Efficient Intermodal Terminals Deliver Supply Chain Benefits
Acknowledgements

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About this Case Study

This case study demonstrates the benefits of using an efficient intermodal terminal and, by way of example, shows how Hams Hall Rail Freight Terminal in the West Midlands strives to deliver an efficient service to its customers. The case study will be of interest to:

- **Supply Chain Decision Makers**: Operational efficiencies that inland intermodal terminals can provide can make them an invaluable supply chain partner
- **Road Freight Hauliers**: How a rail freight terminal operates and how road and rail freight can integrate effectively
- **Rail Freight Operators**: The steps that terminal operators can take to improve service levels and turnaround times
- **Terminal Operators**: Operational improvements and savings can be made by improving the operational performance of both equipment and personnel
Intermodal Terminals in the United Kingdom

There are a range of rail terminals in the UK that handle containers, palletised goods and a range of bulk products. They can be classified as ‘open-access’ and/or ‘multi-user’. An ‘open-access’ terminal refers to the ability of any Freight Operating Company (FOC) to have the option of running services to or from the terminal. A ‘multi-user’ terminal is one where a terminal serves many different shippers rather than a dedicated single customer. Many terminals are in fact both ‘multi-user’ and ‘open-access’.

There are around 95 open-access multi-user terminals; 54 are to be found at ports and the remainder are inland terminals (See Figure 1). There are also several terminals currently being planned or developed that will increase rail’s overall intermodal service offer.

Figure 1 - UK Open-access Multi-user Terminals
Understanding the Importance of Intermodal Terminal Efficiency

When considering different modes of transport it is crucial that each partner in the supply chain is capable of providing a service that reflects the transport buyers' best efficiency interests. Intermodal terminals are increasingly successful as effective supply chain partners for containerised goods and they have sought to optimise their efficiency in container handling in order to maintain and grow their position.

Hams Hall Rail Freight Terminal has understood the need for efficient operations in order to win business and this case study looks at how they have undertaken:

- The implementation of effective IT systems
- Improved reachstacker performance
- Reduced vehicle and train turnaround times
- Staff initiatives to increase productivity
- The installation of lower energy lighting

Some of these interventions can be undertaken by the terminal operator alone; others are achieved in partnership, for example through collaboration between a road freight operator and the intermodal terminal operator.

About Hams Hall Rail Freight Terminal

Hams Hall is an open-access multi-user intermodal rail freight terminal near Coleshill in the West Midlands. It is located on the Birmingham to Nuneaton rail route, with connectivity to the M1, M6, M42 and M69 motorways. The site covers 11 hectares and is a security approved site for Channel Tunnel traffic. The terminal has direct access on to Network Rail's gauge cleared network (W10) giving it flexibility to handle all types of intermodal freight including high cube containers. It has the capability to store 6,000TEU (Twenty-foot Equivalent Units).
Implementation of Effective Site IT Systems

The installation of a state-of-the-art terminal management system at Hams Hall has improved the efficiency of the terminal’s internal operations and provides customers with reports detailing load status, terminal performance, container movements, and road traffic activity.

A full data audit trail for every container movement on the site has enabled Hams Hall to create daily and seasonal traffic profiles. This facilitates matching resources to shifts, thus helping to optimise efficiency.

Figure 2 - Weekly Traffic Profile at Hams Hall Terminal

The IT system records vehicle arrival and departure times allowing management to monitor and manage the volume of vehicles entering and leaving site; smoothing the peaks can improve operational efficiency.
The IT system provides for many benefits including:

- The optimisation of yard space
- Minimising non-productive activity
- Maintaining truck/train turnaround times

Hams Hall's ability to correctly match operational resources to activity levels and the use of Key Performance Indicators (KPIs) has enabled the terminal operator and customers to work together in order to identify areas for improvement through the analysis of trends.

