

**NORTHERN IRELAND TRANSPORT HOLDING  
COMPANY (NITHC) – NORTHERN IRELAND  
RAILWAYS  
ENVIRONMENTAL NOISE DIRECTIVE  
RAILWAYS NOISE ACTION PLAN**



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# Railway Noise Action Plan

## Summary

Annex V of the Environmental Noise Directive requires that Action Plans must include the detail under the various headings below. This information has been summarised from the main body of the plan for the purpose of complying with the Environmental Noise Regulations (Northern Ireland) 2006 in order to assist with EU reporting requirements.

### **A description of the agglomerations, the major roads, major railways or major airports and other noise sources taken into account.**

The Belfast Metropolitan Urban Area (BUMA) constitutes the agglomeration covering an area approximately 198 square kilometres. For the first round of noise mapping in 2007 this threshold was 60,000 train passages per year, with no sections of major rail identified in Northern Ireland. The assessment of railway noise was therefore restricted to locations inside the Belfast agglomeration. Northern Ireland Railways network covers 210 route miles of track of which 55% is continuously welded and 45% is flat bottomed jointed track. Proposed track relay projects will enhance the coverage of continuously welded rail, particularly in the North West. The rail network also consists of almost 400 railway signals, 205 sets of points and 60 level crossings. Structures on the network include 700 bridges, 290 culverts, 3 tunnels, 10 miles of sea defences, 144 embankments and 124 platforms.

### **The authority responsible.**

The Regulations state that the Competent Authority for drawing up Action Plans for: Railways is Translink, on behalf of the Northern Ireland Transport Holding Company.

### **The legal context.**

The Environmental Noise Directive was implemented in Northern Ireland by the Environmental Noise (Northern Ireland) Regulations 2006 (the Regulations) which outline a number of stages to manage and, where necessary, improve environmental noise. The first two of these are listed in table below.

### **Any limit values in place in accordance with Article 5.**

Currently there are no noise limit values set under the Environmental Noise Directive (END) for the UK.

### **A summary of the results of the noise mapping.**

The results of the area analysis for railways within the BMUA are set out in Tables 3.1, 3.2, and 3.3. The tables show the area within each noise contour band, inside the Belfast Agglomeration and the number of dwellings and population within these dwellings. Table 3.1 shows that the railways have little noise impact within the Belfast Agglomeration. With no major railways being identified and the limited rail network the table shows an area of only 1 km<sup>2</sup> exposed to noise levels within the L<sub>den</sub> 65-69 contour band, and 189 km<sup>2</sup> (95%) with less than 50dB.

With limited railway operations during night time hours Table 3.1 again shows little noise impact from railways within the Belfast Agglomeration.

Table 3.2 shows that for the L<sub>den</sub> noise scenario 98% of dwellings (248,528) within the Belfast Agglomeration are exposed to railway noise less than 50dB. No dwellings are exposed to noise levels in excess of 75 dB.

### **An evaluation of the estimated number of people exposed to noise.**

The results of the population analysis for railways are set out in Table 3.3. The table shows that only 58 people are exposed to railway noise levels in excess of 70dB within the Belfast Agglomeration in relation to the L<sub>den</sub> scenario

### **Identification of potential problems and situations that may need to be improved.**

Over the first year of the Action Plan, DOE will develop with the other competent authorities, through the Northern Ireland Environmental Noise Directive Steering Group (NIENDSG), a methodology to determine appropriate and robust noise assessment criteria.

The aim of the methodology and criteria will be to minimise any uncertainty and to ensure that those criteria and management areas selected are relevant thereby enabling the most appropriate and cost effective action to be determined.

The noise assessment criteria, which may include the definition of limit values, will provide a framework for the detailed assessment of the strategic noise maps to inform the identification of priorities for the Action Plan. In the first instance, the criteria will be used to select Candidate Noise Management Areas and further refine the previously identified Candidate Quiet Areas (discussed further in 4.8).

### **A record of the public consultations organised in accordance with Article 8(7).**

During the development of this Action Plan, the Competent Authority undertook a formal consultation of the document with various stakeholders. A total of 9 responses were received of which 3 were substantive. These comments have been taken into account in this Action Plan.

**Any noise-reduction measures already in force and any projects in preparation.**

Translink have only one purpose built noise barrier which is at Central Station. This barrier is accompanied by a barrier diffuser system at the station end of Platform 3 and 4, at Central Station, Belfast. Other network features such as the concrete wall at Blythfield Curve will have noticeable impacts on noise. Rolling noise in railways is created by damaged wheels and tracks. If both can be kept smooth, noise can be reduced significantly. The move from cast-iron brake-blocks to disc brakes and composite blocks reduces brake noise levels. The track and rolling stock are regular monitored and maintained to help reduce noise impacts, and our Infrastructure Division has installed auto track lubrication systems on tight curves which help reduce frictional wear and noise.

Regarding vehicle procurement new buses must have drive-by noise attenuation surpassing EC/ECE70/157, and the specification for the additional new rolling stock project is that they must meet limits as defined Council Directive 96/48/EC on the interoperability of the trans-European high speed rail system and conventional rolling stock (2001/16/EC), which specifies maximum noise emission from trains. Implementation of these EUTSIs will lead to overall reductions in railway noise impact as the train fleet is renewed.

Noise related procedures regarding rail operations include Traction Instruction TI05-01-001 'Noise Abatement De-Dietrich Head End Power' which ensures Enterprise locomotives shut down their head-end power unit whilst moving between York Road Depot and Central Station.

**Actions which the Competent Authorities intend to take in the next five years, including any measures to preserve quiet areas.**

The Action Planning Process includes five key stages as outlined in the table below.

Stage	Description
1	Analysis of the strategic noise maps.
2	Identification and prioritisation of Candidate Noise Management Areas and Candidate Quiet Areas.
3	Confirmation of Noise Management Areas and Quiet Areas.
4	Evaluation of potential mitigation measures.
5	Evaluation of existing UK and Northern Ireland Policies, Plans and Programmes.

## Actions:

- Demonstrate our continuing commitment to managing noise associated with Translink's operations.
- Engage with our neighbours affected by Translink's operations and better understand their concerns and priorities.
- Influencing planning policy to minimise the number of noise sensitive properties around our network.
- Align the organisation to continue to efficiently and effectively manage noise pertaining to our operations – including incorporating noise reduction measures in the planning of engineering and maintenance works.
- Develop our understanding of noise issues to further inform our priorities, strategies and targets.

## **Long-term strategy.**

To promote the use of the best practicable means to minimizing existing noise impacts whilst providing a transformed network of coordinated bus and rail services which attracts a growing number of passengers, enjoys public confidence and is recognised for its quality and innovation.

## **Financial information (if available): budgets, cost-effectiveness assessment, cost-benefit assessment.**

Not available.

## **Provisions envisaged for evaluating the implementation and the results of the Action Plan.**

The current NIENDSG system has proved to be effective in developing this draft Noise Action Plan. Consideration will be given to the form in which the group will continue in order to facilitate ongoing planning work (including identification of Noise Management Areas), implementation of actions, and the development of future plans following the required five yearly reviews of the noise maps.

