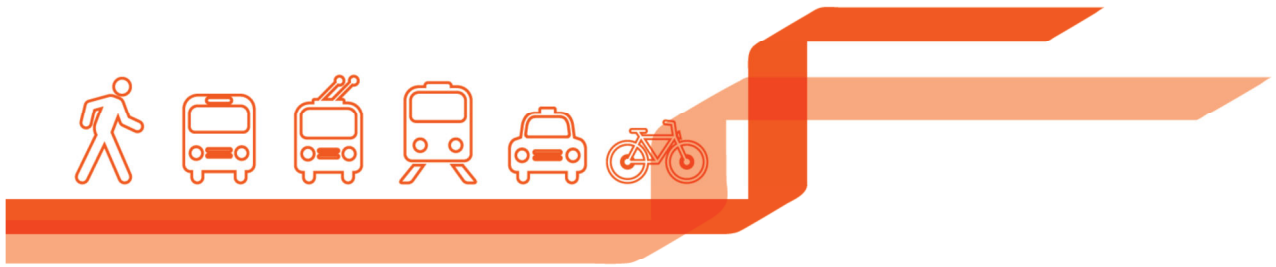


# **NTA Integrated Implementation Plan 2013-2018**



## **SEA Environmental Report Non-Technical Summary**

# 1. Introduction

It should be noted at the very outset that the bulk of the methodology and knowledge base for this SEA and Environmental Report was derived directly from the work undertaken for the SEA of the Draft Transport Strategy for the Greater Dublin Area, also prepared by the NTA, in 2011. The following elements are common to both plans, and therefore a similar SEA process was undertaken:

- The spatial scope relates to the Greater Dublin Area;
- The main thrust of the plan relates to investment in transport infrastructure;
- The plan will also contain a number of policy and integration measures; and
- The plan will impact on a similar set of plans and programmes of other agencies.

The SEA of the Draft Transport Strategy went through an extensive consultation process at a number of stages. It was also subject to a rigorous peer review as part of a wider review of SEA in Ireland. For these reasons, it was deemed appropriate and prudent that it should form the basis for the approach to this SEA.

## 2. The Integrated Implementation Plan

### 2.1 Overall Programme Approach

The Infrastructure Investment Programme forms an integral and central part of the plan and those elements of most concern to the SEA process. Over the six year period of the plan, close to €900 million will be invested in public transport infrastructure and related cycling/walking infrastructure. The overall Infrastructure Investment Programme is divided into four sub-programmes. These are:

1. Bus;
2. Light Rail;
3. Heavy Rail; and
4. Integration Measures and Sustainable Transport.

The table below indicates the total Infrastructure Investment Programme sub-divided into its constituent sub-programmes.

<b>Sub-Programme</b>	<b>2013 (€m)</b>	<b>2014 (€m)</b>	<b>2015 (€m)</b>	<b>2016 (€m)</b>	<b>2017 (€m)</b>	<b>2018 (€m)</b>
Bus	43.6	39.0	40.0	39.0	42.0	42.0
Light Rail	27.3	30.2	43.5	75.0	65.0	65.0
Heavy Rail	32.1	41.7	26.0	10.5	15.0	15.0
Integration Measures & Sustainable Transport	37.6	38.3	35.5	25.5	28.0	28.0
<b>Yearly Totals</b>	<b>140.6</b>	<b>149.2</b>	<b>145</b>	<b>150</b>	<b>150</b>	<b>150</b>

Each of these sub-programmes is addressed in turn in the following sections, with details provided on the projects intended for delivery under that sub-programme.

## 2.2 Main Components of the Plan

### 2.2.1 Bus

The proposals in relation to Bus investment are encompassed in four investment areas:

- Bus Fleet Investment;
- Bus Stop and Shelter Provision;
- General Bus Network Improvements; and
- Bus Rapid Transit Schemes.

It is proposed to progress the development of three BRT routes as part of this Plan. These are:

- Swords / Airport to City Centre;
- Blanchardstown to N11 (UCD); and
- Clongriffin to Tallaght.

### 2.2.2 Light Rail

The proposals in relation to light rail investment are encompassed in two investment areas:

- Luas Cross City; and
- Fleet and Network Enhancement.

### 2.2.3 Heavy Rail

The proposals in relation to heavy rail investment are encompassed in seven investment areas:

- City Centre Resignalling Project;
- Phoenix Park Tunnel Link;
- Level Crossing Programme;
- Ticketing / Revenue Systems;
- Central Traffic Control;
- Station Improvement / Other Enhancements Programme
- Network Development.

### 2.2.4 Integration and Sustainable Transport Investment

This investment sub-programme spans the provision of walking, bus and cycling infrastructure to safety improvements and sophisticated traffic control systems. It also includes supporting initiatives for public transport customers such as travel information provision. Through all its elements it supports the use of the overall public transport system and enhances the accessibility, convenience, and attractiveness of the public transport offering as well as directly providing for cycling and walking. The main objective is to encourage the continuation of modal shift to cycling, walking and public transport.

## 2.2.5 Integration of Land Use and Transport

As part of this plan, the Authority promotes and seeks to implement a number of transport and land-use planning principles including:

- High volume, trip intensive developments, such as offices and retail, should primarily be focussed into Dublin City Centre and the larger Regional Planning Guidelines higher order centres within the GDA;
- The role and function of district centres and neighbourhood centres should be supported and promoted in order to exploit the levels of accessibility offered by public transport, walking and cycling at these locations. This relates to providing for an appropriate scale of development in these centres which would not undermine development potential in Dublin City Centre or the larger Regional Planning Guidelines higher order centres;
- All non-residential development proposals in the GDA should be subject to maximum parking standards. These should be set by the local authorities in the GDA in consultation with the Authority and should vary spatially on the basis of centrality and the level of public transport provision;
- Residential development located proximate to high capacity public transport should be prioritised over development in less accessible locations in the GDA;
- To the extent practicable, residential development should be carried out sequentially, whereby lands which are, or will be, most accessible by walking, cycling and public transport – including infill and brownfield sites – are prioritised; and
- Planning at the local level should promote walking, cycling and public transport by maximising the number of people living within walking and cycling distance of their neighbourhood or district centres and public transport services;

## 3. Integrated Implementation Plan SEA: Process Overview and Progress to Date

### 3.1.1 SEA Screening

The Screening exercise concluded that the view of the NTA is that the Implementation Plan is likely to set a framework for the development consent of projects of a significant scale and is therefore likely to have significant environmental effects within the Plan area. The NTA, therefore, made a determination that a full SEA of the proposed Plan is required in keeping with a purposive interpretation of Directive 2001/42/2004.

### 3.1.2 SEA Scoping

To ensure that the SEA of the Plan was adequately scoped, a Scoping Notification was circulated to the relevant designated environmental authorities. In this case, the authorities comprised the Environmental Protection Agency (EPA), Department of the Environment, Community and Local Government (DECLG), Department of Arts, Heritage and the Gaeltacht (DAHG), Department of Agriculture, Forestry and the Marine (DAFM), and Department of Communications, Energy and Natural Resources (DCENR) so that they could make submissions on the scope of the SEA. A comprehensive submission was received 8 October 2012 from the EPA.

### **3.1.3 Environmental Assessment and Environmental Report**

A two-part assessment was undertaken by the NTA as follows:

1. Alternatives Assessment; and
2. Draft Integrated Implementation Plan.

#### **Alternatives Assessment**

Alternatives were derived on the basis of how different approaches could be taken to achieve the objectives of the Plan. The overarching consideration was that they must be reasonable, particularly in terms of finance. These alternatives were subject to environmental assessment and the results of this can be found in section 8. These results led to the development of the draft Integrated Implementation Plan.

#### **Draft Integrated Implementation Plan Assessment**

This stage involves the environmental assessment of Draft Integrated Implementation Plan. The results of this assessment can be found in section 9.

### **3.1.4 Habitats Directive Assessment (HDA)**

There is a requirement to undertake an assessment under the Habitats Directive (92/42/EEC) as the Plan may have the potential to significantly impact on the integrity of a SAC or SPA within the GDA.

### **3.1.5 Consultation**

Consultation on the draft Plan and the Environmental Report with the relevant designated environmental authorities and the public is required before the Plan can be approved by the Minister for Transport, Tourism and Sport. Both the draft plan and the Environmental Report must be publicly available for comment.

