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INTERNATIONAL

Vertical separation on the horizon

COMPETITIVENESS The government has passed a law paving the way for state railway TCDD to be restructured as a vertically-separated organisation. This should help the railway develop a greater commercial focus to make best use of unprecedented levels of infrastructure investment.

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On November 3 2011, the Turkish government enacted its Transport Sector Rehabilitation Act paving the way for vertical separation of the national railway TCDD, with an independent Railway Authority covering economic and safety regulation reporting to the Ministry of Transport & Communications.

The restructuring of TCDD is being launched against a backdrop of two macro-level processes: the first is Turkey's gradual move towards possible European Union membership, and the second being a programme of investment in the railway unprecedented in modern times.

TCDD's present 10 991 km network is predominantly single track, and is characterised by low speeds, tight curves and severe gradients. There is limited deployment of modern train control, with only 28% of the network supervised by signalboxes or traffic control centres with electronic interlockings; most of the railway is still operated using telephone or radio dispatching, and lineside signals have no train protection function. Just over a fifth is electrified at 25 kV 50 Hz.

The government's railway Master Plan envisages adding a further 14 336 route-km by 2023, the centenary of the Turkish republic. Of this total, around 10 000 km would be made up of fast lines used primarily by passenger services at speeds of at least 250 km/h; these would also carry freight at off-peak times.

Currently TCDD operates two high speed routes, from Ankara to Eskisehir (opened in 2009), and Ankara – Konya, opened last year. Construction of two more lines, from the capital to Istanbul and Sivas, is underway. Contracts were let in December paving the way for a mixed-traffic high speed line to Bursa, a populous city not served by the existing railway (RG 2.12 p8).

Some limited reform of TCDD has been underway alongside the EU accession process since 2005, when it was agreed that a vertical separation model would be most desirable, in keeping with European policy. Although Turkey's hopes of accession in the short term seem remote, the EU has supported measures to adopt a common framework for the transport industry in the intervening period.

Nevertheless, the reform process has been arduous as the government has faced trenchant opposition from TCDD and the trade unions. But with the Transport Sector Rehabilitation Act passed into law, concrete decisions can now be taken. The government will be hoping that the reforms will address some of the systemic challenges facing TCDD, many of which also face railways in other emerging markets. These include:

- heavy operating losses and mounting structural debts;
- a lack of market-led products and service culture;
- a high degree of political interference;
- a regulatory framework that favours highway construction and road haulage.

Energy and labour costs account for 16% and 40% of TCDD's operating costs at present, and these represent a major obstacle to the group achieving profitability.

Turkey has two operational high speed lines conecting Ankara with Konya and Eskisehir. Load factors on the 250 km/h services are reported to be high, but TCDD faces stiff competition from extensive domestic air services.

The new structure

The planned restructuring replicates the model adopted under the EU's railway directives. It would see a separate state-owned infrastructure manager created; TCDD's operations arm would be split into market-driven business units for both freight

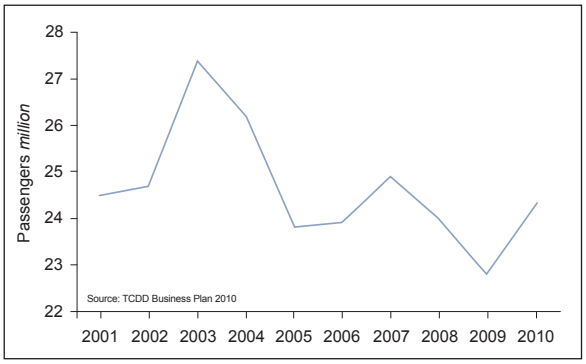

Fig 1. Main line passenger volumes per year.

and passenger traffic; and separate accounting streams would be implemented for each business unit and for the infrastructure manager. Provision would be made for open access operation, at least in the freight market, and a structure of access charges would be introduced.

This would bring TCDD's monopoly of freight and passenger operations to an end, requiring the implementation of a transparent model for state support of socially-necessary services. The construction of new lines and major infrastructure enhancements would continue to be funded directly from government.

Equally important is a major programme of legal, accounting and safety reform. The proposed Railway Authority would oversee economic regulation, address on-rail competition issues (including the provision of non-discriminatory access to the network, stations and freight terminals) and administer the access charge regime. The authority would introduce a system of licensing and certification for operators and a set of tools for transparent reporting between the different players. It would also regulate staff training and assessment, manage relationships with neighbouring countries over international trains, and supervise a programme of inspections to ensure that technical standards are being implemented correctly.

