WAGONLOAD RAIL FREIGHT: IS THERE A FUTURE?

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Abstract

Rail freight tends to be best suited to direct trainload movements from terminal to terminal, where its strengths in moving large volumes can be exploited. In developed countries, such as Britain, these high volume flows have declined with the reduction in heavy industrial activity and the shift towards more dispersed freight movements in a more consumer-driven economy. Rail freight typically is viewed as not being a viable option for the smaller volume flows that have resulted, particularly if they are non-unitised. A major rail freight growth area in recent years has been of direct trainloads of containers and swapbodies, but there is little documented evidence that conventional wagonload traffic has increased and there has been a lack of strategic direction in service provision for these flows. However, an increase in rail's share of this market could assist in meeting environmental, social and, indeed, economic objectives.

This paper evaluates British experience in the non-unitised wagonload (or less-than-trainload) rail freight market and identifies the opportunities for and barriers to growth. This market has undergone considerable change in the last 15 years, with the withdrawal of dedicated Speedlink wagonload services, the reintroduction of a network under the Enterprise banner, its integration with Channel Tunnel wagonload services after rail privatisation and ongoing incremental changes in network coverage, service provision and commodities carried. The paper combines this desk-based research with the evaluation of key positive and negative experiences of wagonload rail freight services that were identified through interviews with a range of customers and rail freight terminal operators. Finally, a strategy to actively develop the wagonload network is proposed. This includes an assessment of the extent to which principles from similar operations (notably the growth of road-based pallet networks) can be transferred to the rail freight sector.

1. Introduction

Transport has attracted a relatively high political and media profile in Britain since the mid-1990s, resulting from concerns about sustainability and integration, together with infrastructure and service quality problems. In common with other European countries, increasing emphasis is being placed on encouraging the use of non-road modes of transport for freight movements. While British transport policy appears to have lost some of its direction and momentum in recent years, European transport policy strongly favours 'sustainable mobility' and envisages rail regaining a larger share of the freight transport market (European Commission, 2001 & 2006). Policy implementation is often less forthcoming than its conception, but increasing attention is being focused on the negative impacts of transport. The growing climate change debate, particularly in light of the recent Stern Review on the economics of climate change (HM Treasury, 2006), may act as a further stimulus within Britain to implement measures that either directly encourage the use of rail for freight movements or result in rail volume growth as a result of the greater internalisation of road haulage costs.

Increasing rail's share of the British freight market is a considerable challenge. There has been some success in recent years, with rail's share of domestic freight moved increasing from 6 per cent in 1994 to 8 per cent in 2004, as a result of 58 per cent volume growth (DfT, 2006). Rail freight tends to be best suited to direct trainload movements from terminal to terminal, where its strengths in moving large volumes can be exploited. Such high volume flows generally have declined with the reduction in heavy industrial activity and the shift towards more dispersed freight movements in a more consumer-driven economy. The increasing distance over which imported coal is transported has been the main driver of rail growth, although there has also been growth in other sectors. Typically, though, rail freight is viewed as not being a viable option for the smaller

volume flows that have resulted from the structural changes to the economy, particularly if they are non-unitised. The structure of and trends in the non-bulk market were analysed in Woodburn (2006), which identified considerable intermodal opportunities but also a continuing demand for conventional wagonload[1] services. Intermodal has been a significant growth area in recent years, with many new direct trainloads of containers and swapbodies, but there is little documented evidence that conventional wagonload traffic has increased and there has been a lack of strategic direction in service provision for these flows. However, an increase in rail's share of this market could assist in meeting environmental, social and, indeed, economic objectives, since much road freight movement is of goods that potentially could be transferred to traditional rail wagons.

The research objective for this paper is to assess the extent to which there is an ongoing market for wagonload rail freight in Britain. The paper is specifically concerned about the potential to increase the use of rail for non-bulk commodities, carried in traditional rail wagons rather than intermodal units. First, some background to wagonload service provision is provided, together with identification of the key trends in the last decade. An assessment of the main benefits and drawbacks associated with traditional wagonload freight is then presented, followed by the evaluation of alternative forms of service provision for this market based on lessons learned both from other rail freight sectors that have been more successful in increasing volumes carried and from experience elsewhere in the transport sector.

A key research challenge lies in establishing the ways in which wagonload service provision has been changing, since there is a lack of detailed official information relating to these services and the relevant operator is reluctant to divulge details that it considers to be commercially sensitive. Official statistics have been analysed where available but are of limited relevance due to the nature of their collection, which precludes the consideration of wagonload services in isolation. As a result, analysis of original databases of rail freight activity has been conducted. Databases have been compiled on an annual basis in each January from 1997 to 2006, with the exception of 2001 which was excluded as a result of the post-Hatfield derailment network disruption. These databases contain details of all known wagonload services. Interviews were also held with a range of wagonload customers and independent rail freight terminal operators, during which the key positive and negative experiences of wagonload rail freight services, and issues surrounding future provision, were discussed. This combination of desk-based research, primary research with key players involved in the industry and literature relating to alternative network types has informed the final sections of the paper which focus on future wagonload network strategy.

