

Latest Developments at Czech Railways

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The political changes that occurred after 1989 throughout Central and Eastern Europe (CEE) following the collapse of communism have affected every society in the region. The Czech Republic (CR) has been no exception. All these changes have also affected railway transport in the CR. In addition to changes in management methods, the former Czechoslovak State Railways (CSD) was split into two separate companies—Czech Railways (CD) and Slovak Railways (ZSR)—as part of the separation of Czechoslovakia into the Czech and Slovak Republics. This article describes the latest developments at CD from the viewpoints of economy and technology.

Basic Information on Czech Railways

Czech Railways is a state organization established in 1993 as the successor to CSD, following the division of Czechoslovakia. It runs the large majority of the state-owned railway infrastructure of the CR and provides most passenger and freight railway services in the CR. Today, CD operates a total railway network of 9435 km (1941 km multiple tracked) of which 2859 km is electrified.



Local CD trains standing at Praha Station

(Y. Akiyama)

Table 1 Basic Czech Railways (CD) Statistics

	1993	1994	1995	1996	1997	1998
Freight (million tonnes)	123.729	108.762	108.859	107.235	103.360	93.521
Freight (million tonne-km)	25,140	22,703	22,623	22,338	20,739	18,294
Passengers (million)	242.182	228.720	227.147	219.244	202.877	181.977
Passengers (million passenger-km)	8,548	8,481	8,023	8,111	7,710	7,001

Providing railway services in the CR is made more complex by the fact that three electrification systems are in use: 25 kV/50 Hz AC, and 3000 and 1500 V DC.

The CR railway network is one of the densest in the world. Although it is quite convenient for some inhabitants, its maintenance and upgrading represent a substantial burden for CD and the Czech government.

The company size can be judged by the number of rolling stock at the end of 1997—3732 locomotives, 5494 passenger carriages and 59,694 freight wagons (about 41,000 in operation). The total

passenger and freight volumes in 1998 were 182 million passengers (7,001 million passenger-km) and 93.521 million tonnes (18,294 million tonne-km), respectively. The total number of CD employees at 1 January 1998 was 90,274.

Table 1 provides more detailed statistics on CD traffic volumes.

CD Transformation and Private Sector Opportunities

To comply with the EU Directives on open access for third parties to railway infrastructure as well as the CR Transport Policy approved by the Czech government in July 1998, CD does not have a monopoly in railway services, but it does have a relatively strong position in the Czech general transport and railway markets. The Transport Policy sets the main targets and strategies for developing each transport mode in the CR. The leading idea is integration of the CR into the European transport infrastructure. Clearly, the Czech legislation and position of railway operators will have to comply with the EU Directives, especially EU Directive 91/440/EEC. A key target of the Czech transport policy is creation of a level-playing field for all transport modes. For the railways, the success of concrete measures to eliminate discrepancies

between transport modes is especially important.

To be as profitable as possible, railway transport must focus on services that can compete with other transport modes, especially long-distance bulk haulage (such as coal, wood, sulphates), combined transport, and transit services.

Czech Law 266/94 enables open access to the CR railway infrastructure. However, unlike the EU, it does not require proof of financial competence. At present, this difference would hinder some Czech operators providing transport services in the EU, and it will have to be ironed out by further legislation by the Czech Ministry of Transport and Communications.

Also the issue of the future legal status, ownership, and structure of CD should be part of the state transport policy. Obviously, if the Czech government wants to achieve entrepreneurial independence for CD in line with EU Directive 91/440/EEC, it must create the pre-requisite conditions. It will have to define the public service obligation (PSO) requirements and set fares and subsidy rates. The legal status of CD will have to be changed to a normal joint stock company—perhaps 100% government owned to start with. If the business results are good after consolidation, privatization could be started, either by seeking business partners or by public offering of shares on the stock market.

Clearly, it will not be possible to build and maintain the railway infrastructure nor to provide better railway services without attracting other funding to supplement the shrinking state subsidies or state-guaranteed credits—a so-called public-private partnership. Indeed, this public-private partnership is a suitable investment model for railways in all the transition economies. It is the only way to upgrade the technical standards of the infrastructure and rolling stock to levels comparable with the rest of Europe and other industrialized countries.

The most effective public-private partner-



Reconstructed track on Brno–Breclav section of Crete Corridor IV

(Czech Railways)

ship is direct involvement of private investors in specific projects to upgrade infrastructure or rolling stock, and in providing railway services. The most difficult issue is the division of risk, which is very high in such projects, between the state and private investors.

However, there are a number of intermediate solutions for investing private capital in CR railways. Private companies could invest in upgrading infrastructure (especially main corridors), providing new rolling stock such as tilting trains for main corridors, and in maintaining infrastructure and rolling stock. Many of these activities were carried out by CD but have been privatized. Private capital could also play a minor role in financing main CD projects using commercial credits.

