

**ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC**

# Development of The Trans-Asian Railway

**TRANS-ASIAN RAILWAY IN THE  
NORTH-SOUTH CORRIDOR  
NORTHERN EUROPE TO THE PERSIAN GULF**



**UNITED NATIONS**

**ST/ESCAP/2182**

This publication was prepared with financial support by the Government of Germany through GTZ German Technical Cooperation.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

This publication has been issued without formal editing.

# CONTENTS

	<b>Page</b>
CHAPTER 1 INTRODUCTION	1
CHAPTER 2 POSSIBLE TRANSPORT ROUTES BETWEEN NORTHERN EUROPE AND THE PERSIAN GULF	7
2.1 Denomination of routes	7
2.2 The Caucasus route	7
2.2.1 Route alignment and technical characteristics	7
2.2.1.1 Caucasus route in Finland	7
2.2.1.2 Caucasus route in the Russian Federation	9
2.2.1.3 Caucasus route in Azerbaijan	9
2.2.1.4 Caucasus route in Armenia	12
2.2.1.5 Caucasus route in the Islamic Republic of Iran	12
2.2.2 Route alignment and technical characteristics	15
2.3 The Central Asian route	15
2.3.1 Route alignment and technical characteristics	15
2.3.1.1 Central Asian route in Finland	16
2.3.1.2 Central Asian route in the Russian Federation	16
2.3.1.3 Central Asian route in Kazakhstan	16
2.3.1.4 Central Asian route in Uzbekistan	18
2.3.1.5 Central Asian route in Turkmenistan	18
2.3.1.6 Central Asian route in the Islamic Republic of Iran	21
2.3.2 Route alignment and technical characteristics	21
2.4 The Caspian Sea route	23
2.4.1 Route alignment and technical characteristics	23
2.4.1.1 Caspian Sea route in Finland	23
2.4.1.2 Caspian Sea route in the Russian Federation	23
2.4.1.3 Caspian Sea route in the Islamic Republic of Iran	24
2.5 Possible future route developments along the corridor	25
2.5.1 The Caucasus route	25
2.5.2 The Central Asian route	26
2.6 Continuation of the corridor in South / South-East Asia	27
2.6.1 Corridor connections with countries in South Asia	27
2.6.1.1 Closing the 'Kerman - Zahedan' gap	27
2.6.1.2 Corridor continuation in Pakistan	29
2.6.1.3 Corridor continuation in India	30
2.6.2 Corridor connections with countries in South-East Asia	31
2.6.2.1 Rail link in Singapore and Malaysia	31
2.6.2.2 Rail link in Thailand	33
2.7 Continuation of the corridor in Europe	33
2.8 Conclusion	36
CHAPTER 3 TECHNICAL REQUIREMENTS	37
3.1 Structure gauge and loading gauge	37
3.2 Axle-load	42
3.3 Commercial speeds	45

	<b>Page</b>
CHAPTER 4 OPERATIONAL REQUIREMENTS	49
4.1 Compatibility of rolling stock	49
4.2 Compatibility of train assembly and load scheduling practices	51
4.3 The break-of-gauge issue	52
4.3.1 The break-of-gauge problem in the Corridor	52
4.3.2 Description of technical solutions to the break-of-gauge problem	53
4.3.3 Advantages vs disadvantages of different solutions	55
4.3.4 Capital costs	57
CHAPTER 5 COMMERCIAL REQUIREMENTS	59
5.1 Business environment of container traffic	60
5.2 Transit times	61
5.2.1 Estimates of sea transit times	61
5.2.2 Estimates of rail or rail-cum-sea transit times	62
5.2.2.1 Estimates of all-rail transit times	63
5.2.2.2 Estimates of land-cum-sea transit times	63
5.3 Tariffs	66
5.3.1 Outline of tariff setting methods applied by railways in the corridor	67
5.3.2 Modern approach to tariff setting	69
5.4 Reliability / Punctuality / Frequency of service	72
5.5 Other aspects of service level	73
5.5.1 Security of cargo	73
5.5.2 Information to customers	75
5.6 General conclusion	79
CHAPTER 6 FACILITATION OF CROSS-BORDER MOVEMENTS OF CARGO	81
6.1 International transit agreements and conventions	81
6.1.1 Work of ESCAP	81
6.1.2 Work of the Organization of Economic Cooperation	85
6.2 Transit facilitation	86
6.3 International rail transit agreements	87
6.4 International agreements and conventions	87
6.5 Railway adoption of EDI systems	88
CHAPTER 7 CONCLUSIONS AND RECOMMENDATIONS	89
7.1 TAR network designation	89
7.2 Fundamental role and operational priorities	90
7.3 Completing the network	91
7.4 Traffic information and forecasting system enhancement	91
7.5 Identifying and achieving targets for competitive rail service	91
7.6 Recommended minimum technical standards	92
7.7 Specific container handling needs	93
7.8 Facilitation measures for cross border traffic	93
7.9 TAR network development needs	94

## LIST OF MAPS

	<b>Page</b>	
Map 1	Proposed Trans-Asian Railway Routes	3
Map 2	Routes of Trans-Asian Railway in North-South Corridor	5
Map 3	North-South Corridor in Finland	8
Map 4	North-South Corridor in the Russian Federation (West of the Urals)	10
Map 5	North-South Corridor in Azerbaijan	11
Map 6	North-South Corridor in Armenia	13
Map 7	North-South Corridor in the Islamic Republic of Iran	14
Map 8	North-South Corridor in Kazakhstan	17
Map 9	North-South Corridor in Uzbekistan	19
Map 10	North-South Corridor in Turkmenistan	20
Map 11	Corridor continuation in South Asia	28
Map 12	Corridor continuation in South-East Asia	32
Map 13	European Railway Networks	34
Map 14	European Road Networks	35

## LIST OF TABLES

Table 3.1	Dimensions of most commonly used ISO and non-ISO containers	39
Table 5.1	Estimates of all-rail transit times from Helsinki to Tehran, Bandar Abbas, Lahore and New Delhi	64
Table 5.2	Estimates of land-cum-sea transit times from Helsinki to Tehran, Lahore, New Delhi and Bangkok	65

## LIST OF ANNEXES

Annex 1	ESCAP Resolution 48/11 and Table of Accession	95
Annex 2	Inter-Governmental Agreement on International North-South Transport Corridor	97