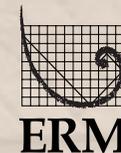




Dublin Light Rail  
Environmental impact Statement  
Non Technical Summary

Line C1  
Connolly to The Point  
Depot



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## Availability of the Environmental Impact Statement (EIS)

Copies of the EIS including the Non Technical Summary are available for inspection and purchase at the following locations:

### Railway Procurement Agency

Parkgate Business Centre,  
Parkgate Street,  
Dublin 8.

### Dublin Transportation Office

69 – 71 St. Stephens Green,  
Hainault House,  
Dublin 2.

The EIS is also available to download (free of charge) through the RPA website: [www.rpa.ie](http://www.rpa.ie)

Copies of this EIS can be purchased for a sum of €15.00 each; A CD version of the EIS can be purchased for a sum of €5.00; Copies of the Non Technical Summary of this EIS may be purchased for a sum of €3.00 each at the above locations.



## **1 INTRODUCTION**

### **1.1 THE NON TECHNICAL SUMMARY**

This document presents, in non-technical language, the key findings of an independent Environmental Impact Assessment (EIA) of the construction and operation of the Luas Red Line extension, Line C1, from Connolly Luas Stop to The Point in Dublin City. The EIS has been prepared by ERM Environmental Resources Management Ireland Ltd ('ERM') on behalf of the Railway Procurement Agency (RPA).

### **1.2 THE PURPOSE OF THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PROCESS**

The purpose of the EIA Process is to:

- Identify the potential environmental impacts of the proposed development;
- Predict and evaluate the extent and significance of potential impacts;
- Identify measures that should be taken to reduce, minimise or avoid causing any significant negative impacts;
- Assess the significance of any impacts remaining after

proposed mitigation measures are implemented; and

- Identify appropriate ways of monitoring the predicted environmental effects of the proposed development during construction and operation.

### **1.3 CONSIDERATION OF ALTERNATIVES**

#### **1.3.1 The Do-Nothing Scenario**

One element of the EIA process is to determine what will happen to the environment in the absence of the proposed development. Evaluating the "do-nothing scenario" in this case, involves determining the development of the study area in the absence of the proposed light rail scheme. The area between Connolly Station and The Point is already subject to considerable development activity under the auspices of the Dublin Dockland Development Authority. A key objective of the ongoing development of this area is the improvement of public transport routes and increased accessibility to the Docklands area. In the absence of this development, public transport opportunities would be severely restricted and the continued reliance on private car-based transport to access the study area would continue. There would potentially be an increase in bus traffic along the alignment in an attempt to serve public

transport requirements in the absence of the scheme.

### **1.3.2 Route Identification**

This Environmental Impact Statement has been prepared pursuant to Section 37 (1) of the Transport (Railway Infrastructure) Act, 2001. The ERM Study Team undertook a detailed Environmental Route Assessment Study, which involved identifying, evaluating and comparing routes to identify a preferred route or combination of routes. The overall route selection process begins with the identification of all possible route options that meet the overall development objective of providing a light rail link from the existing Luas Red Line to The Point.

A wide range of route options and alignment variants were developed and were evaluated by RPA in consultation with Dublin City Council. During the evaluation of this 'long list' of options, a number of key criteria were applied, including:

- engineering feasibility/practicability;
- disruptions to traffic flow (during both construction and operation of the line);
- disruption associated with the relocation of services and utilities;
- impacts to heritage values;

- operational considerations;
- community access and passenger catchment profiles; and
- initial financial appraisal.

The evaluation culminated in the identification of a 'short list' of three routes for more detailed assessment. The full description of the alternative routes and how they compared against each other is presented in *Section 3* of the EIS.

### **1.3.3 Emergence of the Preferred Route**

Following the identification of three feasible alternative route options, the RPA Design team undertook a comprehensive public consultation exercise in order to obtain opinions on the route options from a wide range of people and bodies with particular concerns regarding the development proposals.

In addition to considerations such as technical feasibility and disruption to traffic, a range of issues arising from the consultation programme were included in the final assessment of the three route options. Route Option A emerged as the preferred route. Following the formal consideration of the route options, and the subsequent public consultation process, a number of specific concerns continued to be expressed in relation to that section of the proposed alignment along Mayor Street, in the vicinity of the IFSC.

