## Introduction

Over the past two years a feasibility study has been carried out of the Rhein-Ruhr Rail Connection (3RX), a rail route between the North Sea Ports and the Rhein-Ruhr area in Germany. The study was commissioned by the Flemish Government and co-financed by the European Union. A steering committee, consisting of representatives from all five governments involved (i.e. The Netherlands, Germany, Belgium, Nordrhein-Westfalen and Flanders), has overseen the study. The study was carried out by the ARTECORAIL, a consortium of consultancy companies from all three countries.

## 3RX

3RX connects Antwerp (Belgium) with Mönchengladbach (Germany), via Lier and Mol (Belgium), Weert, Roermond, Venlo (all in The Netherlands) and Viersen (Germany). As the section Antwerp – Lier is common with the Montzen route, the study has concentrated on the section between Lier and Mönchengladbach.
The 3RX is an alternative for revitalisation of the historical Iron Rhine route and for the previously studied A52 route and makes as much as possible use of existing rail infrastructure. The study compares the 3RX with these two alternatives.
The 3RX concept was developed to expand capacity of the east-west rail routes, thereby supporting a modal shift policy towards rail. The 3RX not only relieves existing routes, such as the Montzen route, but also provides an alternative route in case one of the existing east-west rail routes would be temporarily unavailable; consequently, rail freight traffic on the East-West corridor will be more reliable.

## Investment costs

The study has developed various options for each section of the 3RX route, assuming a design capacity of 72 trains per day (both ways), full electrification and state of the art safety systems. In addition, curves are assumed to avoid the necessity of a change of direction of the train. From a commercial point of view the route is only attractive if rail traffic can run east-west with at maximum one stop for changing direction of the train.

The cheapest solution to create a route that satisfies these requirements is a combination of track doubling and electrification of various sections (in Belgium, The Netherlands and Germany), construction of a new rail curve near Roermond and various works in the yard in Venlo to allow a change of direction. The total investment costs of this option is estimated at € 770 million (including risk provision, excluding vat; uncertainty margin: + or - 30%).

Some of the necessary improvements have already been studied and committed by the Belgian government (section Mol – Neerpelt – Hamont/Dutch border) and German government (section Dutch/German border - Kaldenkirchen – Dülken, section Viersen) respectively. The Dutch government is interested in developing passenger transport on the two border sections (Weert – Hamont; Eindhoven – Venlo – Düsseldorf). Taking into account the commitments already made by Belgium and Germany, an additional investment commitment of € 590 million (excluding vat) would be required. The majority of this investment (i.e. € 444 million) relates to works in the Netherlands.
The 3RX is substantially cheaper to realise than either the revitalisation of the historical route, or the construction of the A52 alternative.

## Expected freight traffic on 3RX

The traffic analysis shows that the 3RX route is likely to be used in particular for traffic between Belgian seaports and the Rhein-Ruhr area (and beyond). Expected average daily use is 17 to 20 trains in 2030, increasing to 19 to 23 trains in 2040. The traffic forecast shows that 3RX would also relieve the Brabant route, the Aachen marshalling yard and the Aachen-Düren-Köln route.

## Environmental feasibility

The strategic environmental assessment shows that in principle the necessary works can be carried out, provided that the required mitigating measures are taken. These include among others noise screens along the section that runs through the nature area Weerter- and Buddelerbergen. For this section (Hamont-Weert) presently at maximum 52 freight trains are allowed per week (during daytime), implying that legal procedures are needed to increase capacity of the section.

## Economic feasibility

The social cost-benefit analysis shows that the benefits to society are less than the costs of investment and maintenance of the new infrastructure. The overall benefit cost ratio (at 3% discount rate) is 0.16. The main benefits are lower transport costs and improved reliability of rail transport.

## Planning needs

Once political consensus is reached between the governments involved, various legal steps need to be taken and various in-depth studies will be required. The estimated time needed for these studies and procedures differs by country, but could take up to 10 years. The construction works would additionally take 7 to 13 years.