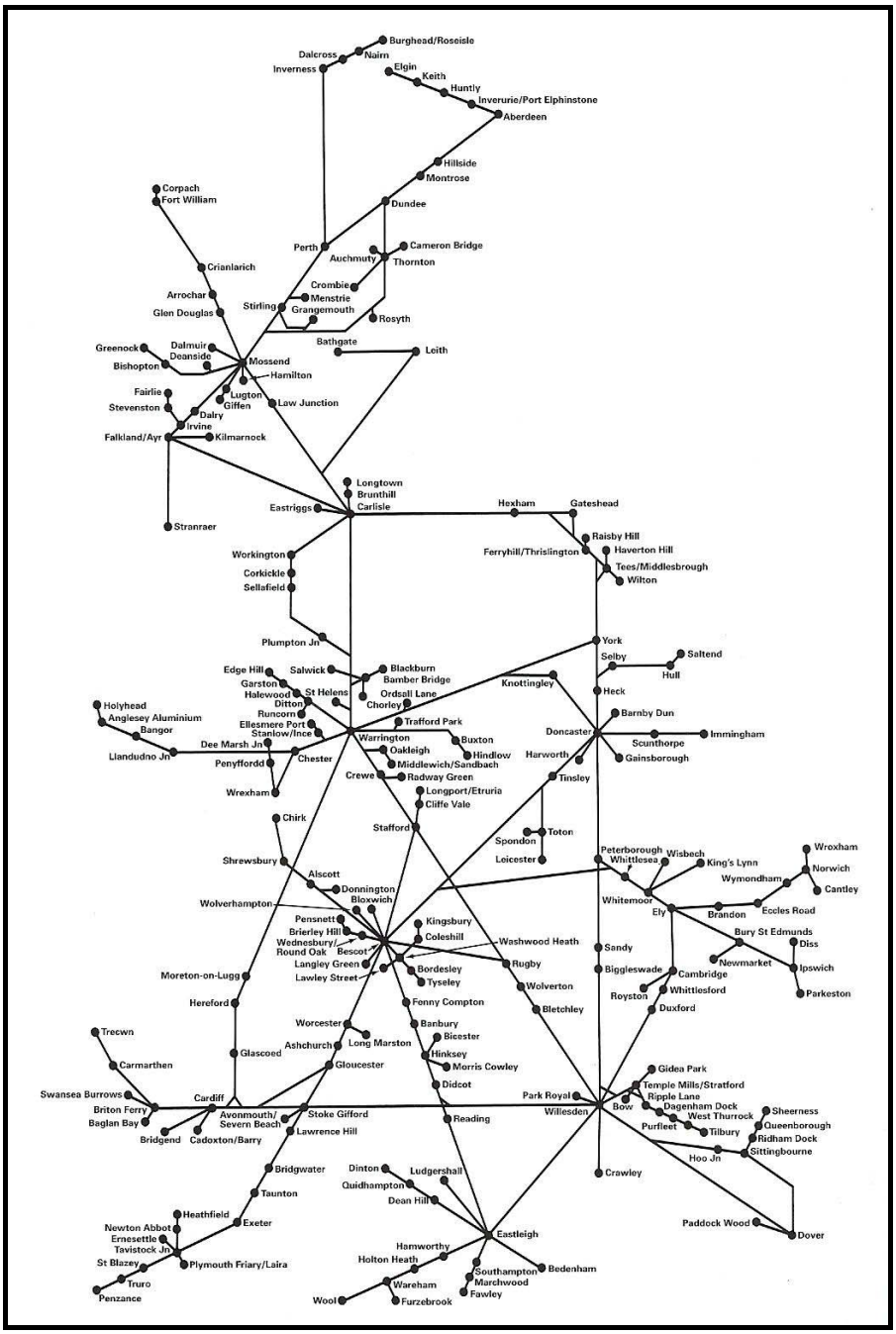
2. Background to wagonload rail freight in Britain

The history of wagonload operations can be traced back to the early days of the railways, with goods trains picking up and depositing wagons at almost all railway stations and goods yards. For more than a century, the private railway companies (and later the nationalised system) were forced to carry all goods offered to them unless this was deemed unreasonable, as a result of the 'common carrier' obligation adopted by government. By the time of the Beeching Report (1963), 'common carrier' status had ceased but the vast majority of rail freight tonnage was still being moved by wagonload services: even coal, a commodity long carried by the direct trainload, was predominantly moved by the wagonload in the early-1960s. The combined effect of the loss of significant rail freight traffic to the developing road network and the conversion of most of the remaining larger volume flows to direct trainload operation decimated the wagonload network. By 1977, however, only 20 per cent of tonnage was still carried by the wagonload network (Shannon, 2006). In an effort to retain these flows, and indeed attract new ones from road, services were revamped in the mid-1970s and the Speedlink brand name was adopted in 1977 for a revamped network offering faster services using modern air-braked wagons, with tonnage carried by the air-braked services increasing from 2.3 million tonnes in 1977 to 3.0 million tonnes in 1979 (Gourvish, 2002). The 1980s witnessed considerable expansion of the Speedlink network, though the number of services operated increased at a faster rate than the tonnage carried; this was particularly the case with the trip workings (i.e. the short distance feeder movements between sidings and

[1] Wagonload operation (also often referred to as less-than-trainload (LTL)) 'assembles a number of smaller shipments from a selection of origin points, from which they are tripped [usually a short distance movement] to an assembly yard. From there they will be run as a complete train (trunked) to another yard, and then distributed by tripping' (Glover, 2005)

assembly yards). By 1990, the operating costs of the Speedlink network came under scrutiny as a result of the financial and operational separation from the trainload freight business. The local marshalling and trip working costs accounted for 80 per cent of the network's costs, though the trunk services connecting the yards tended to be profitable. The review argued that long lengths of haul (i.e. 500 miles or greater) and at least 10 wagon loads per day were required for profitable wagonload network operation, the first criterion in particular being difficult to meet in Britain. Overall, Speedlink lost £28 million on a turnover of £42 million in 1989/90 (Gourvish, 2002) and wagonload's share of rail freight tonnage carried had dwindled to just 2 per cent (Shannon, 2006), although the network coverage remained extensive (see Figure 1). The decision was taken to abandon the Speedlink network from July 1991 (Gourvish, 2002) and to focus on traditional trainload and container freight movement.