The IFSC Steering Committee raised concerns regarding the potential impacts upon existing telecommunications infrastructure, which is critical to business continuity, and of temporary construction stage impacts, which they perceived as having a potentially long term negative effect upon a number of local businesses. As part of this consultation process, a route via the Quays was suggested by the IFSC Steering Committee as an alternative. This had been considered by RPA during the early stage route assessment process and had been rejected mainly due to traffic considerations. However in view of the serious concerns voiced by the IFSC Steering Committee, RPA undertook to re-assess the Quays route.

Following detailed analysis, it was concluded that the North Quays route options would result in significant environmental, traffic management and economic impacts that, in combination, confirmed the exclusion of the Quays route option from further consideration.

#### **1.4 Consultation**

The RPA initiated public consultation in relation to Luas Line C1 in April 2003. The launch of the process was marked by a joint RPA/DDDA initial media briefing where commencement of

public consultation, focusing initially on the selection of the preferred route option for Luas Line C1, was announced. The media briefing was well attended and was successful in prompting a significant amount of media coverage, which served to alert members of the public to the proposed line extension and the associated public consultation process.

The launch of the public consultation process was followed by the distribution of approximately 10,000 newsletters targeted at all addresses - business, residential and institutional - in the vicinity of the indicative route options for Luas Line C1. And RPA initiated meetings with interested parties

In December 2003 and January 2004 RPA organised public open days to update members of the public in relation to the status of plans for the line. The open days were held at the National College of Ireland and The Clarion Hotel respectively and were very well attended. Members of the RPA were on hand to discuss issues raised by attendees.

ERM also contacted a range of organisations in order to inform them of the nature of Line C1 and to determine the nature of any concerns or issues that they wished to have raised during the EIA process.



Photomontage showing proposed Luas Line on Mayor Street

**Summary of Issues Arising from Consultation**

A wide range of issues were raised and responded to during the course of the consultation process. Issues included:

- measures to avoid damage to critical communications cables (which led to the re-examination, and rejection, of the Quay option as discussed previously);
- temporary traffic management measures necessary to facilitate the construction of Luas Line C1;
- traffic management measures which would be required to be introduced on an indefinite basis to facilitate the efficient running of trams following the commissioning of passenger services;
- the maintenance of access to residences and business premises during the construction phase for pedestrians and vehicular traffic;
- the provision of loading/unloading facilities;
- provision of resident parking facilities;
- visual impact of the proposal
- noise, dust and vibration during construction and operation of the line;
- integration with other modes of transport
- spacing between stops; and
- interchange with existing and proposed Iarnród Éireann services.

The submissions that were received during the consultation process aided in the scoping of the EIA process and in the identification of potential impacts, key environmental sensitivities and aspects of the project that required clarification from the Design Team.

Throughout the consultation process it was made clear that the RPA was ready and willing to consult with interested parties in an open and professional manner.

## **1.5 DESCRIPTION OF PROPOSED DEVELOPMENT**

### **1.5.1 Route Alignment**

The Red Line extension is approximately 1,500m in length. For ease of integration with the existing Luas Red Line and to ensure optimal flexibility from an operational perspective, the western end of the proposed extension will link up with the Luas Red Line at Store St (off Amiens St) and will serve Connolly Luas Stop. This will involve reconfiguration of the track arrangements crossing Amiens St. At this location there will be a “delta junction”. The design of this junction at Mayor Street, Amiens Street and Harbourmaster Place allows the greatest level of flexibility operationally with different service patterns possible from each arm in both directions.

From Store Street the line will head across the main junction with Amiens Street serving the Luas Stop at Connolly and along Mayor Street Lower adjacent to the IFSC. The route will then cross Guild Street and across a new bridge over Spencer Dock, over the CIÉ site and on to the Point terminus. The line will be twin-tracked along its length. *Figure 1.5* illustrates the route alignment.

There are four proposed stops along this alignment at the locations detailed below:

- George’s Dock at Mayor Street Lower.
- Mayor Square on Mayor Street Lower.
- Spencer Dock Stop (Within the Spencer Dock Development) .
- The Point Terminus.

### **1.5.2 Construction**

Work on Line C1 is proposed to start at a number of locations simultaneously with many work activities running concurrently. In this way, as construction work progresses along the route different activities will occur in different places and at different times. At each location, the anticipated sequence of activities described below will be followed:

- site preparation and investigation;
- utility diversion;
- foundation excavations;
- installation of ducting and drainage along and adjacent to the route;
- installation of track bed and rails; and
- surface finishes and installation of electrical and operating equipment.

In respect of the first two bullet points covering site preparation and investigation and the requirement to divert utilities, the importance of continuity of telecommunications service to

receptors within the study area was recognised by RPA. In recognition of the criticality of the communications services to IFSC business interests, RPA will implement a utility risk mitigation strategy.