ACTION	PERFORMANCE INDICATOR
<b>Demonstrate our continuing commitment to managing noise associated with Translink's operations.</b>	
We will endeavour to ensure that relevant noise directives, regulations, codes of practice, etc are adhered too when procuring new buses, coaches and rolling stock	<ul style="list-style-type: none"> <li>○ Report on vehicle standards through Fleet Profile reporting.</li> </ul>
We will enforce and update noise abatement procedures relating to bus and train operations – including the limiting of vehicle idling.	<ul style="list-style-type: none"> <li>○ Procedures are monitored through divisional safety management systems.</li> </ul>
<b>Engage with our neighbours affected by Translink's operations and better understand their concerns and priorities.</b>	
We will provide a dedicated environmental email address – <a href="mailto:environment@translink.co.uk">environment@translink.co.uk</a> for environmental enquiries, including noise, relating to Translink, and utilise the existing customer services / complaints department with respect to our Passenger Charter.	<ul style="list-style-type: none"> <li>○ Number of contacts recorded.</li> </ul>
<b>Influence planning policy to minimise the number of noise sensitive properties around our network.</b>	
We will endeavour to engage with planners to ensure awareness of Translink's operations is considered in the development of sensitive sites.	<ul style="list-style-type: none"> <li>○ Number of interactions with local planning department.</li> </ul>



**Align the organisation to continue to efficiently and effectively manage noise pertaining to our operations**

<p>Noise complaints will be reported on the Translink TSMIS system and reported to the Translink Senior Management Environmental Committee.</p>	<ul style="list-style-type: none"> <li>○ Noise complaint trends.</li> </ul>
<p>Noise reduction measures will be incorporated in the planning of engineering and maintenance works, and new capital projects.</p>	<ul style="list-style-type: none"> <li>○ CEEQUAL and BREEAM assessments.</li> </ul>

**Develop our understanding of noise issues to further inform our priorities, strategies and targets.**

<p>We will undertake a review of data collected during the noise modelling phase and the feasibility of acquiring detailed information for all routes from Class 3000 vehicles.</p>	
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**Estimates in terms of the reduction of the number of people affected (annoyed, sleep, disturbed, or other).**

The variances in data available has resulted in noise levels be assigned to certain lines / routes which may not accurately reflect the current noise levels. The provision of accurate data for the Larne Line, for example, and maintenance activities, will help in providing a clearer picture of noise relating to the railway, and we believe significantly reduce the number of dwellings and population exposed to specific noise categories (noise levels 65-69 dB and above).

## 1. Introduction

### 1.1. *Purpose*

1.1.1. The purpose of this Railway Noise Action Plan is to describe how the Northern Ireland Transport Holding Company in conjunction with the Department<sup>1</sup> proposes to deliver their obligations under the Environmental Noise Directive for railway noise in Northern Ireland within the Agglomeration<sup>2</sup> of Belfast.

1.1.2. This is one of a set of five Action Plans, namely:

- The Roads Noise Action Plan;
- The Railways Noise Action Plan;
- The Industrial Noise Action Plan;
- The George Best Belfast City Airport Noise Action Plan; and
- The Belfast International Airport Noise Action Plan.

### 1.2. *Requirement of Noise Action Planning*

1.2.1. The European Parliament and Council Directive for Assessment and Management of Environmental Noise 2002/49/EC, more commonly referred to as the Environmental Noise Directive (END), was published in the Official Journal of the European Union in July 2002. The Directive deals with noise from roads, rail, and air traffic, and from agglomerations.

1.2.2. The aim of the Directive is to define a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise. The three main objectives of END are:

- To determine exposure to environmental noise, through noise mapping;
- To ensure information on environmental noise and its effects is made available to the public; and
- Adopt Action Plans based upon the mapping results, to prevent and reduce environmental noise where necessary, where exposure levels can induce harmful effects on human health and to preserve environmental noise quality where it is good.

1.2.3. The Environmental Noise Regulations (Northern Ireland) 2006 came into force on 20th October 2006 and apply to environmental noise levels, in particular in built-up areas, public parks or other quiet areas in agglomerations, and other noise-sensitive buildings and areas. The Regulations apply to noise from road, railway and airport sources, as well as industrial noise. The Regulations do not apply to noise that is caused

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<sup>1</sup> The competent authorities as per the Regulations are, Department of the Environment, Department for Regional Development, Northern Ireland Transport Holding Company and airport operators.

<sup>2</sup> Major Continuous Urban Area as set out within the Regulation No. 3

by the person exposed to the noise from, domestic activities, noise created by neighbours, noise at workplaces, or noise inside means of transport or due to military activities in military areas.

- 1.2.4. Annex V of the Directive requires that Action Plans must include the detail in Table 1.1 below. Their location in this plan is indicated.

No	Description	Location in this document
1	A description of the agglomerations, the major roads, major railways or major airports and other noise sources taken into account.	Section 3.1
2	The authority responsible.	Section 2.1
3	The legal context.	Section 2.2
4	Any limit values in place in accordance with Article 5.	None
5	A summary of the results of the noise mapping.	Section 3.2
6	An evaluation of the estimated number of people exposed to noise.	Section 3.3
7	Identification of potential problems and situations that may need to be improved.	Section 5.1
8	A record of the public consultations organised in accordance with Article 8(7).	Section 4
9	Any noise-reduction measures already in force and any projects in preparation.	Section 5.2
10	Actions which the competent authorities intend to take in the next five years, including any measures to preserve quiet areas.	Section 5.3
11	Long-term strategy.	Section 5.4
12	Financial information (if available): budgets, cost-effectiveness assessment, cost-benefit assessment.	Section 5.5
13	Estimates in terms of the reduction of the number of people affected (annoyed, sleep, disturbed, or other).	Section 5.7
14	Provisions envisaged for evaluating the implementation and the results of the action plan.	Section 5.6

**Table 1.1 – Annex V Minimum Requirements for Action Plan from Directive**

### **1.3. Current Status**

- 1.3.1. Under the NI Regulations a number of stages are outlined to manage and, where necessary, improve environmental noise. The first two of these are as follows:

Stage	Detail	Due Completion Date
1	Produce the first round of strategic noise maps for major roads, rail, airports, and agglomerations	31 March 2007
2	Competent Authority to draw up first round Action Plans to manage noise for railways.	30 April 2008 18 <sup>th</sup> July 2008 <sup>3</sup>

**Table 1.2 – Annex V Minimum Requirements for Action Plan from Directive**

- 1.3.2. Stage One, the creation of the first round of strategic noise maps, has been completed and published on the Northern Ireland Noise Map website [www.noiseni.co.uk](http://www.noiseni.co.uk).
- 1.3.3. The Department published draft guidance in accordance with the regulations for the purpose of identification of priorities for action plans in June 2008. This allowed the current process of preparing draft Action Plans and the subsequent consultation to take place.
- 1.3.4. On completion of the consultation, the Noise Action Plan will be finalised, adopted and formally submitted (summary) to the European Commission in January 2009.
- 1.3.5. The first round Action Planning Process will continue over a five year period (2008 – 2013). During the first year of the Action Plan, the Department will develop, with the other competent authorities, a methodology to determine;
- Noise map assessment criteria;
  - Noise Management Areas; and
  - To further assess previously identified Candidate Quiet Areas.
- 1.3.6. Thereafter, and throughout the remainder Action Plan period, the Department will work with the other competent authorities to:
- To make recommendations for action;
  - To consult on the recommendations for action; and
  - To update the plan as and when is necessary over the life of the plan.
- 1.3.7. This will be discussed more in Section 4.
- 1.3.8. At the end of the five year period, Noise Mapping and Action Plans will be reviewed and revised as part of the second round process required by the Directive.