Figure 1: Speedlink wagonload network, November 1990



Source: Shannon (2006)

In reality, a small network of wagonload services remained after 1991 to serve the Dover train ferry business, and a number of other less-than-trainload flows were combined to make up long distance

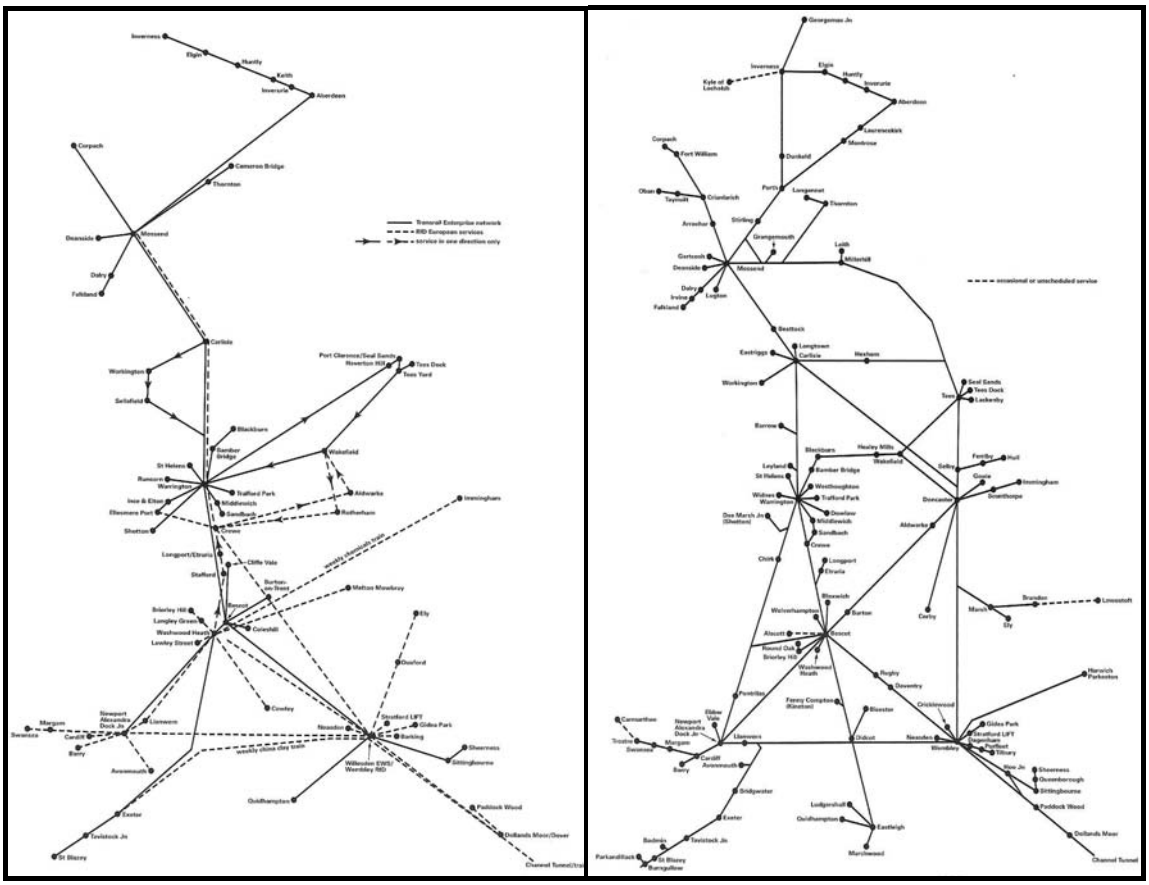
trunk services with some local trip working of portions still taking place. In other cases, wagons were attached to trainload services to get them to/from terminals. This approach was successful, with over 70 per cent of the former Speedlink traffic being retained on rail (Gourvish, 2002), and set the scene for a new development in 1994, in the run up to rail privatisation.

3. Trends in wagonload freight, 1994 - 2006

In preparation for rail privatisation, most of British Rail's freight operations were restructured in to three separate geographically-based operations (Clarke, 2000). Trainload Freight West, North East and South East (rebranded Transrail, Loadhaul and Mainline Freight respectively) gained responsibility for the vast majority of freight traffic, the exceptions being Channel Tunnel, deep-sea container and parcels services which were handled by Railfreight Distribution (RfD), Freightliner and Parcels respectively; the Channel Tunnel opened in 1994 and the Dover train ferry business ceased operation.

In the restructuring, Transrail was given responsibility for the majority of the small volume flows that remained from the Speedlink era, since they tended to operate within (or from) the western half of Britain. In September 1994, Transrail launched a revitalised wagonload network, branded as Enterprise and aimed at capturing long distance flows from the motorway network (Anon, 1994). Transrail emphasised that this development was not the recreation of Speedlink, since only profitable traffic would be carried. Essentially this meant that flows had to lie close to the main corridors served, since extensive remarshalling of wagons and associated trip working of small volumes was the main reason for the huge financial losses at Speedlink. Figure 2 shows the expansion of the Enterprise network during the late-1990s. In March 1995, Transrail's Enterprise and RfD's European networks were separate, with considerable duplication between them. It is clear that the majority of the Enterprise operation in 1995 was in the west of Britain, though with routes in to the Loadhaul area in Yorkshire/Teesside and Mainline Freight territory in South East England.

