

**Tyne and Wear Freight Partnership Rail Freight – Baseline Assessment**

Tyne and Wear Local Transport Plan Core Team  
April 2007

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# 1 Introduction

## 1.1 Purpose of the Report

The purpose of this report is to outline the current position with respect to rail freight in Tyne and Wear in order to provide a context for assessing the potential for increasing the volume of rail freight moved in the conurbation. This has been carried out as part of the Tyne and Wear Freight Action Plan for the Local Transport Plan team. To date, the majority of work undertaken as part of the action plan has focused on road freight transport as the local authorities have greater scope to affect change in this area. However, the Partnership considers that it is also important to investigate the potential for modal shift from road to rail. This could assist in reducing HGV movements and hence help to reduce congestion on the road network, which has increased considerably in recent years and additionally help to reduce the impact of freight on air quality as rail freight is between four and ten times less polluting than road freight (Railfreight Group Research 2007).

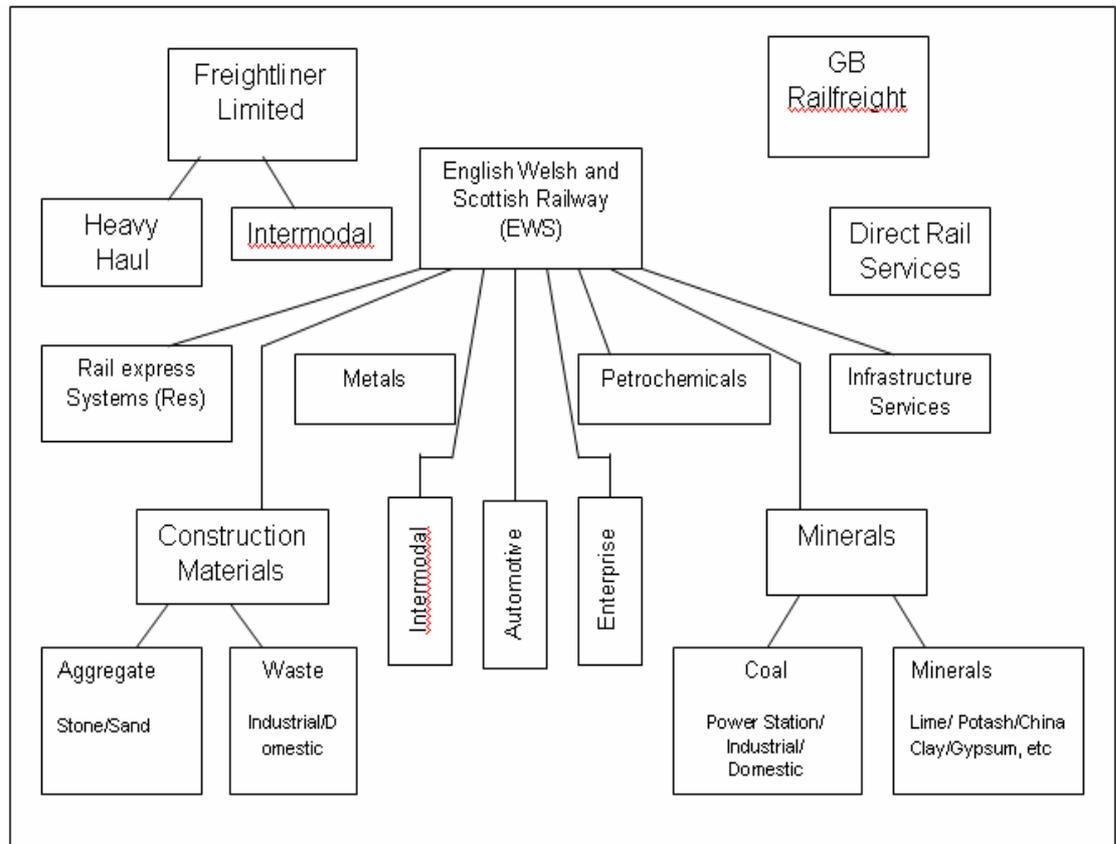
Important information sources in compiling this baseline assessment have been the Freightmaster National Railfreight Timetable No 41 (2006), the Rail Atlas of Great Britain and Ireland and Network Rail's Freight Utilisation Strategy (March, 2007).