### Improving the Performance of Reachstackers

There is a range of container handling machinery at intermodal terminals in the UK. The different machines can include various types of gantry cranes, straddle carriers and reachstackers or, more usually, a combination of these. Reachstackers are often highly valued due to their versatility, manoeuvrability, cost effectiveness and speed and where they are not relied on exclusively in terminals, are often to be found as a supporting piece of equipment.

Most container movements within Hams Hall are undertaken by its seven reachstackers and they handle movements from train to truck, storage area-to-truck and vice versa. As they are used so intensively, their fuel costs and CO$_2$ emissions are significant and Hams Hall has therefore dedicated time and effort to reducing their fuel consumption.

Over the last 12 months the site has successfully adopted a fuel saving programme by electronically limiting the top speed of the reachstackers from 24 to 20 km/h. This intervention alone has resulted in a 16% fuel saving, with no loss of throughput.

The reduction in running speed has also improved the reliability of the reachstackers by reducing the level of breakdowns and, as a consequence, improving machine availability.
With further reductions in fuel consumption achieved by minimising running distances through the optimisation of the container yard layout and modifying operator / driver behaviour with targeted training, a total reduction in fuel consumption of 25% has been achieved.

Improved reachstacker performance can be achieved through:

- **Procurement** - Procuring the most fuel-efficient reachstackers can save fuel from Day 1
- **Training** - Training operational staff to use equipment safely and efficiently maximises fuel savings - particularly where there are many types of equipment on one site
- **Staff co-operation** - The buy-in of staff to any initiative is essential for the success of operational changes
- **Speed Limiters** - Speed limiters can be a very successful means of improving ‘uptime’ and reducing repair cost, as well as saving on fuel and reducing CO₂ emissions

Figure 3 - Reachstacker Fuel Consumption Comparison

Hams Hall started to reduce machine speeds in February 2008 and this led to a reduction in fuel used of approximately 0.3 litres/lift, representing a 16% fuel reduction.

Reducing Road Haulage Vehicle Turnaround Times

Reducing turnaround time provides benefits to the final customer, hauliers, and of course to the terminal operator itself. Indeed queuing trucks that have to wait for a considerable time could be a sign of operational inefficiencies and will certainly translate into extra cost to the haulier and terminal operator.
Where a terminal can give confidence of a reliable turnaround time, transport managers can improve the utilisation of their vehicles by not having to build as much ‘slack’ into their schedule.

Hams Hall has been able to use its terminal management system to provide regular ‘strip and re-load’ times within 30 minutes. Turning vehicles around in under 30 minutes on such a consistent basis (and often achieving faster turnarounds) can significantly benefit both the hauliers’ and terminal owner’s productivity.

**Figure 4 - Vehicle Turnaround Times at Hams Hall**

![Vehicle Turnaround Times at Hams Hall](image)

*Over 90% of vehicles at Hams Hall are turned-around within 30 minutes.*

### Reducing Train Turnaround Times

In order to maximise overall efficiency of the supply chain a terminal must also keep to the schedules demanded of it by the rail Freight Operating Companies (FOC). Trains that miss their agreed time slot on the rail network can often be delayed and can disrupt other operations.

An efficient terminal must have the ability to unload and load a train efficiently and within its allocated time-slot. With some Channel Tunnel freight trains running at 750 metres long and an aspiration within the rail freight industry to see longer trains on the rail network this requirement to unload trains promptly and efficiently will become increasingly important.

Through efficient work practices an intermodal terminal should not only be able to consistently unload a train to time but also have the ability to ‘make up’ time at this stage of the operation without compromising safety in any way. This might involve multi-skilled staff who can operate the relevant mechanical handling equipment. Hams Hall has in the past turned around trains that have arrived late in order that they then leave again on time. To do this it has operational practices in place to allow it, when necessary, to ‘strip and re-load’ a 100 container train within 90 minutes.