Figure 2: Wagonload rail freight networks, March 1995 (left) and May 1999 (right)



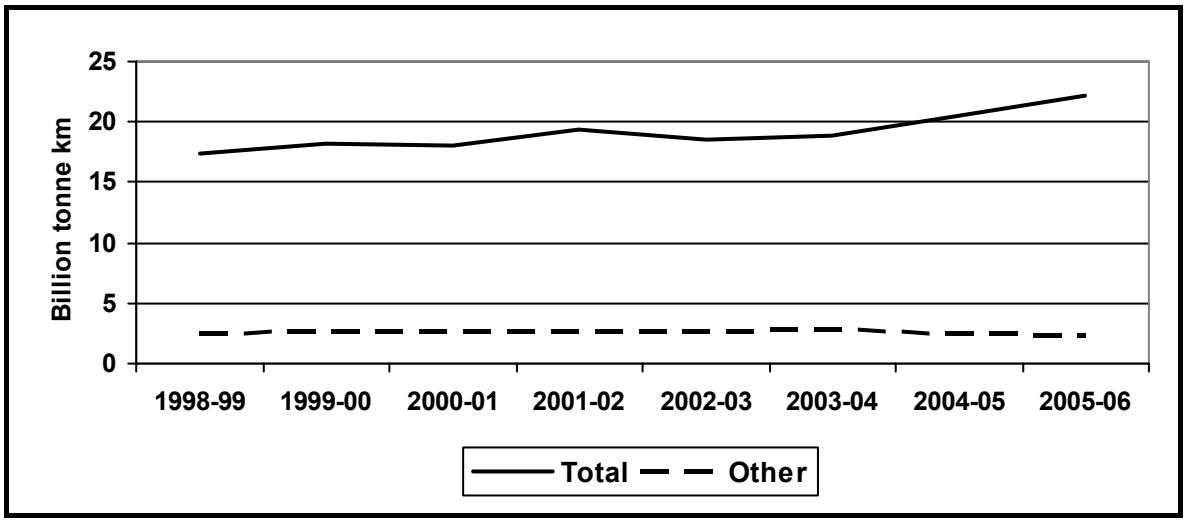
Source: Shannon (2006)

The rail freight operations were largely privatised during 1996, with RfD following in 1997. With the exception of the Freightliner business, all the operations were bought by Wisconsin Central and integrated under the English, Welsh and Scottish (EWS) banner. This provided the opportunity to absorb the European operations in to the Enterprise network to reduce the duplication of services and strengthen wagonload's capabilities. During the late-1990s the Enterprise network expanded fairly rapidly, with additional trunk routes, notably on the eastern side of the country, and extra terminals served by feeder services.

Comparison of Figures 1 and 2 shows that the Enterprise network has been less extensive than its Speedlink predecessor, although many of the same routes and terminals were being served a decade on from Speedlink's demise. The Enterprise network is largely based around hubs at Wembley (London), Bescot (West Midlands), Warrington (Cheshire), Mossend (Lanarkshire), Doncaster (Yorkshire) and Newport (Gwent), with secondary hubs at Carlisle (Cumbria), Eastleigh (Hampshire) and Tees Yard (Teesside). The period from 1999 to 2006 has not witnessed significant change to the fundamental aspects of the network, although there has been a noticeable contraction both in the number of terminals served and in the geographical reach of the network. The core network principles remain and, fundamentally, are little different to those of the earlier Speedlink network. The main difference is the smaller scale of operation for Enterprise when compared to its predecessor.

As stated earlier, statistics relating specifically to wagonload freight activity are no longer published, thus making it difficult to establish trends for this type of movement. The official freight moved statistics disaggregate flows in to seven categories: coal, metals, construction, oil and petroleum, international, domestic intermodal and other. Wagonload service provision essentially falls in to the latter category, although the Channel Tunnel wagonload flows will be at least partly represented in the 'international' sector which accounted for only 2 per cent of freight moved in 2005/06 (ORR, 2006). Figure 3 reveals the recent trend in the 'other' category relative to the total volume of rail freight moved. In 1998-99, 'other' accounted for 14 per cent of all rail freight moved. This declined to 10 per cent in 2005-06, and even further to just 9 per cent in the first quarter of 2006-07 (ORR, 2006). It should be borne in mind that 'other' includes trainload flows that do not fit in to the standard categories (e.g. automotive, chemicals), so wagonload's true significance will be considerably less than shown. Of significance is the decline in the importance of this category, which may be an indication of the state of the wagonload sector, though it is equally possible that wagonload volumes have remained stable or even grown, since some of the non-standard trainload flows have declined significantly in recent years.

Figure 3: Freight moved by rail in Great Britain (1998-99 - 2005-06)

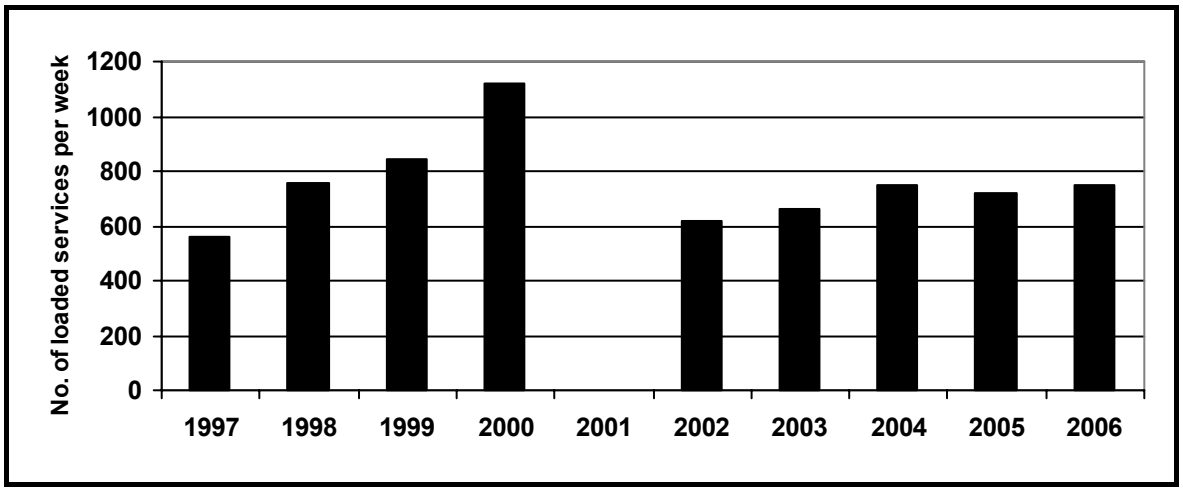


Source: ORR (2006)