This strategy was devised as an integral part of the project by the RPA to enable the diversion of communication cables to take place without interruption in or loss of service to the business community in the locality, which evolved through the public consultations and information gathering. More detailed references are set out within the main EIS, including in sections addressing Public Consultation, Project Description and Construction Impacts.

The overall duration of construction activity will be approximately 20 months, with enabling works likely to commence before this activity. It is anticipated that construction will be undertaken within normal contract hours: 0800 to 1800 Monday to Friday and 0900 to 1600 on Saturdays. However, it is likely that some works will also be undertaken after 1600 on Saturdays and on Sundays. Such working hours and traffic management arrangements will be agreed with the local authority where required and will take the minimisation of disturbance to local residents and businesses into consideration.

Following the construction programme, a period for testing and commissioning of the new system will be required in addition to the above time periods.

### **1.5.3 Operation**

The trams will be driven on a line of sight basis in a similar fashion to road vehicles.

The main control centre for the Luas system operation is located at the Red Cow Depot building. All servicing and maintenance of trams operating on the Red Line Extension will also take place at this location.

Accessibility is also an important operational feature. In order for the tram to comply with accessibility requirements for mobility impaired people the internal floor level is maintained, for at least 70% of the total length of the vehicles at a maximum height of 350mm from the ground surface.

Diversion of the majority of utilities outside the Luas trackbed minimises the risk of disruption of service due to typically minor public utility repairs. This is important for maintaining a reliable public transport service.

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## **2 THE PRINCIPAL ENVIRONMENTAL ISSUES ASSOCIATED WITH THE SCHEME.**

### **2.1 INTRODUCTION**

Given the scale and urban context of the scheme, a degree of disruption will inevitably arise during the construction of the new railway and associated features. The EIA process has identified the key negative impacts to occur during the construction phase, particularly those associated with traffic and noise. However these impacts are considered short term over the course of the construction programme and traffic management plans and best practice in construction site management will minimise the impacts associated with these short term issues.

The following section presents an overview of the key impacts and mitigation measures identified for the Construction and Operation of Line C1. Further details can be found in the relevant sections (*Sections 6 to 15*) of the EIS.

### **2.2 CONSTRUCTION IMPACTS AND MITIGATION**

#### **2.2.1 Socio-economic**

Construction works are likely to result in restrictions to vehicle

and pedestrian movements within the area, although it is intended that they will occur for only short periods of time in any one location within the overall intended construction programme of 20 months. The disruption to local access that is likely to arise will be in the form of changed traffic conditions and a potential reduction in on street car parking. Whilst best-practice construction site management will ensure that safe traffic and pedestrian access is maintained to all businesses and residences throughout the study area, during the course of construction, traffic disruption is inevitable.

Mitigation measures will be implemented to manage the impacts of the Luas Line C1 development, including:

- development and implementation of a Method Statement to limit disruption to nearby businesses and residents through limitations on permissible hours of construction, minimised noise outputs, dust reduction; and
- development and implementation of a *Traffic Management Plan*.

#### **2.2.2 Traffic and Transport**

It is accepted that the traffic impact during the construction phase can be significant. For Line C1, the main impact will arise out of the requirement to temporarily occupy roadspace for

construction works, resulting in partial or full closure of particular roads.

The project will also require the construction of a 'Delta Junction' in the railway at the junction of Amiens Street and Mayor Street Lower. The construction of such a facility will inevitably disrupt services using the existing Luas Red Line into Connolly Station and would require trams to temporarily terminate at, for example, Abbey Street. This work will also require temporary traffic management measures to facilitate continued traffic flow along Amiens Street during the period of construction of the Delta Junction. Two-way access to car parks will be maintained at all times during the construction period.

In order to mitigate against construction impacts, the selected contractor will be requested to prepare and implement a Traffic Management Plan, which will set out in the proposed programme of works, how appropriate access is to be retained throughout the works.

### **2.2.3 Ecological Resources**

Due to the lack of significant ecological resources in the vicinity of the proposed works, impacts from the construction phases on terrestrial ecological resources are predicted to be minimal.

### **2.2.4 Geology and Soil Resources**

A desk top survey of historical landuse activities identified a number of potential areas of soil contamination along the alignment of the Luas Line C1. However, the recent redevelopment of the area has included the management of soil contamination where this has been encountered. Nonetheless, during the construction phase of the Luas Line C1, workers will be obliged to adopt appropriate health and safety management procedures where the potential exists for residual contamination to be encountered.

