



**Luas Lucan (Line F)
Draft Scoping Report**

**Draft Scoping Report for
Consultation**

February 2009



Luas Line F

Draft EIS Scoping Report for Consultation

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1.0 INTRODUCTION

The Railway Procurement Agency (RPA) was established under the Transport (Railway Infrastructure) Act in December 2001. Its statutory functions include:

- Securing the provision of, or providing, such light railway and Metro railway infrastructure as may be determined from time to time by the Minister for Transport
- Entering into agreements with other persons in order to secure the provision of such railway infrastructure whether by means of a concession, joint venture, public private partnership or any other means

Transport 21 was announced by the Minister for Transport in November 2005 and was incorporated into the National Development Plan 2007–2013 which represents Government policy on integrated transport commitments for the country and in particular for the Greater Dublin Area. In addition to expenditure on national roads, mainline and suburban rail, Transport 21 provides for the delivery of seven proposed new Luas lines and two new Metro lines for Dublin. The proposed Luas Line F from Lucan to Dublin City Centre will be similar to the two existing Luas lines. It will open up a new tram corridor on the south inner city serving areas with poor rail access. It will also provide a connection to Metro West.

On 27th September 2007 the Minister for Transport and the RPA Chief Executive launched the public consultation process on the route options for the Luas Line F from Lucan to the city centre. Two broad route options were identified by the RPA. Route Option 1 ran from Lucan Village via Liffey Valley, Ballyfermot, Kylemore Park, Inchicore and Kilmainham, via Mountbrowne, Dame Street to terminate near Trinity College in Dublin City Centre.

Route Option 2 ran from Newcastle Road in Lucan via Rowlagh, Collinstown Park, Parkwest and Kylemore Park to link with the existing Luas Red Line between Blackhorse and Fatima where it continued to St. Stephen's Green in Dublin City Centre. A number of possible stops were also identified on each of the Route Options

and sub options. There were also a number of sub options within these two broad corridors.

On 10th October 2008, the RPA announced the selection of the Emerging Preferred Route Corridor for Luas line F. The preferred route is a hybrid of the two broad Route Options and the sub options referred to above. The emerging preferred corridor runs from Newcastle Road in Lucan to Dame Street via Ballyowen Park, Liffey Valley, Cherry Orchard, Ballyfermot, linking up with the Luas Red Line at Blackhorse Stop and sharing the Red Line as far as Fatima Stop, then via Meath Street and Christchurch, to terminate near Trinity College. The line will be approximately 15km long and will provide interchange with the Luas services, the proposed Metro North and Metro West lines, Iarnród Éireann services and a range of bus services. In the next stage of the process, the RPA will consult further with the public and key stakeholders on the detailed design of the route, i.e. on the specific location of the track alignment, stop locations, Park & Ride facilities and the site for a depot.

An indicative description of the proposed Luas Line F route corridor including proposed stops, interchanges and location of the proposed depot are provided in Appendix II. It should be noted that the project is currently at design stage and the alignment, stops, and location of the proposed depot as detailed in Appendix II are provisional and subject to change.

The Transport (Railway Infrastructure) Act, 2001 as amended by the Planning and Development (Strategic Infrastructure) Act, 2006 sets out the process under which statutory authority for new railway projects is to be granted. This process, in short, involves an application being made for a Railway Order for the construction, operation and maintenance of a railway. A fundamental requirement of the Railway Order application for the project and, a key component of the decision making process for the proposed Luas Line F project, is an Environmental Impact Assessment (EIA).

The application for a Railway Order must be accompanied by a draft of the order being sought, a plan of the works to be carried out under it, a list of any properties

shown on the plan of the works and the purported owners and occupiers of those properties (known as a Book of Reference) affected by the application and an Environmental Impact Statement (EIS). The relevant parts of the Planning and Development (Strategic Infrastructure) Act, 2006 came into force in early 2007, when the power to grant or refuse the Railway Order application has been transferred from the Minister for Transport to An Bord Pleanála.

2.0 THE EIA PROCESS

The EIA process requires a multi-disciplinary approach due to the many varied environment topics (ecological, human etc.) that may be affected.

Once the EIA methodologies outlined in this scoping report have been applied, it will be reported in an EIS to accompany the Railway Order application. The EIS will describe the preferred route corridor, the existing environment as well as identify all likely significant environmental effects, measures proposed to mitigate these effects, residual impacts and any remedial measures and or monitoring required for the life of the project.

The EIS is being prepared in accordance with the following:

- Guidelines on the information to be contained in Environmental Impact Statements: Environmental Protection Agency (2002)
- Advice Notes on current practice (in the preparation of Environmental Impact Statements: Environmental Protection Agency (2003)
- Assessment Guidelines relevant to the specialist area
- Relevant existing and or emerging national and European legislation;
- Best practice

2.1 The scoping process

The EIS scoping study is a key element of the EIA process and signifies commencement of the development of an EIS. Even though it is not a requirement of

the Transport (Railway Infrastructure) Act, 2001, it is considered best practice. As an early stage tool it will provide relevant information on the following issues which will need to be addressed in the EIS:

- Potential significant impacts
- Legal requirements
- Consultation requirements
- Issues to be scoped out
- Specific assessment methods and or standards for each impact
- Outline the potential contents of the EIS

Scoping ensures that mitigation measures are identified at an early stage in the design process, thereby minimising the need for subsequent design amendments and that environmental protection and sustainability are key factors in the project design.

However, if it becomes apparent as the project design develops that there is a significant effect, the environmental issues will be subjected to assessment as appropriate. It is not the purpose of this report to undertake detailed measurement, calculation or assessment of potential impacts. Detailed assessment will be carried out during the development of the EIS.

The Draft EIS Scoping Report will form a basis of common reference for consultation about the scope and methodology for the EIS. Figure 1 outlines the three stages in the EIS scoping process.

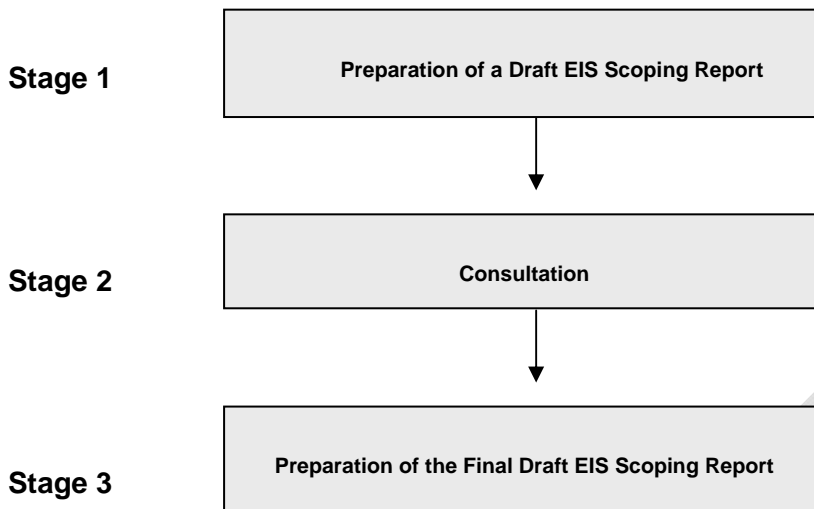


Figure 1 EIS Scoping Process

The technical studies, work completed to date, previous experience of light rail development and the skills and experience of the RPA project team and specialist consultants form the basis of this Draft EIS Scoping Report. This scoping study focuses on detail relevant for the EIA for Luas Line F and is not an assessment or evaluation of the emerging preferred route(s).

2.2 Consultation

Effective consultation with statutory and non-statutory bodies is an essential part of any scoping process. Consultation in relation to the Draft EIS Scoping Report will take place to ensure that the Luas Line F EIS covers all relevant concerns of those consulted, that the necessary studies have been undertaken, that the EIA is appropriate to particular local circumstances and the scale of the proposed scheme. Consultation allows the opportunity for views to be put forward on such environmental topics as heritage, traffic, noise, vibration, ecology, geology, hydrogeology, air quality, landscape and visual amenity and water quality.

It is important to note that consultation is an ongoing process and will evolve and continue right through the EIA process.

Consultation on this Draft EIS Scoping Report will be for a four week period following which a Final Draft Scoping Report will be prepared. All responses and feedback in relation to consultation on this Draft EIS Scoping Report will be incorporated into the Final Draft EIS Scoping Report, where appropriate. The Final Draft EIS Scoping Report will also be made available on the RPA website (www.rpa.ie).