To add weight to this assessment, Figure 4 uses original data from the author's databases to show the trend in the number of wagonload services operated per week in January of each year (with the exception of 2001) between 1997 and 2006. At 28 per cent, wagonload services accounted for a

higher proportion of all services[2] in 2006 than in 1997, when their share was 24 per cent. In line with the decline from the 2000 peak in terms of the absolute number of services operated, the share had reached 36 per cent in that year. Despite this, the absolute number of LTL services was higher in 2006 than in 1997, and there has been some growth in recent years. Therefore, when considering more than solely tonne-based official statistics, there is evidence of some change in the wagonload market. The rapid growth of the Enterprise network in its early years has not been sustained, however, with the large annual increases in service provision in the late-1990s having been replaced by a far slower growing network in the early-2000s, following a sharp decline around 2001. A number of factors are likely to have caused this decline, but notably the rail network disruption in the wake of the derailment at Hatfield in late-2000 and organisational changes and service quality problems within EWS around the same time.

Figure 4: Wagonload service provision, Great Britain (1997 – 2006)



Source: author's databases; no database was constructed in 2001 due to the network disruption following the Hatfield derailment

Overall, there is no clear pattern emerging as to the direction that wagonload rail freight is taking, unlike in the other less-than-trainload market (i.e. intermodal) where there has been significant growth both of container traffic to/from ports and domestic intermodal services particularly on the Anglo-Scottish corridor (Woodburn, 2006). There are some positive signs that the wagonload market is not diminishing, but there is no real evidence that there is any breakthrough happening in developing the wagonload market. It is important, therefore, to consider the main service attributes surrounding wagonload provision and identify an alternative strategy which would be expected to lead to significant growth in tonnage carried. The remainder of this paper focuses on these two matters.

4. The main benefits and drawbacks associated with traditional wagonload rail freight

Customers' experiences of wagonload services for 18 different case study operations were gained from interviews. Almost two thirds of the case studies also involved trainload[3] operation, allowing comparisons between the types of provision to be made. This section summarises the key benefits and drawbacks of wagonload rail freight that were identified through the interview process from the entire sample of wagonload users. Beginning with the negative aspects, the following list

[2] This relates to wagonload's share of all freight services that are recorded in the databases, which differs from the actual number of services operated since coal and mail services are not recorded. Therefore this approach is consistent from year to year, but is not directly comparable to official statistics.

[3] For the purposes of this analysis, trainload is assumed to include all services that operate as a block service between origin and destination, rather than undergoing intermediate marshalling. Thus, intermodal services are deemed to be trainload despite the fact that they may be carrying containers/swapbodies for a number of customers – in rail operations terms, such trains can be considered to be trainload. Wagonload services therefore specifically relate to Enterprise, with its network of trunk services between hubs together with associated trip workings to/from individual terminals.

summarises the key issues raised, with more comprehensive discussion being presented in Woodburn (2006):

- Basic network capability - the current EWS Enterprise network is seen as still being less flexible than its Speedlink predecessor. This reinforces the discussion in the previous section, but is not surprising given that EWS cannot be expected to bear such heavy losses as did British Rail.
- Infrequent local service provision –particularly an issue relating to low frequency trip workings to local terminals from the hub, since most of the trunk routes linking hubs operate daily or more frequently.
- Regular changes to flows or service provision – following on from the previous point, intermittent flows to/from local terminals are particularly problematic. For a range of reasons (e.g. Channel Tunnel disruption, change of contracts with customers), several interviewees had stopped using rail for particular flows for a period of time, but then had problems in restarting them when the flows were able to return to rail.
- Service reliability - trunk services generally operate reasonably well, although often delayed due to marshalling problems or delays with connecting services, but local trip workings are more problematic. This can significantly delay consignments that have almost reached their destination on schedule, but which are then stuck for a period of time in a marshalling yard that may be very close to the destination.
- Service punctuality – this was raised as an issue by the majority of respondents, the consensus being that wagonload service punctuality is considerably worse than that for trainload operation.
- Missing consignments - wagons going missing in transit, occasionally for several days at a time. This appears not to be a regular occurrence and, in any case, has generally been becoming even less common in recent times.
- 'Bumping' of traffic - there were few specific comments relating to trunk flows, but reference was made to the 'bumping' of consignments due to there being insufficient capacity on trunk services. As a result, wagons were sometimes delayed by a day or two awaiting a service that had some spare capacity on it.
- Communications problems – poor working practices and a lack of control required to manage the movement of individual wagons rather than the more straightforward fixed train formations that are generally used for trainload operations compounds many of the other problems.
- Lack of coherent wagonload strategy - A number of respondents criticised the lack of strategic direction with regard to the development of the wagonload network, with much of the growth in the late-1990s being misguided and unsustainable, leading to the subsequent withdrawal of many services (as identified in Figure 4). In general, the specific requirements of operating wagonload services, as opposed to the more straightforward trainload operations, were felt not to be understood by the rail operator.

Despite the drawbacks associated with wagonload operations, however, it was pointed out by interviewees that the network does provide some very important functions, including:

- Low volume flows - the ability to move small and/or irregular volume loads that simply would not travel by rail without the wagonload network
- Flexibility to test new traffic flows - more specifically, the opportunity to trial new flows and, if successful, build up volume over a period of time with limited resourcing and planning requirements, by tagging them on to existing services
- Cost - a lower cost option for moving non-time-critical consignments by utilising existing services rather than having to cover the full costs of trainload operation
- Network coverage – despite the negative comment above, wagonload can give access to a wider rail network than is possible solely with trainload operation
- Cooperation with other rail freight operations to combine resources and provide more service opportunities - greater range of journey opportunities for intermodal or traditional bulk commodities, which previously were limited to those routes served by trainload trains, through the integrated use of trainload and wagonload services for some flows

In summary, it would seem that wagonload operations work best where there are regular flows, albeit often of relatively small volumes. The rail operations requirement to operate to a schedule, both in terms of network access and the provision of traction and traincrew, makes it more difficult to cater for irregular flows. These can often be carried, however, if they can dovetail with other regular flows or where they can bear long transit times and/or uncertain delivery times. The next

section considers the role of multi-user rail freight terminals as enablers of small volume rail freight growth.

