



Technical Assistance Consultant's Report

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People's Republic of China: Railway Passenger and Freight Policy Reform Study (TA4701-PRC) (Financed by TASF)

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For Ministry of Railways
Ministry of Railways

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Asian Development Bank

Key Findings and Recommendations

A. Introduction and Context of the Study

1. The Asian Development Bank contracted a consortium led by Chakra Infrastructure Consultants Pvt. Ltd. to conduct TA 4701-PRC, Railway Passenger and Freight Policy Reform Study. This summary of key findings and recommendations of the Final Report has been prepared in accordance with the terms of reference. This is a macro level analysis of the sector at a time when the PRC's economic growth and railway development is likely to be enhanced qualitatively through several initiatives of the Government, namely 1) the WDS or "Go West" policy for equitable regional development 2) National Development and Reform Commission's (NDRC) *China's Key Reforms in Seven Fields in 2004*, 3) NDRC's *Logistics Development Strategy 2001-2010*, 4) Ministry of Railways' (MOR) Mid and Long-term Railway Network Plan (MLRNP) and 5) commitments incorporated in China's accession to the World Trade Organization (WTO) on foreign participation in railway freight transport.

B. China Railways (CR¹) Strengths, Weaknesses, Opportunities and Threats Analysis

1. Strengths

2. The primary strengths of the railway sector in PRC are its technical efficiency, modern track and other infrastructure, good quality rolling stock, appropriate maintenance facilities, operating efficiency in point-to-point and heavy haul traffic, excellent equipment utilization, and a disciplined and skilled workforce that actively supports management when new techniques, work practices and efficiency measures are introduced. An important feature is the social security net (SSN) in place to ensure that staff redundancies are dealt with humanely, through re-training and seeking to provide alternative productive employment. The organization of Joint Ventures, local railways and Diversified Economy Companies is particularly oriented towards SSN activities and, in addition, a substantial number of excess staff is kept on the rolls pending re-deployment.

3. CR has high levels of project management skills related to developing and building infrastructure of quality rapidly, on time and within budgets. It has similar skills in choosing, inducting and adapting complex and advanced reforms to deliver rail transport services efficiently – there have been 27 such activities since 1991 alone covering a wide spectrum of sector policies and management tools. These factors lead to CR's ability to provide low cost transport services, particularly to long distance customers. In China substantial economic benefits result from railways compared to other modes and they have considerable impact on rural poverty reduction.

4. Among the economic sectors in China transport is not yet the main generator of anthropogenic green house gases (GHGs) that are known to cause global warming and climate change. Nevertheless, a major strength is the superiority of railways in specific energy consumption and lower GHG emissions compared to road and air transport, particularly in the carriage of long distance freight traffic. Safety in the railway sector is of a high standard, particularly when compared to roads. Institutionally it is well structured, reasonably independent, effective system wide and can be readily adapted to any future industry structure in China. Infrastructure and rolling stock are well maintained to ensure high standards of safety.

2. Weaknesses and Mitigating Recommendations

5. In China the sector has structural shortcomings many of which prevail in railways worldwide. It is a capital intensive mode and requires high thresholds of remunerative traffic to make a new route viable. A major difference from other transport modes is that most railways are responsible for developing, owning and maintaining their right of way. This, taken together with the high cost of creating rail infrastructure, generally results in railway enterprise annual turnovers

¹ "CR" collectively designates the part of the sector that is directly controlled by MOR as an enterprise.



that are a fraction of equity invested, not multiples of it (let alone of capital employed), and prevents recouping investments in short gestation periods. (Though this is financially significant, in mitigation one notes that in China during natural disasters railways cope with the situation better than other modes owing to integration of infrastructure ownership and operations.) Further, traditionally, emanating from the industrial situation prevailing in the hinterland of most countries in the nineteenth century, the normative framework for railway enterprises was self-sufficiency in most core and non-core activities. World-wide, and in China as well, the sector is only slowly recognizing the benefits of efficiency that out-sourcing can bring when it replaces inefficient and autarkic practices.