## 1.2 National Rail Freight Operating Structure

There are currently four main railfreight operating companies (FOC's) with four further new entrants to the market over the last year. The four main companies that operate services in the North East are:

1. **English Welsh and Scottish (EWS)** which run the majority of freight services in the country, including all the channel tunnel traffic.
2. **Freightliner Limited** which initially specialised in running high speed, domestic deep-sea container train services, but has since entered the bulk haul business, and won several contracts from EWS.
3. **Direct Rail Services** which is a subsidiary of British Nuclear Fuels Limited operates all nuclear waste and associated trains to and from Sellafield reprocessing plant; plus several daily logistics services between Aberdeen/ Grangemouth and Daventry on behalf of WH Malcolm, Russells and Eddie Stobart.
4. **GB Railfreight (GBRF) which started in 2001** is owned by the First Group and has already won major contracts for intermodal, gypsum and departmental services and in 2007 has won its first contract for carrying coal. This service is running from the North East to a Yorkshire Power Station.

This organisational structure is represented in **Figure 1**.

**Figure1 - Organisation Chart for Rail Operators**

### 1.3

#### **Rail Freight Operations in Tyne and Wear**

Approximately 80% of rail freight services through Tyne and Wear are operated by EWS. Most of the remaining services are operated by Freightliner, whilst there are a limited number of services operated by GB Railfreight and Direct Rail Services (DRS).

The East Coast Main Line, the main rail line in the North East, is now reaching its capacity. Although freight traffic in the area appears to be constrained by line capacity on the ECML and Durham Coast Line (DCL) this is truer for some FOCs than others. There are quite a lot of unused paths/rights over this section. They only become available on a week-by-week basis once the trains are formally cancelled. Network Rail are taking steps to make such paths more widely available. Capacity is beginning to get tighter even allowing for this.

Recent (2007) figures from Network Rail report that there are 32 freight trains per day in each direction via Durham at present. There are 3 Tyne Dock trains that currently go via Durham Coast. There is something in the order of 40 freight paths per day in each direction via Durham at present. 40 paths is a conservative figure as the route via Durham did manage to cope with an extra 18 freight trains per day during Settle and Carlisle diversions in 2006.

There is increasing competition for rail freight paths, which could impact on the opportunity for increasing the volume of rail freight to/from the North East. The paths allocated to rail freight are about 80% utilised 24 hours a day throughout the week. Utilisation is lower at the weekends, but the scope for providing additional services is restricted by track maintenance works, particularly at weekends.

With respect to the North East, some rail freight paths are utilised by the same service on a daily basis, whereas others are only used on specific days. There are also paths that are reserved for contingencies, but can be made available on the day of operation.

A key location with respect to rail freight is Tyne Yard (see Photograph 1), which lies off the East Coast Main Line. The site is located approximately 5 miles south of Newcastle upon Tyne and is south of Team Valley Industrial Estate at Lamesley (Gateshead).