Further division or privatization of CD assets is very important, but the Czech transport policy must clearly state that the goal of privatization must be to offer higher levels of service and customer satisfaction—privatization should not be carried out just for its own sake nor to shed responsibility for a particular area. Obviously, railway transport in the CR

presents a variety of challenges for private capital. The right procedures are needed to generate profits (and divide risks) for the state, for private investors, and last but not least, for customers.

Modernization of Czech Railway Infrastructure

In May 1985, the *European Agreement on Main International Railway Lines* (the so-called AGC) was adopted by the EEC/UNO. It was also accepted by the then Czechoslovak Socialist Republic. This agreement recommended adopting operating speeds of at least 160 km/h for selected main lines. The subsequent political and social changes in the CEE countries created a boom in new markets, but the transport infrastructure did not keep up with this boom in terms of capacity and quality. In the early 1990s, the Czech government passed laws 287/93 and 445/93 to help railway transport meet the nation's transport needs. The first debates on improving the connections between important political, economic and cultural centres in CEE countries had

Table 2 Details of Crete Corridors IV and VI in Czech Republic

	Corridor IV		Corridor VI
	Total	Completed	Total
Length of main tracks (km)	802.6	393.7	673.9
Number of switches	812	446	884
Total length of platforms	21,199	12,879	46,695
Bridges, overpasses, subways	434	205	187
Culverts	270	103	38
New lines (main track km)	333	225	365
Reconstructed lines (main track km)	287	82	394
New buildings	33	19	80
Reconstructed buildings	14	5	51
Acoustic barriers (km)	43,995	8,184	20,885

already started at the 1st Pan-European Transport Conference in Praha (Prague) in 1991. The ideas became more concrete at the 2nd Pan-European Transport Conference in Crete in early 1994, where the concept of the Crete Corridors was born. The Crete Corridors were further extended and amended at the 3rd Pan-European Transport Conference in Helsinki in 1997. Two Crete Corridors—IV and VI—run through the CR and were approved by the Czech government on 17 June 1998 (Fig.1).

Corridor IV runs from Berlin via Dresden, Decin, Praha, Ceska Trebova, Brno and Breclav to Austria and Slovakia and then south-east to Constanta, Thessaloniki and Istanbul, one branch of this corridor links Nürnberg, Plzen and Praha. The Czech Republic designates this route as the Czech Railways Transit Corridor I, and the branch from Cheb via Plzen to Praha is a part of the Czech Railways Transit Corridor III.

Corridor VI leads from Gdańsk via Warsaw and Katowice, with one branch via

Petrovice u Karvine and Ostrava to Breclav, where it connects with Corridor IV, and a second branch via Zwardon to Zilina, where it connects with Corridor V. The Czech Republic designates this route as the Czech Railways Transit Corridor II. From the viewpoint of revenues, this route has the highest economic significance, because it carries the majority of profitable transit freight traffic, forming 22% of total CD revenues for both freight and passenger services. Table 2 shows the details of Crete Corridors IV and VI.

The government is also preparing Czech Railways Transit Corridor III from the CR border to Germany, Cheb via Plzen, Praha, Ceska Trebova, Prerov, Ostrava, to Petrovice u Karvine and Poland or to Mosty u Jablunkova and Slovakia, and Czech Railways Transit Corridor IV from the CR border to Germany, Decin, Praha, Veseli nad Luznici and further to Ceské Velenice or Ceske Budejovice, Horni Dvoriste and Austria. Although the implementation date is still undecided, the launch is expected after completion of Czech Railways Transit Corridors I and II. These four corridors will be modernized first based on the AGC, and the 1991 *European Agreement on Important International Combined Transport Lines and Related Installations* (AGTC), as well as according to the guidelines for railway network development defined by the EU and International Union of Railways (UIC). The main aims of the modernization are as follows:

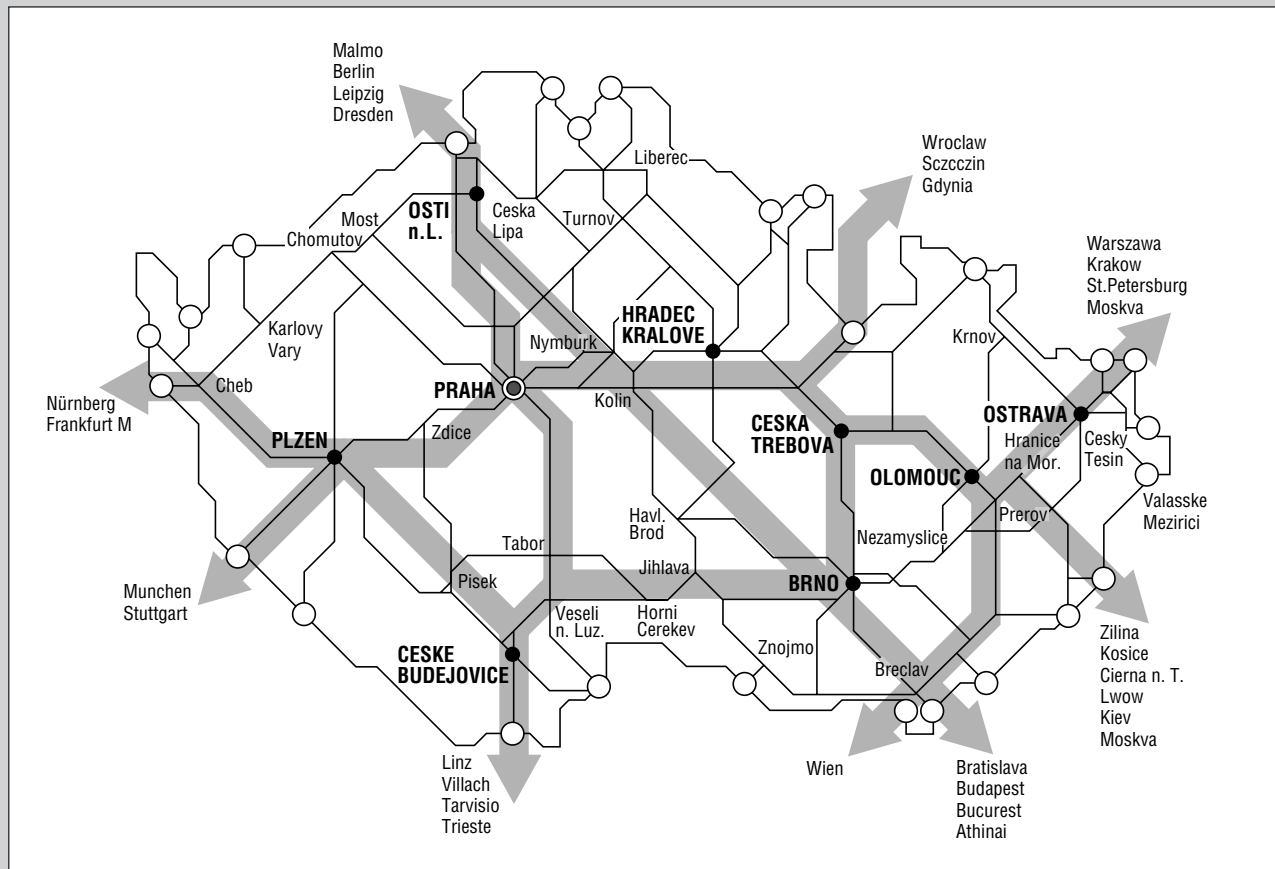
- Connection of selected CD lines with principal European lines
- Fulfillment of conditions for Czech Republic membership of EU
- Reduction of environmental burden
- Reduction of journey times
- Improvement of safety by using new technology
- Improvement of reliability and regularity in freight transport
- Extension of international combined transport



Local train leaving snow-bound Praha Central Station

(Y. Akiyama)

Figure 1 Crete and Czech Railways Transit Corridors



Source: Czech Railways

Rolling Stock on Crete Corridors through Czech Republic

The Crete Corridors through the CR, and Czech Railways Transit Corridors will require adequate numbers of rolling stock for operation of local and express trains. The passenger carriages for local trains will be new or refurbished conventional carriages hauled by modern electric locomotives. The express trains will be composed of new high-speed tilting units able to operate on any of the three current systems in use in the CR.

The conventional international trains will use new four-axle airtight carriages

built by Siemens SGP of Vienna and capable of operating at speeds up to 200 km/h. For express passenger transport, CD has ordered 9 Ampz First Class carriages, 26 Bmz Second Class carriages and 10 WRRmz restaurant cars (Table 3). The First and Second Class carriages are being built by CKD-Vagonka Studenka under licence from Siemens SGP. The restaurant cars were delivered in 1997 and the First and Second Class carriages will be delivered later this year.

All three types feature high comfort levels and modern interiors suiting the long-term needs of *EuroCity* and *InterCity* trains. Extremely low in-carriage noise levels are

achieved by using SGP 300 bogies, which are considered the best in Europe. Each fully air-conditioned carriage has a vacuum-system WC, and automatic entrance and internal doors, as well as all accessories stipulated by the latest UIC requirements. The restaurant cars have fully electric kitchens meeting the highest hygiene standards.