6. As in other developing countries, the state's ownership of railways in China results in the mode being used as a convenient mechanism to deliver non-commercial services to the populace, targeted or otherwise. This is done as a matter of direction and the enterprise is left to find its own cross subsidies. Besides these Public Service Obligations (PSOs) infrastructure investments in new lines are also undertaken for reasons of policy and some of these would not be commercially viable for a long time (In mitigation Government grants are provided in some instances). In any other mode or business, though a government direction would always be followed, it would be necessary for the state to pay for the services or goods used and therefore such requests would not be made lightly.

Recommendation: CR should be compensated for PSOs and a study conducted to establish annual payment norms. **Best Practice:** European Community governments have such contracts with their railways

7. Railway tariffs are tightly regulated by NDRC. This is not the case with tariffs for road freight services and many passenger services. There have been improvements in the frequency of rail tariff changes over the years and there are tariff regimes in force that are oriented to cost recovery for specific new line construction, together with a construction surcharge for most freight traffic. Nevertheless, CR's inability to raise or modify tariffs is a restraint on marketing. It prevents optimizing internal surpluses for investment and, in turn, inhibits raising private sector participation (PSP) in rail to higher levels through enhanced revenue streams. Further, CR staff does not show "ownership" of the tariff structure and it is perceived as imposed on it externally. Since it has no control over pricing CR does not give costing the importance it deserves.

Recommendation: CR should be provided tariff flexibility by the Government, empowering it to operate in a competitive buyers' market. **Best Practice:** Led by the US increasingly rail tariff de-regulation is the industry norm worldwide, with regulatory oversight. Only 28% of traffic is potentially under regulatory review in the US. Rates are not regulated when competition keeps them at reasonable levels.

8. CR has freight carrying capacity limitations on major corridors because passenger trains reduce the number of potential train paths owing to speed differentials. In MLRNP CR plans to increase capacity through new Dedicated Passenger Lines (DPL) and other infrastructure enhancements. However, CR still carries substantial car load traffic (estimated as 50%) which is detrimental to route capacity. In the hierarchy of measures for enhancing capacity, eliminating car load traffic, operational and business innovations, technological steps, etc. do not get priority. Instead, the focus is on capital intensive additions to infrastructure.

Recommendation: Enhance freight carrying capacity by eliminating car load *operations* in 2-5 years and concentrating on point-to-point trains. Retain car load customers by out-sourcing traffic consolidation into train loads at terminals (CR as wholesaler & consolidators as retailers) and encouraging domestic traffic containerization. The methodology should be tried on two routes as a pilot project. **Best Practice:** Railways in North America, Australia and Indian Railways (IR) operate in this manner.



9. CR's infrastructure and equipment standards of loop length, weight of rail section and general freight business (GFB) car axle loads of about 21 t, limit GFB carrying capacity. A considered optimal policy of

Recommendation: Study optimal maximum axle loads, train speeds, train length, double stacking containers and freight car design to formulate standards to enhance GFB throughput cost effectively, taking a 30 year perspective. **Best Practice:** US railroads adopted 32 t (earlier 29 t) axle loads and double stacking containers from 1995 onwards after studies.

raising axle loads and train lengths for GFB has not yet been formulated as a means to enhance GFB carrying capacity, though CR plans to enhance the length of routes capable of carrying double stack container trains to 16,460 km by 2020.