### **3.1.6 Consideration of Submissions**

It is a formal requirement of the SEA Directive that all consultation submissions received must be considered and the Plan amended, if deemed necessary. Any amendments to the Plan may warrant the identification of additional significant environmental effects. If such additional significant effects do arise, then there is likely to be a need to develop additional mitigation measures. Following consideration of the consultation submissions received and associated amendments to the Plan, the NTA may begin the formal plan adoption procedures.

### **3.1.10 Preparation of the SEA Statement**

Following the formal adoption of the plan by the Minister for Transport, Tourism and Sport, the next stage in the SEA process is the preparation of the SEA Statement, which is a document summarising how environment considerations have been integrated into the adoption of the plan. It also summarises how the consultation submissions were considered and if these resulted in the draft plan being amended.

### 3.1.11 Monitoring

Monitoring of the implementation of the plan will be undertaken up until its review. The overall objective of this stage is to monitor the significant environmental effects of the implementation of the plan so as “to identify at an early stage unforeseen adverse effects and to be able to undertake appropriate remedial action” (Article 10/1; SEA Directive 2001/42/EC). The monitoring programme for the Plan can be found in Chapter 11 of the main report.

## 4. Scope of the Integrated Implementation Plan SEA

### 4.1 Overview of the Scoping Process for SEA

The second stage in the SEA process is the determination of the key issues, which are to be addressed in the Environmental Report. Scoping ensures that the SEA is focused on the relevant environmental issues and examines issues at the appropriate level of detail. To ensure that the SEA of the plan was adequately scoped, a Scoping Report was circulated to the relevant designated environmental authorities:

- Environmental Protection Agency (EPA)
- Department of the Environment, Community and Local Government (DECLG)
- Department of Arts, Heritage and the Gaeltacht (DAHG),
- Department of Agriculture, Food and Marine (DAFM),
- Department of Communications, Energy and Natural Resources (DCENR)

This enabled the authorities to make submissions on the scope of the SEA. A comprehensive submission was received on 8th October 2012 from the EPA.

The spatial scope of the plan corresponds to the jurisdictions of the 7 Local Authorities of the Greater Dublin Area – Dublin City, South Dublin, Dún Laoghaire-Rathdown, Fingal, Meath, Kildare and Wicklow.

The temporal scope will be from 2013-2018.

In relation to the technical issues that will be considered by the SEA and included in the environmental report, the range of environmental headings considered was based on the list of environmental topics as specified in S.I. 435 of 2004. These are as follows:

- Biodiversity, flora & fauna;
- Landscape;
- Population;
- Human health;
- Water;
- Air quality;
- Climatic factors & climate change;
- Soil & geology;
- Material assets;
- Cultural heritage (incl. architectural and archaeological heritage), and
- The inter-relationships between the above.

The table below provides a list of environmental issues relevant to the short term transport plan. It is these types of potential environmental issues that will require consideration in undertaking the SEA of the Integrated Implementation Plan. This helps to set a context for the identification of baseline environmental issues, the consideration of the interactions with other plans and programmes and the formulation of SEA Objectives.

**Table 4.1 Potential issues to be considered in the Integrated Implementation Plan SEA**

<b>Environmental topic</b>	<b>Potential effects</b>
Biodiversity, flora & fauna	<p>Potential adverse effects on the integrity of designated sites and on flora &amp; fauna due to land take for new or improved transport infrastructure.</p> <p>Potential effects on sensitive habitats from transport emissions.</p> <p>Potential beneficial effects through ecological enhancement interventions along new and existing transport corridors.</p> <p>Potential risk of disturbance to sensitive species due to noise and lighting along transport corridors.</p>
Landscape	<p>Potential adverse effects on the integrity of designated sites and landscape character due to land take for new or improved transport infrastructure.</p> <p>Potential beneficial effects on landscape and amenity arising from reductions in the presence of heavy traffic flows.</p> <p>Potential adverse effects arising from increases in traffic flows.</p> <p>Potential beneficial effects on townscape and amenity arising from reductions in traffic flows</p> <p>Potential beneficial effects through landscape enhancement interventions along new and existing transport corridors (these measures can be combined with ecological enhancement measures).</p> <p>Potential positive and negative effects on landscape due to changes in land use policy</p>
Population	<p>Potential effects on the access to employment/economic, social and educational opportunities from transport projects and policy recommendations.</p> <p>Potential effects on people with physical mobility limitations from transport projects and policy recommendations.</p> <p>Potential community severance.</p>
Human health	<p>Effects arising from changes in physical fitness and the extent to which people are encouraged to walk and cycle on a regular basis.</p> <p>Effects arising from changes in transport-related accidents.</p> <p>Effects arising from changes in accessibility to employment/economic, social and educational opportunities which are key determinants of health.</p> <p>Potential effects on the quality of life arising from the Integrated Implementation Plan.</p>

<b>Environmental topic</b>	<b>Potential effects</b>
Water	<p>Effects on surface water, groundwater, coastal and transitional systems from transport interventions.</p> <p>Potential compatibilities and conflicts with the policies and programmes in relevant River Basin Management Plans (RBMPs) under the Water Framework Directive (WFD) from transport projects and policy recommendations.</p> <p>Changes in the risk of flooding</p>
Air quality	<p>Potential beneficial effects on air quality arising from reductions in traffic flows.</p> <p>Potential adverse effects may arise in areas where there are any traffic flows increases.</p> <p>Potential effects on vegetation from transport emissions arising from increases and reductions in traffic flows.</p> <p>Potential benefits from the promotion of renewable fuel sources.</p>
Climatic factors & climate change	<p>Potential reductions in CO<sub>2</sub> from reductions in traffic flows</p> <p>Potential adverse effects may arise in areas where there are any traffic increases.</p>
Soil & geology	<p>Potential negative effects due to developments on important and vulnerable soil resources</p> <p>Potential adverse effects on the integrity of designated geological and geomorphological sites due to land take for new or improved transport infrastructure.</p> <p>Potential for increases in coastal erosion due to measures in the Integrated Implementation Plan.</p> <p>Potential positive impact on coastal protection.</p>
Material assets	<p>Potential positive and negative effects on public assets</p> <p>Potential positive effects regarding greater reuse of brownfield sites for development</p> <p>Potential reductions in fuel consumption from reductions in traffic flows contributing to an improved fuel security position.</p>
Cultural heritage (incl. architectural and archaeological heritage)	<p>Potential adverse effects on designated and important sites from land take for new or improved transport infrastructure.</p> <p>Potential beneficial effects on setting of cultural heritage features (townscapes, Conservation Areas, heritage buildings etc.) arising from reductions in the presence of heavy traffic flows. Potential adverse effects may arise should traffic flows increase.</p>

It can be seen from the table that there is potential for likely significant effects in relation to all of the environmental topics in the SEA Directive when developing the NTA Integrated Implementation Plan. On this basis, it is not intended to scope out any environmental topics at this early stage of the SEA.

## 4.2 Habitats Directive Assessment

A Habitats Directive Assessment of the Plan has been undertaken. This considered if potential significant effects on Natura 2000 sites in the GDA are likely. The assessment process included consultation with



National Parks and Wildlife Service (NPWS) and the results have been made available to the public in the accompanying Natura Impact Statement.

### 4.3 SEA Objectives

The SEA of the Plan is primarily an objectives-led exercise. The SEA Objectives are used in the initial environmental assessment of the proposed Measures contained in the Plan. The final SEA Objectives are presented in Table 4.2 below.

Information on the environmental assessment methodology and the actual use of the SEA Objectives is provided in section 5.