In addition to consultation on the scoping element of the EIS, the various consultants will undertake consultation with statutory and/or non-statutory consultees where appropriate to ensure that all relevant issues are included in their respective assessments. A list of consultees which has been identified at this stage is provided in Appendix I.

2.3 Project description

2.3.1 Luas Line F

An indicative description of the proposed Luas Line F route corridor including proposed stops, interchanges, and location of the proposed depot are provided in Appendix II. It should be noted that the Luas Line F proposed scheme is currently at design stage and the alignment, stops, and location of the depot as detailed in Appendix II are indicative and subject to change.

2.3.2 System concept

Luas Line F is the next phase of Dublin's integrated light rail network. The proposed scheme will serve an approximate 15km long corridor from Dublin City Centre to Lucan. The proposed scheme is a light rail system running under line of sight on a generally segregated alignment. Luas signal control will interface with the traffic control system operated by Local Authorities to manage conflicts at road junctions along the route.

The forecast journey time between Dublin City Centre to Lucan is expected to be approximately 45 minutes (depending on the number of stops in operation). The

proposed scheme will initially have the capacity to operate 53m long Light Rail Vehicles (LRVs).

The proposed scheme will be interoperable with the existing and proposed Luas and Metro systems. In order to facilitate the development of interoperable systems the proposed scheme will incorporate the following key requirements:

- A track gauge of 1435mm
- A 750V DC overhead traction power supply
- Space-proofing of both infrastructure and vehicles, including ducting and wiring, for the addition of communication and control systems

Luas Line F is intended to provide an attractive alternative transport mode and will interconnect with Lucan, Liffey Valley Town Centre, Ballyfermot and Dublin City Centre. Moreover Luas Line F is intended to greatly enhance the connectivity of the whole rail based public transport network with connection to the Luas Red Line at Blackhorse Stop.

Interchange with bus and taxi will also be facilitated throughout the system, with bus pull-in bays and pick-up/drop-off facilities being designed into many of the Luas Line F stops. Cycle facilities will be provided at all stops, where possible and all stops will be designed to accommodate mobility impaired access and egress.

Options are being considered for the location of a depot at Collinstown Park, Inchicore railway works or Liffey Valley Town Centre.

2.3.3 System construction

The construction of Luas systems generally involves the same sequence of activities. Due to the linear nature of the construction site it is possible for certain activities to overlap with others or to run concurrently. In general the construction works will involve the following phases:

- Enabling works
- Site preparation
- Establishing site offices, compounds and security
- Utilities diversion
- Excavation and construction of stops
- Construction of tunnels or structures if required
- Installation of the trackbed and rails
- Installation of mechanical, electrical and operating equipment
- The fitting out of stops and associated equipment
- Finishing to surfaces and soft landscaping

It is envisaged that the construction period will take approximately 3.5 years. During this period, a number of construction compounds will be located along the route corridor in addition to stop access points and the proposed depot site.

2.3.4 System operation

The hours of operation for the proposed scheme are currently assumed to be 05:00 to 01:00 Monday to Thursday, 05:00 to 03:00 Friday, 06:00 to 03:00 Saturday and 07:00 to 24:00 on Sunday. It is envisaged that there will initially be a 4 minute headway (15 vehicles per hour) service during peak hours, increasing over time to less than 4 minute headways (>15 vehicles per hour) for the morning and evening peak periods.

In practice early morning and some afternoon off peak service levels are likely to require adjustment when nominal working timetables are produced in order to optimize the entry of vehicles into service. Off-peak services may therefore be improved resulting in more economical and commercially attractive arrangements. A similar situation may result for vehicles leaving service at the end of each peak period.

Saturday and Sunday service levels are anticipated as being similar to off-peak levels with some enhancement to cover peak shopping periods/regular sporting events. Additional services will be run to facilitate seasonal and special events.

Services will stop at all stops. Empty vehicles will also have to stop at all stops to enable operation of detection facilities for input into the signalling system.

3.0 PROPOSED METHODOLOGIES FOR THE ASSESSMENT OF IMPACTS

This section details the environmental topics that will be assessed and likely impacts associated with Luas Line F which will be described within the EIS. The likely potential impacts in relation to construction and operation of Luas Line F have been identified. An overview of the assessment methodologies for each environmental topic is provided so that this can be communicated effectively to stakeholders and the general public.

3.1 Human Health

Responsible: Employment Health Advisors Ltd.

3.1.1 Scope

Previous experience with similar schemes has shown that there are concerns with respect to the potential for human health effects associated with a project of this nature. These concerns relate principally to the construction phase of the proposed scheme.

3.1.2 Likely potential impacts

- Potential human health effects during the construction phase, due to factors such as noise, vibration, electromagnetic radiation, radon gas, dust or traffic. Particular attention will be given to impacts on potentially sensitive receptors, such as schools and hospitals
- Potential for impacts during the construction phase as a result of disturbance of vermin populations
- Potential for human health effects during operation is considered to be largely positive; however, potential psychosocial impacts such as violence, suicide and stress may result

3.1.3 Assessment methodology

The baseline human health assessment will comprise an overview of relevant consultation feedback and a literature review. This will identify the human health effects that will be assessed. Census data and landuse survey data will be used to identify sensitive receptors. These receptors will be described in terms of their location and sensitivities.

The potential effects associated with the construction and operational phase will be assessed in many sections of the EIS, including:

- The potential for health effects associated with noise and vibration during the construction and operational phases will be assessed by review of the results of the noise and vibration modelling exercises. Particular attention will be given to potentially sensitive receptors such as schools and hospitals and the potential effects such as disturbance of sleep. The modelled results will be assessed by comparing the predicted levels with levels specified in relevant standards. Refer also to the Noise and Vibration section
- The potential for health effects associated with radon gas during the construction and operational phases will be assessed by review of predicted levels of radon occurrence and comparison of these levels to relevant standards. Similarly the potential for health effects associated with Electrical and Magnetic Fields (EMF) during the construction and operational phases will be assessed by review of predicted levels of EMF occurrence and comparison of these levels to relevant standards. Refer also to the Electromagnetic Radiation section
- The potential for health effects associated with traffic during the construction and operational phases will be assessed by review of the traffic modelling results. Refer also to the Traffic Impact section
- The potential for health effects associated with dust particularly relating to the construction phase but also the operational phase will be assessed. This information will be reviewed and assessed through comparison with relevant standards. Refer also to the Air Quality and Climatic section

- The potential effects of biological agents e.g. from sewers and the potential for contamination of water supplies, will be assessed through review of information provided by the construction design team
- The potential psychosocial impact (violence, suicide, stress etc.) of the construction and operational phases of the proposed scheme will be assessed using evidence from similar projects both in Ireland (e.g. Luas) and elsewhere. Consultation with the Health Service Executive (HSE) will ensure that local factors are recognised and considered

3.2 Human Beings

Responsible: RPA

The potential impacts on human beings is also addressed under other environmental topics, such as noise, vibration, electromagnetic radiation, landscape, visual amenity, dust and traffic.

In addition, based on the EPA's *Advice notes on Current Practice in the Preparation of Environmental Impact Statements* (EPA, 2003), the human beings assessment will address the identification and evaluation of the impacts from the construction and operation of Luas Line F. This includes planning and policy, socio-economic impacts, and landuse planning applications.

3.2.1 Planning and policy

Responsible: RPA

3.2.1.1 Scope

The planning and policy chapter of the EIS will assess all national, regional and local policies and objectives relevant to the Luas Line F including:

- Capacity of land for development along the route
- Existing community, and other landuses along the route
- Landuse trends along route that could influence demand
- Policy changes that could influence landuse along the route
- Recent decisions by the relevant County Councils and An Bord Pleanála along the route
- Potential for permitted/proposed and future development to be located in the vicinity of the proposed Luas line. This may also have implications for the traffic and community section of the EIS (Interactions)

Luas Line F will be assessed for compliance against relevant planning policy documents including the following:

National

- Sustainable Development – A Strategy for Ireland (1997)
- Dublin Transportation Office – A Platform for Change (2001)
- National Development Plan 2007–2013 (2007)
- National Climate Change Strategy 2007–2013 (2007)
- National Action Plan for Social Inclusion 2007–2016: Building an Inclusive Society (2007)
- National Heritage Plan (2002)
- National Spatial Strategy 2002–2020 (2002)
- National Biodiversity Plan (2002)
- Transport 21 (2005)
- Ten-Year Framework Social Partnership Draft Agreement 2006–2015

Regional and Local

- Dublin City Development Plan 2005–2011 (2005)
- South Dublin County Council Development Plan 2004–2010
- A City of Possibilities; Economic, Social and Cultural Strategy 2002–2012 (2002)
- Dublin City Biodiversity Action Plan 2007–2010 (2007)
- Dublin City Development Plan 2005–2011 (2005)

- Regional Planning Guidelines for the Greater Dublin Area 2004–2016
- Maximising the City's Potential – A Strategy for Intensification and Height –Draft (2007)

The strategic planning context will include reference to current national and strategic policies and objectives.

