HINCKLEY NATIONAL
RAIL FREIGHT INTERCHANGE

Rail Freight Terminal

One of a series of background topic papers prepared by db symmetry in support of a public consultation on proposals for a strategic rail freight interchange in Blaby district, to the north-east of Hinckley in Leicestershire.

INTRODUCTION

1. In 2019 db symmetry will apply to the government for a Development Consent Order (DCO) for a proposed Strategic Rail Freight Interchange (SRFI) on a site in Blaby District, to the east of Hinckley in Leicestershire. The project is known as the Hinckley National Rail Freight Interchange (HNRFI).
2. A DCO is a special form of planning permission for large infrastructure projects. It can include a range of additional powers required to implement the proposals, such as powers to acquire land, undertake works to streets, trees and hedgerows and divert utility services.
3. This topic paper describes the function, design, and operation of the rail freight facilities within Draft DCO Boundary ("the site"). It begins by setting out the main functions of the rail freight facilities. It then outlines the interfaces with the main line railway, it describes the rail facilities and phasing, and finally describes typical activities at the terminal.
4. This paper should be read in conjunction with db symmetry topic paper on *Policy and Need*, which explains the national need for strategic rail freight interchange facilities.

STRATEGIC RAIL FREIGHT INTERCHANGES

5. According to para. 2.44 of the government's National Policy Statement for National Networks ('the NPS'):

> *The aim of a strategic rail freight interchange (SRFI) is to optimise the use of rail in the freight journey by maximising rail trunk haul and minimising some elements of the secondary distribution leg by road, through co-location of other distribution and freight activities. SRFIs are a key element in reducing the cost to users of moving freight by rail and are important in facilitating the transfer of freight from road to rail, thereby reducing trip mileage of freight movements on both the national and local road networks.*

6. Paragraph 4.88 of the NPS describes the key rail functions of an SRFI:

   Applications for a proposed SRFI should provide for a number of rail connected or rail accessible buildings for initial take up, plus rail infrastructure to allow more extensive rail connection within the site in the longer term. The initial stages of the development must provide an operational rail network connection and areas for intermodal handling and container storage. It is not essential for all buildings on the site to be rail connected from the outset, but a significant element should be.

7. Thus an SRFI provides two types of rail freight facility:
   - An intermodal area where containers are lifted to and from rail freight wagons
   - Rail connected buildings where rail freight wagons can be unloaded directly into the buildings
8. These facilities and their functions are described in more detail in the following sections.

TYPES OF FREIGHT TRAIN

9. Intermodal trains carry containers or other similar units. The containers are transferred to and from the train at each end of the journey using large cranes or reach stackers. Once transferred, the containers may be stored at the terminal or loaded onto flat bed lorries for delivery to the final customer's premises.
10. A major benefit of an SRFI is that the distance for the final delivery is likely to be very short – simply from the rail terminal to a nearby warehouse. This eliminates traffic from the road network, and keeps costs low.
11. Conventional wagons are different, in that goods are carried on or in the wagon, generally on pallets. Pallets have to be lifted one by one from the wagon to a lorry. While this may be a more expensive operation, for some products this is compensated for by a much higher payload in the wagon.
12. An SRFI such as HNRFI will be used by up to four types of rail freight service:
    - Three types of intermodal trains:
    - Intermodal trains to and from deep sea ports such as Felixstowe
    - Intermodal trains to and from the continent via the Channel Tunnel
    - Intermodal trains to and from other locations in Great Britain ("domestic intermodal")
    - Conventional wagon trains – usually trains of sliding door vans
13. The photographs below illustrate some key features of likely operations at an SRFI.