**Table 4.2 Final SEA Objectives**

<b>SEA Topic</b>	<b>Proposed SEA Objective</b>
Biodiversity, flora & fauna	<ol style="list-style-type: none"> <li>1. To avoid impacts on the integrity of European Conservation Sites (SACs and SPAs) and nationally designated sites (NHAs).</li> <li>2. To support the strategic objectives of the National Biodiversity Plan.</li> <li>3. To minimise impacts on locally-important biodiversity in the Greater Dublin Area.</li> </ol>
Landscape	<ol style="list-style-type: none"> <li>4. To avoid or, where infeasible, minimise impacts on designated and protected landscapes and conservation areas.</li> <li>5. To minimise impacts on undesignated landscape resources (townscapes, seascapes, riverscapes, general landscapes).</li> </ol>
Population	<ol style="list-style-type: none"> <li>6. To increase accessibility to economic and employment opportunities, in particular for those who are physically, economically or socially disadvantaged within the GDA.</li> <li>7. To increase accessibility to public, cultural and community services, in particular, for those who are physically, economically or socially disadvantaged within the GDA.</li> </ol>
Human health	<ol style="list-style-type: none"> <li>8. To contribute to improvements to transport-related aspects of quality of life for residents, workers and visitors to the GDA.</li> <li>9. To support the objectives of the Environmental Noise Directive in relation to transport-related noise.</li> <li>10. To minimise safety risks to human health arising from transport related activity.</li> <li>11. To support health improvements and benefits from transport-related activities.</li> </ol>
Water	<ol style="list-style-type: none"> <li>12. To support the forthcoming River Basin Management Plans (RBMP) and Programme of Measures (POM). Where these are not available, the objective is to support the aims and objectives of the Water Framework Directive (WFD).</li> <li>13. To minimise impacts to surfacewater systems and resources.</li> <li>14. To minimise impacts to groundwater systems and resources.</li> <li>15. To minimise impacts to coastal systems and resources.</li> <li>16. To minimise impacts to transitional systems and resources.</li> <li>17. To minimise the risk of flooding.</li> </ol>
Air	<ol style="list-style-type: none"> <li>18. To reduce negative air quality impacts arising from transport-related emissions.</li> <li>19. To ensure compliance with the Air Framework Directive and associated daughter Directives (and the transposing Regulations in Ireland).</li> </ol>
Climatic factors & climate change	<ol style="list-style-type: none"> <li>20. To contribute to the reduction of greenhouse gas emissions arising from transport-related activities.</li> </ol>

<b>SEA Topic</b>	<b>Proposed SEA Objective</b>
Soil & geology	21. To minimise negative impacts on important and vulnerable soils resources used for agricultural purposes. 22. To reduce consumption of construction material and generation of construction waste as part of transport infrastructure projects. 23. To avoid or, where infeasible, minimise impacts to protected and designated geological and geomorphological sites.
Material assets	24. To protect public assets and infrastructure. 25. To reduce the fossil fuel demand by the transport sector. 26. To assist with the reuse and regeneration of brownfield sites.
Cultural heritage (inc. architectural and archaeological heritage)	27. To avoid or, where infeasible, minimise impacts to designated cultural, architectural and archaeological resources.

## 5. SEA Methodology

### 5.1 Overall Approach and SEA Methodology

This SEA uses an ‘objectives-led’ approach. The three Alternatives were assessed using the SEA Objectives and the results are summarised in section 8. The environmental assessment of the Alternatives is focused on the performance differences between each of the options, so that the various advantages and disadvantages of each can be highlighted and then considered in the development of the draft Plan.

The SEA Objectives were also then used to assess the likely significant effects on the environment of the draft Plan. Following the identification and assessment of the likely significant effects on the environment (section 9), mitigation measures were developed and these are reported in section 10.

### 5.2 SEA Objectives

Section 4 reports on the scope of the SEA, including the 27 SEA Objectives. In order to undertake the assessment, some of these objectives will rely on qualitative assessment data, and some on GIS-based data. To assist with the clarity of reporting, a seven-point rating scale is used at all levels of the assessment:

- 3 Major negative effect (significant);
- 2 Moderate negative effect (significant);
- 1 Minor negative effect (not significant);
- Neutral;
- + 1 Minor positive effect (not significant);
- + 2 Moderate positive effect (significant); and
- + 3 Major positive effect (significant).

In addition to the rating scale, commentary text will also be provided, highlighting the key conclusions to emerge from the application of the SEA Objectives. This commentary will also outline the full range of effects i.e. if they are short-term, long-term, cumulative or in-combination.

### 5.3 Assessment of Integrated Implementation Plan Alternatives

Each of the Plan Alternatives is assessed as a stand-alone set of proposals against the 27 individual SEA Objectives. The assessment provides an overall rating on the - 3 to + 3 scale as outlined in Section 5.3 above for each of the Alternatives under each of the SEA Objectives. This approach allows the key performance differences (positive and negative) between the 3 Alternatives to be highlighted.

## 5.4 Assessment of Draft Integrated Implementation Plan

The draft Plan is also assessed using the SEA Objectives. The focus of this stage of the environmental assessment is on the identification of likely significant effects on the environment of implementing the draft Plan against a Do-Minimum scenario.

The full range of likely significant effects on the environment of the draft Plan is identified. This is one of the key requirements of an Environmental Report. Mitigation measures are then developed to address the identified likely significant effects and these mitigation measures are integrated into the iterative process of plan refinement. The results of this stage of the assessment are presented in tabular format.

## 5.5 Consultation and Finalisation of the Plan

Following consultation with the public and statutory environmental authorities, all submissions received will be considered and the draft Plan and the draft Environmental Report revised, where necessary. The Final Integrated Implementation Plan will then be published and will be accompanied by a document which summarises the consultation process. It will then be presented to the Minister for Transport for formal approval after which the SEA Statement will be prepared. Monitoring of the environmental impacts of the Plan will be on-going.

# 6. Baseline

## 6.1 Biodiversity, Flora & Fauna

This section provides a description of the biodiversity and ecology present within the GDA and details of their spatial distribution.

The key biodiversity, flora and fauna resources in the GDA comprise the network of Natura 2000 sites consisting of Special Protection Areas (SPAs) and Special Area of Conservations (SACs). These are sites of international ecological importance protected by the European Union.

Below these European sites are nationally-protected sites, called Natural Heritage Areas. These can be divided into two main classifications: those that are fully designated (NHAs) and those that are awaiting formal and official designation (pNHAs).

There was a 20% increase in artificial land from 2000 – 2006 in the GDA due to urban development in previously greenfield areas. Since then there has been further significant growth, but in recent years the rate and extent of this growth has slowed. The general trend over the last 15 years has increased pressures on habitats and species throughout the region, resulting in habitat and biodiversity loss and damage.

There has been a significant impact on the vitality of habitats and species due to the considerable change in land use patterns in recent years. Due to changes in land cover, the amount of land within the GDA that is capable of supporting biodiversity has been reduced. This trend is driven by the large increase in residential and commercial development during the period.

## 6.2 Landscape

The landscape in the GDA is diverse and includes urban areas, rural areas, mountains and upland areas, plains, canals, valleys and coastal areas. Transport infrastructure (roads, rail-lines, etc.) has historically formed a key component and influence on the development and evolution of the landscape character of the GDA. Some key landscape features of the GDA include the Dublin/Wicklow Mountains and the coastline of the Irish Sea. The GDA also contains many urban areas which provide landscape features, particularly some of the historic centres and streets such as those in Georgian Dublin and the heritage towns of Kells, Trim and Dalkey.

Urban development patterns in the GDA in recent years have been notable for the spatial expansion of existing towns and villages into the surrounding countryside. Urban development has the potential to change all landscapes, both designated and undesignated. Unwelcome physical changes may result from new development occurring within such landscapes or from the increased recreational usage of landscapes as a result of increased urbanisation generally in the GDA.

## 6.3 Population

The population of Ireland was recorded as approximately 4.57 million at the last census in April 2011, up from 4.24 million in 2006. In 2011, the population of the GDA was 1,804,156, an increase of over 8% since 2006. All local authority areas within the GDA experienced population between 2006 and 2011..

The most significant population increases over the period 2006 to 2011 were in Fingal, Meath and Kildare. This population growth was accommodated, primarily, by the growth of towns and villages in these counties, from where commuters travel to work in Dublin City and suburban employment centres in areas along the M50 Corridor such as Sandyford and Park West.

There had been a consistent growth in employment in the period from 1996 to 2007. However, the recession has resulted in a decrease in overall employment and a corresponding increase in unemployment. According to the 2011 Census, there were c.750,000 persons at work living in the GDA, down from 800,240 in 2006. The Quarterly National Household Survey from Q3 2012 revealed an unemployment rate of 13.2% for the GDA.

Deprivation data shows that the most deprived areas in Dublin in 2011 were in Darndale, Coolock and Finglas. The most affluent areas were along the coast from Malahide to Dún Laoghaire and large parts of the southern suburbs.

With the large increase in overall population and employment from the late 1990's, and the pattern of urban development and expansion in the peripheral Local Authority areas, there has been an associated increase in travel demand in the GDA. The majority of this demand is being met by the private car as a mode of transport, accounting for just under 60% of work-related journeys in the GDA.

Walking and cycling are also significant modes of transport for those living within the city centre, as defined by the canals, where approximately 50% of residents walk or cycle to work. Likewise, public transport is also significant for transport for those living within Dublin city centre. Indeed, travel data from the NTA shows that car use declined in the period 1996 - 2006 with an increase in walking for this area. Since 2006 this trend has reversed, but rail and cycling have both increased.