The statutory development plan context will include reference to statutory landuse planning and development policies and objectives as adopted by Dublin City Council and South Dublin County Council.

A review of potential proposed developments and recent land developments will also be undertaken along and in the general vicinity of the proposed Luas Line F.

3.2.2 Human Beings: Socio-economics

Responsible: RPA

3.2.2.1 Scope

Luas Line F will serve many areas in Dublin City Centre and west Dublin, with large populations. A demographic profile of the route corridor will provide the socio-economic context within which socio-economic impacts may be assessed.

3.2.2.2 Likely potential impacts

- The construction stage has the potential to disrupt people and businesses including retail along the route corridor. Construction will require the temporary closure of specific roads to allow construction of the stops and track infrastructure
- Resources and amenities particularly valued in the area and their use
- People, groups or activities that may be affected by the proposed scheme (e.g. leisure activities, drivers etc.)

3.2.2.3 Assessment methodology

A desk-top study of the baseline environment will be conducted by referring to the Small Area Population Statistics from the Censuses 2002 and 2006. A one kilometre buffer will be applied around stop locations. This buffer represents the catchment of the Luas Line F route. The socio-economic profile will be presented under the following headings:

- Population, population growth and settlement patterns
- Household formation
- Age profile
- Employment profile of the population
- Profile of employment in the catchment
- Social class
- Community facilities
- Access to public transport

Issues for consideration during construction will include:

- An assessment of the nature and duration of disruption that is likely to arise during construction
- The contribution the presence of construction workers may bring to the local economy
- A quantitative assessment of improvements in accessibility as a result of the project's implementation
- A discussion of the potential contribution that Luas Line F will make to economic development in west Dublin

Operational issues to be considered include:

- A quantitative assessment of improvements in accessibility as a result of the project's implementation
- A discussion of the potential contribution that Luas Line F will give to economic development in Dublin City Centre and west Dublin

Guidelines and data sources will include:

- Dublin City County Council (2005) Dublin City Council Development Plan
- Various local area plans that fall within the Luas Line F catchment
- Census data from 2002 and 2006
- Working papers and other supporting studies undertaken by RPA

3.2.3 Human Beings: Landuse

Responsible: RPA

3.2.3.1 Scope

The existing landuses and land take required for both construction and operation of Luas Line F and its subsequent effects on landuse will be assessed.

3.2.3.2 Likely potential impacts

- Construction of the project will require temporary use of lands
- Lands will be permanently required for the operation of Luas Line F and associated infrastructure
- Landuse trends along the route that could influence demand

3.2.3.3 Assessment methodology

A landuse classification survey will be undertaken to determine all existing landuses along the proposed scheme. Primary landuses (such as residential, commercial, retail, health/medical, educational, industrial, recreational) will be identified.

Temporary (construction) and permanent (operation) land take will be assessed and evaluated in the EIS. The impact on the land being taken will be based on its use. Residential and recreational lands will be classed with the highest sensitivity, as will schools, hospitals and protected lands. Industrial and derelict lands will be given the lowest sensitivity. Lands zoned for development will be classed with a medium sensitivity as any change in landuse is planned.

3.3 Human Beings: Noise

Responsible: ERM

3.3.1 Scope

The noise assessment takes into consideration available national and international guidance. No national standards in relation to noise exist in relation to the operation of a rail system in Ireland. The National Roads Authority (NRA) has developed guidance in relation to noise for road projects which has been taken as relevant for rail schemes that integrate with roads, such as Luas Line F. Assessment of impacts will be undertaken for the construction and operational phases of the project.

3.3.2 Likely potential impacts

- Airborne noise is likely to occur during the construction phase, impacting sensitive properties close to the proposed Luas line. Significant airborne noise may occur at the construction sites of individual stops, where elevated sections of the alignment are to be constructed, and the construction of Park & Ride facilities
- Secondary noise impacts remote from the construction sites could potentially arise due to traffic diversions and construction traffic
- The main potential sources of airborne operational noise are the LRVs, impacting sensitive properties close to the proposed Luas line. The route passes through a variety of areas including residential, industrial and recreational areas. The roads along which Luas Line F runs, or areas where it runs near to, are generally heavily trafficked and existing levels of noise are therefore high. The noise impact from the LRVs is therefore likely to be greater at night when background noise levels are usually lower than day time.
- At some locations it may be necessary to realign road traffic closer to noise-sensitive buildings and this may result in noise increases at these locations. This will be significant only at noise receptors very close to the existing road. The proximity of the nearest receptors will depend on the final layout of the alignment. This will be fully assessed as part of the EIS

- Noise from traffic travelling to and from the Park & Ride sites may impact on receptors. Noise will also be generated from traffic within the Park & Ride areas. The Park & Ride site is potentially to be located between the Quarryvale and Liffey Valley stops. There are relatively few noise-sensitive receptors in these areas and the noise environment is already significantly dominated by traffic noise. The effect of traffic within this Park & Ride is not therefore expected to be significant. However, the impact of traffic will be considered in relation to all proposed Park & Ride sites
- Noise will be generated from the operation of the Luas Line F depot. The depot will be used to stable and maintain LRVs and some maintenance may take place during the out-of-service hours at night. Noise impacts are therefore likely to be greatest during the night. It is noted that both potential locations at Liffey Valley and close to the M50 motorway are already influenced by traffic noise and have few noise sensitive receptors close by. The proposed location at Collinstown Road is located close to noise sensitive receptors and the M50. A third potential depot site has also been investigated at the Inchicore railway works. It is likely that the depot could be located in a manner that would minimise impacts

3.3.3 Assessment methodology

The assessment will examine the impact of the addition of airborne noise from the construction and operation of Luas Line F evaluated by reference to noise receptors along the route.

Construction noise will be predicted and assessed against recognised standards for impacts, including those issued by the NRA.

LRV noise will be predicted at representative receptors along the route. The predicted levels will be assessed against recognised standards for the thresholds of noise impacts, and when the predicted levels exceed these standards, they will be compared against the existing ambient noise levels to assess the resultant change in

noise. Within this process changes in road traffic noise expected on adjoining roads will also be assessed. The impact can be adverse or beneficial depending on whether the change represents an increase or decrease in noise level. Daytime and night-time noise levels will be considered because noise increase tends to be greatest at night when ambient levels are lower. Noise levels will also be predicted in terms of the day, evening and night noise levels L_{den} (an indicator that is a composite of long term L_{Aeq} values for day, evening and night in accordance with the Environmental Noise Directive EC2002/49).

A noise survey will be undertaken to determine the ambient noise environment along the route. Both day and night-time measurements will be taken. In areas which may be redeveloped, ambient noise may change, and it therefore may be necessary to estimate ambient noise levels for future years based on predicted traffic flows or extrapolation from other comparable sites.

The EIS will also identify measures to attenuate noise to as low as reasonable practicable during construction and operation.

3.4 Human Beings: Vibration

Responsible: ERM

3.4.1 Scope

The vibration assessment will take into account available national and international guidance. The NRA has developed guidance in relation to vibration from construction of road projects. No national standards in relation to vibration exist in relation to the operation of a rail system in Ireland.

Assessment of impacts will be undertaken for the construction and operational phases of the project.

3.4.2 Likely potential impacts

- During construction, vibration could impact on sensitive receptors as a result of piling or using heavy vibrating compaction machinery
- Vibration may arise due to the movement of LRVs on the track. However, the likelihood of this resulting in significant impacts is considered to be low unless sensitive properties are very close to fast running sections of the route

3.4.3 Assessment methodology

A survey of the existing environment in the area of the development will be carried out to identify any sensitive features of archaeological/architectural importance and facilities that have vibration-sensitive equipment such as hospitals. Baseline vibration monitoring will not be carried out unless any particularly vibration sensitive locations are confirmed along the proposed alignment.