Figure 1: Intermodal wagons and containers

Figure 2: Intermodal handling using reach stackers

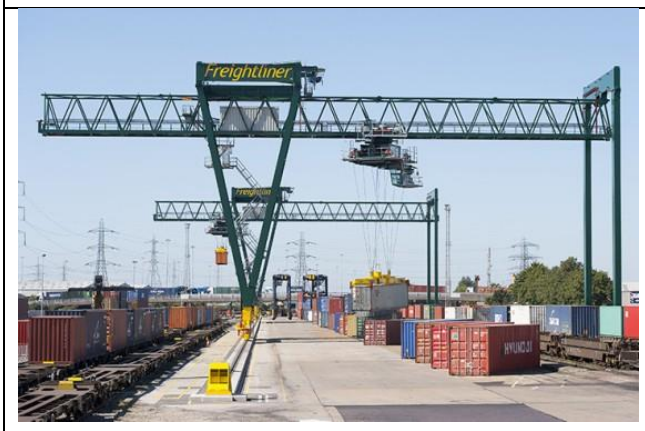

Figure 3: Intermodal handling using gantry cranes

Figure 4: A train of conventional wagons

MAIN LINE ACCESS

Responsibilities

14. Network Rail owns all of the main line rail network. It maintains the railway, operates the signals, and writes and manages the train timetable.
15. Freight Operating Companies (FOC), otherwise known as freight operators, operate trains over the network. They provide locomotives and drivers, and have a license to operate trains. They book timetable paths from Network Rail on a long term or short-term basis. They often provide wagons, although wagons can also be leased separately.
16. Freight customers buy full trains (or, more rarely, space on trains) from the FOCs, usual on a contractual agreement. Customers might include aggregates companies, logistics businesses, or shipping lines.

17. A terminal operator transfers goods to and from trains and provides additional services such as storage, or loading and unloading lorries for final delivery. The terminal operator could be a customer (such as a shipping line), a FOC, or an independent business.

Connecting To The Main Line

18. Hinckley National Rail Freight Interchange (HNRFI) will be located adjacent to the main railway line between Nuneaton and Leicester, on the south side of the line approximately 2.7km east of Hinckley station.
19. There will provision for two connections to the main line, allowing eastbound and westbound access, with crossovers on the main line itself to allow freight trains to move from one track to another. Thus a train from the west will cross to the eastbound line before entering the terminal, but a train from the east would be able to enter directly from the westbound railway line.
20. Connections to the main line will be designed so that trains can enter the terminal at a reasonably high speed, which will minimise the time that each train blocks the main line.

The Felixstowe to Nuneaton Line Today

21. The Felixstowe to Nuneaton railway line is part of an important strategic freight route which links the Port of Felixstowe to the Midlands. This is often referred to as the Felixstowe to Nuneaton Line (F2N). Felixstowe is the major container port for the UK, despatching over 33 trains of containers per day and receiving the same number.
22. As well as trains to and from Felixstowe, the line between Nuneaton and Leicester is currently used by two passenger services each hour in each direction: the Birmingham to Leicester service and the Birmingham to Stansted Airport service.
23. Approximately 30 freight trains use this line in each direction on a typical day (taken from July 2018 Working Timetable). Of these, 15 are container trains to or from Felixstowe, and the remainder include trains of aggregates to and from the Leicestershire quarries, trains carrying steel products, or trains carrying petroleum products to or from the Humber refineries. Up to half of these trains operate at night. During the day time up to 2 freight trains pass the location of the terminal each hour, but there are several hours with no freight trains at all.
24. This would suggest that there is currently more than enough capacity on this line to accommodate freight trains to and from the new terminal.

The Felixstowe to Nuneaton Line In The Future

25. Network Rail produced draft revised rail freight forecasts in May 2018. These included four scenarios for future demand. The forecasts suggest that current demand for rail freight is 1.7 paths per hour in each direction, which is closely in line with our summary above. By 2023/4 the Network Rail forecasts suggest that demand could increase to between1.8 and 3.5 freight paths per hour in each direction along this section of railway.

26. While the 2018 Network Rail forecasts only show forecast demand for 2023, the earlier, 2013, Network Rail Freight Market Study suggest that demand for freight paths between Nuneaton and Leicester could increase by a further 50% between 2023 and 2033.

