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High Speed Line Prague–Wrocław

In the Czech Republic, the technical study of a high-speed railway route (HSL) Prague–Wrocław has been completed recently. In the following article, let's remind the development of ideas of the railway connection of the Czech Republic the Republic of Poland through north-eastern Bohemia and Lower-Silesian Voivodeship and take a look at the current state of preparation of this project.

It is very complicated to travel by train in this direction today. Although the modernization of the main route from Prague to the east, electrification of the side track to Lichkov border crossing, and reconstruction of some tracks on the Polish side have taken place in the past years, no direct rail connection exists. The connection with a change of trains takes considerably longer than 5 hours. The modified infrastructure thus serves rather for the freight transport. Other railway border crossings within the region operate in the tourist traffic mode on summer weekends only. Great success has reported the reestablished connection at the mountain crossing Harrachov after more than 60 years, which shows the interest in travelling between both countries, and that the efforts of the Liberec, Hradec Králové and Lower-Silesian regions to improve the connection over the state border is not useless. The border crossing in Černousy serves for the freight transport only.

The road network in this international direction utilized much more in both, passenger and freight transport. On the Czech side, extension of the highway D11 by other section towards the state border is under development. On the Polish side, selection of the contractor (design&build) for all remaining highway sections S3 that connects to the Czech D11 is in progress.

New route for international and domestic channels

Under EU Regulation no. 1315/2013/EC, the transport policy of the European Union anticipates connection of Czech and Polish railway networks at several points. With respect to the high-speed railway, two of them are interesting: connection of the Ostrava agglomeration on the Czech side with the Silesian agglomeration on the Polish side, and then Prague–Wrocław connection through north-eastern Bohemia. Both connections are reported as part of the “global” network.

From a closer look, the second mentioned connection falls in the ongoing preparation into partial variants of routing on both, the Czech and Polish side. For this reason, the known annex to Directive 1315/2013/EC (picture below) shows this connection schematically only. The principle of basic variants is described hereinafter.

The purpose of the new high-speed line is to increase the potential of passenger and freight railway transport in the international traffic. In passenger transport, this route will become the shortest and fastest link between Prague and Warsaw. In freight transport, it will facilitate connection of the Czech Republic to Baltic ports (e.g. Świnoujście). At the same time, scheduling takes place in the knowledge that national transport needs (in particular in passenger transport) are generally at least offset by international ones. Therefore the new route on both sides of the border is designed so that, in cooperation with the conventional



The journey between Prague and Wrocław by train takes more than 5 hours. In the future, we should be able to make it in 90 minutes: a) Praha Hln Station, b) Wrocław Główny Station (Source PKP S.A.)

rail network, the transport accessibility of the regions of north-eastern Bohemia and Lower Silesia is also significantly improved.

To increase the competitiveness of rail transport in this direction, it is crucial to achieve short travel times. The objective is to achieve the travel time in the international transport in Prague–Wrocław destination less than 90 minutes (currently 5:30 by train, and approx. 4 hours by car). In domestic transport between major centres, such as Prague and Liberec or Hradec Králové, there is an effort to reach a travel time of about 30 minutes.

In this context, it is worthwhile to mention the “Development Program of Rapid services”, which was approved by the Czech government in early 2017 [4]. Rapid services is a Czech term for modern and fast railway transport. The approved program defines the objective, which the railway is to meet in the future on the nationwide level. Within the modernization process of the Czech railway infrastructure, new sections of high-speed lines are to be developed, which, in coordination with the conventional rail network, should offer a global space for operating high-speed international express trains as well as interregional express trains.

These high-speed railway lines are to serve general public for everyday commutation to schools, work, and entertainment, and provide general service within the area. The primary purpose of the planned high-speed lines in the Czech Republic is therefore not the development of a segregated network or the operation of operationally separated premium train connections. This basic setting of objectives of the new railway infrastructure is very important as it is reflected in the proposed terminals, the designed interconnection of the high-speed line with the conventional network, and in the layout of the route itself.

New VRT route suggestions and possible parameters of operation

After completion of basic technical studies on both sides of the border, the original schematic form of the new line is given specific dimensions, although in several variants as yet. There are several possible routes of the line on both sides of the border, and the question of maximum speed is still open; it is considered from 200 to 350 km/h. The use of the Prague–Wrocław line for freight transport does not necessarily mean modification of the new line in its full length for heavy-duty freight trains. Consideration is given to its operation in different sections combined with the use of existing (or upgraded) conventional lines.

In the Czech Republic, the new line route is considered in two basic variants: via Hradec Králové or Liberec. Both variants follow those proposed by Polish study [6], and their plot is on



Fig. 1. TEN-T network between the CR and Poland, the line Prague–Wrocław is plotted schematically

the map (Fig. 2). It should be noted that the routes have a number of other partial options on the Czech and Polish side (not shown), and the final route alignment will be the subject of further preparation stages.