**Photograph 1 - Tyne Yard**



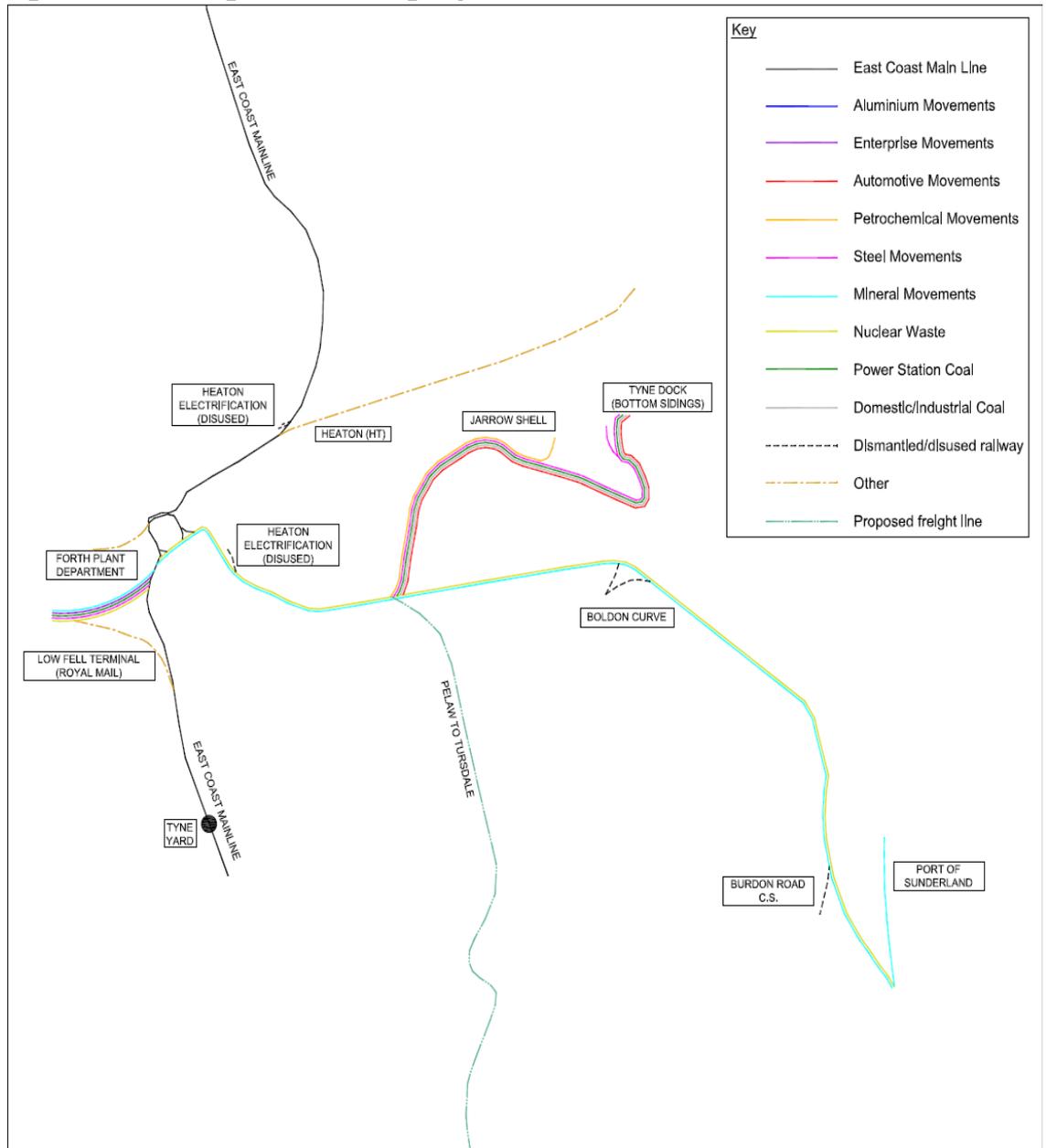
Currently the East Coast Main Line (ECML) passenger service runs adjacent to Tyne Yard and most of the freight traffic runs through the yard. For example, much traffic from the south to the North East and Scotland travels through the Tyne Yard as well as traffic from west of Scotland and Cumbria to the North East.

The map (**Figure 2**) depicts the rail network with respect to freight in Tyne and Wear. This shows current facilities situated across the North East region, illustrating the disused rail heads and major key destinations, maintenance locations as well as current intermodal sites. The plan also shows rail freight paths through Tyne and Wear with respect to industry type.

The key destinations include:

- Port of Tyne - 1.4 million tonnes of coal were transported by rail in 2006. It is anticipated that this will increase to 2.5 million tonnes in 2007. Tyne Dock could ultimately have something in the order of 20 trains per day consisting of mostly coal trains.
- Jarrow Shell for Petrochemicals.

Figure 2 – Rail Freight Paths through Tyne and Wear



A map showing movements nationally from Tyne Yard is included in Appendix A.

