With preparatory works in progress for some time, the coming months are expected to see the start of construction for a new intermodal terminal and freight hub at Lehrte, to the east of Hannover. The so-called ‘MegaHub’ is intended to provide a completely new approach to intermodal operations, based around the automated rail-to-rail transfer of containers and swap bodies rather than shunting blocks of wagons between trains.

Hannover is a key node in the trans-European rail freight network, lying at the intersection of the North Sea-Baltic, Orient/East-Med and Scandinavian-Mediterranean TEN-T corridors.

The new terminal at Lehrte is expected to take over two key functions. Firstly, it will act as a central hub for national and international transport flows, providing rail-to-rail transhipment between trains on different corridors. And it will also serve as a regional terminal for intermodal road-rail transport, allowing the closure of the existing terminal at Hannover-Linden.

The MegaHub is being developed for DB Netz AG by DB ProjektBau GmbH. It will be built on the site of existing freight sidings, at the western end of the current Lehrte marshalling yard. This is connected by triangular junctions to both the east-west main line from Hannover to Braunschweig and Wolfsburg and the north-south Hildesheim – Celle route, giving easy access in all directions. The site is also easily accessible by road, with a connection to the Lehrte western bypass and avoiding the need for lorries to pass through the town. DB ProjektBau also notes that land is available adjacent to the terminal for the development of a freight logistics park and warehousing.

A long time coming

The MegaHub project has been under development since 1997, and after much negotiation planning consent was granted in April 2005. However, various interruptions to the process meant that it was not until September 2011 that detailed design for the project resumed. By this time, the requirements had to be amended to take account of the latest technical developments and changing market conditions.

A decisive step forward came in November 2011 when DB Netz AG reached agreement with the Federal Ministry of Transport over the financing of the project. The ministry subsequently allocated €77·1m for the scheme in its 2011-15 investment plan.

In the summer of 2013, DB began clearance work to prepare the site for construction, followed in November by preliminary work on the overhead line equipment. Site clearance works were largely completed by February, ready for the start of the main construction phase. This was anticipated to begin during the second quarter of 2014, but has not yet started, although some alterations to the existing trackwork have been carried out.

Nevertheless, DB Netz is hoping to
begin trial operation during 2016, with a full start of revenue service the following year.

Implementation of the MegaHub will take place in several stages. Once fully completed, it is intended to have a handling capacity of 345,000 TEU per year. However, the first stage envisages a maximum throughput of 135,000 TEU, of which 35,000 will be switching between road and rail. This would see the terminal handling 16 trains a day for rail-to-rail transshipment purposes and four trains for rail-road transfer, generating around 115 lorry movements per day. Most transfers are expected to take place at night, between 21.00 and 05.00 (Table I).

The terminal was originally designed to handle up to 52 trains per day. However, as part of the planning approval process, the forecasts were reduced to 60% of this level. Once the MegaHub is fully operational, it would be expected to handle 24 trains/day for rail-to-road transfers and another eight for road-rail.

Terminal facilities

The centrepiece of the terminal will be the six transfer tracks, which will have a minimum operational length of 700 m. This will accommodate the longest trains able to run across the TEN-T network, even though DB Schenker Rail is now operating trains of 850 m on some international services and investigating a length of 1,000 m. There will also be a separate run-around track for locomotive release, plus two access lanes for lorries on the north side of the site.

The loading tracks are grouped in two banks of three, flanked by container storage areas. In the first stage of construction, the terminal will be equipped with three gantry cranes, 80 m wide, which are to be supplied by an unnamed Austrian group. The 2005 planning decision allows for up to six cranes, rather than the 10 initially envisaged, although in practice all six may not be needed because of technical developments in the intervening period.

Automated sorting

The most innovative element of the project is a fully-automated container sorting system, which is being adopted in the rail sector for the first time. Between the two banks of loading tracks will be three sorting lanes, on which at least 12 automated carriers will shuttle containers and swap bodies back and forth and side-to-side between the gantry cranes as they are loaded and unloaded on different trains.

As yet, no decision has been taken about the technology to be used for this sorting system, except that it will be rail-based to minimise the width needed under the cranes. Similar systems used in major ports employ rubber-tyred drayage units and straddle carriers. One technology reportedly under consideration is that supplied by Würzburg-based Noell Mobile Systems, which is now part of Terex Ports Solutions.

However, the sorting system is not the only innovation planned, as the operating method for the terminal will also be new. Rather than directing an arriving train into an electrified reception track and shunting the wagons under the crane with a separate diesel locomotive, the intention is that trains will arrive and depart directly from the loading tracks.

All six loading tracks will therefore be protected by signals at both ends, in order to control the arrival and departure of trains. Electrically-hauled trains will coast into the terminal without power, as the need for overhead access to the wagons during loading and unloading precludes the use of catenary. The electric locos should be able to couple to the outer ends of a departing train ‘under the wires’, although some operators may opt to deploy the new generation of electric locos with ‘last mile’ auxiliary diesel engines. This mode of operation will eliminate the need for separate shunting locomotives, but it has yet to be agreed by the various approval authorities.

In parallel with the construction of the MegaHub, DB Netz will have to modify the layout of its existing Lehrte marshalling yard (Fig 2). The new terminal will replace a bank of dead-end sidings to the west of the site, and the new road access will sever the so-called West Tangent connecting line which enables trains from Celle to Wunstorf to bypass the yard on its northern side. This 1,750 m long curve will be relocated south of the terminal, bisecting the eastern marshalling sidings into two banks. One will continue to be used for train assembly, but the more northerly tracks to the east of the intermodal terminal will be dedicated to the storage and repair of defective wagons. There will also be two tracks equipped for brake testing.
Exchanging containers at the new interchange will eliminate the need for shunting wagons between intermodal trains, as currently happens at the existing Hannover-Linden yard.

Operating pattern
As yet, the service pattern for the new terminal is still at the concept stage, but a sample timetable developed by DB Netz during the consultation phase (Table I) envisages the initial 16 trains/day would connect Lehren to ports and hubs throughout the country. Each train would depart in the evening, spend 2 h at the MegaHub exchanging loads during the night and arrive at its destination early the next morning. Up to four trains would be exchanging loads at any given time.

At this stage, it is envisaged that the MegaHub will be used primarily by DB Schenker Rail, but it will be open to other operators in line with European regulations on non-discriminatory access to railway infrastructure. The existing terminal at Hannover-Linden, like many others around the country, is operated by Deutsche Umschlaggesellschaft Schiene-Strasse, which is owned 75% by DB Netz and 12.5% each by DB Mobility Logistics and Kombiverkehr. A similar arrangement is expected to apply at Lehre.