The conventional rolling stock modernized by Movo S.R.O. of Plzen will operate at speeds of 160 km/h on the Czech Railways Transit Corridors. The modern interiors meet the levels for *EuroCity/InterCity* category trains. However, they are not air-conditioned nor airtight, although they

Table 3 Specifications of New Carriages

Series	Length of body(m)	Weight(tonne)	Number of seats	Max. speed(km/h)	Number Ordered
Ampz	26.4	47.1	58	200	9
Bmz	26.4	49.6	66	200	26
WRRmz	26.4	54.9	30	200	10
Ahee	24.5	39.6	60	160	15
Bhee	24.5	39.6	78	160	35
Aeel	24.5	42.0	54	160	15
Beel	24.5	42.5	60	160	40

Table 4 Specifications of New EMUs

Traction system	3 kV DC	
	15 kV, 16 2/3 Hz	
	25 kV, 50 Hz	
Gauge	1435 mm	
Maximum speed	230 km/h	
Nominal rating	4 MW	
Maximum axle load	13.5 tonne	
Tilting	Active, $\pm 8^{\circ}$	
Number of seats	First Class	95
	Second Class	258 + 2
Total length	185.400 m	
Nominal weight	350 tonne	
Wheel arrangement *	(1A)'(1A)'+2'2'+(1A)'(1A)'+2'2'+(1A)'(1A)'+2'2'+(1A)'(1A)'	
Carriages First Class	2	
Carriages Second Class	4	
Buffet car	1	
Structure	Air-conditioned	
	Airtight	
	WC with vacuum system	
	Integrated construction	

* (1A)' means one powered and one unpowered axle per bogie.
2' means two unpowered axles per bogie.

have automatic entrance and internal doors and all other accessories stipulated by UIC.

Basic Specifications of Locomotives on Czech Railways Corridors

The locomotives for use on the Czech Railways Corridors have not been purchased yet. Lines electrified at 3000 V DC will use modernized Series 151 electric locomotives (4 MW) for speeds of 160 km/h, as well as Series 162 locomotives (3.2 MW) for speeds of 140 km/h. The modernized two-current Series 362 and 371 locomotives destined for 3000 V DC and 25 kV 50 Hz, and 3000 V DC and 15 kV 16.67 Hz lines, respectively, have the same ratings and maximum speeds. None are suitable for speeds higher than 160 km/h. In the long-term, operation of two- and three-current locomotives at speeds of 200 km/h is being considered, and technical guidelines are being prepared. Lack of funds has prevented implementation of this project so far.

In accordance with European and world trends to replace conventional loco-hauled commuter trains with EMUs, three-current tilting units have been ordered from a consortium of Siemens AG, Fiat Ferroviaria SpA and CKD Praha Holding a.s. The specifications are shown in Table 4. The general design meets UIC requirements and the criteria for through operations on CD, Deutsche Bahn (DB AG), and Austrian Federal Railways (ÖBB) lines.

International Activities of Czech Railways

The UIC, based in Paris, is the most important technical resource for CD. Not only does UIC deal with technical issues and interoperability, it plays a vital role in presenting the views of its member railways to the EU. The most important



Antonin Dvorak Vienna–Praha EuroCity train standing at Praha Central Station (Czech Railways)

Summary

Like every CEE railway in Europe, Czech Railways is going through a difficult stage, but despite the difficulties related to competition and harmonization, I am convinced that CD will succeed in increasing its traffic volumes and market share to become an important and full member of the European railway network. ■

UIC link with the EU is the Brussels-based Community of European Railways (CER). Czech Railways was accepted as a CER member-observer in February 1999. The UIC/CER Charter states that a principal role is coordinating and lobbying for railways' rights in the EU, and CD intends to use its CER membership for reintegration into the European railway infrastructure. UIC itself is also providing a strong guiding influence on CD reintegration.

Czech Railways and Polish State Railways (PKP) are especially involved in the steering committee of the UIC High Speed Task Force. Part of the CD strategy is to strengthen its influence in planning high-speed lines in Europe and incorporating CD corridors into the network.

The position of Czech Railways in UIC is quite strong compared to other CEE railways, because it is a reliable UIC member and is playing an active role in UIC reforms and strategy. This is a very good position for the future.

The Organization for the Collaboration of Railways (OSSHD), based in Warsaw, is another important international body in which CD is playing an important role, especially restructuring. The main goal

of OSSHD is creation of favourable conditions for railway and combined transport between Europe and Asia. The importance of OSSHD will grow, because there are many opportunities for transport services in this still undeveloped region. Czech Railways has already gained a good position in other bodies. For example, it has long been a leading railway at the European Conference on Freight Train Timetables. Recently, CD and Swiss Federal Railways are joint presidents of Forum Train Europe (FTE) formed to coordinate international timetables. FTE will have a number of opportunities to influence the European concept of infrastructure fees and slot allocations, thereby contributing towards development of the Freight-Freeways Project.



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