10. This framework of internal characteristics and external factors makes the sector insular and it is most comfortable carrying traditional traffic streams such as low cost bulk goods and long distance passengers. The organization is production driven and not customer centric and business oriented. CR's environment hitherto has been a segmented sellers market in passenger and freight traffic and it

Recommendation CR should establish marketing and CRM as a core enterprise function for freight and passenger services. Activities include "E" enabling the customer, growing in inter-modal operations including cooperation with other modes, engaging with 3PL and 4 PL operators (freight) and the tourist industry (passenger). Improved use of statistics and costing is a pre-requisite. **Best Practice:** US Class I railroads have evolved techniques for competing and cooperating in the freight market with innovative products and guaranteed service quality. European and Japanese railways use internet and IT for user friendly systems and innovative products for passenger market segments. Developing countries have started using IT effectively in passenger sales and marketing, notably IR

has generally not worked, or had to work, in cooperation with other modes. For these reasons Marketing and Customer Relations Management (CRM) do not exist in CR per se, even though the enterprise has Information Technology aids that can be used for this activity. CR is also not a major player in third and fourth party logistics (3PL and 4PL) and has a poor image with the industry, though a container corporation has been established.

Recommendation: Pricing should be selectively delegated within CR, in a framework of enterprise norms, as a marketing tool. Good costing and dissemination of statistics with sharply reduced confidentiality is a pre-requisite. **Best Practice:** Led by North America, this is increasingly a common practice in freight railways worldwide. Passenger services' pricing flexibility with yield management is used effectively by railways in Europe and Japan.

11. In the case of passenger traffic 96% of passenger km and 92% of revenue in 2006 were from hard seat and hard sleeper categories. These categories of passengers are largely (about 60%) carried below average costs and this is a business weakness. In freight traffic there is great emphasis on reducing average freight car turnaround and this was 4.87 days in 2006. This included substantial bulk traffic cars with turnaround time of 1-2 days. Therefore, GFB traffic cars had much higher average turnarounds. Since average wagon movement time is already only about 39 hours for 873 km average length of hauls, emphasis on reducing average freight car turnaround through higher speeds may not be an optimal strategy, as it does not significantly reduce total transit time for customers, for whom reliable transit times and advance arrival information is more important. Further, GFB trains operating at speeds higher than 80 kph are energy intensive and this ought to be an important cost consideration. In addition there are unnecessary levels of confidentiality in disseminating statistics, business statistics are neglected and commodity and class wise revenue statistics are unavailable.

Recommendation: CR needs to establish Quality Assurance (QA) for passenger services. **Best Practice:** With QA, European railways have created new rail markets in segments that were earlier captive to other modes



12. Network strengths of enhanced traffic for CR with increased profits, which could result from operating branch lines under a framework different from the main line, are not being realized. 25% of carloads on the US rail network originate or terminate or both on short lines and this traffic adds 18-22% to Class I railroads' bottom line profits.

Recommendation: CR should vigorously pursue rejuvenating branch lines through PSP with the objective of enhancing main line traffic and profitability and marketing rail transport through branch line operators. This has been highlighted by the MOR study tour team as well. **Best Practice:** In North America the industry framework encourages efficient and profitable branch lines that add real value to the large Class I railroads. Some Chinese local railways can grow into this role – e.g. Qinhuangdao

13. Most rolling stock operated on CR is owned by it, involving considerable annual capital outlays (US \$ 2 bn a year) for renewals and new stock. Leasing and private ownership of rolling stock do not have high priority.

Recommendation: For enhancing non-traditional investments rolling stock replacement and purchases could be funded by PSP, encouraging shippers to buy rolling stock and leasing companies to operate in China. Similarly, additional areas of rail activity should be identified for PSP through a review of what is non-core. **Best Practice:** US Class I railroads owned only 35% of cars used on the system in 2006.

Recommendation: For enhancing its ability to obtain funds from the market the financial statements of MOR should incorporate the construction surcharge paid by freight traffic customers in its revenue. This would show the profitability of rail services in 2006 as 4% PAT on equity invested, instead of 0.37%. This change can easily be implemented with tax neutrality. **Best Practice:** US Class I railroads had a return on equity of 11.3% in 2006 and raised most of their capital in the market.