## 6.4 Human Health

According to the Survey of Lifestyle, Attitudes and Nutrition (SLAN) in Ireland in 2007, self-rated health was recorded as 'excellent' or 'very good' by approximately 58% of respondents, with only 3% rating their health as 'poor', an increase in those rating as 'excellent' or 'very good' from 1998 (45%) and 2002 (50%). Approximately 11% of respondents reported a long-term illness, health problem or disability that limited their daily activity. Lower social class groups showed higher than average long-term illnesses. Overall, 12% of respondents indicated that they had recently suffered from ill-health and limitations because of mental or physical health in the previous 30 days.

In the same survey, relatively high levels of positive mental health were reported. Approximately 6% of respondents reported suffering from major depression, while 3% suffered from generalised anxiety disorder. In general, men, younger people, and those in higher social class groups reported lower levels of mental health problems.

Data from the Road Safety Authority website notes that the number of Irish road deaths was 186 in 2011, the lowest level on record. The 186 who died consisted of 47 pedestrians, 9 cyclists, 95 car users and 18 bikers. On the basis of road deaths per million population, in 2010, the latest year for which international comparative information is available, Ireland is ranked seventh out of the EU-27.

The region accounts for 35.2% of all accidents in Ireland and 36% of all registered vehicles. The four Dublin Local Authorities account for 24.5% of all reported collisions and 24.4% of registered vehicles in the State. In relation to road fatalities, the four Dublin Local Authorities have a combined total of 5.9%, with the GDA having 17.7% of all road fatalities in Ireland.

In relation to human health, obesity is a considerable health risk for both adults and children, with incident rates rising continuously. A lack of exercise and activity is a key factor behind this growing health problem.

## 6.5 Noise

The Dublin Noise Action Plan notes that road traffic is the main source of environmental noise in the four Local Authorities of County Dublin and that railway noise does not have a major impact on overall noise levels.

These results show that – broadly - the proportion of the population exposed to undesirable day time noise levels (>70dB) from traffic are relatively minor (3.7% in Dublin City Council to 9.5% in Dun Laoghaire-Rathdown County Council). However, the percentage of the population exposed to undesirable night time noise levels (>55dB) is considerably greater (58.5% in Dublin City Council to 21.6% in Fingal County Council).

Other results also reveal that the greatest source of road traffic noise exposure is not limited to 'Major roads' (defined as carrying more than 16,438 vehicles per 24 hours): these comprise 9.9% of the overall roads in the Dublin agglomeration), with all other roads being the greatest source of this exposure.

## 6.6 Water

The EPA's (2010) Water Quality in Ireland 2007 - 2009 report indicate that river water quality between 2007 to 2009 showed a small decline compared with the 2004 to 2006 period. It reports that throughout Ireland 68.9% of watercourses have been determined to be unpolluted, 20.7% slightly polluted, 10.0% moderately polluted and 0.5% seriously polluted. However, the Eastern River Basin District, which covers almost 75% of

the GDA, despite the steady reduction in seriously polluted channel length, had the lowest percentage of unpolluted channel length in the 2007-2009 survey period. The percentage of unpolluted channel length has decreased from 52% to 46% since the 2004-06 period.

Many of the rivers and surfacewater bodies of the GDA are under pressure and are at risk of not attaining the standards as required under the WFD. The key reason for this is that most of the surface water bodies in the GDA are at risk from point sources of pollution such as industrial and wastewater discharges and diffuse sources of pollution such as urban and agricultural runoff.

Groundwater sources, particularly public, group scheme and industrial supplies, are of critical importance in many regions. The objective of Groundwater Source Protection Zones is to provide protection by placing tighter controls on activities within all or part of the zone of contribution (ZOC) of the source.

Groundwater status in the ERBD has been found to be generally good with almost 91% of the groundwater area achieving good chemical status (chemical composition of groundwater) and 99% of the area achieving good quantitative status (groundwater flows).

Approximately 26% of the total drinking water supplied in Ireland is directly from groundwater supplies (EPA, 2008). Drinking water compliance is not a significant issue in the GDA.

The Tolka and the Dodder Rivers have been causes of historical flooding in parts of Dublin city. Coastal flooding has also occurred in the Docklands area of the city and other coastal areas. The Boyne River has also caused significant flooding within its catchment. Inadequately designed or sized drainage infrastructure is also responsible for more localised flooding-events – these situations arise where the infrastructure cannot drain land faster than water is collecting on the surface. Serious flooding caused by severe rainfall occurred in several locations in metropolitan Dublin, including the City Centre, in October 2011.

Poor siting of new developments on land prone to flooding has also resulted in an increase in the physical and financial damage to property and infrastructure from flooding.

Within the GDA, there has been a general problem of water pollution due to the inadequate treatment of effluents and spillages and leaks from sewerage networks. The issue of poor and inadequate treatment of wastewater is exacerbated by the large growth in the population and level of employment of the GDA up to 2008.

## 6.7 Air

In comparison with other European countries, Ireland's air quality is generally good. This can be attributed to Ireland's general lack of old and heavy industry and to the meteorological systems which influence Ireland providing very good air mixing and dispersion. However there were exceedances in Dublin city centre of EU ambient air quality limit values in 2009.

Road traffic is one of the main sources of air pollution in Ireland. Common road traffic pollutants are nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM), sulphur dioxide (SO<sub>2</sub>) and carbon monoxide (CO) causing harm to human health. These pollutants are taken as the key determinants of air quality in Ireland.

Generally, air quality in Ireland is good with pollutant levels below the EU limit values. However, the increase in traffic flows in Dublin city centre has resulted in the various air quality limit values almost being breached on a number of occasions. The pollutant of most concern in Ireland is PM<sub>10</sub>, daily mean levels of which are close to the EU limit value across the country. Levels of NO<sub>x</sub> in traffic-impacted city centre areas will also

continue to be a problem due to the difficulty in achieving large-scale reductions in road traffic numbers, according to the EPA's "Air Quality in Ireland, 2011" report.

## 6.8 Climatic Factors & Climate Change

The EPA noted that between 1990 and 2011, the transport sector showed the greatest overall increase at 121%. However, transport emissions have decreased for four consecutive years and are now 22.0% below peak levels in 2007. This is primarily due to the economic downturn. The increase up to 2007 can be attributed to general economic prosperity, increasing population with a high reliance on private car travel as well as rapidly increasing road freight transport.

Transport represented 19.7% of the total emissions. No data is available for the GDA, although as this region has the largest population and the greatest volume of vehicles and car use, it is expected that the GDA is one of the largest contributors to the national transport-based GHG emissions.

Ireland faces a major challenge in meeting the EU's proposed reduction targets in the long term. Ireland has one of the highest national proportions of agricultural emissions within the EU and until the recession, saw significant on-going growth in transport-related emissions. Addressing the issue of transport emissions is likely to be particularly problematic.

## 6.9 Soils & Geology

There are a variety of soil types to be found in the GDA, the most commonly found being Grey Brown Podzolics, Gleys, Acid Brown Earths and Brown Podzolics. Grey Brown Podzolics, Gleys and Acid Brown Earths which are found in the lowlands are naturally fertile and well suited for productive agriculture. There are also numerous areas in the GDA where Basin Peats are present and High Level Blanket Peats and Lithosols are found on the mountain ridges, with Brown Podzolics and Peaty Podzolics on the upper flanks.

The bedrock geology of the GDA is composed of igneous and sedimentary formations. Meath consists primarily of Dinantian Upper Impure Limestone and Dinantian Mixed Sandstone, Shale and Limestone. Dublin is comprised of mostly Dinantian Mixed Sandstone, Shale and Limestone. Kildare's bedrock consists of Dinantian Pure Bedded Limestone, Silurian Metasediments, Volcanics and Dinantian Early Sandstones, Shale and Limestone, whereas Wicklow's bedrock is primarily Granites and other igneous intrusive rocks, Ordovician Metasediments and Cambrian Metasediments.

## 6.10 Material Assets

Given that the GDA contains approximately 40% of Ireland's population, the region contains a high proportion of material assets relative to the other regions in Ireland. Dublin has more of Ireland's public transport network and is the hub of the national bus and rail networks. The M50 is the hub of Ireland's radial national road network and Dublin Port and Dublin Airport are the largest port and airport in Ireland, respectively. There is an extensive network of utilities (electricity, gas, telecommunications, water supply, wastewater network etc.) throughout the GDA, serving the various towns and urban areas.