At present, TCDD is responsible for managing its own safety standards, but analysis of incidents shows that significant risk factors are affecting operations, especially in the areas of rolling stock maintenance, train preparation and manual signalling.

The Transport Sector Rehabilitation Act includes powers to establish DEKAK as an independent railway safety inspectorate reporting directly to MoTC rather than TCDD. This will mark the culmination of a process intended to improve the level of safety on the Turkish network.

Already, a number of domestic and international consultancies, including Railistics, are assessing the risk factors affecting TCDD using the 'hazard tree' approach first developed by ÖBB and used in several European countries. This model allocates numbers to accidents which have happened and other safety-related incidents based upon records over the previous three years. Each incident is characterised by identifying causal factors, and this data is then evaluated to pinpoint where specific safety measures should be targeted.

The latest research indicates that the greatest risk to safety is attributable to human factors.

Growing the passenger market

Surrounded by sea on three sides, Turkey has a surface area of 779 500 km^2, which makes the role of the transport sector in the economy especially important. Furthermore, the high rate of population growth (1·6% per year on average) is having an inflationary effect on transport demand, although in comparison with many developed countries, overall demand remains low.

Gripped by high overheads, TCDD's passenger operations have made little progress in improving their operating ratio over the past decade. With the exception of a few premium overnight trains between Ankara, Istanbul and Izmir, all of them are heavily loss-making (Fig 1).

In the 2010 financial year, TCDD saw a 6% increase in passenger volume and a 1% increase in passenger-km compared to the previous year; long-distance conventional services accounted for 79% of this traffic and the nascent high speed services 8%.

Whilst the overnight trains achieve a relatively high distance per passenger-journey of 450 km, the average journey on a conventional express service is just 122 km. This has a material impact on the unit costs of these trains.

TCDD has tried to reduce costs by ceasing to operate uneconomic trains, a measure which has had little or no effect in many other countries with a very high proportion of fixed costs. A greater degree of co-operation with the private sector is already underway in an effort to improve the quality and marketing of passenger services, and TCDD has identified the core market of premium routes between the capital, Istanbul and Izmir as a priority for growing yield through the provision of express and dedicated high speed services.

Making freight commercial

TCDD is confident that the historic trade route between Asia and Europe can be revived and expanded using rail to exploit Turkey's strategic

The introduction of block train operation has allowed TCDD to grow freight volumes in recent years, but its modal share continues to dwindle.

location. Rail's share of the domestic freight market has declined sharply from 65% in the mid-1950s to 4% in recent years. Freight traffic density is low and unbalanced — the existing volume is nowhere near enough to meet operational costs. By the end of 2010, the ratio of income to expenses in the freight operation was just 29%.

Annual freight volumes have fluctuated between 8 billion and 11·5 billion net tonne-km over the past 15 years; the dominant commodities are iron ore (accounting for around 30% of traffic), other metal products, cement, clinker, lignite, coal, coke and petroleum.

TCDD has struggled to ensure its rail freight operation remains competitive with road, and it has been slow to adapt to macro-level trends, such as the need to deliver shipments to the customer's desired destination, rather than the nearest railhead. The speed, reliability and traceability of shipments no longer meet the customer's expectations, and too few resources have been allocated to an effective client relationship or marketing strategy.

Although volumes have grown significantly over the past three decades from 13 million tonnes in 1981 to 24 million tonnes in 2010, there remains significant suppressed demand in the market. TCDD continues to operate a considerable number of low-volume flows across a wide geographical area: its typical daily loading volume is around 60 000 tonnes, with turnaround times as long as 10·5 days. In addition, poor rolling stock productivity and reliability have added to the mounting losses, whilst the management lacks the flexibility and commercial prowess to respond quickly to market changes.

Nevertheless, there are signs of optimism, provided that the freight business can refocus on the needs of its customers and maximise the potential of the huge amount of capital investment now being poured into the rail network. TCDD has been steadily introducing block trains on key flows since 2003 at the expense of wagonload operations, and this has contributed to the stronger volume growth and enabled some economy measures to be implemented, with shunting costs declining by up to 50% in some instances.

Whilst the west of the country is strategically vital for the passenger business, much of the freight operation is centred on flows in Anatolia and other eastern provinces. Considerable scope exists for TCDD to grow its intermodal traffic, especially through the development of hinterland terminals in the east, close to the country's largest industrial producers.