<sup>3</sup> The 18<sup>th</sup> July applies to the industry and consolidated plans.

#### **1.4. *Layout of Action Plan***

- 1.4.1. Section 2 contains information on Policy context. Section 3 provides an outline of the characteristics of the areas considered as well as the findings of the noise mapping process. Section 4 Public Consultation, Section 5 gives details of the action planning process. This includes mitigation measures which may be already in place, financial information available and future provisions for targets, monitoring and review of the plan.

## 2. Policy Context

### 2.1. *The authority responsible*

2.1.1. The Environmental Noise Regulations (Northern Ireland) 2006 (the “Regulations”) sets out various responsibilities associated with the production of noise action plans. Various Competent Authorities are charged with the responsibility of producing noise action plans, and the Department of the Environment (DoE) is the designated Authority overseeing the implementation.

2.1.2. The Regulations state that the competent authority for drawing up Action Plans for:

- major railways; and
- railways within the agglomerations;  
is the Northern Ireland Transport Holding Company.<sup>4</sup>
- major airports; and
- other airports that were mapped;  
is the relevant airport operator.

2.1.3. The NIENDSG was set up by the Department in 2005 to provide input to the development of the strategic noise maps for Northern Ireland and subsequent Action Plans. This group is made of representatives from the competent authority responsible for each Action Plan. The representatives from the Northern Ireland Transport Holding Company relating to Railways is

- Translink.

### 2.2. *The legal context*

2.2.1. Directive 2002/49/EC relates to the assessment and management of environmental noise and is referred to as the Environmental Noise Directive or END<sup>5</sup>. The END requires Member States to produce strategic noise maps for the main sources of environmental noise, i.e. major roads, major railways, major airports. The Directive also requires strategic noise maps to be produced for agglomerations with a population of more than 250,000 persons and a certain population density in 2007 and those with a population of more than 100,000 persons and a certain population density in 2012 and subsequent rounds<sup>6</sup>. Action Plans must be produced based on the results of the noise mapping. The Regulations require the competent authorities to produce an Action Plan in 2008, 2013 and every five years thereafter, based on the results of the noise mapping.

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<sup>4</sup> See Appendices D for the schedule of railways for which maps were produced in the first round of mapping

<sup>5</sup> For further information see

[http://eur-lex.europa.eu/pri/en/oj/dat/2002/l\\_189/l\\_18920020718en00120025.pdf](http://eur-lex.europa.eu/pri/en/oj/dat/2002/l_189/l_18920020718en00120025.pdf)

<sup>6</sup> The population density, specified within the NI Regulations, is equal to or greater than 500 people per km<sup>2</sup>.

- 2.2.2. The Regulations also require the noise maps to be reviewed and revised, if necessary, from time to time and whenever a major development<sup>7</sup> occurs affecting the existing noise situation.
- 2.2.3. The first round the production of the noise mapping process was completed in December 2007.
- 2.2.4. The Regulations do not apply to noise caused by the person exposed to the noise, noise from domestic activities, noise created by neighbours, noise at work places, noise inside means of transport or due to military activities in military areas. They apply solely to environmental noise to which humans are exposed, in particular in built-up areas, in public parks or other quiet areas in an agglomeration, near schools, hospitals and other noise-sensitive buildings and area Noise from domestic activities or noise created by neighbours or construction sites can be dealt with under the Pollution Control and Local Government (Northern Ireland) Order 1978. Noise at work is governed by the Control of Noise at Work Regulations (Northern Ireland) 2006.
- 2.2.5. If a proposed development is likely to be a source of noise, its location and measures regarding the level or timing of noise emissions may be controlled through the planning system. Existing sources of noise such as road or rail traffic are not subject to planning control but they may be considered in the context of proposed development which may be affected by such sources.
- 2.2.6. Under Integrated Pollution Prevention and Control (IPPC) and the PPC Regulations 2007, there are existing controls in respect of major operational industrial sources, but at present there are no such controls over operational transportation sources and the preparation of noise mapping and Action Plans affords an opportunity to inform policy on such matters.
- 2.2.7. It is important that the action planning process takes into account the existing legislative and guidance framework that exists within Northern Ireland. The current policy and legislative framework for controlling environmental noise is detailed in Appendix A.
- 2.2.8. In addition to the above Action Plan will need to consider the wider context of local and national sustainable development plans, policies and strategies, including but not necessarily limited to, the following:
- Regional Development Strategy 2025;
  - Draft Belfast Metropolitan Area Plan 2015;
  - Regional Transportation Strategy for Northern Ireland 2002-2012;
  - Belfast Metropolitan Transport Plan 2015;
  - Regional Strategic Transport Network Transport Plan 2015;
  - Sub-Regional Transport Plan 2015;
  - Strategic Environmental Assessment Regulations;

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<sup>7</sup> The term 'major development' is not defined in the Regulations or the END

- Environmental Impact Assessment Regulations;
- Noise Insulation Regulations;
- Air Quality Regulations and Action Plans;
- A Planning Strategy for Rural Northern Ireland, 1993;
- Renewable Energy Action Plan;
- Local Authority Open Spaces policies;
- Planning Policy Statements and design guides;;
- Emerging climate change initiatives;
- Mosaic GI strategy for Northern Ireland;
- Urban Regeneration Strategies; and
- Noise Abatement Policy.

2.2.9. When detailed Action Plan recommendations have been developed, these will be assessed in the context of current plans, policies and strategies to establish potential synergies or conflicts.

### **2.3. Any limit values in place**

2.3.1. Currently there are no noise limit values set under the Environmental Noise Directive (END) for the UK. However, regard could be given to the guideline levels in Planning Policy 24 that advise England on land use with respect to noise from Railways. Although there are no immediate plans to introduce limit values, Defra and the DAs will keep the option under review during the implementation phase of the early rounds of action planning and when the Commission develops proposals for a revision of the END in 2010.

2.3.2. When considering candidate quiet areas, threshold values will also give weight to the soundscape value and residents' perception of an area as well as to an absolute noise level.



## 3. Characteristics

### **3.1 A description of the agglomerations, major railways**

3.1.1. Translink, on behalf of the Northern Ireland Transport Holding Company, are responsible for identifying and reporting sections of major railway, within the Northern Ireland Railways network, above the relevant threshold set out in the Regulations. For the first round of noise mapping in 2007 this threshold was 60,000 train passages per year, with no sections of major rail identified in Northern Ireland. The assessment of railway noise was therefore restricted to locations inside the Belfast agglomeration. Northern Ireland Railways network covers 210 route miles of track of which 55% is continuously welded and 45% is flat bottomed jointed track. Proposed track relay projects will enhance the coverage of continuously welded rail, particularly in the North West. The rail network also consists of almost 400 railway signals, 205 sets of points and 60 level crossings. Structures on the network include 700 bridges, 290 culverts, 3 tunnels, 10 miles of sea defences, 144 embankments and 124 platforms.