The potential impact to soil and geological resources during the construction phase are minimal and relate to possible spills and waste from other construction-type activities. As no large quantities of potentially contaminating substances are anticipated during the construction phase, and with the application of best practice in site management, it is likely that no significant impacts will occur.

### **2.2.5 Water Resources**

The principal potential impact that may arise due to the construction of Luas Line C1 will be a threat of contamination of the shallow groundwater due to spillages of hazardous liquids or discharges of potentially contaminating substances. There is

potential for impacts on water quality during the construction of the Bridge over the Royal Canal at Spencer Dock. A short-term reduction in water quality may occur due to a release of pollutants or canal bed disturbance. However, best practice site management will be implemented throughout the construction of Luas Line C1 to reduce the risk of spillages into the Royal Canal. The RPA must also adhere to the objectives outlined in the Royal Canal Corridor Study 1995 and notify appropriate environmental bodies should a spillage occur.

Adequate protection will be provided for stormwater runoff and sewer openings and containment measures and procedures will be put in place during construction work when required. Particular care and protection of the canal will be taken during the construction of the Bridge over the Royal Canal at Spencer Dock.

### **2.2.6 Noise and Vibration**

The likely impacts from the construction phase of the Luas Line C1 will be limited to a total period of 20 months. In reality, construction at any one location will be of a much shorter duration, ensuring that all construction-related noise impacts are of a temporary nature.

The following mitigation measures will be implemented for the construction phase:

- all construction equipment will be required to meet the EC Directive on noise emission from construction plant and equipment;
- Dublin City Council and any other relevant authorities will be consulted on aspects of the construction programme;
- the appointed contractor will agree working hours with the local authority in advance of the works; and
- equipment will be located as far from noise sensitive receptors as practicable during the construction phase.

Vibration levels due to construction works have been predicted at receptors along the proposed alignment. During specific construction activities, ground vibration has the potential to be perceptible. However, vibration from construction work will not be at levels that are associated with structural damage to properties. The following mitigation measures will be implemented for the construction phase:

- controlled working within specified and pre-agreed working hours;
- the appointed contractor will ensure that no vibration impacts on structures occur by monitoring where appropriate; and
- if any new receptors are built within 4 m of the track

alignment before the Luas tramway is given permission to proceed, further vibration isolation techniques will be incorporated into the track and track-bed design to ensure that the assessment criteria are not exceeded.

### **2.2.7 Climate & Air Quality**

Emissions of potential pollutants during the construction of Line C1 will be limited to those associated with the operation of construction vehicles and machinery. However, these emissions will be temporary in nature and are not considered to be significant.

Construction dust is likely to give rise to minor impacts at sensitive receptors within 100 m of the source of the dust generated. Whilst it is not possible to eliminate emissions of dust from construction activities completely, impacts will be minimised through the application of best site management practices.

### **2.2.8 Townscape & Visual**

Short-term townscape impacts will result from temporary alterations to the townscape during the construction period. Such activities include temporary traffic management (both vehicular and pedestrian), movement of construction machinery, excavations and earthworks, storage of construction

materials, site compounds, lighting and dust.

The construction activities are predicted to have a negative impact on the townscape of the area through which the alignment is to be developed. These impacts will be temporary in nature and over an anticipated 20 month period, thus their impacts are not regarded as significant.

Mitigation measures will be achieved throughout the construction phase to minimise townscape and visual disruption in accordance with best practice construction site management measures to be further developed by the Contractor. Principal mitigation measures include the erection and removal of hoarding as appropriate, restricted lighting of compounds and work sites to working hours, the retention of trees where possible.

### **2.2.9 Cultural Heritage**

During construction, excavation works will take place along the Luas Line C1 route. Although such disturbance of subsurface deposits has the potential to impact upon features of archaeological significance, much of the route is to be constructed over areas of imported fill material and as such the likelihood of construction works revealing archaeological deposits is considered slight. Nonetheless, should

# 2

archaeological features be identified, the RPA will ensure full adherence to relevant legislation and, in the event of the discovery of archaeological finds or remains, National Parks & Wildlife Service (formerly Dúchas) and the NMI will be notified in order that appropriate mitigation can be effected.

## **2.3 OPERATION IMPACTS AND MITIGATION MEASURES**

### **2.3.1 Introduction**

The operation of Luas Line C1 is predicted to have an overall significant and positive benefit to the study area, principally in terms of improved accessibility, increased pedestrian and cyclist safety, net reduction in traffic and improved air quality. Moreover, the operation of the scheme will contribute to the overall regeneration objectives of the Docklands area and provide traffic benefits to the wider Dublin area.