Another key material asset class consists of the various public recreational amenities such as Phoenix Park, Wicklow National Park, Dublin Bay and Liffey Valley Park. There are also many town and village centres, providing a range of public and community facilities for their local, regional and national catchments. These range from the many small village and neighbourhood centres, to district centres, major town centres and to Dublin city centre which serves a national function.

The global focus on fossil fuel consumption and long-term reserves means that national fossil fuel supplies should be considered as a form of asset. The fact that the transport sector almost completely relies on fossil fuels further justifies this status.

The significant increase in the GDA's population during the period 2000 – 2006 resulted in considerable pressure on existing utility networks and also on existing infrastructure. However, the economic downturn has reduced this pressure.

Ireland's considerable reliance on fossil fuel imports is likely to remain for the foreseeable future, primarily driven by domestic energy, transport and agricultural demand. Notwithstanding the Government's aims to have renewable energy supplying 17% of Ireland's total energy supply by 2020, coal and gas will continue to fuel 72% of the total electricity demand by 2020, a significant amount of which will be imported.

## **6.11 Cultural Heritage (incl. Architectural Heritage & Archaeological Heritage)**

There are in excess of 10,000 National Monuments in the GDA. There are also a number of sites with international importance for heritage within the GDA area. Bull Island has been proposed as a UNESCO Biodiversity Site, and the Archaeological Ensemble of the Bend of the Boyne has been designated as a UNESCO world heritage site, and is Europe's largest and most important concentration of prehistoric megalithic art.

The growth and urban expansion of the GDA in the last 10 years has resulted in considerable pressure being placed on the status and condition of the GDA's cultural heritage resources. Although these resources are protected via legislation and also through the planning system, it is widely regarded that damage and deterioration has occurred.

## **6.12 Inter-Relationships and Interactions**

Considering inter-relationships within the environment is an important aspect of SEA – i.e. where one environmental topic can also have both a direct or indirect effect on another environmental topic. Interrelationships are common through the environment and this is not surprising, given the interconnected nature of ecosystems and environmental cycles.

# **7. Alternatives Assessment**

## **7.1 Do-Minimum**

The Do-Minimum contains the following infrastructural elements:

- Luas Cross City – a light rail line from St. Stephen's Green to Broadstone linking the Green Line to the Maynooth Commuter rail line via interchange with the Red Line at Abbey Street;
- The Sustainable Transport Measures Grants (STMG) Programme up to 2016 only;
- Completion of Phase 1 of City Centre Resignalling Programme; and
- Bus Stops Facilities Programme.



## 7.2 Prioritisation of Heavy Rail

The Heavy Rail Alternative prioritises the following infrastructural elements:

- Luas Cross City;
- The STMG Programme up to 2018;
- Bus Stops Facilities Programme;
- Opening of Heuston West, Kishoge and Pelletstown Stations;
- Completion of all phases of City Centre Resignalling Programme;
- Closure of all level crossings on the Maynooth Line;
- Electrification of the Northern and Maynooth Lines;
- Re-opening of the Phoenix Park Tunnel; and
- Station Upgrade and Improvement Programme.

## 7.3 Prioritisation of Bus Rapid Transit

The Bus Rapid Transit Alternative prioritises the following infrastructural elements:

- Luas Cross City;
- The STMG Programme up to 2018;
- Completion of Phase 1 of City Centre Resignalling Programme;
- Bus Stops Facilities Programme;
- BRT from Swords to the City Centre;
- BRT from Blanchardstown to UCD via City Centre; and
- BRT from Clongriffin to Tallaght via City Centre.

## 7.4 Alternatives Assessment Results

Table 8.1 below presents the results for the alternatives assessment. The following key applies to the rating in Table 8.1 below.

+ 3	Major positive impacts
+ 2	Moderate Positive impacts
+ 1	Minor positive impacts
0	Neutral
- 1	Minor negative impacts
- 2	Moderate negative impacts
- 3	Major negative impacts

Table 8.1 SEA results for Alternative Strategies

Assessment Against SEA Objectives and Assessment Scores			
SEA Objective	Do-Minimum	Heavy Rail	Bus Rapid Transit
<b>Biodiversity</b>			
1. To avoid impacts on the integrity of European Conservation Sites (SACs and SPAs).	0	0	0
2. To support the strategic objectives of the National Biodiversity Plan (NBP).	0	0	0
3. To minimise impacts on locally-important biodiversity in the Greater Dublin Area.	0	0	0

<b>Assessment Against SEA Objectives and Assessment Scores</b>			
<b>Landscape</b>			
4. To avoid or, where infeasible, minimise impacts on designated and protected landscapes and conservation areas.	+1	0	+1
5. To minimise impacts on undesignated landscape resources (townscapes, seascapes, riverscapes, general landscapes).	+1	+1	+2
<b>Population</b>			
6. To increase accessibility to economic and employment opportunities, in particular for those who are physically, economically or socially disadvantaged within the GDA.	+1	+2	+2
7. To increase accessibility to quality public, cultural and community services, in particular, for those who are physically, economically or socially disadvantaged within the GDA.	+1	+2	+2
<b>Human Health</b>			
8. To contribute to improvements to transport-related aspects of quality of life for residents, workers and visitors to the GDA.	+1	+2	+2
9. To support the objectives of the Environmental Noise Directive in relation to transport-related noise.	+1	+1	+1
10. To minimise safety risks to human health arising from transport related activity.	+1	+1	+1
11. To support health improvements and benefits from transport-related activities.	+1	+1	+1
<b>Water</b>			
12. To support the forthcoming River Basin Management Plans (RBMP) and Programme of Measures (POM). Where these are not available, the objective is to support the aims and objectives of the Water Framework Directive (WFD)	0	0	0
13. To minimise impacts to surfacewater systems and resources.	0	0	0
14. To minimise impacts to groundwater systems and resources.	0	0	0
15. To minimise impacts to coastal systems and resources.	0	0	0
16. To minimise impacts to transitional systems and resources.	0	0	0
17. To minimise the risk of flooding.	0	0	0
<b>Air</b>			
18. To reduce negative air quality impacts arising from transport-related emissions.	+1	+2	+2
19. To ensure compliance with the Air Framework Directive and associated daughter Directives (and the transposing Regulations in Ireland).	0	+1	0
<b>Climatic Factors</b>			
20. To contribute to the reduction of greenhouse gas emissions arising from transport-related activities.	+1	+2	+2
<b>Soils &amp; Geology</b>			
21. To minimise negative impacts on important and vulnerable soils resources used for agricultural purposes.	0	0	0
22. To reduce consumption of construction material and generation of construction waste as part of transport infrastructure projects.	0	-1	-1
23. To avoid or, where infeasible, minimise impacts to protected and designated geological and geomorphological sites.	0	0	0
<b>Material Assets</b>			
24. To protect public assets and infrastructure.	+1	+1	+1
25. To reduce the fossil fuel demand by the transport sector.	+1	+2	+2
26. To assist with the reuse and regeneration of brownfield sites.	+1	+2	+2
<b>Cultural Heritage</b>			
27. To avoid or, where infeasible, minimise impacts to designated cultural, architectural and archaeological resources.	0	0	0

## 7.5 Summary of Alternatives Results

In terms of the comparison of the three options, the do-minimum, while positive, does not emerge as a preferred approach as it has less positive impacts than the other two. The Heavy Rail and BRT alternatives both score very positively. There are two key SEA topics where the two alternatives differ – Air (19 and 20)

and Landscape (4 and 5), with Rail being more positive on the former and BRT on the latter. Due to the fact that BRT's weakness in terms of the Air Framework Directive is highly precautionary, the differences between the two alternatives in this regard are negligible. Similarly, the positive impact on undesignated landscapes arising from BRT is one which a Heavy Rail alternative simply cannot really achieve and the negative impact identified in Heavy Rail is precautionary. As such it would be unfair to differentiate between the two on this basis.

## **7.6 Development of Preferred Draft Integrated Implementation Plan**

As this assessment was concerned primarily with the prioritisation of certain elements of the plan in order to assess which projects and proposals should be implemented first, the Authority is satisfied that both Heavy Rail and Bus Rapid Transit alternatives should be implemented in tandem with each other and that the impetus of the plan can be based on both. As such, the SEA process in relation to the assessment of alternatives has not chosen one particular option and the decision related to which proposals to prioritise will not relate solely to environmental impacts.

The next section sets out, in greater detail, the environmental impacts of a combined Heavy Rail and Bus Rapid Transit plan – together with an assumed STMG programme, a set of principles for land use and a whole suite of public transport passenger improvements for travel in the Greater Dublin Area.