# 2 Current and Future Rail Freight Movements through Tyne & Wear

## 2.1 Overview

It is important to understand the current position in order to provide a context for looking at the scope for increasing the volume of rail freight. This section assesses the existing situation with respect to the variation in the number of movements during the day and night, industry type and origins and destinations. As many rail freight trains in Tyne and Wear move through Tyne Yard, the yard was selected as the basis for information on rail movements. The National Railfreight timetable (Freightmaster 2006) was the key information source. This provides a snapshot of freight services running at the time of going to press. It should be noted that rail freight movements are subject to a high level of variation within a relatively short time span.

## 2.2 Number and Time of Movements

There are some key differences between the planning and operation of freight and passenger services. The first is that passenger operators respond in anticipation of demand whereas freight operators operate according to demand. Secondly, freight operators will cancel services if there is no business, whereas passenger trains operate in accordance with the time table. Thirdly, a passenger train is deemed to be using a planned path when it runs irrespective of the number of passengers on the train. In contrast, freight services only run if the demand exists, in accordance with the needs of the end customer. Most bulk commodities operate loaded in a single direction, so if the loaded portion does not operate the empty portion will equally not run. For example, a coal train will not operate from a port to a power station and back just because a path exists in the timetable. The exception to this rule is an intermodal train, where the wagons must travel to the next terminal to pick up containers. This explains the higher utilisation of intermodal paths.

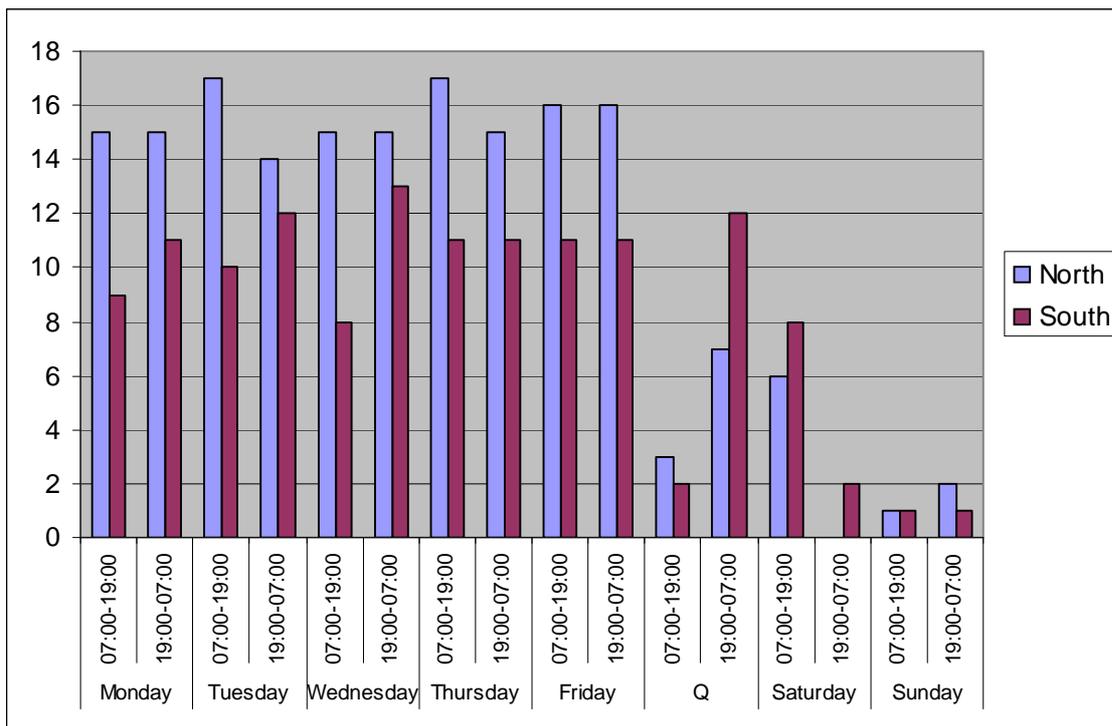
As alluded to above, the National Railfreight timetable is a 'point in time' working timetable of rail freight operations. However, there are times when trains can run early owing to them being loaded earlier, generous schedules or previously booked slots not being utilised. Equally, services can also run late and can be cancelled altogether. As freight services are subject to such variability, it has been perceived that they are unreliable. However, intermodal services, which have been introduced more recently, are more time sensitive operations and as such run promptly and reliably. Delivering this reliability is key as such services form an important part of the supply chain.