27. Midlands Connect reports aspirations to increase the number of passenger trains on this section of line from the current 2 trains per hour in each direction up to 4 trains per hour (from the Midlands Connect Strategy). This may require some infrastructure improvements. The Midlands Connect strategy includes the following statement:

> *'Through our technical work we have identified the potential for a phased increase in the service frequency from the current two trains per hour to four trains per hour between Birmingham and Leicester. In terms of journey speed, there is a strong case for the enabling infrastructure to increase journey speeds to at least an average of 60 mph, reducing journey times by 20% to around 40 minutes. The infrastructure needed to deliver these improvements are relatively discrete and could be developed and delivered in parallel to the Midlands Rail Hub work. Further work will investigate the benefits to freight (particularly at Water Orton and Leicester) and the need to ensure the benefits of the infrastructure proposed are maximised for both passengers and goods.'*

28. Operating a forecast 8 trains per hour (4 passenger and 4 freight) in each direction on a modern two track railway is not likely to be an issue. Trains to and from the proposed terminal will be a small part of forecast freight demand (0.5 trains per hour each way out of a total of up to 4).

29. There are more complex constraints at junctions, particularly the sections of line through Leicester and Water Orton the Midlands Connect Strategy identifies that some upgrades will be needed at these locations which would also benefit freight trains. The HNRFI project will reduce pressure on the junctions at Water Orton by providing a destination for trains from Felixstowe before they reach the congested West Midlands rail network.

30. The developer is working closely with Network Rail on the design of access to the railway and to confirm the availability of capacity.

Loading Gauge and Train Length

31. The "loading gauge" is the profile of bridges and tunnels. A larger loading gauge will allow bigger freight wagons to pass. The key loading gauges for rail freight are:

- **W10** Gauge: 9ft 6in height International Organization for Standardization (ISO) containers are now the dominant size in the deep sea maritime sector. In order for rail freight companies to transport this size of container on a standard height wagon, the W10 gauge is required. Although the use of low deck wagons can act as a solution to overcome infrastructure gauge constraints, these are an inefficient and therefore more expensive method of transportation due to factors including unused loadable train length, increased maintenance running costs and higher daily leasing costs.

- **W12** Gauge: The W12 gauge maintains the height of W10 (9ft 6in on a standard platform) but has an increased width of 2600mm, which accommodates wider intermodal unit sizes, typically required for pallet-wide swapbodies employed in domestic and continental intermodal traffic. Fewer routes are cleared for W12, but this gauge may become useful in

future years for traffic to and from the Channel Tunnel and short sea ports such as Harwich or Immingham.

32. As the map below illustrates, the line from Nuneaton to Leicester is cleared to W10, and is at the heart of the national W10 network. 9'6" containers can be carried from the proposed terminal to any deep sea port and most rail freight terminals