Vibration criteria will be developed for different receptors i.e. human beings, structure types, equipment etc. These criteria will be based on conservative international standards for annoyance and disturbance and will take into account the operational characteristics of Luas Line F.

For assessing possible effects on structures, the NRA Guidelines for the Treatment of Noise and Vibration in National Road Schemes, will be referred to. Standards have been set in the NRA document so as to ensure that there is little or no risk of even cosmetic damage to buildings.

The assessment of potential ground-borne noise and vibration impacts on people will be used to outline the linear extent of area where vibration attenuating trackforms would be needed. From experience, it is expected that such trackforms will ensure that there are no significant impacts.

The EIS will identify areas where mitigation is likely to be required to minimise any impacts.

3.5 Human Beings: Radiation and Stray Current

Responsible: To be confirmed

3.5.1 Scope

The potential for interference to existing and potential receptors and potential impacts associated with electromagnetic (EM) radiation from operation of Luas Line F will be assessed. In addition, the potential for interference to the operation of Luas Line F from external electromagnetic sources in the vicinity of the line will also be assessed. Electromagnetic radiation is not expected to be generated during the construction phase.

3.5.2 Likely potential impacts

- EM emissions may be generated by the power supply system elements of the scheme such as electrical substations and power cables, by the overhead traction system along the route, or by the propulsion system onboard the trams
- The Luas Line F system could be susceptible to external electromagnetic fields that are generated by sources such as electricity cables and local radio frequency (RF) transmitters
- Stray currents may be generated externally from a number of sources including industrial premises and internally from any poorly insulated sections of rail, from which uncontrolled earth leakage takes place
- Potentially sensitive receptors along the route may include hospitals and schools, as well as other rail transport systems operating sensitive signalling equipment
- Rail systems can generate transient emissions. Such transients can pose a threat to the operation of neighbouring electrical and electronic equipment

3.5.3 Assessment methodology

The electromagnetic interference and radiation assessment will be carried out in accordance with the documents as set out in section 2.0 of this report. The construction of Luas Line F will be required to comply with the requirements of the European Directive on Electromagnetic Compatibility (2004/108/EC) and European Standard EN 50121 (Parts 1-5), which addresses railway EMC. In addition all electrical and electronic products placed on the market or taken into service in the European Union must comply with all applicable directives which include the above EMC Directive, the Low Voltage Equipment Directive 2006/95/EC and the Radio and Telecommunications Terminal Equipment Directive 1999/5/EC.

It is proposed to assess the project's compliance in accordance with the above directives and standards in addition to guidelines on limiting exposures to electromagnetic fields as published by the International Commission on Non-Ionising Radiation Protection (ICNIRP) and the EU EMF Recommendation 1999/519/EC.

The levels of transient emissions will be determined based on previous experience and by carrying out measurements on existing operating light rail systems similar to Luas Line F.

Details of the route and the system parameters will be assessed including the proposed power feeding arrangements, the overhead lines, traction return system, the signaling systems and the vehicle propulsion systems.

The baseline evaluation will include a desktop study of existing available data and consultation with relevant stakeholders e.g. utility providers, other transport operators, ComReg and the Radiological Protection Institute of Ireland, to identify both sensitive receptors and external sources of electromagnetic radiation.

Compliance with relevant standards and guidelines shall be achieved through design studies, mitigation measures and verification testing.

3.6 Human Beings: Traffic

Responsible: RPS

3.6.1 Scope

The route crosses a number of major roadways and passes through urban locations which are likely to result in significant potential disruption for road users during construction and operational phase. The traffic chapter of the EIS will primarily evaluate the impact on Heavy Goods Vehicles (HGVs), general traffic, public transport, pedestrians and cyclists.

The planning of the project will aim to optimise the level of service, segregation and priority for Luas Line F with minimal effect on other users of the transport network:

- Minimising the impact on bus services throughout construction and operation
- Maintaining accessibility for pedestrians and cyclists
- Taking account of future road and public transport proposals
- Developing appropriate traffic management measures
- Consulting with relevant stakeholders

3.6.2 Likely potential impacts - operation

- Traffic delays at specific junctions, and on roads where the carriageway is shared between LRVs and general traffic, particularly near Luas Line F stops
- Modal shift from other modes of transport is likely to reduce the number of car journeys on the road network overall. Impacts will include localised increases and decreases
- Provision of Park & Ride sites is likely to shorten some car journeys, reducing traffic on the road network overall. Impacts will include localised increases and decreases
- Increases in pedestrian movements in the vicinity of Luas Line F stops

- Possible loss of bus lanes or traffic lanes in order to provide a segregated running lane for LRVs, leading to reduction in journey reliability for bus passengers or additional congestion

3.6.3 Likely potential impacts – construction

- Traffic disruption during construction is likely which will include road closures, traffic diversions, including bus services
- Construction will also require movements of HGVs to import plant, equipment and materials and also to remove construction and demolition waste

3.6.4 Assessment methodology

The Dublin Transportation Office (DTO) holds an up-to-date strategic multi-modal transport model for the Greater Dublin Area. A relevant portion of this model covering the vicinity of Luas Line F will be used, with enhanced detail and accuracy, to assess the impact of the Luas Line F route on traffic patterns. This will be supplemented by more detailed modelling of individual junctions. Forecasts will be produced for an agreed future year in which Luas Line F and other Transport 21 schemes are fully operational. The model will take into account other planned infrastructure projects and their respective timelines.

Modelling of traffic flows, routing and congestion will be supplemented by site surveys to identify other impacts and possible mitigation measures.

The assessment will cover impact on all road users, specifically including:

- Traffic congestion and delay for drivers and their passengers, including bus users
- Changes to the ease with which pedestrians can cross roads
- Changes to bus lanes and cycle lanes, and consequent re-routing of bus services and bicycle flows
- Changes to access and servicing of properties

- Changes to permitted locations for parking, loading, etc.

The following standards and guidelines will be consulted as part of the traffic assessment:

- Institution of Highways and Transportation Guidelines on Traffic Impact Assessment (1994)
- Design Manual for Roads and Bridges (DMRB) (1997)
- NRA Growth Factors
- Traffic Management Guidelines (DoT)

The traffic modelling will also take account of the landuse characteristics of the area and any significant changes in landuse resulting from the opening of Luas Line F. Pedestrian activity at stops will be linked to Luas Line F patronage data and changes in traffic levels on individual roads will feed into assessment of noise and local air quality impacts.

3.7 Flora and Fauna

Responsible: NATURA Environmental Consultants

3.7.1 Scope

The emerging preferred route for Luas Line F follows existing roads through mainly urban and suburban areas. A number of public parks and sports grounds are located close to or along the proposed route corridor.

The Grand Canal is the most significant semi-natural feature within the study area from the Grand Canal Way to Dolphins barn. Two other watercourses are within the study area; the River Griffeen, a first order tributary of the River Liffey, and a minor tributary of the Grand Canal which flows through Landsdown Valley Park.

3.7.2 Likely potential impacts

- The removal of vegetation during construction and the storage of excavated materials have the potential to cause increased sediment and silt run-off into adjacent water bodies
- The potential pollution of watercourses during the construction phase through uncontrolled discharges and therefore may impact on aquatic ecology
- Habitat severance, habitat deterioration or loss of habitat (for example severance of badger foraging areas, loss of potential bat roosts in trees and buildings, or loss of treelines and other wooded areas) during construction may impact on flora and fauna
- Potential for disturbance to wildlife during construction and operation
- Potential for bird strike (collision of birds with the overhead traction power supply)

3.7.3 Assessment methodology

The following guidance documents will be used in the ecological assessment:

- Guidelines for Assessment of Ecological Impacts of National Road Schemes, National Roads Authority, (2004)
- Guidelines for Ecological Assessment, Institute of Ecological and Environmental Management, (2002)
- Environmental Assessment and Construction Guidelines series, as published by the National Roads Authority (2006)
- Guidelines on the information to be contained in Environmental Impact Statements; Environmental Protection Agency (2002)
- Advice Notes on current practice (in the preparation of Environmental Impact Statements) Environmental Protection Agency (2003)
- Dublin City Council Biodiversity Action Plan (2008)

The assessment will establish the current baseline ecological conditions, the construction and operational activities and will predict their impacts or changes to the

baseline in the future. This will be followed by the determination of mitigation measures to avoid or attenuate potential impacts.