This kind of flexibility ensures that both up and down the supply chain, logistics partners are not adversely affected by a delay to rail running times either inbound or outbound to a rail/road terminal.
Staff Initiatives

Well motivated employees are crucial to running an effective terminal. Having the most efficient machinery and the most up-to-date terminal management systems can only go so far without the support and 'buy-in' of employees. At Hams Hall three initiatives to help staff improve terminal efficiency have been introduced:

1. **Daily Staff Briefings**
   Staff have a daily pre-shift briefing about the terminal's current operational position and performance against the previous day's KPIs. They are briefed on their role in delivering success and importantly this briefing is a two-way process, allowing staff the opportunity for continuous improvement through management feedback.

2. **Flexible Working Practices**
   To increase the level of customer service a flexible working system has been introduced that allows the increase or reduction in manning levels at short notice. This helps to correctly match resources to business need.

3. **Staff Training**
   A multi-skilled workforce helps to support efficient operations. On the yard, the multi-skilled members are capable of operating reach-stackers, the gantry crane and a shunt locomotive, as well as undertaking various ground staff duties. In addition, traffic office staff are also now able to cover aspects of both truck and train duties.

**Figure 5 - Productive Lifts per Machine Hour at Hams Hall**

A combination of I.T. system introduction, better planning and improved training have seen productive lifts per machine hour steadily improve over 2009.

**Reduction in Lighting Costs**

Having suitable lighting for a safe 24-hour operation is important. Hams Hall has reduced the amount of lighting by introducing greater control over lighting levels and their operational duration. This has resulted in a 15-20% saving in power costs and an annual environmental saving of over 50 tonnes of CO₂.
Conclusion

Quite simply, the more rail/road terminals increase their efficiency the more reasons there are for supply chain decision makers to integrate rail into their operation.

The benefits to be gained by working with intermodal terminals include:

**Service Level Improvements.** Data capture from the terminal management system contributes to operational efficiencies both up and down the supply chain. Regular communication between the various logistics partners (rail, road, terminal operator as well as the final customer) have, in the case of Hams Hall, improved truck turnaround times to typically 30 minutes, improved staff productivity by 40% and improved the productivity of their mechanical handling equipment by 50%.

**Environmental Benefits.** The introduction of speed limiters and staff training at Hams Hall between 2008 and 2009 reduced fuel consumption by 163,000 litres which has reduced emissions by 436 tonnes of CO$_2$. The re-specification of the terminal’s lighting also saved an additional 50 tonnes of CO$_2$.

The wider implications of switching from road to rail are well documented and the increasing willingness of companies, both in the logistics sector and, more generally, across the industry as a whole, to report on their CO$_2$ emissions mean that more and more supply chain decision makers will be evaluating the benefits of intermodal terminals.

**Financial Savings.** Efficient operations are less costly operations. At Hams Hall a 25% saving in fuel for the reachstacker fleet was achieved. The 163,000 litres of fuel saved in 2009 represented a financial saving of £84,000 (based on a 2009 fuel price for red diesel of 51 pence per litre).
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Saving FUEL

Fuel Management Guide
This is the definitive guide to improving the fuel performance of your fleet. It gives step-by-step explanations of the key elements of fuel management, how to measure performance and how to implement an effective improvement programme.

Performance MANAGEMENT

Monitoring and Understanding CO\textsubscript{2} Emissions from Road Freight Operations
This guide provides step by step advice for creating a comprehensive CO\textsubscript{2} inventory and the benefits this can bring. It provides templates to enable the reader to monitor the amount of CO\textsubscript{2} produced by its Trucks, Vans, Warehouses, MHE and Company Cars.

Developing - SKILLS

Saving Fuel Through People
This guide provides advice and real life examples to help operators motivate their staff effectively and shows how to implement and manage change more successfully.

Multi MODAL

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This guide provides a useful insight into the rail and water freight industries, explains the process for making an informed choice about modal shift, and also explains the availability of financial assistance such as grant funding.

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This guide shows you how to find and choose backloads in order to improve your fleet efficiency.

Case STUDIES

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- Highland Waterbourne Freight
- The Malcolm Group: An Award Winning Multi-modal Operator