5. Multi-user rail freight terminals

A particular issue that arose during the research was the existence of considerable untapped potential of rail freight terminal operators, in terms of rail operations experience, knowledge of the customer base and available infrastructure. These operators range from having a single rail-connected depot and mainly local/regional road haulage operations (e.g. Gilbraith's in Blackburn (Lancashire) and Creative Logistics in Salford (Greater Manchester)) to those that are far larger companies with much more extensive operating areas and, in some cases, a number of rail depots as part of their considerable third party logistics provider role (e.g. Potter Group, WH Malcolm). This analysis focuses on specific issues raised by the seven freight terminal operators that made up a subset of the survey sample: in addition to operating railheads, many of these companies also provided other activities (e.g. warehousing, road transport) and in some cases integrated logistics packages. Their views have been analysed separately since, in addition to being rail freight customers themselves, they offer a key link between the rail freight service provider and the ultimate customer (e.g. manufacturer, retailer) and may have potential to play a bigger role within wagonload service provision. Indeed, many of the wagonload flows discussed within the case study operations resulted from the actions of the terminal operators.

It may be instructive first to consider some recent experience in the domestic intermodal market. A specific growth area within intermodal rail freight has resulted from the involvement of third parties acting as intermediaries between the rail freight operator and the ultimate customers, in the manner identified in the previous section. Due to the complexities of rail freight, not many freight customers have the knowledge or expertise to identify the role for rail in meeting their transport requirements, and the rail freight operators are typically viewed as having relatively poor understanding of contemporary supply chains, particularly for non-bulk flows such as consumer products. A role has therefore been established, whereby rail freight terminal operators and/or third party logistics companies have entered in to partnerships with both the customers and the rail freight companies to attract new flows to rail. The Anglo-Scottish services operated by Direct Rail Services (DRS) in collaboration with third party logistics companies such as WH Malcolm, Russell and, more recently, Eddie Stobart are good examples of this development, which has largely involved intermodal traffic for major retailers. In wagonload, some of the terminal operators have been instrumental in retaining or attracting rail flows, and would appear to offer potential for further development of this type of traffic.

There was general consensus among the sample of terminal operators that much more could be achieved with conventional wagonload rail freight. As key players, there was considerable potential for the terminal operators to be able to integrate rail in to the supply chains of a much larger range of companies given their greater customer-awareness and customer-focused approaches compared to the rail freight operators. While the latter arguably have a detailed understanding of the bulk (and, perhaps, intermodal) customers' requirements, there is less evidence that they are able to respond to the increasingly demanding customers moving, for example, fast moving consumer goods (FMCGs) around the country.

6. Identification of alternative wagonload network scenarios

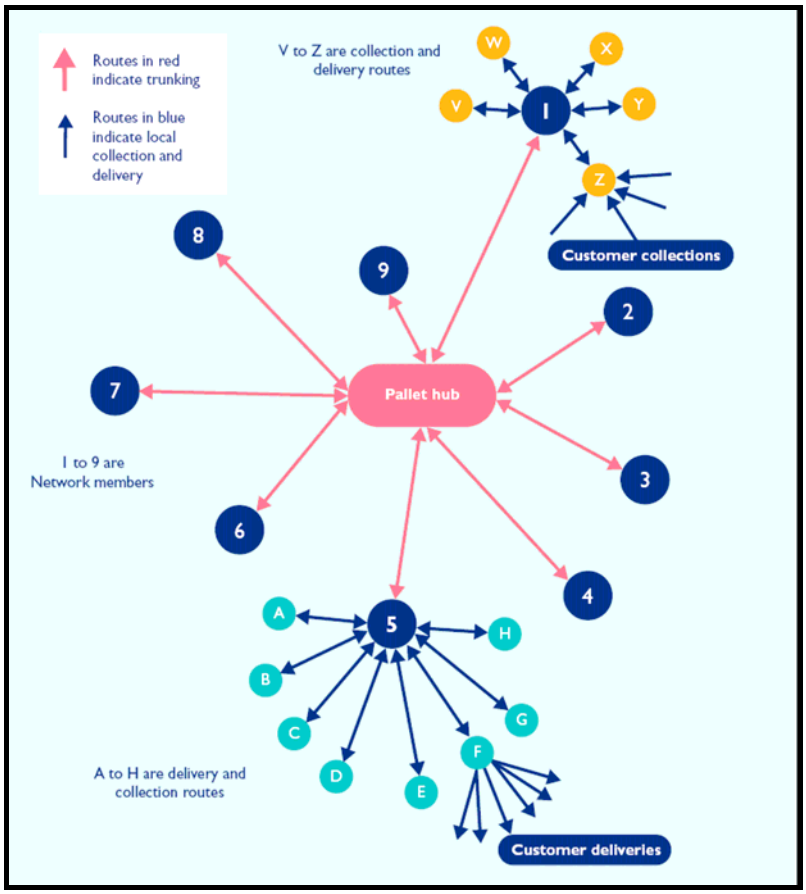
The key aim is to identify a way to provide a cost-effective rail service for wagonload flows (i.e. with regular volumes and minimal trip working) that also provides a sufficiently high quality of customer service to attract considerable additional volume. From the analysis thus far, it is evident that the following conditions will need to be satisfied:

- Relatively stable volumes, at least sufficient to justify the provision of a scheduled service, and ideally with a lengthy trunk haul
- As little marshalling of wagons and associated trip working of small volume flows to separate terminals as possible, since past experience shows these activities to be highly unprofitable
- Network stability to provide reassurance to customers that rail will cater for their flows in the long-term, since there may be significant logistical implications (and costs) associated with choosing to use rail

- The development of partnerships between rail freight operators and others within the industry, so as to maximise rail's potential through the provision of better customer-focused services

If these conditions can be met, the evidence suggests that rail stands a better chance of gaining a greater share of small volume flows. Obvious targets are the overnight/next-day market for palletised goods and for parcels, both of which have grown substantially in the past few years. Rail currently has a minimal role in these markets, with an overnight parcels train operating between the Midlands and Scotland and some palletised products moving on both the wagonload network and on trainload services. There has been no concerted attempt by any of the privatised rail freight operators to develop a coherent network serving palletised goods and/or parcels. As a recent benchmarking exercise of the road-based pallet networks showed (TransportEnergy BestPractice, 2005), there are around 10 competing networks operating and they cater for large numbers of pallets per night. The parcels and pallet networks operate on similar hub-and-spoke principles: an example of a pallet distribution network is shown in Figure 5, consisting of nine independent regional pallet network members each responsible for collections and deliveries within their geographical area and a central hub through which all inter-regional traffic is routed. The networks operate on the basis of independent regional transport operators signing up to a national 'brand' and operating inter-regional services to a fixed schedule.

Figure 5: An example of a road-based pallet distribution network



Source: TransportEnergy BestPractice (2005)

Rail typically is not a viable option for the customer collections and deliveries unless the volumes are sufficient to fill a number of wagons, which is relatively rare. However, for the trunking movements, which are normally longer distance in nature and of consolidated volumes, there could well be scope for rail use. The existing pallet networks achieve high vehicle utilisation rates for the vehicles on these trunk flows: 73% by weight and 80% by deck length (TransportEnergy BestPractice, 2005), much greater than in the benchmarking studies of the food and non-food retail sectors. While there are no authoritative statistics for the total number of vehicles, pallets or parcels moving between network hubs each night, the totals of each are certainly substantial. IFW (2006) estimated that 12 major pallet networks handled around 75,000 pallets per night through British hub networks, suggesting volumes large enough for rail even if it gained just a small share of this market.

As Table 1 demonstrates, there are many existing rail terminals that offer potential to act as regional hubs in a national network in much the same way as the road-based pallet networks operate. This list is intended to be indicative rather than exhaustive, and the terminals vary in terms of their handling and storage facilities, road and rail network connections, level of existing throughput, etc., but it shows that there is the potential to develop a rail-based hub network with rail carrying out the trunk movements between hubs. Additional facilities would be required to enable certain terminals to fulfil a useful role in a dedicated network.

Table 1: Existing terminals that potentially could serve an overnight wagonload network

Region	Potential terminals
South East	Hoo Junction; Tilbury IRFT; Cricklewood; Tonbridge
South Wales/South West	Cardiff; Avonmouth; Bristol Parkway
East Anglia	Ely; Felixstowe
Midlands	Daventry IRFT; Birmingham Landor St; Stafford
North West	Ordsall Lane (Salford); Blackburn; Knowsley; Warrington
Yorkshire and Humber	Selby; Wakefield; Doncaster; Immingham
North East	Middlesbrough; Low Fell (Newcastle)
Scotland	Mossend; Grangemouth; Hillington; Shieldmuir; Law Junction

Figure 6 displays two potential scenarios for a rail-based overnight express network designed to cater for wagonload consignments. The one on the left mirrors the majority of existing road-based systems, with traffic being collected at (and distributed from) regional hubs and taken to/from a central hub, most commonly in the Midlands area. The network on the right is based upon direct connections between each of the regional hubs, which creates a far greater number of links but removes the central hub. This network more closely resembles past rail freight experience, for example the former Royal Mail letter distribution operation or, indeed the wagonload networks of Speedlink and the current Enterprise. The big difference compared to the traditional wagonload network structure would be the lack of trip workings from the regional hubs to local terminals, although these could be accommodated should traffic levels justify them. In other cases, consignments would transfer at the regional hub for local road movement. Alternatively, this new network could be marketed as a dedicated pallet/parcels network using standard handling equipment and rolling stock and operated entirely separately from the Enterprise network. There may also be potential for hybrid trunk networks between the extremes shown in Figure 6. For example it may be feasible to develop a hub-and-spoke network that also has selected direct links between geographically close and/or high volume pairs of terminals, or a directly linked network of terminals that provides intermediate terminal calls on the line of route (e.g. South East to Scotland calling at the Midlands and/or North West terminal). Such a rail-based network could be exclusive to palletised goods or parcels, or have a much broader remit to cater for different types of wagonload traffic. A key strategic decision would need to be taken as to the focus of a new type of wagonload network, essentially with three options to select from:

1. Establishment of a new pallet/parcels network based on regional hubs and operating independently of the existing Enterprise network, either independently or in conjunction with one or more existing pallet networks
2. Transformation of the existing Enterprise network in to a coherent overnight network based around regional hubs (with very limited trip working) and able to attract greater volumes of pallets/parcels
3. A hybrid network, based on some joint services catering for pallets/parcels and other wagon loads and some independent service provision by other wagonload services (e.g. Enterprise)

A comprehensive analysis would have to be undertaken before being able to determine which would be the best option and, indeed, which of the two scenarios shown in Figure 2 would be more appropriate. This would clearly require detailed investigation of the operational impacts, but an element often overlooked in rail freight is the marketing potential of a coherent network with obvious capabilities and purpose. The Enterprise network certainly appears to have suffered from the lack of strategic direction and variability in the network's capabilities, since it has typically responded to the requirements for specific flows rather than the provision of a relatively fixed network of which customers can have faith in its continuing existence. Table 2 summarises some of the key benefits and drawbacks that would be expected to result from each of the three network options.