# **8. Environmental Assessment of Integrated Implementation Plan**

## **8.1 Introduction**

This section presents the results of the environmental assessment of the Integrated Implementation Plan. The results are presented in a tabular format (Table 9.1) with a - 3 to + 3 rating and associated text provided for each SEA Objective. Individual elements of the plan which warrant specific commentary and assessment, by virtue of their specific impacts within the plan's overall cumulative impact, are addressed in the main text commentary under each SEA Objective. It should be reiterated at this point that the assessment focusses on those aspects of the plan which are predicted to have the most significant environmental impact, i.e. proposed infrastructural measures and supporting land use principles.

## **8.2 Strategic Environmental Assessment Results**

The results of the SEA of the Integrated Implementation Plan are set out in Table 8.1 overleaf.

Table 8.1 SEA results for Integrated Implementation Plan

SEA Objective	Rating	Assessment
<b>Biodiversity</b>		
<p>1. To avoid impacts on the integrity of European Conservation Sites (SACs and SPAs).</p>	0	<p>The proposed electrification of the Northern Rail line, which involves the construction of overhead electric cables and supporting gantries across Swords/Broadmeadow and Rogerstown estuaries has been identified as having potentially significant direct impacts on the conservation objectives of these two Special Protection Areas in terms of the movement of birds. As such, a stage 2 Appropriate Assessment was carried out and mitigation measures have been proposed. Details of this are to be found in the accompanying Natura Impact Statement. This exercise concluded that the Northern railway line should be included within the plan as, with the application of mitigation, it is reasonable to assume significant adverse effects on site integrity can be avoided. The final plan will incorporate a clear commitment in this regard and the precise details of the design of the electrification project and accompanying mitigation measures will be determined at the project-level Appropriate Assessment.</p> <p>The Authority does not foresee any indirect impacts arising out of the Integrated Implementation Plan which are of significance. In some areas, such as Swords/Broadmeadow and Rogerstown Estuaries, Rye Water Valley/Carton and South Dublin Bay, increased numbers of train services may lead to more trains passing through some Natura 2000 sites on existing rail lines. This would comprise the increased use of existing built infrastructure and may have an impact on the conservation objectives of those sites due to very minor increases in disturbance and some increased pollution from the passing of additional Diesel Multiple Units (DMUs). The Authority regards such impacts as insignificant and is therefore satisfied that the Integrated Implementation Plan will have no significant indirect impacts on the Natura 2000 network.</p> <p>One location emerges where possible In-Combination impacts may arise as a result of the plan, namely at Baldoyle Bay SAC and SPA. This impact could potentially arise as a result of the construction of a Bus Rapid Transit to the new development area around Clongriffin and the associated development of this suburb. The protection of these two designated sites is a matter for the local authority and the Draft Local Area Plan for this area contains a number of objectives which clearly set out policy in this regard. The Authority is therefore satisfied that no significant In-Combination effects will arise as a result of the Implementation Plan.</p> <p>A preliminary 0 score is therefore given, but it must be borne in mind that the level of detail which is available at present is not sufficient to make a definitive determination across all elements of the plan. The Authority, in conjunction with other agencies and the local authorities, will not pursue any schemes arising out of this plan, or in-combination with other plans, which will adversely affect the integrity of a Natura 2000 site, unless there are no alternative solutions and that it has been demonstrated that the project is of overriding public interest. Further information is contained in the accompanying Appropriate Assessment Screening Report and Natura Impact Statement.</p>
<p>2. To support the strategic objectives of the National Biodiversity Plan (NBP).</p>	0	<p>The plan will have a neutral impact on biodiversity in the Greater Dublin Area. There is minimal land-take involved and where any is required, it will be undertaken in a manner which is consistent with the principles of proper planning and sustainable development. In line with the objectives of the NBP, this plan has taken full account of biodiversity in its development; it fully sets out the elements of the GDA ecosystem which needs to be considered – not only in this plan but in subsequent infrastructural proposals; and will help conserve and restore biodiversity in the GDA by promoting a mode shift away from the private car to public transport, walking and cycling, thereby reducing greenhouse gas emissions and improving air quality. Applying the precautionary principle, however, the SEA gives a rating of 0 as it cannot be definitively determined that a positive impact will accrue.</p>

3. To minimise impacts on locally-important biodiversity in the Greater Dublin Area.	0	The reasoning and rationale for the 0 score for this SEA objective are identical to that set out for Objective no. 2.
Landscape		
4. To avoid or, where infeasible, minimise impacts on designated and protected landscapes and conservation areas.	+1	<p>Due to the low level of intervention in the natural environment proposed by this plan, the main focus in terms of landscape was the city centre and urban conservation areas where the bulk of the plan's transport proposals will be developed. In relation to Cross City Luas, the EIS concluded that there will be a permanent positive architectural heritage impact that will enhance the amenity value and future viability of the city. This relates primarily to the Architectural Conservation Areas (ACAs) at O'Connell Street, College Green and the south city retail core, including permanent positive public realm improvements at St. Stephen's Green between Grafton Street and Dawson Street.</p> <p>Cross City Luas will also traverse the Royal Canal pNHA for a very short distance, close to its terminus at Broombridge. This will lead to a permanent loss of a small area of dry meadow and grassy verge/scrub habitat. The EIS concluded that, as this habitat is of moderate ecological value and as its loss does not affect the conservation status of the designated area or the integrity of the site, it should not be considered as a significant adverse impact.</p> <p>While this plan does not set down specific alignments for a BRT network, potential permanent adverse impacts have been identified along the Swords BRT at the Santry Demesne Proposed Natural Heritage Area, if this alignment is chosen. At this stage it cannot be definitively concluded that such impacts will in fact arise. Where BRT runs through the city centre, it is predicted to have similar effects to Cross City Luas but this will depend on the precise nature of the infrastructure. If BRT involves the complete removal of general traffic lanes and conventional buses from streets through conservation areas such as the south Georgian core, it will result in a more positive permanent impact than if traffic remained.</p> <p>In other locations potentially served by BRT such as Tallaght village and Rathfarnham – both ACAs – the same general permanent positive impacts may potentially arise, with benefits accruing from the removal of general traffic at these sensitive locations.</p> <p>Where new infrastructure is proposed and construction is required – even within the curtilage of the existing carriageway – it is assumed for the purposes of this SEA that best practice methods will ensure that no permanent adverse impacts on conservation areas related to the rivers and canals in the GDA will arise. This relates mainly to any works to the carriageways at river and canal bridges.</p>

<p>(Continued)</p> <p>4. To avoid or, where infeasible, minimise impacts on designated and protected landscapes and conservation areas.</p>	+1	<p>While there is no detail in the plan related to the Cycling and Walking programme (as part of STMG), it is assumed that this programme will be undertaken in accordance with the all relevant environmental directives, and planning legislation and guidance, and that no significant impacts will accrue as a result of their implementation.</p> <p>As part of the Implementation Plan, a 2<sup>nd</sup> train station is to be built at Pelletstown. This is located at the Royal Canal pNHA and will involve a degree of land take from this designated site. The project is the subject of a current planning application and the Environmental Report states that following implementation of a suite of mitigation measures, there will be minor residual impacts at a local level to Treeline and Woodland habitats, and fauna including nesting birds, Pygmy shrew, Hedgehog, and foraging bats (short-term). This localised minor impact is not deemed significant on a regional scale.</p> <p>Overall, due to the minimal extent of intervention required in the natural and built environment as a result of this plan, i.e. minimal land-take, demolition etc. – and when viewed in the context of the anticipated direct removal of general traffic within a number of conservation areas, a general decrease arising from an anticipated mode shift away from the private car on a regional basis, and the policies of existing Development Plans and Local Area plans in this regard, a minor positive score has been given for the plan against this SEA objective.</p>
<p>5. To minimise impacts on undesignated landscape resources (townscapes, seascapes, riverscapes, general landscapes).</p>	+1	<p>In a similar manner to Objective #4, in combination with the plans of the relevant local authorities, the impacts on undesignated landscapes can be deemed to be minor positive due to the direct impacts in terms of traffic removal at urban locations and the overall reduction in traffic regionally brought about by the anticipated mode shift away from the private car.</p>
<b>Population</b>		
<p>6. To increase accessibility to economic and employment opportunities, in particular for those who are physically, economically or socially disadvantaged within the GDA.</p>	+2	<p>The plan is predicted to contribute positively to accessibility to employment for those who are economically and socially disadvantaged on a permanent basis across the entire Greater Dublin Area. In particular the reuse of the Phoenix Park Tunnel for passenger services will permanently enhance accessibility to the city centre employment areas for many people in areas such as Ballyfermot, Cherry Orchard and Clondalkin, while BRT will serve Darndale, Coolock and parts of Tallaght not previously served by high-quality public transport, linking them to the city centre. Luas Cross-City will serve parts of Cabra and link this area directly to the city centre. All of these areas are characterised by a certain level of disadvantage in some locations. Improved interchange and the development of a more closely linked transport network will enhance accessibility to other employment areas such as Sandyford, Park West etc.</p> <p>The development of a regional cycling network is intended to facilitate safe and convenient access by bicycle from people's places of residence to potential places of work and other social services. As cycling is a highly efficient mode in terms of costs, speed and reliability, the promotion of it as a means of travel should have major benefits in terms of accessibility for those who are economically and socially disadvantaged. This is of particular relevance for trips up to 10km in length.</p> <p>In terms of those who are physically disadvantaged, the better spread of services proposed by the creation of a high quality public transport network is a positive development. The Implementation plan includes proposals for accessibility for all persons with reduced mobility incorporating the design of vehicles, stations and platforms.</p> <p>It is reasonable therefore, particularly when the above impacts are viewed in combination with those arising from the National Action Plan for Social Inclusion, to give a moderate positive score of +2 for this objective.</p>