The desktop assessments will be supplemented by a full habitat survey using standard Heritage Council methodology (Fossitt, 2000 and NATURA, 2000) to Level II or Level III as appropriate. Based on the desktop assessment and the habitat survey the following targeted surveys may be carried out:

- Large mammal survey (including badgers and otters)
- Bird surveys
- Bat surveys (daytime and night time)
- Inspections of watercourses for protected species and amphibians
- Rare plant survey

The criteria to be used for evaluating ecological sites and rating impacts will follow the *Guidelines for Assessment of National Road Schemes*, (NRA, 2006) and comprise two parts, a site evaluation scheme and criteria for rating impacts on terrestrial and aquatic sites.

The level of significance of any and all of the impacts of Luas Line F will then be assessed and a full suite of appropriate mitigation measures will be incorporated into the EIS.

3.8 Soil and Geology

Responsible: Fehily Timoney & Company

3.8.1 Scope

This chapter of the EIS will focus mainly on the likely impact on soil and geology along the route corridor, during the construction and operation of the proposed Luas Line F.

3.8.2 Likely potential impacts

- Loss of soil cover in open urban green spaces;
- Risk that existing made ground and natural soils may be contaminated by construction activities such as accidental fuel spills
- Potential to encounter contamination of the underlying ground and specifically the environmental issues arising from its excavation, handling, on-site processing, transport and off-site disposal or recovery;
- Soil erosion and compaction
- Removal and storage of spoil
- Impacts on any features of geological or geomorphological interest and importance
- Impact of surface water run-off on soil quality over the operational life of the project

3.8.3 Assessment methodologies

The methodology for assessment of the impacts on soil and geology will be undertaken in accordance with the recommendations contained in the following documents:

- Geology in Environmental Impacts Statements – A Guide (Institute of Geologists of Ireland, 2002)
- Guidelines and procedures for assessment and treatment of geology, hydrology and hydrogeology for National Road Schemes (National Roads Authority, 2008)

- Design Manual for Roads and Bridges Vol. 11 1994
- Published geological information

Baseline data collection will include an assessment of topographic mapping and any relevant published information in the vicinity of the proposed scheme which will be followed by a walkover survey. Sites and features of geological heritage value along or in the vicinity of the route will be visited and inspected in order to obtain relevant information.

Further baseline information on the nature, depth and quality of soils, rock and groundwater along the route will be obtained from ground investigation. Soil quality testing will be carried out at sites identified by desk based studies as being potentially contaminated or at a higher risk of contamination (open urban green space or derelict land).

All areas that require construction on or in soil and/or rock will be identified in addition to the potential risks posed during the construction and operation phase.

Mitigation strategies will be developed with the design team and incorporated into the overall design to address significant potential impacts on soil and geology arising from its construction and operation. Residual impacts arising after the establishment of mitigation measures will also be subject to assessment. Refer to the waste management section below.

3.9 Water Quality (Groundwater and Surface Water)

Responsible: Fehily Timoney & Company

3.9.1 Scope

The water quality chapters will focus mainly on the likely impact on the quality of surface water bodies, water courses, streams and ditches and groundwater quality and hydrogeology along the route corridor, during the construction and operation of the proposed scheme.

3.9.2 Likely potential impacts

- The construction phase has the potential to pollute watercourses through uncontrolled discharges
- The excavation of material and in particular the excavation of trenches for utilities has the potential to provide preferential pathways for pollutants to enter groundwater. The removal of overburden will also increase the vulnerability of the underlying aquifer
- The removal of vegetation during construction and the storage of excavated materials have the potential to cause increased sediment and silt run-off into adjacent water bodies
- There is potential for hydrocarbon contamination from the operation of Luas Line F as a result of oils, mechanical fluids, lubricants etc.
- Potential for contamination as a result of the use of pesticides that may be used for the control of vegetation
- Potential impacts may also arise from the operation of Luas Line F in terms of drainage and flooding impacts

3.9.3 Assessment methodologies

The water quality assessment will be carried out in accordance with all relevant existing national and European legislation with specific reference to The EU Water Framework Directive (2000/60/EC) and river basin management planning.

A desktop study will be carried out on existing available data including mapping. This will be followed by field assessments and water sampling, where required.

The assessment will identify the potential risks to the water quality during both the construction and operation stage. The assessment will classify each of the potential impacts according to their significance. The assessment will include the identification of surface water drainage and proposed outfalls and the potential impact on water quality.

Mitigation strategies will be developed and potentially adverse environmental impacts will be avoided and reduced wherever practicable. Specific engineering and/or construction solutions will be developed with the design team and incorporated into the proposed scheme to reduce insofar as practicable the unavoidable impacts arising from its construction and operation. Residual impacts arising after the establishment of mitigation measures will also be subject to assessment.

3.10 Air and Climatic Factors

Responsible: ERM

3.10.1 Scope

Air Quality is likely to be a consideration primarily during the construction phase of the proposed development when dust emissions have the potential to create nuisance. No construction related impacts to climate are anticipated. During operation, potential air quality impacts relate to redistribution in traffic on the existing road network.

3.10.2 Likely potential impacts

- Construction activities associated with the proposed scheme have the potential to generate dust, which may cause nuisance at nearby receptors for short periods of time
- Construction may also result in temporary road closures, which may have a temporary impact on traffic flows and therefore air quality in localised areas
- Significant construction-related impacts on climate are not envisaged
- Operation of the proposed scheme may have an impact on air quality due to changes in traffic flows. It is likely that traffic flow changes will result due to the permanent closure of some roads along the proposed scheme and diversion of existing traffic onto alternative routes. The proposed Park & Ride sites may also result in localised air quality impacts, due to increased local traffic in these areas. In addition secondary and remote

impacts will be associated with the generation of electricity for the proposed scheme which may also have an impact in terms of the quantity of CO₂ emissions that is associated with transport in Dublin City

- The paving of any substantial green areas could have a localised effect on the microclimate of those areas within the city
- Luas Line F is likely to reduce the volume of potential car-based journeys and therefore indirectly lead to a reduction in the quantities of carbon dioxide produced due to car journeys. However, this may be offset to an extent due to the additional power resources that will be required to operate the proposed scheme

3.10.3 Assessment methodology

Relevant air quality baseline data will be obtained from a number of sources including Dublin City Council, South Dublin County Council and the EPA. Climate data will be obtained from Met Éireann.

In terms of construction impacts, the potential adverse impacts of dust will be assessed qualitatively by considering the potential for impacts at sensitive receptors along the route and in close proximity to work sites. Sensitive receptors will comprise places where it would be reasonable to expect people to be exposed to ambient air quality; they will include:

- Residential dwellings
- Industrial or commercial uses sensitive to dust (including food businesses)
- Public open spaces
- Recreational areas and sports grounds
- Schools and other educational establishments
- Churches and buildings of similar religious sensitivity
- Theatres, auditoria and concert halls
- Hospitals and nursing homes

The air quality effects associated with significant changes to traffic flows will be investigated using the Transport Analysis Guidance (Department of the Environment, (2004) and the Design Manual for Roads and Bridges (DMRB) (Highways Agency, (2003) Air Quality methodology. DMRB will be used to evaluate changes in airborne concentrations of nitrogen dioxide and particulate matter (measured as particles with aerodynamic diameter $\leq 10\mu\text{m}$ (PM_{10})), as these are the principal pollutants relating to emissions from road traffic. The mass of CO_2 emissions associated with the proposed scheme due to changes in traffic flows will also be calculated using the DMRB methodology.

Changes to roadside air quality will be determined through the application of a dispersion model to the outputs of the traffic modelling on a link by link basis. Traffic assessments are usually undertaken for road links where:

- Traffic flow changes by 10% or more; or
- HGV numbers changes by 10% or more; or
- Annual Average Daily Traffic (AADT) increase by > 1000 vehicles; or
- HGV AADT increase by > 200 vehicles; or
- Daily Average Speed changes by more than 10kph; or
- Peak Speed changes by more than 20kph

There are no established criteria for the assessment of dust deposition arising from construction sites. A risk-based approach has therefore been developed to identify the potential to generate significant quantities of dust near to sensitive receptors. This is based on studies highlighted by the Building Research Establishment. These studies suggest that nuisance is unlikely to occur at distances greater than 50 metres from a construction site boundary ⁽¹⁾. One of these has also shown that at least half the people living within 50 metres of the site boundary of a road construction scheme were seriously bothered by construction nuisance due to dust, but that beyond 100 metres less than 20 percent of the people were seriously bothered. On this

(1) Buildings Research Establishment (BRE) (2003). Control of dust from construction and demolition activities. Kukadia, V., Upton, S. and Hall, D. BRE Bookshop, London. February 2003.

basis, a risk evaluation matrix has been devised and used to determine the significance of effects arising from construction dust deposition.

