

Short Haul Rail Freight on Track for Profits in Scotland

Case Study



Companies Involved: Lafarge Cement Ltd
The Malcolm Group
Freightliner Ltd

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Lafarge Cement Ltd

Dunbar Works
Dunbar
East Lothian
EH42 1SL
sales@lafargecement.co.uk

The Malcolm Group

Logistics Services Division
Tillyflats
Laurieston Road
Grangemouth
FK3 8XT
sales@whm.co.uk

Freightliner Limited Head Office

3rd Floor
The Podium
1 Evershott Street
London
NW1 2FL
sales@freightliner.co.uk

Cover photograph - Elderslie Intermodal Depot
(courtesy of The Malcolm Group)

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Rail's ability to move large quantities of freight has never been in question (photograph courtesy of Freightliner Ltd)

Introduction

It is a commonly held view that rail can only compete with road over longer distances in terms of operating costs, it is however harder to know where the 'break even point' comes after which rail becomes more economical than road. For shorter distances two of the challenges faced by rail freight are the tendency for longer end to end journey times and the need to double handle products where an onward road journey is required.

There are a number of key factors preventing more companies using rail freight, including:

- ➔ **A lack of information** on services and basic understanding how rail fits into the modern supply chain
- ➔ **A lack of facilities** close to your company
- ➔ **Reliability problems** associated with two or three major headline incidents and derailments in the early part of this decade
- ➔ **A lack of customer focus** from major rail freight operators compared to road freight hauliers
- ➔ The need to gather **sufficient volume** for an economical train load
- ➔ **Delays and problems** affecting a train affect a larger quantity of goods than those affecting a single lorry

It is common practice to obtain a price and service details within 24 hours from asking for information from a road haulier. This is not as easy in the rail sector as applications have to be made to the network manager and checks made on the availability of train paths and types of wagon required. This tends to delay the process and may even not be provided in time for

a potential customer. Even when prices and service details are known there is the possibility there might not be a suitable terminal close enough to the destination.

Today in Scotland there are a number of examples of short distance routes with proven environmental and cost benefits. The two case studies shown in this publication outline best practice in the Scottish rail freight sector. They show that there can be real benefits to companies and customers using even short distance services for regular operations.

The first case study highlights the 43 mile movement of intermodal and containers bodies from Grangemouth across Central Glasgow to Paisley and the second a

72 mile journey of bulk cement powder from East Lothian to North Lanarkshire.

If services are not locally available a Freight Facilities Grant (FFG) may be able to assist in the creation of the necessary facilities.

The Malcolm Group

The Malcolm Group operates a multi-modal service, providing the end-to-end delivery of products using road to rail and then back to road for final delivery. This provides a seamless customer collection and delivery service for products that can be containerised. From the customer's point of view this can be cost effective for just a single container using the service.

Specialist flat bed rail wagons allow the loading / unloading of ISO containers and swap-body containers to and from rail wagons to waiting or delivering HGVs with skeletal trailers. Container sizes include 20ft, 40ft and 45ft.

Situated in Grangemouth The Malcolm Group's intermodal freight terminal has grown and developed rapidly in the recent years, operating several long distance services to its Daventry terminal in England.

The focus of this case study, however, is its regular service between Grangemouth and Elderslie (Paisley) to the West of Glasgow as shown in Figure 1. This route is approximately 43 miles (69 km) in length and is the shortest service of its kind in the United Kingdom. The service operates 5 days a week throughout the year and 6 days a week at peak periods, September through to December.

It is utilised almost 100% on the eastbound journey but only 10% westbound. This is due to a lack of appropriate work to fit the schedule, and so instead it is used to reposition empty containers to sustain the service. This removes the need to operate road vehicles from the heavily congested M8 / M80 / M876 / M9 route.

➔ Each train includes up to twelve MegaFret wagons, each able to carry either:

- Four TEU (Twenty foot Equivalent Units) (20') containers or

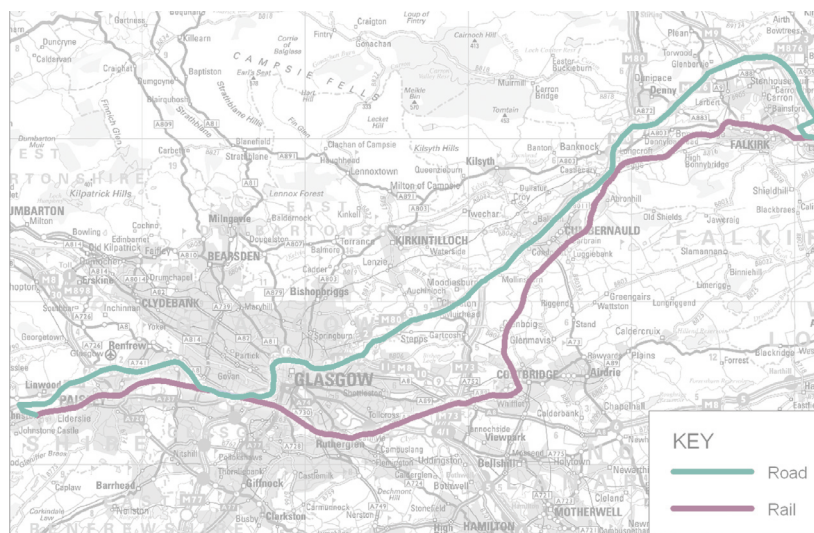
- Two 2TEU (40') containers

➔ The rail service calls at both Grangemouth depot and Forth Ports for further onward delivery

➔ The economic viability of the service is enhanced by the use of the train on another daily service running between Elderslie and Kirkby Thore in Cumbria, reutilising the wagons by carrying Intermodal bulk. This service was introduced with the aid of a Freight Facilities Grant (FFG) from the Scottish Government. The services are linked with very short loading and unloading times and they combine to increase the train's utilisation

➔ The train spends around fourteen hours per day moving and ten hours per day being loaded and unloaded

Figure 1 Route of The Malcolm Group rail service compared to its road alternative





Making use of real estate and handling equipment at Elderslie

Environmental Benefits

- ➔ A single MalcolM Group train carries the same amount of freight as 24 HGVs
- ➔ Defra figures state 1 litre of fuel creates
- ➔ 2.63 kg of CO₂
- ➔ MDS Transmodal evaluates a train's fuel efficiency at 7 litres per mile

Using these figures it is possible to work out the annual CO₂ burden of The MalcolM Group's rail service, and compare it to the CO₂ emission of the equivalent HGV journeys. See Table 1 below.

By running this rail service The MalcolM Group saved 511 tonnes of CO₂ emissions per year

Table 1 Comparison figures for The MalcolM Group's rail service and its road equivalent

	HGV's	Trains
Journeys per year	6,312	263
Typical journey distance	86 miles	86 miles
Total annual distance	542,832 miles	22,618 miles
Fuel efficiency	7 miles per gallon / (~0.65 litres per mile)	(~0.7 miles per gallon) / 7 litres per mile
Annual fuel use	77,547 gallons / 352,538 litres	34,827 gallons 158,326 litres
CO2 burden	927 tonnes	416 tonnes

Other Benefits

Costs

The MalcolM Group's key benefits are maximising the use of its terminal and rail assets and using the road vehicles that would otherwise be deployed moving goods between Grangemouth and Elderslie on other duties. The service is cost-effective due to the utilisation of existing facilities and resources.

Reliability

The significant congestion on various sections of the road route in particular central Glasgow and the M8 can increase road journey times by up to 40 minutes per trip. This also has the added benefit of allowing road routing as a contingency in business continuity planning, again improving the reliability of supply.

Operational Flexibility

The fixed nature of rail paths and train scheduling combined with a trainload of containers being emptied onto waiting road vehicles in under two hours ensures a swift turnaround of rolling stock and thus a reliable service. Third party hauliers operating from the intermodal sites are assured business, servicing the demands of intermodal services and working closely with The Malcolm Group to provide high quality service.

Benefit to Customers

The service offers high levels of reliability compared to the equivalent road journey with both economical and environmental value reducing the supply chain's carbon

Speed of turnaround is key to the reliability of this service (photograph courtesy of The Malcolm Group)



Lafarge Cement Ltd

The Lafarge Cement Ltd service is a **bulk rail service** which moves cement powder between Lafarge Cement Ltd's manufacturing site in Dunbar and their batching plant and distribution site in Uddingston in South Lanarkshire for onward distribution. The service covers a distance of 72 miles as detailed in Figure 2. The cement powder is carried in bespoke rail bulk tankers which are loaded directly through the top using gravity, and in turn discharged using a gravity feed at the destination.

The position of the Lafarge Cement Ltd's lime quarry next to the East Coast Main rail line provides easy access to a major rail link both towards Central Scotland and South to the Border.