### **3.2 Definition of Areas mapped**

3.2.1. Under the Regulations there is a requirement to assess the noise levels from roads, railways industry and airports at locations within any agglomerations. An agglomeration is a continuous area of urban development extended around a town or city, including out lying suburbs. The agglomeration extents are determined by the department of Environment Northern Ireland under the Regulations.

3.2.2. There is also a requirement to assess the noise levels from “major roads”, “major railways” and “major airports” at any locations outside any agglomerations. For the first round of noise mapping in 2007:

- “major railways” are those sections of rail route above threshold of 60,000 vehicle passages per year<sup>8</sup>;

#### **Agglomeration of Belfast**

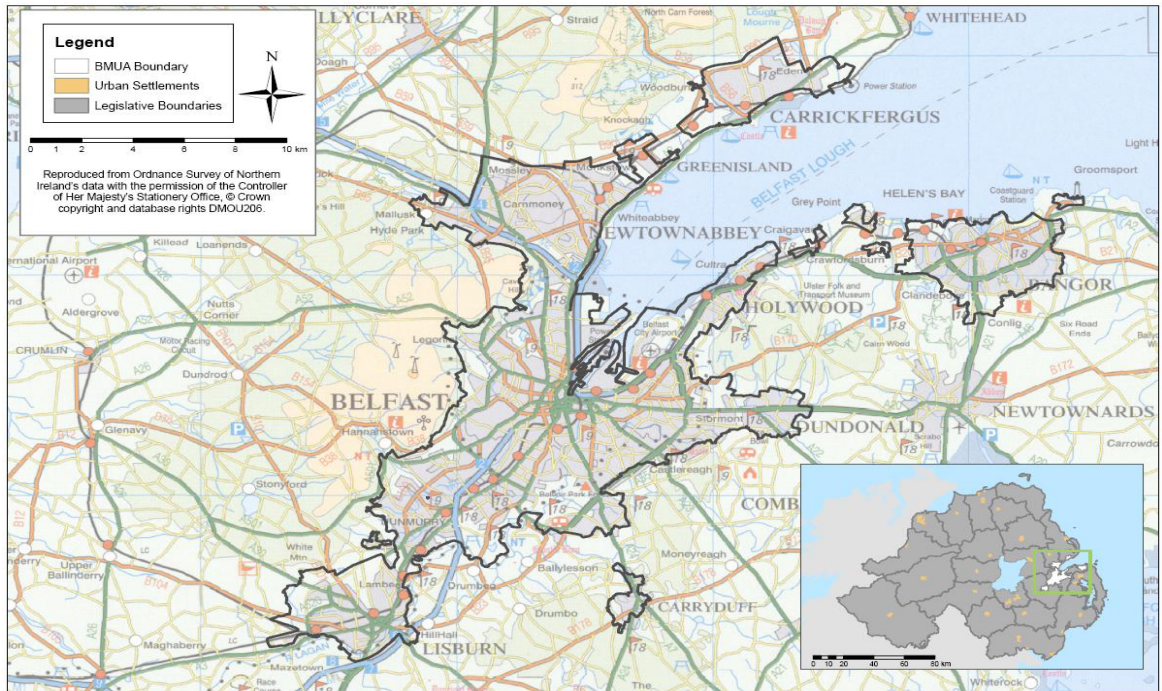
3.2.3. The mapping exercise for the agglomerations required the production of noise level maps for the extent of the Belfast agglomeration as defined in the Regulations. The Belfast Metropolitan Urban Area (BMUA) constitutes the agglomeration for the noise mapping project.

3.2.4. The mapping exercise for the agglomeration required the production of noise level maps for an area of approximately 198km<sup>2</sup>. Figure 3.1 shows the Belfast agglomeration for which the noise assessment was undertaken.

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<sup>8</sup> See Appendices D for the schedule of railways for which maps were produced in the first round of mapping

**Figure 3.1 Belfast agglomeration**



### **Extent of Railways**

- 3.2.5. Within agglomerations there is a requirement to assess the impact of all railways. There is also a requirement to assess the noise levels from “major railways” at any locations outside any agglomerations. A “major railway” is defined as one with in excess of 60,000 train passages per year.
- 3.2.6. At the time of the assessment there were no sections of major rail identified in Northern Ireland. The assessment of railway noise was therefore restricted to locations inside the Belfast agglomeration. Figure 3.5 shows the extent of railway lines modelled during the assessment of noise within the Belfast agglomeration.

### **3.3 A summary of the results of the noise mapping**

- 3.3.1. The approach set out within the Directive is to first undertake strategic noise mapping within agglomerations, and for major sources outside agglomerations, and then assess the numbers of people exposed to noise within 5 dB bands.
- 3.3.2. It should be noted that the noise mapping process produces maps which are to be used on a strategic level. There are limitations to the maps and it is accepted that noise levels represented by the maps do not necessarily reflect the noise level which would be experienced at any given point.
- 3.3.3. The results of the strategic noise mapping process help to gain an understanding of:
  - Where environmental noise is located;

- The approximate magnitude of noise levels within the assessment area; and
- Approximately how many people are exposed to differing levels of environmental noise.

3.3.4. The results of the area analysis for railways within the Belfast Agglomeration are set out in Table 3.1, indicating the area within each noise contour band.

Table 3.1: Area exposed to railway noise within the Belfast Agglomeration

Noise Scenario	Noise Category dB	Area (km <sup>2</sup> )
		Inside BMUA
L <sub>den</sub>	<50	189
	50-54	3
	55-59	3
	60-64	2
	65-69	1
	70-74	0
	≥75	0
	<b>Total</b>	<b>198</b>
L <sub>night</sub>	<45	192
	45-49	3
	50-54	2
	55-59	1
	60-64	0
	65-69	0
	≥70	0
	<b>Total</b>	<b>198</b>

3.3.5. Table 3.1 shows that the railways have little noise impact within the Belfast Agglomeration. With no major railways being identified and the limited rail network, the table shows an area of only 1 km<sup>2</sup> exposed to noise levels within the L<sub>den</sub> 65-69 contour band, and 189 km<sup>2</sup> (95%) with less than 50dB.

3.3.6. With limited railway operations during night time hours Table 3.1 again shows little noise impact from railways within the Belfast Agglomeration.

3.3.7. Following the establishment of noise assessment criteria by the NIENDSG, Northern Ireland Railways will determine, using these criteria, the number of noise sensitive premises that lie within each of the noise map contour bands for the purpose of making recommendations for action.

3.3.8. Where noise from a major source affects an agglomeration then prioritisation of recommendations for action will be agreed with the other relevant competent authorities via the NIENDSG.

Table 3.2:

Number of Dwellings exposed to noise categories within the BMUA  
All Railways

Noise Scenario	Noise Category dB	Dwellings
		Inside BMUA
L <sub>den</sub>	<50	248,528
	50-54	2,493
	55-59	1,383
	60-64	1,120
	65-69	513
	70-74	36
	≥75	0
	<b>Total</b>	<b>254,073</b>
L <sub>night</sub>	<45	250,705
	45-49	1,550
	50-54	1,138
	55-59	553
	60-64	127
	65-69	0
	≥70	0
	<b>Total</b>	<b>254,073</b>

- 3.3.9. An initial approximation of the exposure of noise sensitive buildings has been undertaken by assessing the number of “dwellings”, as defined in the Northern Ireland Census 2001 with each noise contour band on the strategic noise maps. Table 3.2 shows the number of dwellings exposed to noise from railways within the Belfast Agglomeration.
- 3.3.10. Table 3.2 shows that for the L<sub>den</sub> noise scenario 98% of dwellings (248,528) within the Belfast Agglomeration are exposed to railway noise less than 50dB. No dwellings are exposed to noise levels in excess of 75 dB.