Studies show that it is possible to build a rail track for maximum speed of 350 km/h and combined transport. In all vari-



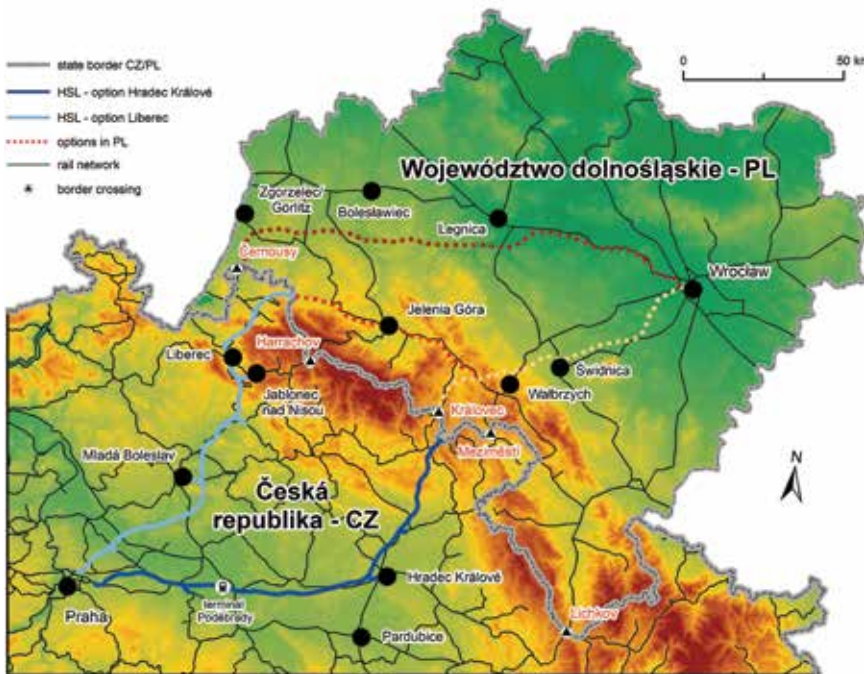


Fig. 2. Routes of two basic variants of HSL Prague–Wrocław (other sub-variants are not shown) through Liberec and Hradec Králové regions. In both events, it is necessary to overcome the mountain range. In addition to international connection, both options will also enable quality service for regional centres on both sides of the border

ants, it is necessary to overcome the border mountain range. While in sections outside of the mountainous terrain the line is to some extent routed independently of the maximum speed and traffic structure considered, in mountain sections several variants are proposed in the 200–250 to 350 km/h speed range even in a gradient solution. Both, routes with maximum gradient of 20‰, suitable also for some freight trains, and routes with maximum gradient of 35‰, suitable for passenger transport only, are suggested.

For the future route design in certain sections within passenger transport parameters only, several points connecting the route with the conventional network are proposed. The freight transport in the integrated branch can use the high-speed line partially, while in another section it uses the conventional track in similar direction. In the Czech territory, feasibility studies have been prepared, or will be prepared in the near future, to improve the parameters of certain even conventional lines in this area, which the future high-speed network can suitably complement. These are the sections Prague–Liberec and Hradec Králové–Trutnov/Meziměstí crossing. Modernization of the route Prague–Hradec Králové has been even in the more advanced stage of preparation.

Great emphasis is put on the possibility of phasing the construction of Prague–Wrocław branch. In both variants in the territory of the Czech Republic, it is possible to build national sections independently of the cross-border interconnection, thus also as separate projects if the opposite option is chosen for international connection. Similar variants are conceived also in Poland where it is possible to realize required connections between the centres and the tourist mountain areas directly by international high-speed line or by turning off this line in case of choosing another variant of the main route.

Terminals in town centres

If the new track and trains running on it are to serve the day-to-day needs of the inhabitants of the entire area concerned, it is essential to provide for easy availability of rail services. In relation to the customer, it is presented mainly by standards of railway stations. Because the train is not just the ride itself but also the time spent to reach the railway station, the Czech Republic is trying to serve important republic and regional centres by direct trains coming from the HSL to the city centres. The regional terminal outside the town is currently proposed in the vicinity of Poděbrady only for servicing the Central Bohemia region.

The length of the new track is approximately 290 km in the most forward direction, but it depends greatly on the route chosen. Estimated costs range about € 6 billion. The final configuration and route of the high-speed line and its connection to the conventional network will be the result of a feasibility study that the Czech infrastructure administrator (SŽDC) would like to submit in 2018. However, it is already possible to state that both regions in the Czech territory are interested in the new high-speed line route in their territories.

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