The development of a network of inland container terminals should include provision for customs clearance to speed up the export of goods by rail and sea. Efforts are being made to establish logistics hubs in the outskirts of Ankara, Istanbul, Izmir, Samsun, Eskişehir, Kayseri, Gökköy, Erzurum, Uşak, Konya, Denizli, Bilecik and Mersin, which are close to existing industrial zones with strong traffic potential.

A hub and spoke mechanism could then be used to encourage private funding to support branch lines feeding these intermodal 'villages'. In order to speed up transit times and increase reliability, it is envisaged that intermodal freight would use the high speed network and Marmaray Crossing at night (RG 2.09 p56).

The freedom to set tariffs has long been an aspiration of TCDD's freight management; currently rates are agreed by the TCDD board but ratified by MoTC. Currently, a surcharge

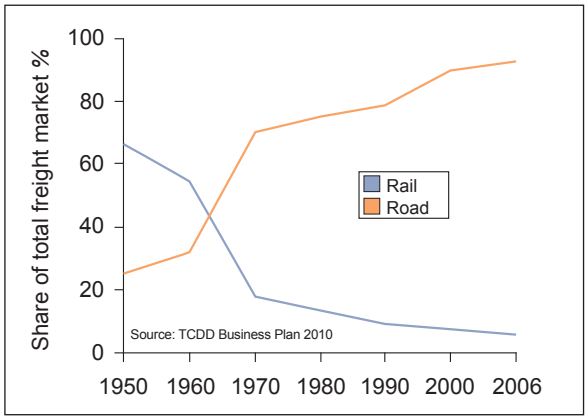

Fig 3. Modal split between rail and road freight.

After significant track refurbishment works, a frequent DMU service operates on the network between Izmir Basmane and towns to the southeast.

Construction of the high speed network is forging ahead. This is the line from Eskisehir to Gebze, which is expected to carry Ankara – Istanbul services from 2014.

of up to 100% can be levied for shipments of less than 250 tonnes and other supplements are issued for short hauls of less than 150 km on a per-tonne basis. Despite abandoning a commodity-based pricing structure which had nine pricing bands, TCDD's tariffs are still heavily influenced by the level of government subsidy in any given year.

Labour costs and productivity

By the end of 2010, TCDD had a total of 27 114 employees in its railway, ports and five supply businesses. This total includes 4 100 employees in three affiliated corporations, including Tülomsas and Tüvasas, which manufacture and refurbish locomotives and rolling stock.

Around 5% of the employees are located at headquarters, with the rest scattered across TCDD's seven regions. Most of the headquarters departments have regional units too, resulting in considerable organisational overlap and a duplication of skills. Although the number of staff per kilometre is fewer than that of many countries, productivity per head is very low.

Improving staff efficiency must be an absolute priority for the restructured TCDD: appropriate incentives and continuous improvement techniques should be implemented to bring a greater degree of co-operation across business units, but the large numbers of employees on the payroll who have in effect lost their function needs to be addressed. TCDD has set a target of reducing staff costs by 25% by 2015 to leave a core workforce of 22 000.

Funding expansion

TCDD's new line programme constitutes one of the largest elements of the state budget. In 2010, some YTL1·6bn of a total package worth YTL2·5bn came from the government, with a further YTL909m from international finance agencies, including YTL137m in credits from the World Bank.

This budget allocation contributes to the construction of a further 2 622 route-km of high speed line by 2013, with a further 6 792 km to be funded separately for completion by 2023. The conventional network is set to grow by 4 707 km by 2023; in addition, completion of the YTL7·5bn Marmaray project is expected by 2015.

The reform project will develop a modern and sustainable railway, but TCDD needs to invest to integrate logistics knowledge, business thinking and intermodal know-how into the company — privatisation of the freight business would certainly help to achieve a dynamic structure to meet the demands of the market.

An essential element contributing to the success of the restructuring programme has been the consistent policy of the transport ministry, demonstrating how strong political backing can overcome all kinds of obstacles. Two decades ago Turkey's railways were under threat of abolition. Now the outlook has been utterly transformed, and, despite the sometimes slow pace of reform, Turkey could yet become a model European rail market.

Table I. Passenger transport market shares by mode

Year	Road	Rail	Maritime	Air
1950	50	42	8	0
1960	73	24	2·2	0·8
1970	91	8	0·3	0·7
1980	95	4·5	0	0·5
1990	97	2·1	0	0·9
2000	97	2	0	1
2008	96	2	0	2
2009	95·8	1·7	0	2·5

Source: TCDD Business Plan 2010

Right: TCDD continues to invest in fleet renewal. These passengers at Mersin board a Hyundai Rotem-designed DMU.