**Figure 3** presents the number of rail freight movements through Tyne Yard during the day (07:00-19:00) and the night (19:00-07:00) for each day of the week and by direction (north/south). The Q symbol denotes a reserved path when a freight train may or may not run according to demand.

From the chart it is apparent that there is a relatively even split between the number of rail freight movements during the day and night. From a total of 307 train movements over the week, 157 (51%) take place during the night, compared to 150 (49%) during the day. It is also clear that the majority of freight trains operate on weekdays (85% of all services).

It should be noted that there are more services running in the northbound direction compared with southbound. There are 174 services running northbound and 133 which run southbound – this equates to 57% of services running northbound. This is a result of the movement of trains around the national network. Some of the trains travelling north on the East Coast Main Line may not return via the same route and may use the West Coast Main Line or Settle and Carlisle line.

**Figure 3 – Rail Freight Movements at Tyne Yard (Day and Night)**



**2.3**

**Industry Types**

Tyne and Wear have varied range of commodities being moved by rail through the region. These include:

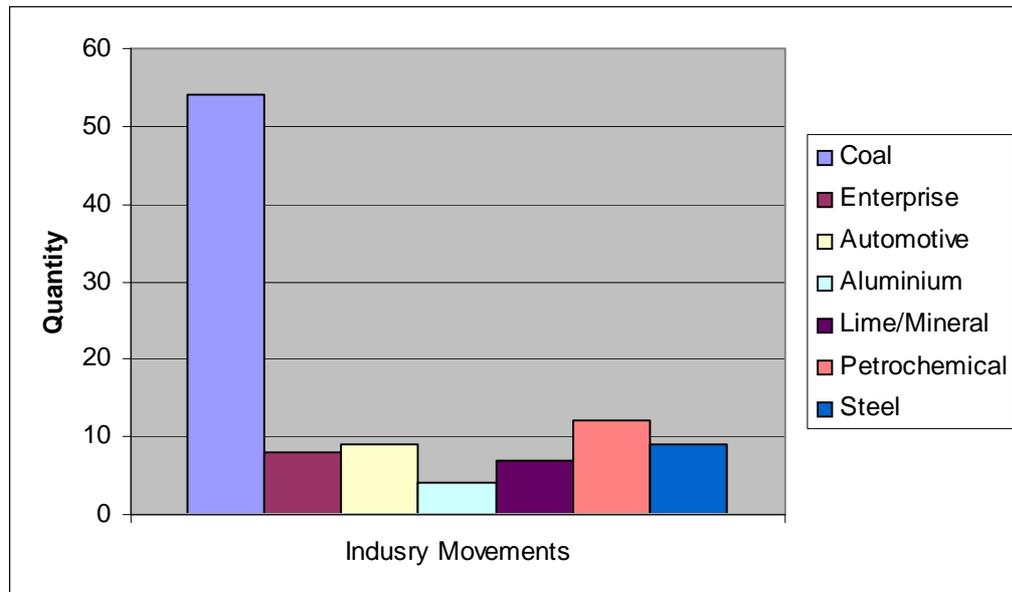
- Coal;
- Automotive;
- Aluminium/Alumina;
- Lime/Minerals;
- Steel;
- Enterprise; and
- Petrochemical Tanks.

Figure 3 shows the number of rail freight movements by commodity through the area. Empty movements, which are included in Figure 3, are excluded from this analysis.

It is therefore apparent that Coal comprises the highest number of movements at 54 per week, which equates to 52% of the total. Increased movement of coal through the Port of Tyne has been key to the increased number of coal trains. The focus had been on exporting coal from the port, but exports from the river ceased in 1998 following the demise of the North East deep mining industry. The coal loading equipment was subsequently sold in 2002. However, in 2004 the first imports of Russian coal through the port began. 115,500 tonnes of coal was handled in 2004, which increased to 630,000 tonnes in 2005. Information from the Port shows that this increased to 1.6 million tonnes in 2006 and is anticipated to grow to 2.5 million tonnes in 2007. The majority of coal being imported at present is from Lithuania.

