Reduction of private car dependency and increased accessibility for all trip makers	DTO, WCC, GTC and P.T. Operator	2005+			1.4.12, 4.6, 8
5.2	Creation of Bus Only link in Rathdown Park	To increase L.P.T. catchment	DTO, WCC & GTC	200+			1.4.12, 4.6, 8
5.3	Associated bus priority measures	To increase speed and reliability of L.P.T.	DTO, WCC & GTC	200+			1.4.12, 4.6, 8
5.4	Provision of bus stops	As part of L.P.T. infrastructure	DTO, WCC & GTC	2005+	Should be a bus flag, shelter and information post		1.4.12, 4.6, 8
5.5	Improvement of accessibility to bus stops to / from surrounding areas	Increase the catchment of L.P.T. and increase accessibility.	DTO, WCC & GTC	2005+			1.4.12, 4.6, 8
5.6	Marketing and Promotion	Increase the awareness of the L.P.T.	DTO, WCC and P.T. Operator	2004			1.4.12, 4.6, 8
N	TASK / SUBTASK	OBJECTIVE	REQUIRES COOPERATION OF:	TIMESCALE	BASIC CONDITIONS	ADDITIONAL CONDITIONS	IFP REFERENCE
6.	Examine feasibility of linking Bus Eireann Route 2 & 33 to Greystones (Charlesland)	Interconnection of L.P.T. with regional bus services	DTO & BE	2004			4.5.11
6.1	Bring services into Greystones	To make regional bus services accessible to Greystones residents	DTO, GTC, WCC & BE	2005			4.5.11
7.	Improvement of Dublin Bus Services 84, 84X & 184	To improve and widen Local and semi local services	DTO & DB	2006	To coordinate with LPT development		4.5.19
7.1	Restructuring of services to compliment L.P.T.	To provide better connectivity to Bray and South Dublin	DTO, P.T. Operator & DB	2006	Once L.P.T. is up and running		4.5.19
8	Provision of bus priority measures	To increase speed and reliability of L.P.T.	DTO, WCC & GTC	2004			4.5.19
8.1	Blacklion	To increase speed and reliability of L.P.T.	DTO, WCC & GTC	2004	Congestion “hotspots” as		4.5.19

8.2	Prettybush	To increase speed and reliability of L.P.T.	DTO, WCC & GTC	2004	identified in PARAMICS Congestion “hotspots” as identified in PARAMICS	4.5.19
10.	Traffic management measures		WCC & GTC	2004	CBP Traffic Studies and modelling exercises	Figure 2.4
10.1	Parking Strategy	To reinforce existing commercial core by increasing accessibility	WCC & GTC	2004		4.8
10.2	Traffic Calming	To reduce the impact of traffic on the town centre area and improve road safety	WCC & GTC	2004		4.8, Figure 2.4
10.3	Improved signage	To improve the certainty of vehicle manoeuvres at junctions and reduce delay	WCC & GTC	2004		Figure 2.4
10.4	Shared surface for pedestrians, cyclists and buses only	To reduce car usage and dominance	WCC & GTC	2004		4.8
10.5	Speed cameras	To enforce speed restrictions	Gardai	2004		Figure 2.4
11.	Provision of an interchange facility	To promote and improve inter-modality	DTO, BE, DB, P.T. Operator, WCC & GTC	2005		Figure 4.4.38, 4.7, 2.6.4
11.1	Creation of enlarged bus bays near to DART station	To promote and improve inter-modality	DTO, WCC, IR & GTC	2005		4.7, 2.6.4
11.2	Improved access to existing park and ride site	To promote and improve inter-modality and the existing under utilised facility	DTO, WCC, IR & GTC	2004	Urban design improvements	4.7.4
12.	Provision, preservation and enhancement of new and existing pedestrian and cycle routes	To promote walking as a primary transport mode	DTO, WCC & GTC	2004		Appendix F