### **3.4 An evaluation of the estimated number of people exposed to noise**

- 3.4.1. The results of the population analysis for railways within are set out in Table 3.3. The table shows that only 58 people are exposed to railway noise levels in excess of 70dB within the Belfast Agglomeration in relation to the L<sub>den</sub> scenario.

Table 3.3: Population living within dwellings exposed to noise from railways.

Noise Scenario	Noise Category dB	Population
		Inside BMUA
L <sub>den</sub>	<50	566,121
	50-54	4,638
	55-59	2,693
	60-64	2,023
	65-69	760
	70-74	58
	≥75	0
	<b>Total</b>	<b>576,293</b>
L <sub>night</sub>	<45	570,255
	45-49	2,938
	50-54	2,068
	55-59	831
	60-64	201
	65-69	0
	≥70	0
	<b>Total</b>	<b>576,293</b>

3.4.2. This preliminary analysis of the strategic noise maps sets the potential scope for the Action Planning Process. This analysis will inform the derivation of noise assessment criteria by the NIENDSG and will be supplemented by more detailed analysis used to identify potential Noise Management Areas and Quiet Areas.

## 4. Public Consultations

4.1.1. During the development of this Action Plan, the Competent Authority undertook a formal consultation of the document with various stakeholders including the following:

- Disability Action
- Belfast City Council
- Belfast Health and Social Care Trust
- Irish Branch of the Institute of Acoustics
- Northern Ireland Tourist Board
- Statutory Advisory Council Secretariat
- CAA Aerodrome Standards Department
- Belfast City Airport Watch

4.1.2 The formal public consultation commenced on 1<sup>st</sup> December 2008 with responses being required by 26<sup>th</sup> January 2009.

4.1.3 Of the above stakeholders, a total of 9 responses were received of which 3 were substantive. These comments have been taken into account in this Action Plan.

## 5. Action Planning Process

### 5.1 Identification of problems and situations that need to be improved.

#### ***Aim of Action Plans***

- 5.1.1. In accordance with the aims and objectives of the Directive, the proposals within this Action Plan are focussed upon:

*“preventing and reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and to preserving environmental noise quality where it is good.”*

#### ***Effects of Noise***

- 5.1.2. There are many different effects of noise, and individuals experience each of them to different degrees. It is known that noise can disturb human activity, by causing distraction or by physically interfering with it. These effects can include:

- general detection/distraction;
- speech interference;
- disruption of work/mental activity; and
- sleep disturbance.

Any of these can lead to annoyance and possibly more overt reactions, including complaints.

- 5.1.3. In addition there are physiological effects that can occur including stress and other health effects<sup>9</sup>. The nature of these effects is much less certain, although it is known that noise can cause a variety of biological reflexes and responses referred to as stress reactions. Whether, over a period of time, these reactions could lead to clinically recognisable disease is unclear. The possibility that severe annoyance might itself induce stress cannot be ignored<sup>10</sup>.

- 5.1.4. Noise is an inevitable consequence of a mature and vibrant society. People enjoy a benefit from road, rail and air transport and industrial processes, and these benefits manifests themselves in terms of business, leisure, the movement of goods and employment. When managing the environmental noise that arises from transportation noise sources, we have to strike a balance.

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<sup>9</sup> Exposure to noise can cause direct auditory effects, i.e. noise induced hearing loss. Exposure to environmental noise tends to be at a level where the risk of this effect occurring is very small.

<sup>10</sup> The World Health Organisation provides a range of evidence on the effects of exposure to environmental noise – more information at [www.who.int/topics/noise/en/](http://www.who.int/topics/noise/en/)

### **Noise Assessment Criteria**

- 5.1.5. Before any measures to manage noise can be explored, the potential problems need to be identified by way of detailed and consistent assessment.
- 5.1.6. Over the first year of the Action Plan, DOE will develop with the other competent authorities, through the NIENDSG, a methodology to determine appropriate and robust criteria for identifying which areas are exposed to unacceptable levels of noise and therefore which areas should be investigated for potential action.
- 5.1.7. The aim of the methodology and criteria will be to minimise any uncertainty and to ensure that those criteria and management areas selected are relevant thereby enabling the most appropriate and cost effective action to be determined.
- 5.1.8. In developing the criteria, the NIENDSG will take account of guidance and other publications elsewhere within the UK and Europe and will also consider the findings of on-going research into health effects such as the 'annoyance' level and sleep disturbance.
- 5.1.9. The noise assessment criteria, which may include the definition of limit values, will provide a framework for the detailed assessment of the strategic noise maps to inform the identification of priorities for the Action Plan. In the first instance, the criteria will be used to select Candidate Noise Management Areas and further refine the previously identified Candidate Quiet Areas.

### **5.2 Any noise reduction measures already in force and any projects in preparation.**

- 5.2.1 Translink have only one purpose built noise barrier which is at Central Station, Belfast. This barrier is accompanied by a barrier diffuser system at the station end of Platform 3 and 4, at Central Station. Other network features such as the concrete wall at Blythfield Curve will have noticeable impacts on noise. Rolling noise in railways is created by damaged wheels and tracks. If both can be kept smooth, noise can be reduced significantly. The move from cast-iron brake-blocks to disc brakes and composite blocks reduces brake noise levels. The track and rolling stock are regularly monitored and maintained to help reduce noise impacts, and our Infrastructure Division has installed auto track lubrication systems on tight curves which help reduce frictional wear and noise.
- 5.2.2 Regarding vehicle procurement new trains must have drive-by noise attenuation surpassing EC/ECE70/157, and the specification for the additional new rolling stock project is that they must meet limits as defined by Council Directive 96/48/EC on the interoperability of the trans-European high speed rail system and conventional rolling stock (2001/16/EC), which specifies maximum noise emission from trains. Implementation of these EUTSIs will lead to overall reductions in railway noise impact as the train fleet is renewed.

5.2.3 Noise related procedures regarding rail operations include Traction Instruction TI05-01-001 'Noise Abatement De-Dietrich Head End Power' which ensures Enterprise locomotives shut down their head-end power unit whilst moving between York Road Depot and Central Station.

### **5.3 Actions which the competent authority intends to take in the next five years, including measures to preserve quiet areas.**

In the short-term Translink will review the information provided by the mapping process to identify specific areas for action. We will also:

- Demonstrate our continuing commitment to managing noise associated with Translink's operations.
- Engage with our neighbours affected by Translink's operations and better understand their concerns and priorities.
- Influencing planning policy to minimise the number of noise sensitive properties around our network.
- Align the organisation to continue to efficiently and effectively manage noise pertaining to our operations – including incorporating noise reduction measures in the planning of engineering and maintenance works.
- Develop our understanding of noise issues to further inform our priorities, strategies and targets.

### **5.4 Long-Term Strategy**

To promote the use of the best practicable means to minimizing existing noise impacts whilst providing a transformed network of coordinated bus and rail services which attracts a growing number of passengers, enjoys public confidence and is recognised for its quality and innovation.