The significance of any impacts on air quality as a result of temporary road closures will also be assessed.

Operational impacts from the proposed scheme will be assessed against EU air quality standards which have been transposed into Irish law. The legislation relevant to this assessment is the Directive on Ambient Air Quality and Cleaner Air for Europe (2008/50/EC) which transposes the daughter Directives set by the European Commission. These established new air quality standards for NO₂, PM₁₀ and PM_{2.5}, which are relevant to this study.

The assessment will compare the number of road links where pollutant concentrations exceed the air quality standards by considering the impact from the proposed scheme in combination with predicted background concentration levels. This will be done for both the Do Minimum and Do Something scenarios, in all assessment years. Links that show exceedence to air quality limit values in both the Do Minimum and Do Something scenarios will be identified.

The assessment will present the results in terms of the road links which will be subject to an improvement, degradation, or no change in air quality in the study area. The significance of impacts will be assessed by making reference to the air quality impact significance criteria, set out in the National Roads Authority document 'Guidelines for the treatment of air quality during the planning and construction of national roads schemes', 2004.

The EIS will identify areas where mitigation is likely to be required to minimise any impacts.

3.11 Landscape and Visual

Responsible: Murray and Associates

3.11.1 Scope

Luas Line F passes mainly through urban landscape that would not generally be described as sensitive to the type of infrastructure development proposed. However, there are some exceptions along the route corridor.

Landscape impacts are defined as changes in the fabric, character and quality of the landscape as a result of the proposed scheme. This includes direct impacts to landscape receptors and greater effects that can alter the wider distinctiveness of the landscape. Landscape receptors are the physical or natural resource - such as parks or streetscapes in this study area - or special interest group that will experience an impact. The sensitivity (of a landscape receptor) is the vulnerability to change.

Visual impacts relate solely to changes in available views of the landscape and the effects of those changes on people. They include the direct impact of the development on views, the potential reaction of viewers, their location and number and the impact on visual amenity.

Landscape and Visual Impact will be assessed separately along the proposed scheme.

3.11.2 Likely potential impacts

- Construction of the project may have potential temporary negative impacts on landscape and visual aspects of the receiving environment. Such impacts include construction traffic and associated haulage routes, construction lighting, plant and machinery, hoarding and site compounds
- Luas Line F will generate permanent effects on landscape and visual aspects of the environment due to the changes to the fabric of the study

area and in the visual environment caused by the operation of and the infrastructure associated with a light rail development

- Impacts in terms of lighting may also occur at associated buildings, stops and structures; and due to any additional structures placed as a requirement by the Local Authority
- There is potential for new, unrelated development to occur, particularly adjacent to the proposed stops and this is considered in general terms, related to the landuse zoning of the Local Authority Development Plans
- As a result of the proposed development, it is also possible that there would be positive impacts on the streetscape and associated areas resulting from the issues of public space being dealt with in tandem with infrastructure

3.11.3 Assessment methodology

The assessment will include desktop analysis of maps, aerial photos, plans, written sources, etc., identification of sensitive receptors and a field study of the route. The assessment will follow from prescribed methodologies as set down in the following publications:

- Guidelines for Landscape and Visual Impact Assessment 2nd Edition, by The Landscape Institute/Institute of Environmental Assessment published by E&FN Spon (2002)
- Design Manual for Roads and Bridges, Vol. 11, Environmental Assessment, published by HMSO (1993)

The study area used in this assessment refers to the route corridor itself and its wider landscape context in the study of the physical landscape and landscape character. This may extend for approximately 1km in all directions from the route corridor in order to achieve an understanding of the overall landscape. In terms of the visual assessment, the study of visual amenity may extend outside the study area where possible.

The assessment will include the following:

- Desktop survey of detailed alignments, maps, aerial photography and other information relevant to the study area
- Site survey and photographic survey to determine landscape character of the general and specific landscape
- Detailed site survey of significant landscape areas
- Assessment of the potential significant impacts of the proposed scheme to determine the main impacting features, the degree to which these elements would be visible in relation to observations made during the field survey. In determining visibility, the views to and from Luas Line F will be considered
- Assessment of the significant impacts in terms of lighting during both construction and operation will be carried out
- The identification of mitigation measures including specific landscape measures (SLMs). Specific engineering and/or construction solutions will be developed with the design team and incorporated into the proposed scheme to mitigate the unavoidable impacts arising from its construction and operation
- An evaluation of the impacts with and without amelioration, based on standard assessment terminology and scales of impact. For the purposes of assessment the predicted visual effects of the proposed scheme are assumed at 20 years following the opening of the scheme
- All the relevant stakeholders, listed in Appendix 1, will be consulted to seek their views on the scoping of the EIS for the proposed scheme. This consultation process facilitates their communication of views/recommendations regarding suitable mitigation measures for adverse impacts to landscape and visual amenity

3.12 Material Assets: Archaeology and Cultural Heritage

Responsible: Valerie J Keeley Ltd.

3.12.1 Scope

The assessment in terms of archaeology and cultural heritage will be based on a review of available data and field assessments to obtain the archaeological and cultural heritage baseline. This will be followed up by an assessment of the potential impacts from the proposed scheme and development of mitigation measures to reduce or ameliorate potential adverse impacts.

In terms of archaeological heritage impacts, the construction phase of the project will have the most potential impact as this is when permanent loss/impact can occur. In terms of cultural heritage potential impacts may occur both during the construction and operational phase of the project. These impacts may be permanent or temporary in nature.

3.12.2 Likely potential impacts

- A preliminary review of baseline data has identified a number of potential impacts on recorded archaeological sites as listed in the Record of Monuments and Places (RMP) and a potential impact at four locations on a composite National Monument (Dublin City Walls and Defences). Potential impacts are either direct or indirect impacts on sub-surface remains which may have survived modern disturbance. No upstanding remains have survived which would be directly impacted by the proposed route
- Impacts that have been identified at this stage include direct and indirect impacts on the Zone of Archaeological Potential (ZAP) for historic Dublin (DU018-020) and the Medieval Core of Dublin City as defined in the Conservation Plan for Dublin City Walls and Defences (Gowen, 2004). The city's defences, designated as a composite National Monument will be potentially impacted at four locations (DU018-020028; DU018-020034; DU018-020035; DU018-020992). In addition, there will potentially be a direct impact on 15 RMP sites, all of which are located within the constraints of historic Dublin (DU018-020) and 10 of which are within the Medieval Core of Dublin City

3.12.3 Assessment methodologies

The baseline data gathering will comprise of consultation of available data from known sources, including the Record of Monuments and Places (RMP), aerial photography and consultations with local authorities and key stakeholders. A field survey shall also be carried out to verify the desktop study and to identify all potentially-impacted areas that are intersected by, or in close proximity to the proposed scheme. A catalogue of archaeological sites and archaeological artefacts will be provided. Known cultural heritage remains will be discussed within the text and highlighted on maps provided.

A general survey will consist of a document and cartographic search utilising a number of sources including the following:

- Record of Monuments and Places (RMP)
- Register of Historic Monuments
- Sites and Monuments Record (SMR)
- National Museum of Ireland Topographical Files
- City and county development plans
- Record of Protected Structures
- Cartographic and photographic sources
- National Inventory of Architectural Heritage
- Irish Architectural Archive
- Published sources

The scope of this assessment will include archaeology and cultural heritage. Known archaeological sites and items of cultural heritage identified in proximity or within the proposed route will be inspected. During the archaeological/cultural heritage field inspections previously unrecorded structures or features and areas of archaeological potential impacted by the alignment may be noted and photographed by the field archaeologist. Areas of particular importance, such as any National Monuments and items of cultural and archaeological sensitivity, must also be identified and all associated statutory obligations set out.