### **2.3.2 Socio-economic**

The operation of Luas Line C1 will result in considerable improvements in accessibility of people to, from and within the study area. Resultant improvements in accessibility to jobs, residences and services, to The Point and to the proposed National Conference Centre and from such locations to the city centre, Connolly and Heuston Stations and the bus depot (via connecting Luas lines) will be an important element of the

economic restructuring process taking place within the planned development of the area.

Improved accessibility to the Dublin Docklands Area, in particular through the provision of additional, efficient public transport, is an important and recognised element of a cohesive regeneration strategy for the area. It will have an important role in bringing neglected and underused land back into use. The route meets the strategic objectives for the redevelopment of the area in that it provides vastly improved access to key transport hubs such as Connolly Station, community and entertainment venues such as The Point, and will be a key transport feature of the wider development of the Docklands area. There are no mitigation measures attached to the operation of the scheme in terms of socio-economic assessment.

### **2.3.3 Traffic and Transport**

The operation of the scheme affects traffic patterns through the study area, with the net impact of the scheme resulting in a reduction in traffic activity within the study area, most noticeably in the area to the west of Spencer Dock. The reduction in car traffic that will result from the operation of the scheme will extend far beyond the immediate Study Area. The provision of end-to-end accessibility is an important feature in providing for public transport use, and will facilitate the long-

term reduction in car use throughout the Greater Dublin Area. For pedestrians and cyclists, the operation of Line C1 will lead to a greatly improved environment as a result of the environmental improvements along Mayor Street. Positive impacts on accessibility to The Point have also been noted, with a potential dramatic improvement to the current situation of car-dependency for access to this site. The Luas Line C1 will provide a high quality, high capacity public transport corridor through the centre of an existing and future area of high-density development, and will facilitate sustainable travel habits by users from an early stage.

### **2.3.4 Ecological Resources**

The operational phase of Luas Line C1 is not predicted to cause any likely or significant adverse impacts on flora or fauna.

### **2.3.5 Geology and Soil**

There are no potential impacts to the soils and geology during the operational phase of the development.

### **2.3.6 Water Resources**

There are no predicted significant impacts to water resources during the operational phase of the development and no mitigation measures are required during the operational phase of the Luas scheme.

### **2.3.7 Noise and Vibration**

The noise from the operation of the tram will result in a slight increase in night-time noise impacts around the houses at Mayor Street Upper. However this impact is not considered significant when measured against existing night time noise conditions. The following mitigation measures will be implemented for the operational phase for noise and vibration:

- potential groundborne vibration will be controlled, where necessary, through the specification and adoption of a resilient trackform;
- the existing trams have been required to incorporate noise control measures in the design to comply with noise performance specifications and track and tram wheels will be maintained in good order;
- to reduce the risk of additional noise when light rail vehicles are moving around tight curves, anti wear and anti squeal measures will be applied to the rails;
- as far as is practicable operation activities will be kept to hours which will minimise the potential for noise impact, e.g. keep night-time maintenance noise to a minimum in residential areas.

### **2.3.8 Electromagnetic**

One new substation will be required to service the operational Line C1. Substations are required to house the necessary equipment to transform and rectify a supply at 10kv from the national electricity grid and output to the tram traction system at 750v d.c. Concerns regarding electromagnetic effects are sometimes raised with regard to electrically-powered railways. The magnetic and electric field strengths from railway operations are both considerably less than a person would normally experience from natural sources of radiation and



**Custom House**

radiation emitted from household appliances such as microwave ovens, PC monitors and televisions.

A number of mitigation measures have been developed and include:

- Luas Line C1 will be constructed to meet the requirements of the EU Directive on Electromagnetic Compatibility (89/336/EEC).
- Measures to minimise stray current have been incorporated into the design specifications and will be implemented during the construction and operation of the scheme.

### **2.3.9 Climate and Air Quality**

The operation of Luas is predicted to cause negligible impacts to air quality. The overall contribution of the new Luas line to the local air quality will be positive.

### **2.3.10 Townscape & Visual**

The operation of Line C1 will introduce a number of new elements into the townscape, however the magnitude of change in the physical environment is judged to be moderate overall. At each particular location the magnitude of change will vary, being higher in locations where stops are proposed or where significant new infrastructure is required and lower in locations where change is limited to the introduction of wires, tracks and passing trams into the existing townscape.