Making good use of the transport network, one train is the equivalent of 37 HGVs (photograph courtesy of Freightliner Ltd)



This crucial factor means that cement powder can be delivered to customers from Dunbar in bulk tankers on either road or rail.

Environmental Benefits

- Road deliveries of bulk cement deliveries are handled by 44 tonne articulated trucks with a 30 tonne payload
- Rail deliveries use wagons with a 35.75 tonne payload carried on a train made up on average of 31.2 wagons
- A single train carries the equivalent payload of 37 HGVs
- The service operates three times a week in peak periods

Using these figures we can work out the annual CO₂ burden of the Lafarge Cement Ltd's rail service, and compare it to the CO₂ burden of the equivalent HGV journeys. See Table 2 below.

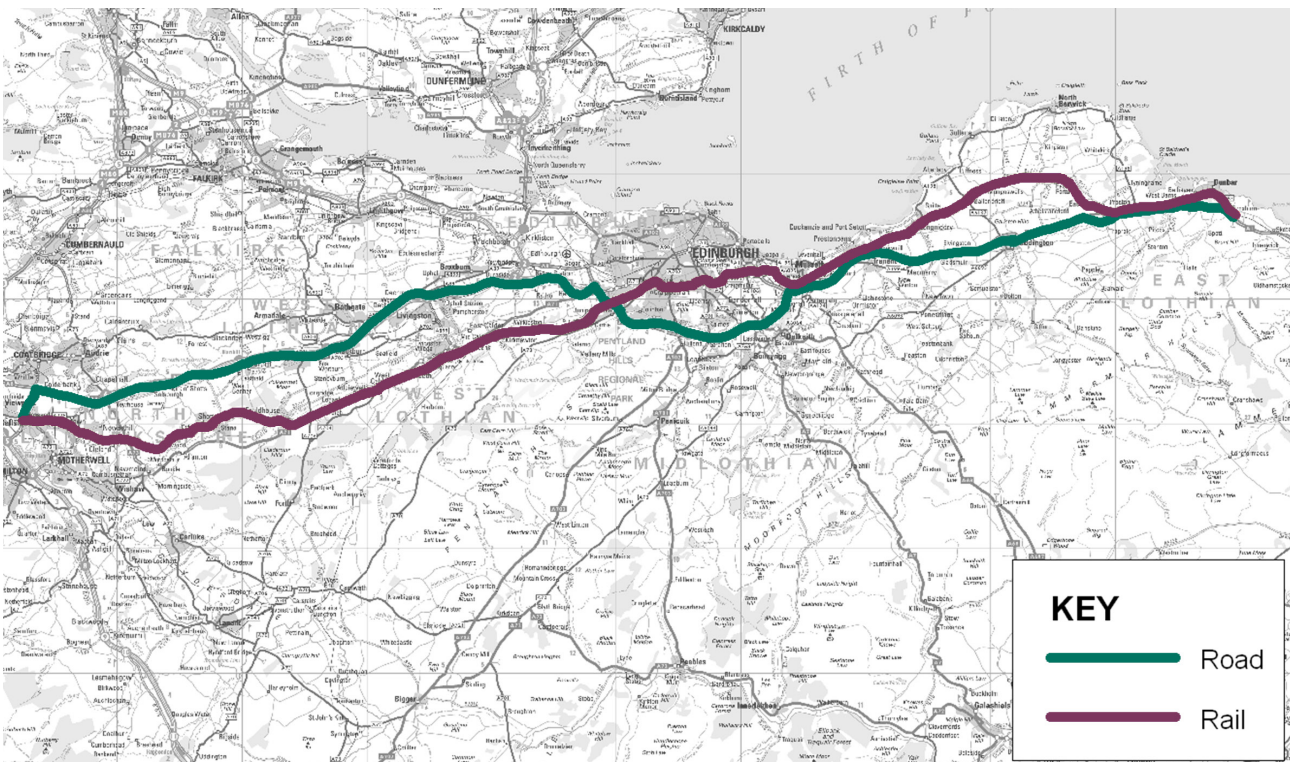
During 2008 the service removed an estimated 5,019 HGV movements from the heavily congested M8 corridor.

This means that by running this rail service, Lafarge with Freightliner, have saved 722 tonnes of CO₂ emissions during 2008 by using rail rather than road in their operations.