The evaluation of the baseline data for archaeological and cultural heritage and the preparation of an impact assessment and mitigation strategy shall be based on the NRA 'Guidelines for Assessment of Archaeological Heritage Impacts of National Road Schemes'. The significance of the impacts will be informed by the proposed design of construction at these locations.

In relation to archaeological heritage, the preferred government policy is avoidance of direct impacts or preservation *in situ*. However, where this is not possible, the approach of preservation by record will be applied.

All archaeological surveys and investigations will be undertaken in accordance with licences and/or consents issued by the Minister for Environment Heritage and Local Government and the National Museum of Ireland. All archaeological surveys and investigations will also be conducted in accordance with the Code of Practice agreed between the RPA and the DoEHLG.

3.13 Material Assets: Architectural Heritage

Responsible: Valerie J Keeley Ltd.

3.13.1 Scope

The assessment in terms of architectural heritage will be based on a review of available data and field assessments to obtain the architectural baseline. This will be followed up by an assessment of the potential impacts from the proposed scheme and development of mitigation measures to reduce or ameliorate potential adverse impacts.

In terms of architectural heritage impacts, temporary and permanent impacts associated with construction and operational of the proposed scheme will be addressed.

3.13.2 Likely potential impacts

- A preliminary review of baseline data has identified a number of impacts on Protected Structures as listed in the Record of Protected Structures in the Dublin City Development Plan 2005–2011 (Vol. 3) and in the South Dublin County Council Development Plan 2004–2010 (Part 4, Schedule 2). There will be a number of impacts on Conservation Areas as designated in the Dublin City Development Plan 2005–2011. It is anticipated that additional structures of architectural heritage significance will be identified during the assessment
- Potential impacts that have been identified at this stage include direct and indirect impacts on a protected structure (RPS 1997: Henry Grattan monument and surrounding street furniture) and on the basements of Protected Structures. There will be an indirect impact on c.166 Protected Structures, four of which are of international importance (RPS 1520: Christchurch Cathedral, RPS 2425: Dublin Castle, RPS 1996: Bank of Ireland and RPS 2011/2013: Trinity College) and on a Lock Keepers cottage. There will be a direct impact on the Grand Canal and the section of route extending from James's Street to College Green, which are designated as conservation areas

3.13.3 Assessment methodologies

The baseline data gathering will comprise consultation of available data from known sources, including historical photographs, documents, cartographic sources and consultations with local authorities and key stakeholders. Additionally, a field survey will be carried out to verify the desktop study and to identify all potentially-impacted areas that are intersected by, or in close proximity to the proposed scheme. A catalogue of architectural sites and annotated maps will be provided.

A general survey will consist of a document and cartographic search utilising a number of sources including the following:

- City/County development plans
- Area plans and policies
- Record of Protected Structures

- Cartographic and photographic sources
- National Inventory of Architectural Heritage
- Irish Architectural Archive
- Published sources

The scope of this assessment will include architectural heritage. Known sites of architectural heritage value identified in proximity or within the proposed route will be inspected. During architectural field inspections previously unrecorded structures of architectural merit impacted by the alignment may be noted and photographed by the architectural heritage consultant. Areas of particular importance must also be identified and all associated statutory obligations are to be set out.

The evaluation of the baseline data for architectural heritage and the preparation of an impact assessment and mitigation strategy will be based on all relevant existing and or emerging national and European legislation; Department of Environment, Heritage and Local Government 'Architectural Heritage Protection – Guidelines for Planning Authorities', 2004 and the NRA 'Guidelines for Assessment of Architectural Heritage Impacts of National Road Schemes'.

3.14 Waste Management

Responsible: To be confirmed

3.14.1 Scope

The volumes of construction waste material arising from the excavation of unsuitable material, contaminated soils and demolition waste will be calculated and the potential re-use of such wastes assessed. Wastes generated during the operation of Luas Line F will also be assessed. Requirements and recommendations will be indicated for the disposal or off-site treatment of contaminated materials.

3.14.2 Likely potential impacts

- Waste material, arising from excavated unsuitable material, vegetation, contaminated soils and building and demolition wastes
- Excavation of hazardous waste in areas of contaminated lands
- Potential demolition works on buildings may encounter hazardous materials such as asbestos
- Waste generation from construction may cause a number of direct and cross-media impacts such as dust, odours, traffic, noise, impacts on soils, contaminated land, geology, water, health, etc.
- Waste will be generated during the operation of Luas Line F in the form of materials left by passengers on rail vehicles and at stops

3.14.3 Assessment methodologies

The methodology for assessment of impacts in terms of waste will be undertaken in accordance with the recommendations contained in the following documents:

- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Waste Projects published in July, (2006)
- Construction and Demolition Waste Management – A Handbook for Contractors and Site Managers (Construction Industry Federation) (2002)

The volumes of construction waste material will be calculated and the potential re-use of such wastes assessed. Requirements and recommendations will be indicated for the collection, disposal and/or off-site treatment of contaminated materials.

The potential outlets for the different types of waste material expected to be generated at the site will be examined. This will include potential for beneficial re-use, recycling, recovery and disposal, if required.

The permitting and licensing issues under the Waste Management Acts, 1996 to 2007 will be considered. This may apply to the excavation, treatment and disposal of waste, as well as to the collection and transport of all wastes from the sites.

The cross medial impacts of waste management issues will be considered, such as the traffic impacts from the export of waste materials from the sites and the nuisance impacts (dust and noise) from the handling and processing of waste materials.

Baseline data collection will include an assessment of topographic mapping and any relevant published information in the vicinity of the proposed scheme followed by a walkover survey.

Potential waste arising from the operation phase will be identified in addition to identifying waste management measures.

The rating of waste management environmental impacts of Luas Line F will be assessed by:

- Classifying the importance of the environmental attributes
- Quantifying the likely magnitude of any impact on these attributes

All the relevant stakeholders, listed in Appendix 1, will be consulted to seek their views on the scoping of the EIA for the proposed project. This consultation process will scope out their concerns in relation to the proposed project, agree suitable methods of assessment and obtain their views/recommendations regarding suitable mitigation measures for adverse environmental impacts.

Mitigation strategies will be developed and potentially adverse environmental impacts will be avoided wherever practicable. If this is not possible, potentially adverse impacts will be reduced insofar as practicable. Specific engineering and/or construction solutions will be developed with the engineering design team and incorporated into the proposed scheme to deal with the unavoidable impacts arising from its construction and operation. Residual impacts arising after the establishment of mitigation measures will also be subject to assessment.

3.15 Material Assets: Property

Responsible Consultant: RPA

3.15.1 Scope

All non agricultural properties are viewed as being very important to the individual owners and occupiers and can be very sensitive to acquisition and other impacts. Properties in the vicinity of the route corridor include residential, commercial, retail, social community, public green space, public recreational space and health infrastructure.

3.15.2 Likely potential impacts

- As the route passes through urban and suburban areas, it is possible that there will be some requirement for property take which may result in demolition or reconstruction
- The operational impacts on property relate to aspects already addressed in this scoping report such as noise and vibration, air quality, landscape and visual amenity and architectural heritage

3.15.3 Assessment methodology

The material assets assessment will be carried out in accordance with the following:

- Guidelines on the information to be contained in Environmental Impact Statements (Environmental Protection Agency, 2002)
- Advice Notes on Current Practice in the Preparation of Environmental Impact Assessments (EPA, 2003)
- All relevant existing and or emerging national and European legislation

A detailed analysis of property along the route corridor will be carried out and the properties that will require demolition or reconstruction will be determined. Mitigation measures will be developed to avoid and minimise property impacts.

3.16 Material Assets: Utilities

Responsible Consultant: RPA

3.16.1 Scope

Utilities refer to the physical infrastructure such as electricity, gas, telecommunications and other communications infrastructure, surface drainage and foul drainage networks and transport infrastructure. Along the route corridor there are several areas where such infrastructure exists, particularly high voltage power lines, gas pipelines and water mains.

3.16.2 Likely potential impacts

- Construction of the proposed scheme is likely to impact on existing utilities. Construction of the proposed scheme may also disrupt existing transport infrastructure and services such as Luas and rail
- In terms of operation, there is potential for electrical magnetic interference which is addressed under the Electromagnetic Radiation Section

3.16.3 Assessment methodology

All utility infrastructure will be identified along the route corridor. Following a desktop assessment, field assessment and consultation with all respective utility providers, the potential impacts on utilities along the route corridor will be identified.