7. To increase accessibility to quality public, cultural and community services, in particular, for those who are physically, economically or socially disadvantaged within the GDA.	+2	The outcome of the assessment here is similar to that for Objective #6. Many cultural and community outlets are located in the same areas as employment, e.g., major town centres such as Blanchardstown or Tallaght as well as Dublin City Centre. As such a permanent positive impact score on this objective is given.
<b>Human Health</b>		
8. To contribute to improvements to transport-related aspects of quality of life for residents, workers and visitors to the GDA.	+2	<p>The plan is predicted to have significant positive impacts on the coverage of the GDA in terms of public transport infrastructure and services. This will result in enhanced reliability and frequency of public transport leading to less transport associated stress for residents, workers and visitors. The plan also includes improvements to travel information, which is a key factor in terms of this objective.</p> <p>The implementation of the walking and cycling programmes will also contribute positively to this objective in terms of costs and the reliability of these modes. Overall, a permanent, region-wide moderate positive impact can be predicted and a +2 score was deemed appropriate.</p>
9. To support the objectives of the Environmental Noise Directive in relation to transport-related noise.	+1	The plan will lead to a higher proportion of trips being undertaken by public transport than by private car, which will permanently lead to lower traffic noise levels, particularly in key central locations. There is potential, however, for increased levels of car traffic in some locations where traffic has been diverted as a result of the implementation of BRT and Luas Cross City. Due to the possibility of these localised adverse impacts, and when balanced with an overall mode shift to non-car modes on a regional basis, a minor positive score of +1 was deemed to be reasonable against this objective.
10. To minimise safety risks to human health arising from transport related activity.	+1	It can be predicted that the further development of an integrated public transport network and a high quality and safe walking and cycling network will make the transport environment in the GDA safer, particularly in combination with on-going road safety programmes and measures emerging from the Road Safety Strategy. The plan is also anticipated to engender a shift towards these modes and will remove some potential for accidents by reducing the numbers of cars on the road network. A minor positive assessment has been given for this objective.
11. To support health improvements and benefits from transport-related activities.	+1	The plan facilitates the development of a regional walking and cycling network, together with a suite of policy measures which are intended to deliver a mode shift towards these active modes of travel for all trip purposes. As the extent of this shift is not fully evident at this point, a precautionary +1 has been given. This positive impact will be permanent and should accrue across the Greater Dublin Area.
<b>Water</b>		
12. To support the forthcoming River Basin Management Plans (RBMP) and Programme of Measures (POM). Where these are not available, the objective is to support the aims and objectives of the Water Framework Directive (WFD)	0	The plan is rated as having a neutral effect on the relevant RBMPs and the overall objectives of the WFD, the primary focus of which is to achieve 'good' ecological status for all waters by 2015. The plan does have the potential to directly impact on water resources in the GDA, but these are actually relatively limited in their occurrence (and discussed in SEA Objectives #13 to #17).
13. To minimise impacts to surfacewater systems and resources.	0	GIS analysis shows BRT lines crossing a number of rivers – Tolka, Dodder, Liffey, and Santry. It is anticipated that these lines will be constructed primarily within the curtilage of the existing roadways and that relevant design standards, good construction practice and management will apply in the implementation of all infrastructural schemes. All of these schemes will also require development consent and in some cases, project-level EIA. These 'lower-tier' processes will also assist in reducing, managing and limiting negative impacts. As such, a neutral 0 score was considered appropriate.
14. To minimise impacts to groundwater systems and resources.	0	GIS analysis shows that no schemes proposed will have direct impacts on Groundwater Source Protection Areas. It is also assumed that transport schemes in the Strategy will comply with relevant design standards and good construction practice and management will apply in the implementation of all schemes. As such, a neutral score is given for this objective.

15. To minimise impacts to coastal systems and resources.	0	The only potential impacts identified related to coastal walking and cycling routes which may emerge as the regional networks are developed for these two modes. In line with the commentary on SEA Objective #1, it is assumed that as projects are developed via the Part VIII or EIS process, as appropriate, principles of proper planning and sustainable development will apply and impacts to coastal systems will be minimised. At the level of a regional plan assessment, a neutral impact and a score of 0 has therefore been given against this objective.
16. To minimise impacts to transitional systems and resources.	0	BRT routes are likely to cross the River Liffey Estuary in the city centre and one option may also cross the Tolka Estuary. Luas Cross City also crosses River Liffey Estuary in the city centre. The limited scale of the infrastructure proposed for the former means no impacts should accrue. In the case of the latter, residual impacts of low magnitude and slight significance were identified in the EIS. On a regional scale – the level at which this plan applies – it was deemed unreasonable to allow such a minor impact lead to a negative score. As such, and similar to the rest of the Water theme, a neutral rating has been deemed appropriate here.
17. To minimise the risk of flooding.	0	In assessing the potential for impacts in relation to this objective, it is taken to be the case that any schemes will not be allowed to proceed unless they meet design standards which avoid undue increases to the risk of flooding. On this basis, and taking into account the limited level of intervention in the environment proposed, it is considered unlikely that there would be significant impacts arising from flooding as a consequence of the plan.
<b>Air</b>		
18. To reduce negative air quality impacts arising from transport-related emissions.	+2	The anticipated mode shift from the private car to public transport, cycling and walking, as a result of this plan will lead to a reduction in transport-related emissions. Certain traffic management re-routings may increase the numbers of cars using certain links, but overall, at the regional scale, it is reasonable to conclude that the integration of the transport network to provide much greater choice in terms of linking origins to destinations, through the development of 5 BRT routes, Luas Cross City and the roll-out of a walking and cycling programme, will lead to a reduced number of cars on the road in the GDA leading to a significant permanent reduction in transport emissions overall at the regional level. A +2 is therefore regarded as appropriate.
19. To ensure compliance with the Air Framework Directive and associated daughter Directives (and the transposing Regulations in Ireland).	0	A highly precautionary approach has been taken in the assessment of the plan against this objective. This relates to the above point on the potential to increase traffic on certain routes, which, in exceptional circumstances, may lead to exceedances of the standards set out in the directive. As this is a localised impact, it must be balanced against the regional-level positive impacts that are anticipated to occur on a permanent basis. It was deemed prudent, however, to conclude a neutral impact rather than a positive one.
<b>Climatic Factors</b>		
20. To contribute to the reduction of greenhouse gas emissions arising from transport-related activities.	+2	A similar logic applies here as to Objective #18. Taking a regional-level view, the enhancements to the public transport network and the walking and cycling networks, by engendering a shift towards these modes away from the private car, will lead to a reduction in greenhouse gas emissions from transport. When viewed in combination with actions on renewable energy and fuel economy in Smarter Travel, a +2 score was deemed appropriate.
<b>Soils &amp; Geology</b>		
21. To minimise negative impacts on important and vulnerable soils resources used for agricultural purposes.	0	As the level of land-take proposed is minimal and confined to the urban area, no impact on soils is anticipated.
22. To reduce consumption of construction material and generation of construction waste as part of transport infrastructure projects.	-1	Taking a precautionary approach, a -1 score has been given here. There will be a degree of construction required as part of this plan but the potential for impacts will be reduced where the principles of sustainable development are applied to construction and procurement of materials, i.e. the re-use and recycling of materials.
23. To avoid or, where infeasible, minimise impacts to protected and designated geological and geomorphological sites.	0	The transport schemes included within the plan may have the potential to impact on geological and geomorphological sites. However, there is no national designation for such sites. Potential direct impacts are considered unlikely given the quantum of new infrastructure proposed and given that much of this is in urban areas which have already been developed. As such, a neutral rating is deemed reasonable for this SEA Objective.