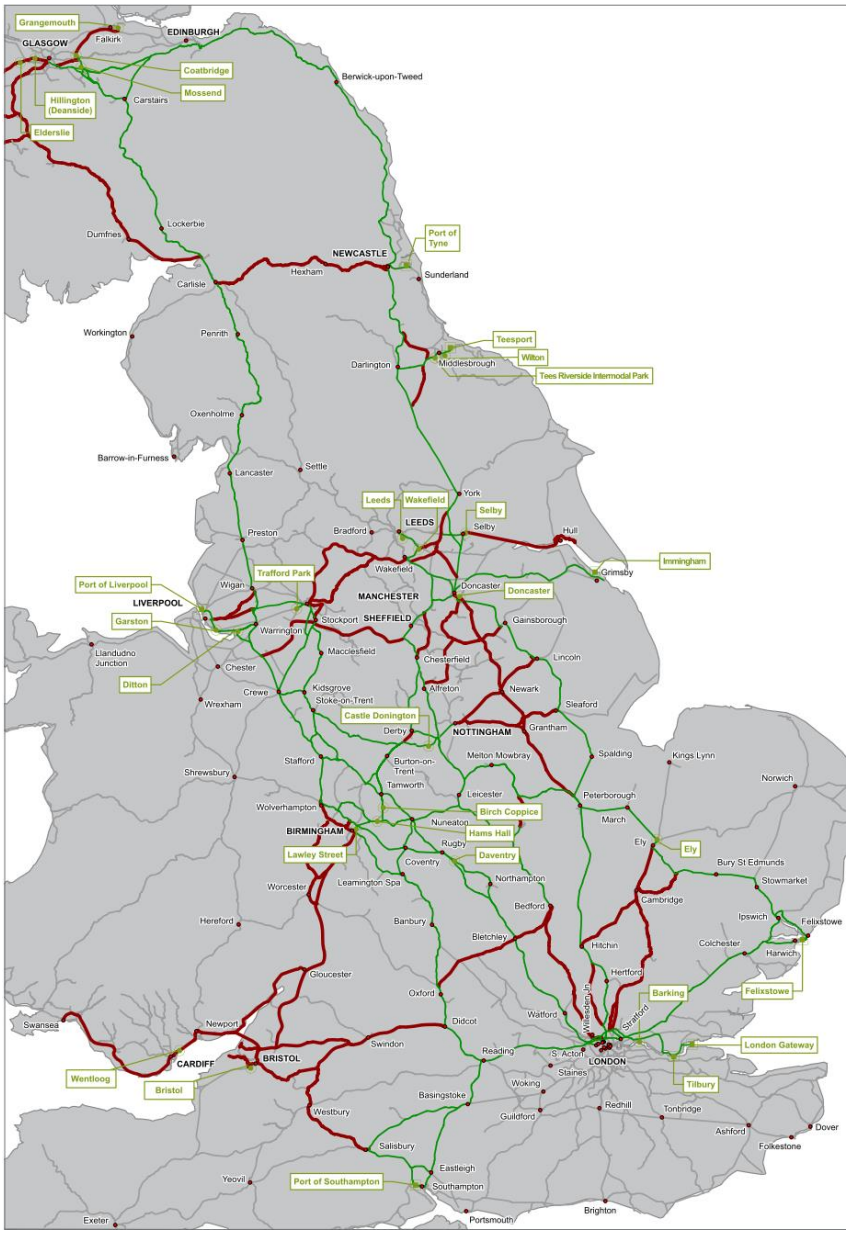

Figure 5: W10 Network (2017) . Network Rail

33. Intermodal trains, carrying containers or swap bodies, are among the longest trains on the UK rail network. The standard maximum length for an intermodal train is 600m. Most ports and terminals can accommodate 600m long trains. Network Rail is undertaking a programme to increase maximum train lengths on key routes to 775m. The longer trains provide more capacity and reduced costs per container.

34. Currently the only 775m capable routes are from Southampton to Nuneaton / Birmingham, and Felixstowe to Nuneaton via London. The F2N route and the Nuneaton to Leicester line have not been cleared for 775m long trains, but may be in the future.

35. The proposed rail terminal will be able to receive 775m long trains and so will be compatible with the increased length whenever the route is upgraded.

RAIL FREIGHT FACILITIES TO BE PROVIDED

36. The completed terminal, will be able to handle 12 trains per day each way, but it will take some years for traffic to build up to this volume. The terminal is being designed so that capacity can be added when required, while ensuring that a viable and efficient terminal is provided from the start.

37. The proposed Phase 1 terminal would be a much simpler facility comprising:

- A single connection facing towards the East
- Direct access from the connection onto the intermodal terminal
- 2 or 3 tracks within the terminal from which containers can be lifted using reach stackers
- An adequate area of hard standing to store containers.

38. This would immediately allow up to 4 trains per day to be handled.

39. The Phase 2 terminal would include the facilities of Phase 1 but would add:

- An extra pair of unloading tracks in the future location of access sidings for the warehouses
- A reversing siding to allow wagons to reach the new unloading area

40. This would potentially increase capacity to 6 trains per day

Phase Three: The Complete Facility

41. Phase 3 maximises capacity by adding the exchange sidings, providing much more flexibility to sequence trains, and separating rail movement operations from terminal operations. Phase 3 also releases unloading sidings to provide access to warehouses.

42. The rail freight facilities have been designed so that capacity can be provided to meet demand incrementally. Initially a basic terminal will be provided capable of handling one or two trains per day. Ultimately a high capacity flexible terminal will be completed. The final terminal layout and operation is described in this section, with the next section describing the phasing.