It should be noted the figure of 54 movements per week is a point in time and that the movement of coal for power stations, and that movements are dependant on the level of demand. For example, there was a recent increase in coal movements following a shortage in gas supplies which pushed energy prices up generally.

Petrochemical bogie tanks to Jarrow yard are the next highest (12 movements per week). The tanks carry a number of products including Petroleum, Ammonia and water. There are 9 movements relating to Steel and Automotive respectively and 8 Enterprise trains. Enterprise trains are generally a wagon load or mixed service train. Other movements include Lime/Mineral and Aluminium.

**Figure 4 – Weekly Rail Freight Movements through Tyne Yard**

## 2.4

### Origins and Destinations of Movements

The origins and destinations of the key rail freight movements through Tyneside is presented in Table 1. It is therefore apparent that coal is primarily moved from Tyne Dock and a number of places in Scotland, including Inverkeithing, Knockshinnick, Millerhill and Mossend to various power stations in Teesside, Yorkshire and the Midlands. The main power stations include Drax and Eggborough in Yorkshire, Wilton in Teesside and Radcliffe, Cottam and West Burton in Nottinghamshire. In addition to the movements identified in Table 1, coal is also delivered to the Alcan Power Station via Tyne Yard – previously the power station was supplied direct from Lynemouth Colliery.

With the exception of West Burton, which receives coal from Tyne Dock and Mossend, all the power stations take deliveries from Millerhill. In addition, Drax and Eggsborough also receive coal from Inverkeithing and Knockshinnick.

Automobiles and parts are taken to Tyne Yard from Doncaster and to Bathgate in Scotland from Washwood Heath in Birmingham. Some Nissan cars are sent to Europe via a weekly service through the Channel Tunnel.

Aluminium is moved from Lynemouth and North Blyth in Northumberland to Tyne Dock and Tees Yard. Bauxite is also sent from Blyth to Fort William - it starts out as a part train load and travels via Tyne Yard and Millerhill Yard in Edinburgh.

Enterprise trains run nationally and to Europe – movements within the UK run from Carlisle Yard to Tees Yard, from Tees Yard and Doncaster to Mossend, Fort William to Tyne Yard and Tees Yard to Carlisle Yard.

Oil and Petroleum is delivered to Jarrow, in Tyne and Wear from Lindsey in Humberside. Steel from Lackenby in Teesside is taken by rail to Workington, Cumbria and also to Dalzell in Scotland. There is also a train for scrap metal trains that runs from Tyne Dock to Cardiff.

An additional movement through Tyne and Wear, which does not move through Tyne Yard is nuclear waste from Sellafield in Cumbria – the service runs via Sunderland to Teesside. The service runs at random times for security reasons.

**Table 1- Origins and Destinations by Industry Type**

Industry Type	Destination	Origin			
Coal	Drax	Millerhill	Mossend	Tyne Dock	Inverkeithing
	Eggsborough				Knockshinnoch
	Cottam			Tyne Dock	
	Ratcliff				
	Wilton				
	West Burton		Mossend	Tyne Dock	
Automotive	Tyne Yard	Doncaster			
	Bathgate	Washwood Heath			
Aluminium	Tees Yard		Lynemouth	Tyne Yard	
	Tyne Yard		North Blyth		
Enterprise	Tees Yard		Carlisle Yard	Tyne Yard	
	Mossend	Doncaster	Tees Yard		
	Tyne Yard	Fort William			
	Carlisle yard		Tees Yard		
Oil and Petrochemicals	Jarrow	Humber	Lindsey	Tyne Yard	
	Lindsey		Jarrow		
Steel	Dalzell		Lackenby		
	Workington		Lackenby		
	Cardiff (tidal)			Tyne Dock	

## 2.5

### Boldon East Curve

Network Rail has plans to reinstate the Boldon East Curve. Once the Boldon curve and/or the signalling works on the Durham Coast are completed, some freight will transfer from the ECML to the DCL. Potentially Boldon Curve will allow the re-routing of 8 coal trains per day.. These will be down through the Durham coastal rail path allowing routeing of some import coal services via the Durham coast line avoiding the constrained King Edward Bridge Junction and join at Northallerton to the Tursdale section of the ECML.