3. Opportunities

14. In a 10 to 15 year perspective two strands in demographic and spatial development are 1) The populations of the 10 largest cities (in the east and in coastal areas) grew at an annual rate of 7.2% in the period 2000-05 and 2) the view of scholars that the overall population of China may start reducing in absolute terms after 2016. This will result in concentrations of high economic growth populations in urban agglomerations stretching from North to South along the eastern part of China (acting as magnets for migration) and at the same time areas of the country will continue to have relatively lower rates of development in the western parts of PRC.

15. In the constant search for lower cost products and prices in global supply chains, WDS incentives and higher wage levels will probably result in a gradual shift of some of the manufacturing bases in the eastern and coastal areas of the country to interior areas where wages and other costs are less. For locations that have similar manufacturing infrastructure, labor and other facilities, transport and logistics costs and capabilities will determine where these new bases get established. This is an important growth opportunity for railways.

16. A pattern that could emerge for medium and long distance passenger traffic is the need for fast services linking the major cities. With increasing per capita incomes the rail DPLs could provide serious competition in high yield markets that are currently considered captive to airlines at one end of the spectrum and road services at the other. The growing concern about environmental degradation in China could be an opportunity for the mode to use its inherently superior energy consumption and environmental characteristics to attract traffic to it for both freight and passenger traffic, provided that external environmental costs are appropriately internalized by the modes over the years.

4. Threats

17. With a paradigm shift in the transport sector to a buyers market in both freight and passenger traffic there has to be a change in the approach of CR to marketing and CRM. The customer has to be the centerpiece of business development and not rail sector production targets with, as is presently the case, the customer taking whatever is provided by, or available from, the railways. This change not



only implies CR competing with other modes but also developing innovative products and cooperating with other transport modes in passenger and freight transport, and with 3PL and 4PL entities.

18. A major danger for railway traffic is that road transport providers are usually much quicker to see opportunities in the market and establish themselves with customers than CR. It is difficult to wean away a satisfied customer from an efficient transport supplier if there is a standing relationship between them and transport costs are not the only major issue in the customer's logistics supply chain. Another related threat is that in China the expressway system in the eastern part of the country will be mostly complete by 2009 facilitating competition in rail's long-distance markets. Prices of efficient operators could reduce quite rapidly, even with clamping down on overloaded vehicles, owing to improved vehicle types and better return loads. Similarly, a change towards qualitative regulation in passenger transport could result in higher vehicle utilization, enhanced competition among large bus operators and lower tariffs with higher comfort levels for customers.

19. If reduced regulation of rail tariffs is not instituted it will be difficult, or impossible, for railways to utilize marketing tools to maintain and enhance traffic levels. Similarly the problem of PSOs has to be resolved to empower the railways to work in the buyer's market efficiently. If this does not happen the DPLs could become the cause of a specific problem of "creaming off" all paying traffic to the new lines, leaving CR to cater for shorter distance, low tariff, hard travel category passengers and fending for itself with internal cross subsidies².

C. Summary of Recommendations of the MOR Study Tour Team

20. The main recommendations were 1) the quality of customer servicing systems should be improved in CR, 2) establish a transparent, practical and reasonable tariff system, 3) encourage customers to buy private freight cars and use wagons flexibly, 3) reform existing transportation planning to fit market demand, 4) privatized branch railways should be established on lines that have low traffic and 5) establish railway logistics parks quickly.

D. Leveraging CR's Strengths through the Recommendations

21. In the context of the paradigm shift from a sellers market for railways to a buyers market, the recommendations were consolidated for freight and passenger transport related to enhancing freight carrying capacity, systematically reviewing passenger services to improve capacity utilization, establishing marketing and CRM for freight as well as passenger traffic, and developing new freight products. This seeks to leverage on the strengths of railways and ameliorate its weaknesses. Decision trees have been prepared for these groups of recommendations showing the main problems, contributing causes and constraints; strategies and activities proposed; benefits that could result from the recommendations, risks in implementation and mitigation of risks.