Figure 6: Potential network scenarios: centralised hub-and-spoke (left) and direct links (right)

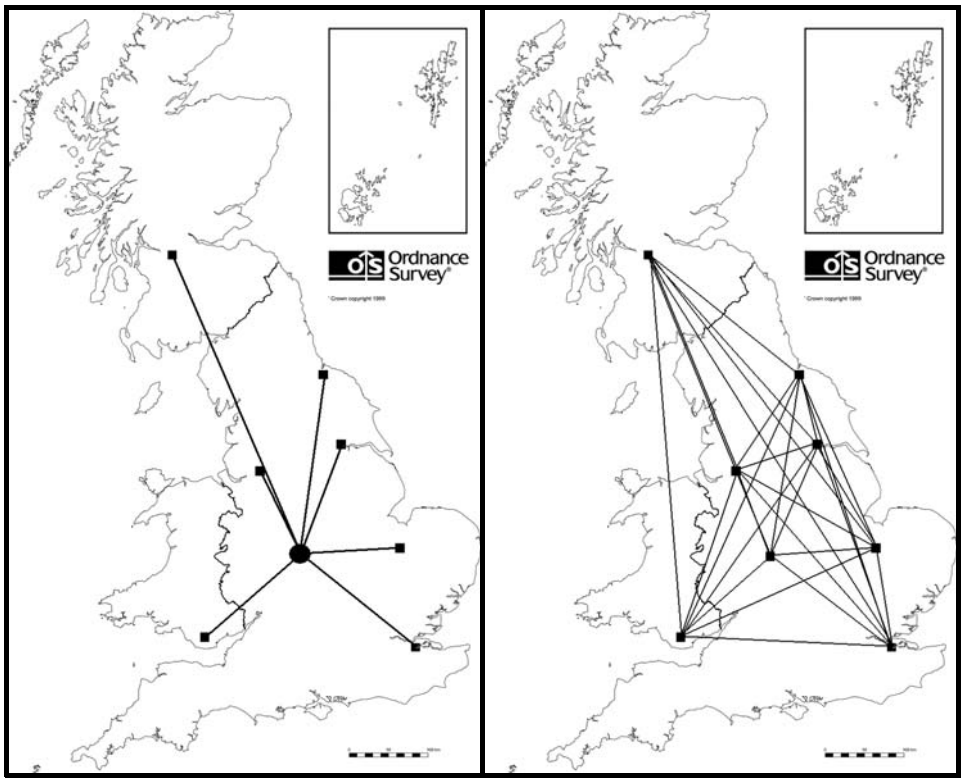


Table 2: Preliminary assessment of network options for an overnight wagonload network

Option	Potential benefits	Potential drawbacks
1 – new independent pallet/parcels network	• Potential for either network scenario to be feasible, dependent on volumes • Whole operation effectively becomes trainload, overcoming many of the wagonload service quality problems • Marketing benefits of dedicated network for time-sensitive traffic • Common handling and rolling stock requirements • Tight control over operations due to the relative network simplicity	• High start-up costs for development of wholly new network • Additional resources likely to be required from rail freight operator • Potential lack of volume solely from pallets/parcels sector to allow a viable network
2 – transformation of existing Enterprise network	• Relatively low start-up costs, since based largely on existing operations • Resource implications (e.g. wagons, locomotives, traincrew) are likely to be relatively low	• Many of the existing service quality problems likely to be perpetuated • Difficulties in marketing the network as a coherent entity • Mismatch between the requirements of different traffic types • Potential capacity constraints at the limited number of terminals • Potential loss of some Enterprise flows where an inferior service would result
3 – hybrid network	• Greater flexibility of provision, allowing network to be 'all things to all people' • Potential for some resources (especially locomotives) to be used during daytime for any necessary trip workings to other terminals	• Potential lack of synergy between requirements of Enterprise-type flows and pallets/parcels • Possible difficulties in marketing the network as a coherent entity • Service quality likely to suffer (compared to 1) due to the greater complexities involved

On balance, a variant of the hybrid network option is likely to offer the best overall solution, subject to more detailed investigation as to how the potential drawbacks can be mitigated. Option 2 seems unlikely to make much of an impact without significant change, and Option 1 is likely to be costly to implement so would perhaps require external financial support to get it started.

7. Conclusions

This paper has investigated recent experience in the wagonload rail freight market in Britain. The analysis found that there had been rapid expansion of the Enterprise network in the mid- to late-1990s after its introduction in 1994. However, little evidence has been found of any further significant expansion of traditional wagonload rail freight since 2000, despite the general growth in rail freight volumes that has occurred since that time. The survey of wagonload rail freight users and terminal operators handling wagonload volumes revealed a considerable range of problems relating to the existing service provision for small volume flows. Despite this, a continuing role for such services was identified by the majority of customers, although measures that allowed services to operate in a manner more common to trainload (i.e. without intermediate marshalling) would be widely welcomed. The relatively new Anglo-Scottish intermodal services were identified as a good operating model, where traffic for multiple customers is formed in to a trainload at one terminal and transported by rail directly to another terminal for onward local road distribution. The paper has therefore proposed the development of an overnight network linking regional terminals that would offer a next-day service to a range of customers, either operating through a central hub or with direct links between the regional terminals. The exact nature of this network would need to be developed but it would be expected to have similar operating principles to the road-based pallet networks, thus catering for pallets/parcels and, most likely, some of the existing wagonload traffic of other types. Such a development would offer scope for rail to expand in the very significant market for small volume consignments through the provision of a fixed network, and would potentially lead to environmental and economic gains through the use of rail for trunk hauls.

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