There should be sufficient freight capacity through to around 2020 as a result of better use of currently unused paths and the freeing up of capacity following the reinstatement of Boldon East Curve

## 2.6

### Leamside Line

There is a separate study in progress assessing the case for reopening the Leamside Line, either as a through route or with a more local function. This report does not want to pre-judge the outcomes but possible freight uses could be:

- Use to access local freight opportunities, e.g. Nissan and a potential multi-modal terminal at Tursdale Junction about six miles south of Durham.
- Use by freight trains which would otherwise have to use congested sections of the existing network, thus creating performance benefits and potentially allowing additional trains (passenger or freight) to operate.

All ECML freight should look to be diverted on to the Leamside. For trains serving Tyne Yard this may also require the reinstatement of a curve at Norwood, (near Low Fell). At present, there is no Durham Coast freight traffic that would be re-routed via Leamside.

It is worth being aware however of the significant uphill gradient from the Carlisle line towards Gateshead, (if then accessing the Leamside line). Over a one mile section there is some 1 in 92 and then 1 in 64. If wagons are of 56 tonne coupling strength, then a train of 2510 tonnes is permitted. If not it falls to 1800 tonnes. There are certain parts of the rail network where economic full trains are not allowed to run because of the adverse steeper inclines. Rail freight operators are less likely to run smaller and lighter trains which are less profitable to the company.

With this in mind, the Leamside line would also convey diverted Anglo-Scottish coal trains when the Settle and Carlisle line is closed.

There could be additional (local) freight traffic generated in the area but it is not perceived that capacity constraints are the current limiting factor. Leamside could have some benefits in stimulating freight growth in Tyneside and the north east as a result of improved pathing opportunities and more convenient services. For example, a major benefit of the Leamside for Nissan would be a journey time saving of at least 30 minutes.

In terms of capacity, any potential traffic from Nissan can be treated as any other freight that is being routed via the ECML. The ECML upgrade envisaged creating freight sidings at the former Tyneside Central Freight Depot for trains to/from Leamside + Tyne Dock/Jarrow. Tyne Dock could ultimately have something in the order of 20 trains per day.

A big benefit of Leamside would be improved performance for both passenger and freight traffic and improved maintenance opportunities for the ECML via Durham as the Leamside provides a suitable alternative route.

## 2.7 **Freight Route Utilisation Study (RUS),**

The Network Rail Freight Route Utilisation Study (RUS), published in March 2007, brings together all of the key strategic issues facing the future of rail freight and identifies a strategy for accommodating growth and changes in current demand on the network. The strategy has been developed with the involvement of the freight operators and other key industry players.

The 2014/15 base case of the RUS envisages a post 2004/05 shortfall in domestic coal production and that some increase in rail freight market share will be met by growth from a combination of import facilities on the east coast, including Tyne Dock. This results in a net gain of 18 trains per day from East Coast ports. With respect to capacity issues, Tyne Yard – Tursdale junction is identified as a significant constraint in the RUS with respect to rail freight.

As already mentioned re-activation of the Boldon East Curve is recommended as the best option for addressing this. This will generate a small number of additional paths to and from the Port of Tyne, providing an alternative route to/from the Aire/Trent Valley via the Durham Coast. It also offers an alternative route from the Port of Tyne to the constrained part of the East Coast Main Line between King Edward Bridge and Ferryhill. The cost of the scheme is estimated at £12.4 million and the scheme has a benefit to cost ratio of 3.19.

The RUS suggests that the short/medium term recommendations (including the Boldon East Curve) will be sufficient to handle the industries 2014/15 base case demand for the east coast ports. If further growth takes place beyond the industry forecast for the Port of Tyne and more generally the ECML from Ferryhill and Newcastle, the RUS states that it may be sensible to look again at the re-opening of the Leamside line for freight traffic. At present it is considered that there is an insufficient case for this, but that the route should be protected.