E. Policy Support for Changes: Taking the Process of Change Forward

22. The main considerations for taking change forward through separation of enterprise and government functions in the sector are 1) a supportive institutional and policy structure is required to empower CR as a commercial enterprise (tariff flexibility, PSO contracts and refunds) as this can only function efficiently with transparent passive regulation, 2) funds required annually for investment in the sector over the next 15 years will be at least 3.5 times what was expended in the past five years and diversifying sources must be facilitated, because the current pattern of raising funds from only provincial governments, state owned enterprises, banks, insurance and pension funds and some PSP is not sustainable in the long term [there are signs of potential debt servicing problems in the 2006 annual accounts], 3) investment risks can be reduced with PSP

² This could also affect DPLs. Mitigating factors that would reduce the risks of unviable DPLs include 1) potential increase in per capita incomes, 2) ensuring affordable hard class accommodation in all DPL trains albeit at higher than current fares, 3) ensuring flexible pricing powers for rail 4) Government compensating operators for any PSOs on DPLs or in the residual services of CR.



and, 4) there are potential breach of international obligations to WTO that are to enter into force in December 2007.

23. The framework for changes in the railway sector are in the NDRC directive *China's Key Reforms in Seven Fields in 2004*. It should be noted that the institutional changes in the document of separating Government and enterprise functions have the objective of making railways more market oriented - these are enabling sector features and not ends in themselves. They merely provide the framework for encouraging better processes and efficiency in the sector. Other changes – such as whether on-rail competition should take place or not – can be debated upon and decided at some future stage. While it may be an old saw it is also important to stress that no one single set of circumstances prevailing elsewhere can be replicated in China and vice versa. What to adapt and use in China, and when, will be a matter of judgment on the part of the Government and its relevant entities, particularly NDRC and MOR.

24. From international experience (already available with the Government) there is a substantial body of reforms that have elements relevant to the situation prevailing in China. We consider that areas of most interest could be in 1) safety regulation, 2) economic regulation, 3) track access, 4) vehicle interchange, and 5) revenue division. The sector functions that will need attention at a national level separate from running CR through independent regulation include the first two functions with oversight of the rest. Important direct activities of the Government are 1) formulating and executing sector policies, 2) long term planning for the sector, and 3) the ownership function of CR. The arrangements in the US can be a starting point for deliberations because of their level of maturity and efficiency in a market driven economy.

25. To carry the process of changes in the railway sector forward in a meaningful way a decision tree has been prepared. An empowered working unit of Chinese specialists should be established (with not just a “think tank” function) to undertake changes in the railway sector and establish all necessary enabling mechanisms and regular activities that are part of an enabling supportive framework mentioned above with 1) a railway sector and a transport sector perspective, 2) no specific responsibility for day-to-day functions of railways as an enterprise, 3) responsibility for holding a brief for the consumer and ordinary user of railway services 4) a remit to evolve, recommend and implement policy and institutional structures to bring changes related to the industry and sector in a time bound framework and 5) answerability to the various stakeholders in Government at the highest level for the activities of the unit.

26. Another area for the unit to foster should be to use the mechanism of revitalizing branch lines in PRC's railway sector to attract entrepreneurial talent to railways. This too will need some degree of support from the proposed unit to see that such activities are not subsumed by the existing CR.

Recommendation: Establish a high level empowered working unit with appropriate Chinese experts to plan and oversee the changes. Subsequently the unit should be transformed as the sector regulator. Though there are numerous examples of such restructuring there are no **best practices** that can be directly adopted without a detailed study. China, like all other countries must take its own view of extensive information that is already available with Government and adapt it for use in the country. However US regulatory structures and separation of enterprise and Government functions can be used as a starting point.

27. An Action Plan has been prepared focusing on: 1) transport capacity and technology, 2) enabling environment for market competition 3) investment, and 4) taking forward sector change and restructuring. This was prepared with the proposed time frame (short term up to 1 year, medium term 2-5 years; long term beyond 5 years) for implementing recommendations, main activities involved, impacts of the recommendations and principal indicative costs.