43. The completed rail freight terminal will include the following components:

- Provision for two connections to the main line, one in each direction
- Reception sidings able to receive 775m long trains and with provision for future electrification
- A reversing siding allowing trains to be moved from the reception sidings to the parallel intermodal terminal

- An intermodal terminal able to accommodate 4x 600m long trains. Ultimately this may be operated using gantry cranes, but initially reach stackers will be used
- Rail sidings serving a number of warehouses for conventional wagon services
- An area to store containers
- Associated facilities such as an office block, gates and a gatehouse, lighting, and fences

44. The completed rail terminal will have the capacity to handle12 trains per day inbound and 12 outbound.

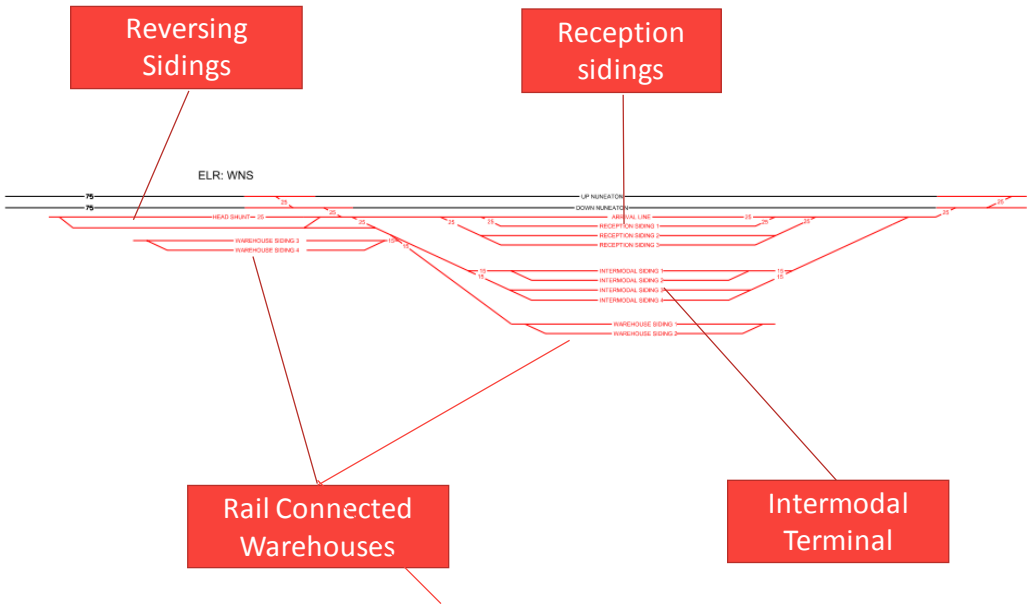

Figure 6: Conceptual Rail Layout Showing Key Features

Typical Operations

45. When a train arrives from either direction it will pull into the reception sidings as quickly as possible to avoid blocking the main line.

46. The train must then be moved from the reception sidings to the parallel rail terminal. This involves pulling the train onto the reversing siding and then pushing the train back into the intermodal terminal.

47. Once in the intermodal terminal cranes or reach stackers can be used to remove containers from the train and reload containers back onto the train.

48. A reach stacker is a large mobile lift truck which can pick up containers and move around flexibly. The cranes would be gantry cranes which are fixed to rails and move up and down the terminal. Initially reach stackers would be used, switching to gantry crane operation when more capacity is needed. The main benefit of the gantry cranes is to allow a faster operation with more space to stack containers. While reach stackers are flexible, they require more space to manoeuvre, and storage space will be in much demand by the terminal's customers.

49. Containers unloaded from a train can be transferred by the crane to a temporary stock pile nearby, or, more often, transferred onto a flat bed trailer being pulled by a lorry. The lorry can then undertake one of three operations:

    - Make a direct delivery by road within the surrounding development
    - Make a delivery to a business further away, generally likely to be within 80km
    - Transfer the container to the container storage area where it can be held until needed

50. The container storage area will be a dense stack of containers up to 5 high. Containers will be lifted to and from the stack by reach stackers, initially, and by rubber tyred gantry cranes when more capacity is required.

Figure 7: Reach Stacker Operation

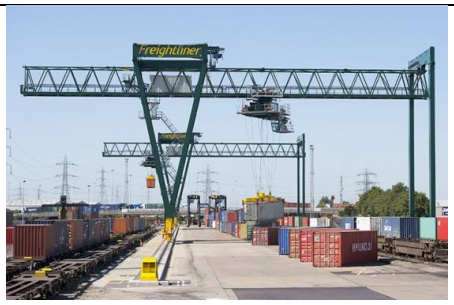

Figure 8: Rail Mounted Gantry Crane (RMG)

Figure 9: Rubber Tyred Gantry Crane (RTG)