### **5.5 Financial Information, Budgets, Cost-Effectiveness Assessment, Cost-Benefit Assessment.**

Type	Description	Approximate Cost
Staff Costs	Translink HSE Department,	£10,000
	Translink Marketing Department, External Consultants.	
Equipment Costs	Noise monitoring equipment and maintenance.	£2000



Media Campaigns / Publications	Engineering and maintenance works, leaflet drops and poster campaigns.	£1500
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## 5.6 Provisions envisaged for evaluating the implementation and the results of the Action Plan.

ACTION	PERFORMANCE INDICATOR
<b>Demonstrate our continuing commitment to managing noise associated with Translink's operations.</b>	
We will endeavour to ensure that relevant noise directives, regulations, codes of practice, etc are adhered too when procuring new buses, coaches and rolling stock	<ul style="list-style-type: none"> <li>○ Report on vehicle standards through Fleet Profile reporting.</li> </ul>
We will enforce and update noise abatement procedures relating to bus and train operations – including the limiting of vehicle idling.	<ul style="list-style-type: none"> <li>○ Procedures are monitored through divisional safety management systems.</li> </ul>
<b>Engage with our neighbours affected by Translink's operations and better understand their concerns and priorities.</b>	
We will provide a dedicated environmental email address – <a href="mailto:environment@translink.co.uk">environment@translink.co.uk</a> for environmental enquiries, including noise, relating to Translink, and utilise the existing customer services / complaints department with respect to our Passenger Charter.	<ul style="list-style-type: none"> <li>○ Number of contacts recorded.</li> </ul>

**Influence planning policy to minimise the number of noise sensitive properties around our network.**

We will endeavour to engage with planners to ensure awareness of Translink’s operations is considered in the development of sensitive sites.

- Number of interactions with local planning department.

**Align the organisation to continue to efficiently and effectively manage noise pertaining to our operations**

Noise complaints will be reported on the Translink TSMIS system and reported to the Translink Senior Management Environmental Committee.

- Noise complaint trends.

Noise reduction measures will be incorporated in the planning of engineering and maintenance works, and new capital projects.

- CEEQUAL and BREEAM assessments.

**Develop our understanding of noise issues to further inform our priorities, strategies and targets.**

We will undertake a review of data collected during the noise modelling phase and the feasibility of acquiring detailed information for all routes from Class 3000 vehicles.

## **5.7 Estimates in terms of the reduction of the number of people affected (annoyed, sleep disturbed or other).**

As highlighted in Section 4.1 the data available from the new Class 3000 CAF trains provided an accurate method and resolution to fulfil the modelling exercise, providing accurate train speed for example, however, this information, at the time, was only available on certain routes. Other difficulties arose in collecting accurate data for infrastructure maintenance movements and depot maintenance movements. The variances in data available has resulted in noise levels being assigned to certain lines / routes which may not accurately reflect the current noise levels. The provision of accurate data for the Larne Line, for example, and maintenance activities, will help in providing a clearer picture of noise relating to the railway, and we believe significantly reduce the number of dwellings and population exposed to specific noise categories (noise levels 65-69 dB and above).

## Appendices

## **Appendix A**

### **List of Current Policy and Legislative Framework for Controlling Environmental Noise in Northern Ireland.**

Air Navigation Order 2005

Air Navigation (Environmental Standards) Order 2002

The Airports (NI) Order 1994 Aeroplane Noise Regulations 1999

Land Acquisition and Compensation (Northern Ireland) Order 1973

Pollution Control and Local Government (NI) Order 1978

Pollution Prevention and Control Regulations (Northern Ireland) 2003

Noise Insulation Regulations (NI) 1995

Aeroplane Noise Regulations 1999

Aeroplane Noise (Amendment) Regulations 1999

Air Navigation (General) Regulations 1999

The Aerodromes (Noise Restrictions) (Rules and Procedures) Regulations 2003

The Environmental Assessment of Plans and Programmes Regulations (NI) 2004

The Civil aviation Act 2006

Environmental Noise Regulations (Northern Ireland) 2006.

### **Relevant Policy and Guidance Publications.**

Control of Noise (Code of Practice for Construction and Open Sites) Order (NI) 2002

Calculation of Road Traffic Noise Department of Transport 1998 - NI Modification

Design Manual for Roads and Bridges Volume 11 Section3 Part 7 Traffic Noise and Vibration Land Compensation - Your Rights Explained DOE (NI)

Land Compensation Your rights explained - Insulation against Traffic Noise 1995

DOE Control of Noise at Surface Mineral Workings 1990

DOE Environmental Effects of Surface Mineral Workings 1992

BS 5228 Noise & Vibration Control on Construction and Open Sites

Part 1 1997 - Code of Practice for basic info and procedures for noise & vibration control

Part 2 1997 - Guide to noise & vibration control legislation for construction and demolition including road construction and maintenance

BS 5228 Part 3 1997 - Code of Practice applicable to surface coal extraction by open cast methods

BS 5228 Part 4 1992 - Code of Practice for noise and vibration from piling operations

BS 5228 Part 5 1997 - Code of Practice applicable to surface mineral extraction (except coal) sites

BS 4142: 1997 - Method of rating industrial noise affecting mixed residential and industrial areas

BS 6472 1992 - Guide to Evaluation of human exposure to vibration in buildings (1Hz to 80 Hz)

BS 7385 Part 1 1990 – Evaluation and Measurement for Vibration in Buildings – Guide for measurement and evaluation of their effects on buildings

BS 7385 Part 2 1993 - Evaluation and Measurement for Vibration in buildings - Guide to damage levels from ground borne vibration

BS 7445 Part 1: 1999 - Description and measurement of environmental noise

BS 7445 Part 2: 1999 - Guide to the acquisition of data pertinent to land use

BS 7445 Part 3: 1999 - Guide to the application of noise limits.

BS 8233 1999 - Sound Insulation and noise reduction for buildings – Code of Practice

DEFRA - Low Frequency Noise 2002

Delivering the goods – a toolkit for improving night time-deliveries Freight Transport Association in consultation with Department for Transport

Calculation of Railway Noise 1995 Department of Transport

Environment Agency IPPC Draft Noise Guidance Part 1 Regulation and Permitting 2001

Environment Agency Horizontal Guidance for Noise Part 2 - Noise Assessment and Control 2001

The Noise Insulation (Railways and other Guided Transport Systems) Regulations 1996 DEFRA – A Review of Published Research On High Freq. Noise and It Effects – May 2003

DOE Circular 10/73 Planning and Noise (19 January 1973)

Environmental Impact Assessment (August 1999)

DMRB Screening Method Spreadsheet Version 1.02 November 2003

Transport Assessment; Guidelines for Development Proposals in N. Ireland Nov 06  
DRD/DOE

ODPM -PPG24: Planning and Noise (1994)