Table 2 Comparison figures for Lafarge Cement Ltd's rail service and its road equivalent

	HGV's	Trains
Journeys per year	5,019	135
Typical journey distance	144 miles	144 miles
Total annual distance	722,736 miles	19,440 miles
Fuel efficiency	8 miles per gallon / (~0.57 litres per mile)	(~0.7 miles per gallon) / 7 litres per mile
Annual fuel use	90,347 gallons / 410,719 litres	29,933 gallons 136,080 litres
CO2 burden	1,080 tonnes	358 tonnes

Figure 2 Route of the Lafarge rail service compared to its road alternative



Corporate Social Responsibility in Supply Chains

The customers of the construction industry are becoming aware of the need to manage the carbon footprint of their supply chain and can

state as a requirement that cement needs to be locally sourced and moved in an environmentally sensitive manner. Lafarge Cement Ltd is committed to an environmental programme covering many aspects of their operations, and has achieved ISO14001 environmental management accreditation.

Costs

Besides the environmental savings Lafarge Cement Ltd operates this service primarily for commercial reasons; the cost of moving bulk cement powder by rail over this distance is quite simply cheaper than by road.

There are significant operational cost savings when using rail. There is only one motive power unit to fuel and maintain instead of several HGV tractor units. There is only one driver required for the train compared to several HGV drivers.

Reliability

The significant congestion along the alternative road route means that the rail route can offer a more reliable service. The nature of rail paths and scheduling rail freight can provide a reliable service that customers can build into their supply chain and rely on with confidence.

This also has the added benefit of allowing road routing or rail routing as a contingency in business continuity planning, again ensuring the reliability of supply.

Operational Flexibility

The working pattern with the rail service ensures that the remaining road vehicles are better utilised on shorter journeys making an increased number of deliveries in one day, which increases the flexibility of the company to react to the changing demands of their customers.

“One of our customers who had left us over price has recently returned to us as one of their customers required a sustainably distributed product, at reasonable cost.”

Iain Campbell, Regional Logistics Manager (North), Lafarge Cement Ltd

Conclusion

Striving for a Rail Freight Solution?

The first step is to find the necessary information perhaps by contacting a Rail Freight Operator, Network Rail's Freight Managers or a Trade association like

the Rail Freight Group (RFG) or Freight Transport Association (FTA).

Having established the basic information and determined that there is capacity on the rail network to run a suitable train it is necessary to build an economic case to do so. In some instances, depending on the type of commodity and the volume it can be economic to run trains over a relatively short distance.

A major part of the costs concerns the handling at the terminals at either end. If there are rail connected warehouses or intermodal terminals within easy reach of the final destination then rail can be very cost effective. There are some government grants to help defray part of the cost of terminal provision and “start-up” services.

Most of the rail freight companies are now much more customer focused and do understand logistics much better. Indeed at least four logistics companies better known for their road haulage and warehousing now run freight trains. This has brought a new angle to the industry and is offering customers an “end-to-end” service where the final leg of the journey is by road.

Several companies that have not used rail for many years are now running successful services. The willingness to do this is being enhanced by the “green” agenda and Corporate Social Responsibility requirements to demonstrate that companies are looking to reduce their transport related carbon footprint.

Conclusions

These two examples in Scotland have highlighted where rail freight is bringing competitive advantage through cost saving as well as bringing significant environmental advantages:

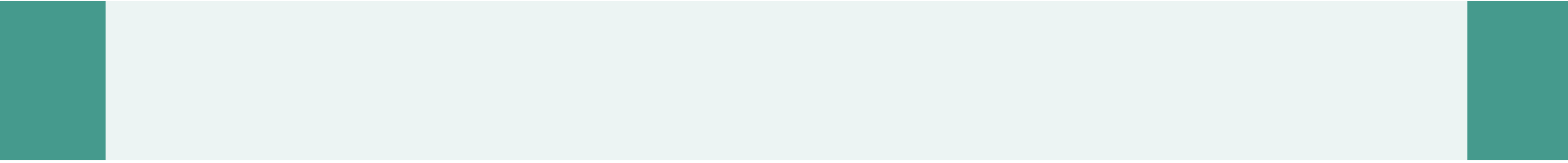
- These case studies show that a long distance is not always necessary for rail freight to be economically and environmentally viable
- 1,233 tonnes of CO2 emissions were saved in one year by just two rail freight routes
- Removal of 11,331 HGV movements in one year from Scotland's roads by the use of two rail freight routes

There are a range of other similar rail services in Scotland that have not been profiled, but are providing similar savings and environmental benefits.

The case studies show that for short distances bulk and containerised products can use rail and benefit from lower costs and emissions.

The latest machinery is key to providing a reliable service in the modern freight transport climate (photograph courtesy of The Malcolm Group)





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