A program for utility relocation during the construction stage will be developed. Engineering and/or construction solutions will be developed with the engineering design team and incorporated into the railway scheme to mitigate the unavoidable impacts arising from the construction of the scheme. Potential disruption to transport

infrastructure will be assessed and a program detailing any proposed disruption and measures to minimise disruption will be determined.

3.17 Material Assets: Agronomy

Responsible Consultant: RPA

As noted in the EPA Guidelines on the information to be contained in Environmental Impact Statements (2002) 'the scoping process identifies the issues and emphasis that are likely to be important during the EIA process and eliminates those that are not'.

Upon preliminary review of the Luas Line F corridor, it is apparent that the proposed scheme lies predominantly within an urban environment within the administrative areas of South Dublin City Council and Dublin City Council. No lands are classified as 'agricultural' within the corridor. As such, the necessity to identify farms directly affected by the proposed scheme is no longer applicable and the requirement to undertake this assessment has been scoped out of the EIA process.

4.0 INTERRELATIONSHIPS, INTERACTIONS AND CUMULATIVE EFFECTS

The EIS will address and describe interactions between the various environmental aspects that are being assessed. The potential indirect and cumulative impacts associated with the project will also be addressed in the EIS.

5.0 EIS STRUCTURE AND CONTENTS

The EIS will be submitted to An Bord Pleanála as part of the Railway Order application for the project. The structure of the EIS will be in accordance with Guidelines on the information to be contained in Environmental Impact Statements (Environmental Protection Agency, 2002).

The EIS will comprise of a number of sections which will include the following:

5.1 Background to the project and EIA process

This section will include the planning and environmental legislative requirements in relation to Luas Line F, description of the requirement for an EIA, the structure of the EIS and the EIS project team. A description of the needs and objectives of the Luas Line F will also be provided.

The overall approach to the EIA process will be detailed including a description of how the scope of the EIA was defined and the issues relating to the consultation process undertaken by RPA.

A description of difficulties encountered and any limitations and that were experienced by the project team will be provided.

5.2 Alternatives

This section will describe and appraise the alternatives that were considered during the design of the project and during the EIA process. The consultation that was undertaken with regard to the design of the project will also be discussed.

5.3 Project description

A description on the project including the design principles, risk analysis, safety issues, construction methodology and programme will be detailed.

5.4 Planning context

The planning context for the project, including national, regional and local policy guidance will be detailed.

5.5 Existing environment

A description of the baseline environment along the route corridor will be provided for each environmental topic.

5.6 Impacts of the proposed project

A description of the potential impacts that will occur during the construction and operational phase of the project will be provided for each environmental topic. The likelihood, extent, magnitude, duration and significance of potential impacts will be described.

5.7 Mitigation measures

The mitigation measures to be put in place to mitigate the likely significant impacts will be described and the residual impacts that will persist after mitigation has been put in place will be also be detailed.

Mitigation measures will be provided in the form of avoidance, reduction or remedy. Residual impacts will be classified as insignificant or significant. If residual impacts are deemed to be significant, then the level of significance will be explained in the EIS.

5.8 Interactions

A section detailing the interactions between the various environmental topics will be provided. This will be provided in the overall context, area by area assessment and a matrix summarising the interactions will be provided.

5.9 Non-Technical Summary (NTS)

A non-technical summary will provide a summary of the main findings from the EIS.

It is likely that the EIS will be presented in a number of volumes such as:

Volume 1 Chapters 1 – 25 (Introduction to the proposed scheme and a description of the receiving environment);

Volume 2 Chapter 1 - 18 (Environmental Impact – Area 24-25);
Chapter 1 - 18 (Environmental Impact – Area 26-27);

Volume 3 Maps – baseline and impact;
Annexes to the EIS;

EIS Non-Technical Summary (NTS).

It is the intention of the RPA that the EIS will be clear, concise, representative and of an appropriate standard to reflect the nature and scale of the project. The EIS will be made widely available.

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APPENDIX I

LIST OF EIA CONSULTEES

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List of EIA Consultees

Aspect	Stakeholders
<p>EIA SCOPING & CONSULTATION</p> <p>(Includes consultees relevant to environmental aspects listed below)</p>	<p>An Bord Gáis An Taisce Badgerwatch Ireland Bat Conservation Ireland Birdwatch Ireland Bord Gáis Commission for Energy Regulation Department of Communications Marine & Natural Resources Department of Environment Heritage & Local Government Department of Transport Dublin Airport Authority Dublin City Council Dublin Transportation Office Eastern Regional Fisheries Board Eircom Environmental Protection Agency ESB Geological Survey of Ireland Heritage Council Irish Aviation Authority National Museum of Ireland National Parks and Wildlife Service National Roads Authority Office of Public Works South Dublin County Council Waterways Ireland</p>
Air Quality	<p>Local Authorities EPA</p>
Archaeology, Architectural and Cultural Heritage Heritage	<p>National Monuments (DoEH&LG) Local Historical & Archaeological Groups Heritage Council An Taisce</p>

Aspect	Stakeholders
Ecology	Eastern Regional Fisheries Board National Parks & Wildlife Service Badgerwatch Bat Conservation Ireland Birdwatch Ireland
Landscape, Visual Amenity	Dublin City Council Parks and Landscape Services Division South Dublin County Council Parks Department Sports Clubs
Noise & Vibration	Local Authorities EPA
Radiation & Electromagnetic Aspects	Dublin Fire Brigade An Garda Síochána Comreg Utility Companies Radiological Protection Institute of Ireland
Soil & Geology	Geological Survey of Ireland Teagasc EPA Local Authorities Environment Services Departments
Traffic	National Roads Authorities Irish Rail Dublin Bus Chambers of Commerce Dublin Airport Authority
Waste	EPA National Construction and Demolition Waste Council
Water Quality	Office of Public Works Eastern Regional Fisheries Board Environmental Protection Agency Waterways Ireland Local Authorities Environment Services Departments.

APPENDIX II

LUAS LINE F ROUTE DESCRIPTION

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On Friday 10th October 2008 RPA announced the selection of the Emerging Preferred Route Corridor for Luas Line F. This Route Corridor is based on Luas Line F Route Options presented to the public in September 2007. The route shown is an indicative route within the Emerging Preferred Route Corridor for Luas Line F.

The line starts from a terminus located on the Newcastle Road in the existing Sports Ground close to Superquinn Shopping Centre and Lucan Community College. The alignment then runs along Esker Road to Griffeen Valley Park Stop serving the Sports Centre and then to a possible Esker Meadow Stop located after Griffeen Valley Park Stop. It then turns to Castle Road Stop and Droim Na Coile Stop and northwards to reach Ballyowen Park Stop and Quarryvale Park Stop where an interchange with Metro West will be provided. The route then runs through Liffey Valley Town Centre where two stops may be located Liffey Valley Town Centre West Stop and Liffey Valley Town Centre South Stop. From Liffey Valley Town Centre the route runs along Coldcut Road, crosses the M50 on a new bridge and continues to Cherry Orchard Hospital Stop on Ballyfermot Road. On Ballyfermot Road there may be a stop located near the Community & Health Centre, Blackditch Stop. The route then continues along Ballyfermot Road to Ballyfermot Village Stop in Ballyfermot Village. From Ballyfermot Road the route turns onto Kylemore Road and runs to Kylemore Park Stop beside Kylemore Park. From there the route turns to run beside the Grand Canal to Tyrconnell Road linking up with the existing Luas Red Line at Blackhorse Stop. The route continues along the existing Luas Red Line via Drimnagh Stop, Goldenbridge Stop, Suir Road Stop and Rialto Stop to Fatima Stop. From Fatima Stop the line will run along Thomas Street to Meath Street Stop, to continue to Christchurch Stop.

The eastern terminus will be on Dame Street in the vicinity of College Green. The new line will be approximately 15km in length and will provide interchange with the Luas Red Line, the proposed Metro West and Metro North lines, Iarnród Éireann services and a wide range of bus services.

Possible Stops are located at or close to current business and residential centres and other locations of interest. At this stage the stops are indicative only and many reflect submissions received during the first round of public consultation.

RPA hopes to provide Park & Ride facilities near the N4 interchange at Liffey Valley Town Centre. A depot will be required for storing and maintaining vehicles. The location of the depot will be identified during next stage of design.

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