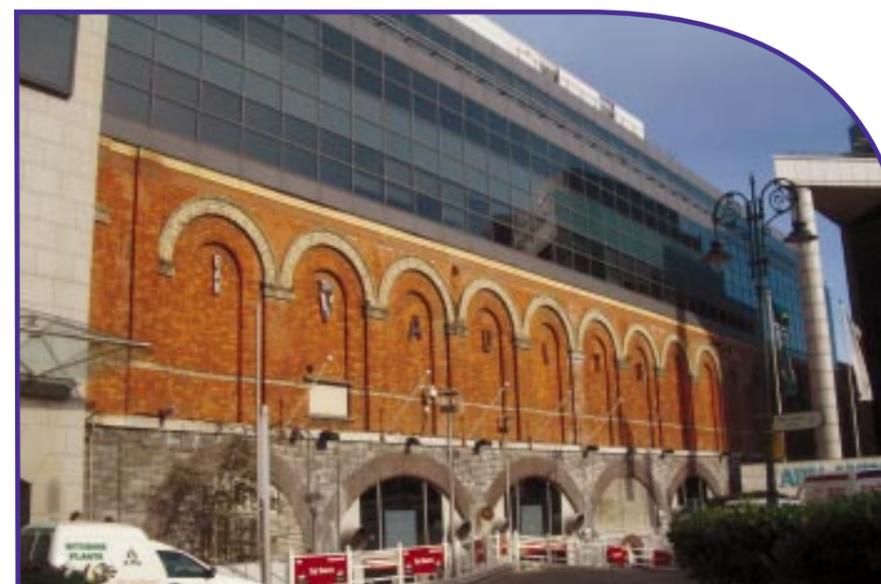
Once complete, the proposed Luas Line C1 will pass through a number of areas that will be subject to wider environmental improvements. The whole area is undergoing redevelopment currently and there will be opportunities for landscape planting upon completion of the redevelopment works. Mitigation measure will be carried out to reduce residual impacts and include the use of the current distinctive, characteristic and high quality visual 'language' throughout the scheme, and street planting to be carried out within the Dublin Docklands Development Authority Masterplan. The Spencer Dock Bridge has been consciously designed as a landmark feature and with the use of modern high quality materials, namely steel and glass, is expected to have a beneficial visual impact in this area.

### **2.3.11 Cultural Heritage**

There are no predicted operation impacts associated with cultural heritage other than the appearance of wires (and their associated fixings) on a number of buildings which is considered a marginal impact.



**Connolly Station (front)**



**Connolly Station (rear)**

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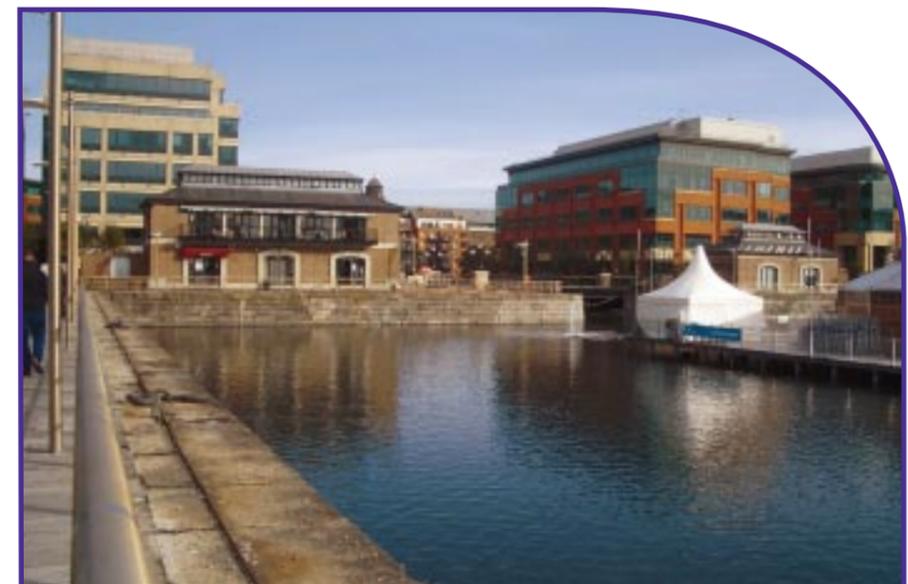
## **3 IMPACT INTERACTIONS**

Following the completion of the various EIA technical studies, a validation process was initiated using a summary matrix that allowed the impacts of certain project activities (e.g. excavation, traffic movements) upon certain environmental media (e.g. ecological resources, water resources and quality) to be presented in a readable format. The matrix is presented below.