## Appendix B

## Glossary of Acoustic and Technical Terms

Term	Definition
Agglomeration	Major Continuous Urban Area as set out within the Regulations
ASL	Above Sea Level
Attribute Data	A trait, quality, or property describing a geographical feature, e.g. vehicle flow or building height
Attributing (Data)	The linking of attribute data to spatial geometric data
BCA	Belfast City Airport
BIA	Belfast International Airport
CRN	The Calculation of Railway Noise 1995. The railway prediction methodology published by the UK Department of Transport.
CRTN	The Calculation of Road Traffic Noise 1988. The road traffic prediction methodology published by the UK Department of Transport.
Data	Data comprises information required to generate the outputs specified, and the results specified
dB	Decibel
DEM	Digital Elevation Model
DSM	Digital Surface Model
DTM	Digital Terrain Model
DVD	Digital Versatile Disk
EC	European Commission
END	Environmental Noise Directive (2002/49/EC)
First Round Agglomeration	An agglomeration but having a population in excess of 250,000 persons.
GIS	Geographic Information System
INM	Integrated Noise Model
Irish National Grid (ING)	The official spatial referencing system of Ireland
ISO	International Standards Organisation
Metadata	Descriptive information summarising data
NA	Not Applicable
Noise Bands	Areas lying between contours of the following levels (dB): $L_{den}$ <55, 55 – 59, 60 – 64, 65 – 69, 70 – 74, >74 $L_d$ <55, 55 – 59, 60 – 64, 65 – 69, 70 – 74, >74 $L_e$ <55, 55 – 59, 60 – 64, 65 – 69, 70 – 74, >74 $L_n$ <50, 50 – 54, 55 – 59, 60 – 64, 65 – 69, >69



<b>Term</b>	<b>Definition</b>
Noise Levels	Free-field values of $L_{den}$ , $L_d$ , $L_e$ , $L_n$ , and $L_{A10,18h}$ at a height of 4m above local ground level
Noise Level - $L_d$ - Daytime	$L_d$ (or $L_{day}$ ) = $L_{Aeq,12h}(07:00 \text{ to } 19:00)$
Noise Level - $L_e$ - Evening	$L_e$ (or $L_{evening}$ ) = $L_{Aeq,4h}(19:00 \text{ to } 23:00)$
Noise Level - $L_n$ - Night	$L_n$ (or $L_{night}$ ) = $L_{Aeq,8h}(23:00 \text{ to } 07:00)$
Noise Level - $L_{den}$ - Day/Evening/Night	A noise rating indicator based upon $L_d$ , $L_e$ and $L_n$ as follows: $L_{den} = 10 * \lg \left[ \frac{1}{24} \left\{ 12 * 10^{((L_{day})/10)} + 4 * 10^{((L_{evening}+5)/10)} + 8 * 10^{((L_{night}+10)/10)} \right\} \right]$
Noise Level – $L_{A10,18h}$	$L_{A10,18h} = L_{A10,18h} (06:00 \text{ to } 24:00)$
Noise Mapping (Input) Data	Two broad categories: (1) Spatial (e.g. road centre lines, building outlines). (2) Attribute (e.g. vehicle flow, building height – assigned to specific spatial data)
Noise Mapping Software	Computer program that calculates required noise levels based on relevant input data
Noise Model	All the input data collated and held within a computer program to enable noise levels to be calculated.
Noise Model File	The (proprietary software specific) project file(s) comprising the noise model
Output Data	The noise outputs generated by the noise model
OSNI	Ordnance Survey for Northern Ireland
Processing Data	Any form of manipulation, correction, adjustment factoring, correcting, or other adjustment of data to make it fit for purpose. (Includes operations sometimes referred to as 'cleaning' of data)
QA	Quality Assurance
Shapefile	ESRI proprietary GIS dataset format. Contains both geometry to define features, and associated alphanumeric attribute information.
Spatial (Input) Data	Information about the location, shape, and relationships among geographic features, for example road centre lines and buildings.
WG - AEN	Working Group – Assessment of Exposure to Noise

## Appendix C Schedule of railways within Belfast agglomeration

### NI Passenger Rail Movements 2006

J_ID	TRAIN	TYPE	LINE	ROUTE	24H	DAY	EVE	NIGHT	6H	18H
P1	Class 3000	Stopper	Bangor-Portadown	Bangor - Belfast Central	10967	8008	2278	681	57	10910
P2	Class 3000	Flyer	Bangor-Portadown	Bangor - Belfast Central	2602	2347	0	255	0	2602
P3	Class 3000	Stopper	Bangor-Portadown	Belfast Central - GVS	13658	10501	2278	879	0	13658
P4	Class 3000	Stopper	Bangor-Portadown	GVS - Lisburn	10655	8263	1768	624	0	10655
P5	Class 3000	Flyer	Bangor-Portadown	GVS - Lisburn	2805	2295	255	255	0	2805
P6	Class 3000	Stopper	Bangor-Portadown	Belfast Central - Bangor	10546	7899	2023	624	0	10546
P7	Class 3000	Flyer	Bangor-Portadown	Belfast Central - Bangor	2040	2040	0	0	0	2040
P8	Class 3000	Stopper	Bangor-Portadown	GVS - Central	13096	10501	1716	879	0	13096
P9	Class 3000	Stopper	Bangor-Portadown	Lisburn - GVS	10405	7441	2028	936	57	10348
P10	Class 3000	Flyer	Bangor-Portadown	Lisburn - GVS	3315	2805	255	255	0	3315
P11	Class 450	Stopper	Belfast - Carrickfergus/Larne	Central - Carrickfergus	10833	7978	1607	1248	312	10521
P12	Class 450	Stopper	Belfast - Carrickfergus/Larne	GVS - Central (Carrickfergus)	5364	4522	332	510	0	5364
P13	Class 450	Stopper	Belfast - Carrickfergus/Larne	Carrickfergus - Central	10323	8149	1555	619	0	10323
P14	Class 450	Flyer	Belfast - Carrickfergus/Larne	Carrickfergus - Central	510	510	0	0	0	510
P15	Class 450	Stopper	Belfast - Carrickfergus/Larne	Central - GVS	5057	4777	280	0	0	5057
P16	Class 3000	Stopper	Belfast - Londonderry	Central - Antrim	3271	2595	676	0	0	3271
P17	Class 3000	Stopper	Belfast - Londonderry	GVS - Central (LY)	3271	2283	676	312	0	3271
P18	Class 3000	Stopper	Belfast - Londonderry	Antrim - Central (LY)	3271	2231	1040	0	312	2959
P19	Class 3000	Stopper	Belfast - Londonderry	Central - GVS (LY)	3271	2231	1040	0	0	3271
P20	Enterprise	Stopper	Belfast - Dublin	Central - Dublin	2756	2132	312	312	0	2756
P21	Enterprise	Stopper	Belfast - Dublin	Dublin - Central	2756	2028	728	0	0	2756
P22	Class 3000	Terminating	Bangor-Portadown	Bangor - Belfast Central	832	520	0	312	0	832
P23	Class 3000	Terminating	Bangor-Portadown	Portadown - Belfast Central	1237	879	358	0	0	1237
P24	Class 450	Terminating	Belfast - Carrickfergus/Larne	Carrickfergus - Central	5724	4080	1332	312	0	5724
P25	Class 450	Terminating	Belfast - Carrickfergus/Larne	Belfast Central - Carrickfergus	3432	3120	0	312	0	3432