## 2.8 **Potential Freight Traffic**

It is likely that potential additional trains would consist of more coal, intermodal and aggregates. These are the types of commodity that are growing in volumes across the national rail network. Certain retailers including Tesco, Asda, Sainsburys and M & S are experimenting with running freight trains as part of their supply chains and if reliability remains high then this type of traffic could be expanded. There is potential for additional port related traffic both from Tyneside and Teesport to run through the area as both ports look to expand volumes. The East Coast Main Line also provides an invaluable alternative to the West Coast route in times of service interruption as well. Therefore for a number of reasons rail freight is important in Tyne and Wear and should be encouraged.

# 3 Summary and Way Forward

## 3.1

### Summary

Key findings from this baseline assessment can be summarised as follows:

- The majority of rail freight movements in Tyne and Wear pass through Tyne Yard.
- Recent rail freight timetables record 307 train movements per week through Tyne Yard, with 51% taking place at night (07:00-19:00) and 49% during the day.
- 85% of the weekly total of freight trains operate between Monday and Friday
- Approximately 32 freight trains run in both directions on a weekday.
- There are 40 freight train paths in each direction on a weekday.
- 52% of loaded freight trains are carrying imported coal. This follows the curtailment of coal exports from the port in 1998 and coal imports commencing in 2004. 1.6 million tonnes of coal was imported in 2006 and this is expected to grow to 2.5 million tonnes in 2007.
- Coal is moved from Tyne Dock and a number of places in Scotland, including Inverkeithing, Knockshinnick, Millerhill and Mossend.
- Coal is primarily moved to power stations in Teesside, South Yorkshire and the Midlands.
- Other significant movements include Petrochemical (12 per week) and Steel (9 per week), Automotive (9 per week) and Enterprise (8 per week).
- Oil and Petroleum is delivered to Jarrow from Lindsey in Humberside.
- Aluminium is moved from Lynemouth and Blyth in Northumberland to Tyne Dock and Tees Yard.

## 3.2

### Way Forward

The scope for increasing the volume of rail freight moved in Tyne and Wear may be constrained by the shortage of available paths on the East Coast Main Line (ECML) in the future but in Network Rail's view there is some spare capacity as illustrated by the fact that extra slots were found when disruption to the WCML or Settle and Carlisle has proved.

These issues are addressed by the Network Rail Freight Route Utilisation Study (RUS), which was published in March 2007. The RUS brings together all of the key strategic issues facing the future of rail freight and identifies a strategy for accommodating growth and changes in current demand on the network. The strategy has been developed with the involvement of the freight operators and other key industry players.

With respect to capacity issues, Tyne Yard – Tursdale junction is identified as a significant constraint in the RUS with respect to rail freight. Re-activation of the Boldon East Curve is recommended as the best option for addressing this. This will generate a small number of additional paths to and from the Port of Tyne, providing an alternative route to/from the Aire/Trent Valley via the Durham Coast. It also offers an alternative route from the Port of Tyne to the constrained part of the East Coast Main Line between King Edward Bridge and Ferryhill.

The RUS suggests that the short/medium term recommendations (including the Boldon East Curve) this will be sufficient to handle the industries 2014/15 base case demand for the east coast ports. If further growth takes place beyond the industry forecast for the Port of Tyne and more generally the ECML from Ferryhill and Newcastle, the RUS states that it may be sensible to look again at the re-opening of the Leamside line for freight traffic. At present it is considered that there is an insufficient case for this, but that the route should be protected.

It is likely that potential additional trains would consist of more coal, intermodal and aggregates. These are the types of commodity that are growing in volumes across the national rail network. Certain retailers are experimenting with running intermodal freight trains as part of their supply chains and if reliability remains high then this type of traffic could be expanded. There is potential for additional port related traffic both from Tyneside and Teesport to run through the area as both ports look to expand volumes.

# Appendix A – National Representation of Rail Freight Movements through Tyne Yard

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