The proposed development includes both the construction and operational phases. These have been sub-divided into aspects of the development that were identified as being sources of impacts in *Chapter 6-15 of the EIS*. These impact sources form the vertical axis of the matrix and are structured as described below.



**Harbourmaster Pub**



**George's Dock**

### ***Potential Sources of Impacts***

<b>Stage of Development</b>	<b>Source of Impact</b>
Construction	<ul style="list-style-type: none"> <li>General Construction Works (inc. utility diversion)</li> <li>Re-direction of Traffic</li> <li>Movements of Construction Traffic</li> <li>Changes to local access</li> <li>Erection of temporary ancillary developments</li> <li>Employment opportunities</li> <li>Accidental spillages of chemicals</li> <li>Removal of vegetation</li> <li>Removal and disposal of soil</li> <li>Installation of hardstanding areas</li> </ul>
Operation	<ul style="list-style-type: none"> <li>Movement of Luas vehicles on-street</li> <li>Changes to traffic flow</li> <li>Changes to local vehicular access</li> <li>Changes to city-wide access</li> <li>Access for pedestrians and cyclists</li> <li>Presence of permanent structures</li> </ul>

The horizontal axis comprises the impact receptor (e.g. human beings, noise and vibration) that may be affected by aspects of the project.

The matrix is a method of presenting the results of evaluating the significance of project impacts on the environment. The significance of the impact is described using specific terms that are defined here and are based upon the definitions contained within the revised EPA EIA Guidelines.

# 3

## ***Impact Significance***

### ***Positive impact***

A change that improves the quality of the environment (for example, by reducing vehicular emissions; or improving social mobility and accessibility, or removing nuisances or improving amenities).

### ***Negative impact***

A change that reduces the quality of the environment (such as, for example, a deterioration in air quality or diminishing the mobility and accessibility; or damaging health or property or by causing nuisance).

### ***Neutral impact***

A change that does not affect the quality of the environment.

### ***Imperceptible positive/negative impact***

An impact capable of measurement but without noticeable consequences.

### ***Slight positive/negative impact***

An impact that causes noticeable changes in the character of the environment without affecting its sensitivities.

### ***Significant positive/negative impact***

An impact that, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.

### ***Profound positive/negative impact***

An impact that obliterates sensitive characteristics.

# Impact Interaction Matrix



Impact Source / Receptor	Traffic and Transportation Human Beings	Flora and Fauna	Geology and Soils	Water Resources	Noise and Vibration	Air Quality and Electromagnetism	Townscape and Climate	Cultural Heritage
<b>Construction</b>								
General Construction Works (inc. utility diversion)	Red	Red with diagonal lines				Red		Red
Re-direction of Traffic	Red	Red with diagonal lines						
Movements of Construction Traffic	Red	Red with diagonal lines				Red		
Changes to local access	Red	Red with diagonal lines						
Erection of temporary ancillary developments								
Employment opportunities		Green						
Accidental spillages of chemicals			Red		Red			
Removal of vegetation			Red				Red	
Removal and disposal of soil				Red			Red	Green
Installation of hardstanding areas					Yellow			
<b>Operation</b>								
Movement of Luas vehicles on-street		Red				Yellow		
Changes to traffic flow		Green with diagonal lines				Yellow	Yellow	
Changes to local vehicular access						Yellow	Yellow	
Changes to city-wide access	Green with diagonal lines	Green with diagonal lines						
Access for pedestrians and cyclists	Green with diagonal lines	Green with diagonal lines						
Presence of permanent structures							Yellow	Green

Imperceptible positive/negative:



Slight negative:



Significant negative:



Profound negative:



Slight positive:



Significant positive:



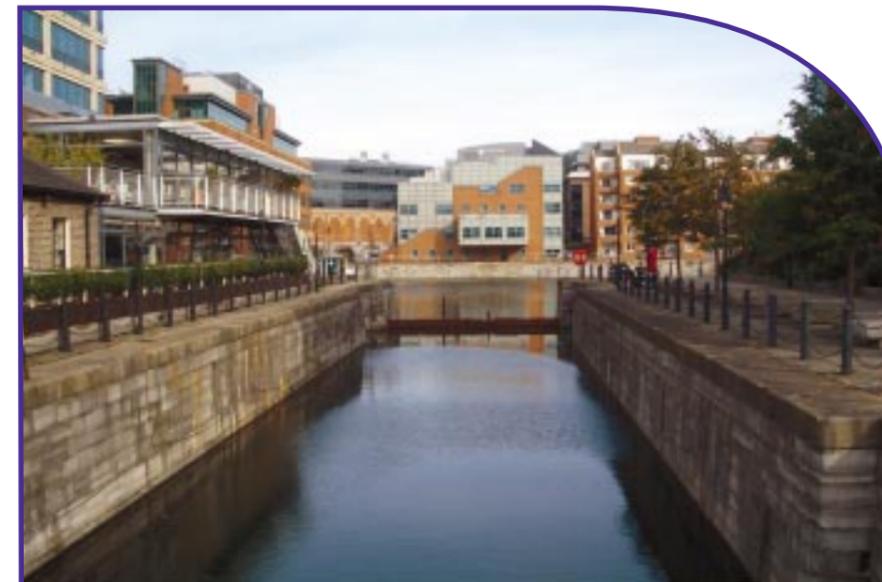
Profound positive:



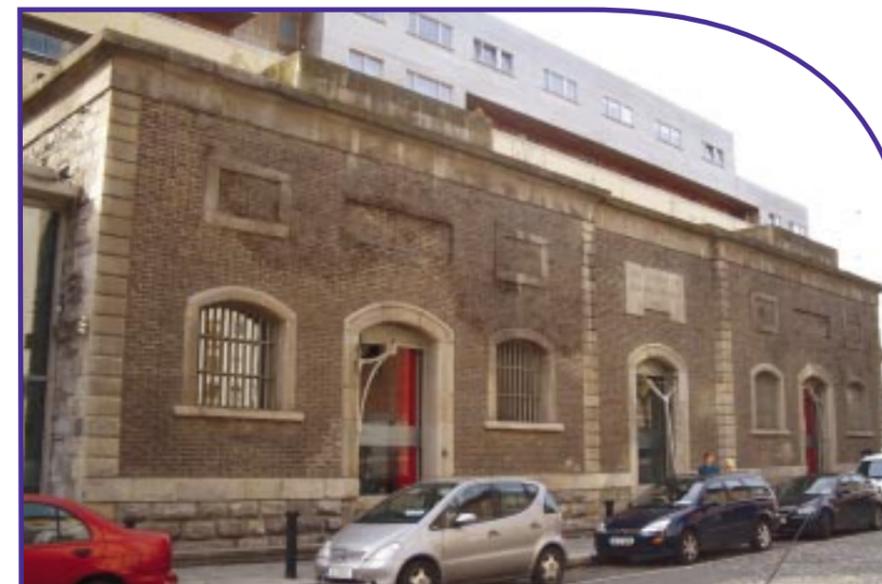
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## **4 OVERALL CONCLUSIONS**

The EIS concludes that although there will be several potentially negative impacts, none of these will be significant once suitable mitigating measures are successfully implemented. Significant long term, positive impacts will result from the proposed development, including improved access to the Docklands area, a reduction in traffic flows and consequential air quality benefits. The EIS also recommended several management measures to ensure that these key benefits are realised throughout the construction and operation of Luas Line C1.



**Inner Dock**



**Former Excise Building**

## 5 EIA STUDY TEAM

The EIS has been prepared by ERM Environmental Resources Management Ireland Ltd ('ERM') on behalf of the Railway Procurement Agency (RPA). ERM mobilised a team of experienced consultants to undertake the individual stages of the EIA. Their names and responsibilities are listed in the *Table* opposite:

## EIA Study Team

Function	Name	Organisation
Project Director	Peter Marsden	ERM
Project Manager	Ruth Minogue	ERM
Soils, Geology and Hydrogeology	Clare Glanville Tracey Ryan	ERM
Air Quality	Nicola Walden Georgina le Neve Foster	ERM
Ecology	Aileen McSwiney	ERM
Noise	Steve Mitchell Mike Fraser Aileen McSwiney	ERM
Vibration	Rob Barlow	ERM
Archaeology	Lisa Courtney Jackie Jordan	Margaret Gowen & Co Ltd
Landscape and Visual	Neil Elliot Sam Oxley Ruth Minogue Eimear O'Connor	ERM
Electromagnetic	Peter Dray	ERM
Traffic and Transport	Alan O'Brien Andy Blanchard Jonathan Noonan	Faber Maunsell
Consultation	Paul Scott Peter Marsden	ERM
Planning	Alison Harvey	ERM
Socio-economic	Kirsten Williams Rachelle Marburg	ERM
EIS Preparation	Peter Marsden Ruth Minogue Paul Scott	ERM

*Line C1 Design Team* – a multi-discipline team managed by the RPA, including specialists from traffic, safety, engineering, environment and architecture.

**Notes:**

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