**Supplementary Data**

<b>ROUTE / LINE</b>	<b>OPERATED BY</b>	<b>TRAIN CONFIGURATION</b>	<b>MAXIMUM SPEED</b>
Bangor-Portadown	Class 3000	3-car diesel multiple unit comprising of two Driving Motor (DM) vehicles and on Trailer Motor (TM) vehicle per unit.	90mph (144kmh)
Belfast – Carrickfergus / Larne Line	Class 450	3-car Diesel Electric Multiple Unit (DEMU) consisting of a driving Motor Brake Standard (DMBS), Driving Trailer Standard (DTS) and Trailer Standard (DS). Built on former British Rail Mark I coach underframes by BREL Derby utilising second hand English Electric 560bhp 4SRKT Engine salvaged from ex-NIR Class 70 vehicles	No details provided
Belfast – Londonderry Line	Class 3000	3-car diesel multiple unit comprising of two Driving Motor (DM) vehicles and on Trailer Motor (TM) vehicle per unit.	90mph (144kmh)
Belfast – Dublin Line	Enterprise Train (Class 201 Loco and 8 Carriages)	Class 201 Locomotive built by General Motors Canada powered by GM3200bhp engine. Operates in conjunction with Enterprise De-Dietrich coaching stock in push / pull mode. Built by Alstrom De-Deitrich Ferroviare France. Normally 8 carriages including catering and driving trailer brake.	No details provided

### NI Engineering Rail Movements 2006

J_ID	TRAIN	TYPE	ROUTE	24H	DAY	EVE	NIGHT	6H	18H
E1	Tamper & Liner and Ballast Regulator	(2 vehicles)	York Road Depot – Carrickfergus	15	0	0	15	5	10
E2	Tamper & Liner and Ballast Regulator	(2 vehicles)	Carrickfergus – York Road Depot	15	0	0	15	5	10
E3	Tamper & Liner and Ballast Regulator	(2 vehicles)	York Road Depot – Lisburn	40	0	0	40	10	30
E4	Tamper & Liner and Ballast Regulator	(2 vehicles)	Lisburn – York Road Depot	40	0	0	40	10	30
E5	Tamper & Liner and Ballast Regulator	(2 vehicles)	York Road Depot - Antrim	40	0	0	40	10	30
E6	Tamper & Liner and Ballast Regulator	(2 vehicles)	Antrim – York Road Depot	40	0	0	40	10	30
E7	Tamper & Liner and Ballast Regulator	(2 vehicles)	York Road Depot - Bangor	15	0	0	15	5	10
E8	Tamper & Liner and Ballast Regulator	(2 vehicles)	Bangor -York Road Depot	15	0	0	15	5	10
E9	GM loco		York Road Depot - Antrim	40	20	0	20	7	33
E10	GM loco		Antrim – York Road Depot	40	20	0	20	7	33
E11	GM loco and hoppers		Antrim - Belfast - Portadown	40	20	0	20	7	33
E12	GM loco and hoppers		Portadown - Belfast - Antrim	40	20	0	20	7	33
E13	GM loco		York Road Depot - Adelaide	40	20	0	20	7	33
E14	GM loco		Adelaide - York Road Depot	40	20	0	20	7	33
E15	GM loco and hoppers		Adelaide - Portadown	40	20	0	20	7	33
E16	GM loco and hoppers		Portadown - Adelaide	40	20	0	20	7	33
E17	GM loco - training		York Road - Templepatrick	70	0	0	70	15	55
E18	GM loco - training		Templepatrick - York Road	70	0	0	70	15	55
E19	GM loco + Flat Bed Wagons		York Road Depot - Carrickfergus	6	1	0	5	1	5
E20	GM loco + Flat Bed Wagons		Carrickfergus - York Road Depot	6	1	0	5	1	5
E21	GM loco + Flat Bed		York Road Depot - Lisburn	15	5	0	10	3	12

	Wagons								
E22	GM loco + Flat Bed Wagons		Lisburn - York Road Depot	15	5	0	10	3	12
E23	GM loco + Flat Bed Wagons		York Road Depot - Antrim	20	5	0	15	5	15
E24	GM loco + Flat Bed Wagons		Antrim - York Road Depot	20	5	0	15	5	15
E25	GM loco + Flat Bed Wagons		York Road Depot - Bangor	6	1	0	5	1	5
E26	GM loco + Flat Bed Wagons		Bangor - York Road Depot	6	1	0	5	1	5
E27	VMT and Sandite Train		York Road - Portadown - Bangor - Carrick - York Road	200	100	0	100	25	175

#### Supplementary Data

J ID	NOTES
E1 – E8	2 separate vehicles, can either work together one after the other or the tampler & liner may work one night and the regulator will regulate the ballast the next night.
E9 – E16	GM loco and normally four hoppers are used to collect and transport ballast. The hoppers are normally kept at Antrim or Adelaide. For example if kept at Antrim a GM loco would leave York Road, collect hoppers in Antrim and pass back through Belfast collect ballast at Pontzpass return to Antrim drop hoppers and loco would return to York Road.
E11 – E12	GM loco used as training train between York Road and Templepatrick at night. Loco operated over a couple of weeks travelling between York Road and Templepatrick 7-8 times per night = 70 total return trips.
E19 – E26	GM loco and flatbed wagon movements
E27	VMT and Sandite Train used during leaf fall season and used in tandem, one after the other. Starts mid September until Christmas once during the day and once at night. Sandite train is a converted Class 80 train. Covers York Road to Portadown to Carrick to Bangor and returns to York Road.

It was assumed that these movements enter and leave the York Road depot from the Belfast end.

### NI Out-of-Service Passenger Rail Movements 2006

J_ID	TRAIN	MOVEMENT TYPE	ROUTE	24H	DAY	EVE	NIGHT	6H	18H
OS1	110 - Loco	Vehicle	To York Road Depot	365	365	0	0	0	365
OS2	201 - Loco	Vehicle	To York Road Depot	730	0	730	0	0	730
OS3	Mk IIf/I Ib Coach	Vehicle	To York Road Depot	1825	1825	0	0	0	1825
OS4	Enterprise Loco Hauled Pass Coach	Vehicle	To York Road Depot	5840	0	5840	0	0	5840
OS5	450	Train	To York Road Depot	2555	1095	730	730	0	2555
OS6	3000 -CAF	Train	To York Road Depot	2190	1460	730	0	0	2190
OS7	80	Vehicle	To York Road Depot	365	0	365	0	0	365
OS8	110 - Loco	Vehicle	Leaving York Road Depot	365	365	0	0	0	365
OS9	201 - Loco	Vehicle	Leaving York Road Depot	730	365	0	365	0	730
OS10	Mk IIf/I Ib Coach	Vehicle	Leaving York Road Depot	1825	1825	0	0	0	1825
OS11	Enterprise Loco Hauled Pass Coach	Vehicle	Leaving York Road Depot	5840	2920	0	2920	0	5840
OS12	450	Train	Leaving York Road Depot	2555	1095	0	1460	0	2555
OS13	3000 -CAF	Train	Leaving York Road Depot	2190	1095	365	730	0	2190
OS14	80	Vehicle	Leaving York Road Depot	365	0	0	365	0	365

NOTE: All movements have been provided as vehicle movements however Class 3000 and Class 450 movements to and from York Road depot have been provided per train.

#### Supplementary Data

Movements presented in Appendix D are for those trains which services start or finish at either Belfast Central or Great Victoria Street. It was assumed that these trains enter and leave the York Road depot from the Belfast end.