Material Assets		
24. To protect public assets and infrastructure.	+1	<p>The plan scores positively against this objective as it increases regional accessibility to public assets and infrastructure. The construction of Luas Cross City, the BRT Network and a number of new rail stations will enable more people to access Dublin Airport, major open spaces and key urban centres more efficiently. Access to transport itself will also be enhanced by bringing high-quality public transport to a greater number of people across a wider geographical area.</p> <p>This benefits public assets and infrastructure as they require certain levels of usage and therefore good accessibility to make them more economically and socially viable and to encourage on-going investment. It is assumed that utilities such as telecommunications networks, electricity transmissions network, gas network etc. will not be negatively impacted by the plan and that temporary loss in service will be minimised during implementation of the plan. A minor positive score has been given on this basis.</p>
25. To reduce the fossil fuel demand by the transport sector.	+2	<p>By securing a mode shift away from the private car towards walking, cycling and public transport, and in combination with Smarter Travel, the plan's delivery should contribute to a reduction in fossil fuel demand on a permanent basis across the region. A moderate positive +2 was seen as appropriate here as it is anticipated that a significant number of car trips would transfer to BRT and rail due to the integration of the high quality public transport network in a manner that creates choice for many trips that heretofore did not exist. In terms of walking, and cycling in particular, the development of the networks should engender a shift towards these modes as well.</p> <p>In relation to those trips by car and goods vehicles that will still be undertaken with the plan in place, it is anticipated that the efficiency of these trips will be greatly enhanced as a result of the removal of unnecessary journeys from the network. This will have the effect of easing congestion and reducing the amount of fuel wasted in stationary traffic.</p>
26. To assist with the reuse and regeneration of brownfield sites.	+3	<p>The clear focus of this plan is on the existing urban areas of the GDA and, in particular, Dublin City Centre. All of the proposed BRT routes converge on the city centre, while the construction of Luas Cross City and the re-use of the Phoenix park Tunnel will greatly enhance access to the very centre of the city where potential to meet this objective is greatest. Examples of this include key sites on O'Connell Street, Grangegorman DIT Campus, Georges Quay, Dublin Docklands, and areas in the west of the city centre which are not served by high-quality public transport at present, where in combination with the Development Plans, Local Area Plans and Strategic Development Zone Planning Schemes of the local authorities, the reuse and regeneration of brownfield sites will be assisted and promoted as a central desired outcome of the plan. At many inner and outer suburban locations along the proposed network, there will also be one-off former employment, industrial or institutional sites, the potential for whose redevelopment may benefit from the arrival of new transport services.</p> <p>In addition, while this plan seeks to support and feed into land use decisions by local authorities rather than direct them, the planning principles contained within the plan, if implemented, will also contribute to meeting this SEA objective. Overall, it was deemed reasonable to give a +3 major positive score against this objective.</p>

Cultural Heritage		
<p>27. To avoid or, where infeasible, minimise impacts to designated cultural, architectural and archaeological resources.</p>	<p>0</p>	<p>The level of land-take required in this plan should ensure that there will be no significant impact on this SEA Objective, apart from that associated with Luas Cross City. The EIS for that particular project did outline a number of adverse impacts of varying significance on archaeology and cultural heritage, many of which were highly significant. Further mitigation and monitoring of these impacts will continue throughout the construction period. In terms of architecture, the Luas Cross City EIS concluded that there will be a permanent positive impact.</p> <p>It is assumed that all future transport projects will be constructed in accordance with the required design standards; in accordance with all required planning and environmental regulations and that standard mitigation measures are incorporated into the design and construction. Potential disturbance of archaeological resources during scheme development will generally be mitigated by preservation in-situ where possible and preservation by recording, similar to Luas Cross City. The various measures which will result in town and streetscape improvements can also be expected to potentially enhance the setting of the urban architectural and cultural heritage resources.</p> <p>Taking all of the above into account, the adverse impacts on archaeology, coupled with the potentially positive impacts on architecture mean a neutral score is reasonable for this objective.</p>
<p>Cumulative impacts and impact interactions</p>	<p>0</p>	<p>Section 7.13 presented a set of baseline impact interactions and interrelationships. These also apply to the environmental assessment results of the Integrated Implementation Plan. However, a consideration of these impacts is that they will not cumulatively interact with the various impacts identified above in this table. Additionally, the potential for cumulative impacts and impact interactions was also directly considered when undertaking the assessment against each of the 27 SEA Objectives and any areas where common impacts were identified were generally expressed in such a manner, e.g. Objectives 2 and 3. The methodology and information used to undertake the assessment also considered impact interactions (e.g. the reduction in traffic volume provided a cross-topic basis for air quality, noise, climate change and fossil fuel consumption and GIS information on the various schemes provided a basis for biodiversity, landscape, water and cultural heritage).</p> <p>As referred to under Objective #26, the Implementation plan will not directly determine land use in the GDA. It will, however, have a major bearing on such decisions and the Authority will seek to influence development in a manner which exploits investment in transport infrastructure and services to the maximum extent possible. As such, there is a potential cumulative impact in how the plan will work in-combination with the Regional Planning Guidelines for the Greater Dublin Area, the County and City Development Plans, Local Area Plans and Strategic Development Zone Planning Schemes across the region. It can be concluded, having reviewed these documents in the context of transport investment in the region, that a positive impact will accrue as a result of their cumulative effects. This relates to the consolidation of development into the existing urban area and a focussing of any greenfield development into locations along high quality public transport corridors.</p> <p>Overall, it is not expected that interactions/interrelations between environmental topics and subsequent cumulative effects will lead to significant impacts over and above those identified already with respect to the SEA objectives and a neutral score has been given.</p>

## 9. Mitigation Measures

As no significant adverse impacts have been identified through the SEA process, it was not necessary to derive a comprehensive set of mitigation measures for each piece of infrastructure proposed, for example. As a high-level regional plan with little land-take and other negative environmental impacts anticipated, it is the view of the Authority that a policy statement insert which covers all proposals will suffice.

The Authority is therefore satisfied that this SEA has highlighted any potential adverse impacts that may arise in the delivery of the Integrated Implementation Plan at the regional level, and that it is appropriate to mitigate in this manner. As such, the following policy statement has been inserted into the Integrated Implementation Plan as a means of ensuring that environmental impacts arising from the progress of the plan into the future are fully and comprehensively considered, minimised and mitigated to the greatest extent possible:

*“The development of the Implementation Plan has been accompanied by consideration of environmental issues through, in particular, the Strategic Environmental Assessment process and the Habitats Directive Assessment process. That process of environmental assessment will continue through the project development stage for individual schemes forming part of the plan.*

*In delivering the plan, the Authority will, in collaboration with the relevant agencies, actively address the protection and enhancement, where practical, of the natural, built and historic environment associated with these schemes. Projects which are taken forward to development consent stage will be supported by environmental appraisal, Habitats Directive Assessment and Environmental Impact Assessment (EIA) where appropriate. All transport projects will be constructed in accordance with applicable design standards and environmental regulations and mitigation measures in accordance with good practice will be incorporated into the design and construction of these schemes.”*

## 10. Monitoring

Monitoring has been proposed for all 27 SEA Objectives and not limited to topics for which more significant effects are predicted. This was undertaken with a view to better understanding the effects of the plan’s implementation across all environmental topics.

The intention when developing the monitoring programme was to build upon the existing data collected by the NTA and the other agencies in the Greater Dublin Area. The role of the Regional Planning Guidelines for the GDA will be of specific relevance in this regard.

It is recommended that a bi-annual Monitoring Report is prepared to report on the progress of the SEA monitoring programme and that a summary of key actions required to address both predicted and also unforeseen significant environmental effects included.

If monitoring identifies a regular frequency of a negative significant environmental effect, then more frequent monitoring and reporting may be required to determine if remedial action is effective in addressing the negative effect.

The suite of monitoring measures below should also be reviewed on an annual basis with new monitoring measures included should new and relevant data sets become available.