

The Master Plan Study on the Development of Syrian Railways in the Syrian Arab Republic

Volume I

Development of Phased Rehabilitation and Modernization Plan for the year 2005, 2010 and 2020

Final Report



August, 2001

**Japan Railway Technical Service (JARTS)
Yachiyo Engineering CO., LTD. (YEC)**

SSF
JR
01- 120 (1/6)

Exchange Rate of Currency

1 US\$ = 46 Syrian Pounds

1 US\$ = ¥106

1 Syrian Pound = ¥2.3

June, 2000

PREFACE

In response to a request from the Government of the Syrian Arab Republic, the Government of Japan decided to conduct a Master Plan Study on the Development of Syrian Railways in the Syrian Arab Republic and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Dr. Sadaaki Kuroda of Japan Railway Technical Service, and consist of Japan Railway Technical Service and Yachiyo Engineering Co., Ltd. to the Syrian Arab Republic, 3 times between April 2000 and August 2001.

In addition, JICA set up an advisory committee headed by Mr. Hiroshi Saeki, Director, Environmental Office, Railway Bureau, Ministry of Transport (present Ministry of Land, Infrastructure and Transport) between April 2000 and August 2001, which examined the study from specialist and technical points of view.

The team held discussions with the officials concerned of the Government of the Syrian Arab Republic and conducted field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of this project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Syrian Arab Republic for their close cooperation extended to the Team.

August 2001



Kunihiko Saito
President

Japan International Cooperation Agency

August, 2001

Mr. Kunihiko SAITO
President
Japan International Cooperation Agency

Dear Sir,

Letter of Transmittal

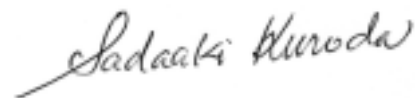
We have the pleasure of submitting herewith our Report for the Master Plan Study on the Development of Syrian Railways in the Syrian Arab Republic. The report describes the results of the Study carried out by Japan Railway Technical Service and Yachiyo Engineering Co. Ltd., as per the contract with Japan International Cooperation Agency.

The Study Team conducted field surveys three times during the period from April 2000 to August 2001. The Team held sufficient consultations with the Syrian governmental agencies concerned regarding the results of the field surveys and study activities in Japan, and drew up a master plan for the rehabilitation and modernization of the nationwide railway for the year 2020; phased rehabilitation and modernization plans for 2005 (short term), 2010 (medium term), and 2020 (long term); and two plans, as short-term urgent projects, on the rehabilitation and modernization of Tartous, Homs and Al-Sharqia section and on the locomotive workshop modernization. In close coordination with the Syrian side, the Team thereafter studied the feasibility of these plans from technical, environmental, economic, and financial aspects, and drew up this report.

From the standpoint of reinforcing the transport infrastructures necessary for the social and economic development of Syria, we would like to recommend the early implementation of the two projects: rehabilitation and modernization of the railway section between Tortous, Homs and Al-Sharqia; and locomotive workshop modernization.

We wish to express our sincere gratitude to the Japan International Cooperation Agency, the Ministry of Foreign Affairs, the Ministry of Land, Infrastructure and Transport, and the Japanese Embassy and JICA Office in Syria for the kind assistance and guidance extended to us in executing the Study.

Yours faithfully,



Sadaaki KURODA, Dr. Eng.

Leader

The Study Team for the Master Plan Study on the Development
of Syrian Railways in the Syrian Arab Republic



Diesel Car Train Passing through the Bridge

The Master Plan Study on the Development of Syrian Railways in the Syrian Arab Republic

Volume

Development of Phased Rehabilitation and modernization Plan for the year 2005, 2010 and 2020.

(Executive Summary)

Study period : April 2000- August 2001
Accepting Organization: Ministry of Transport

1. Objective of the Study

- (1) Development of Phased Rehabilitation and Modernization Plan of GESR and GEHR for the Year 2005, 2010 and 2020 (Master Plan)
- (2) Feasibility Study of the Urgent Short Term Project Selected from Master Plan
- (3) Technology Transfer Through the Study Activities

2. Study Method

The study team conducted on-site surveys in order to obtain an understanding of the actual situations in Syria. It exchanged views with the Syrian Steering Committee, Managing Committee and counterpart team, and collected relevant information. Based on the results of the survey in Syria and Japanese experiences, the study team drew up a report.

3. Outline of the Study

3.1 Outline of Master Plan and Staged Development Plan

(1) Staged Development plan

- Rehabilitation and modernization of Existing Facilities – (GESR)

12 projects for rehabilitation and modernization of existing facilities were set up together with rolling stock procurement, and priority was given to each project from the overall view points. Based on priorities thus established, staged development plan as shown in Table 3.1.1 was drawn up.

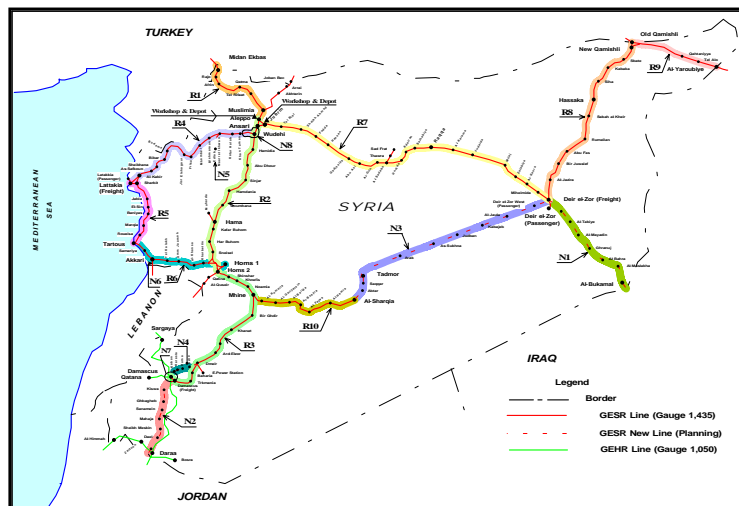


Fig 3.1 Railway Network

**Table 3.1.1 Staged Development Plan (GESR)
Rehabilitation and Modernization of Existing Facilities)**

No.	Project	Short-term	Medium-term	Long-term	
		2001 ~ 2005	2006 ~ 2010	2011 ~ 2015	2016 ~ 2020
1	Midan Ekbas ~ Aleppo	■	■		
2	Aleppo ~ Damascus	■	■	
3	Aleppo ~ Lattakia	■	■		
4	Lattakia ~ Tartous	■	■		
5	Tartous ~ Homs ~ Mhine ~ Al Sharqia	■	■
6	Aleppo ~ Deir el-zor	■	■		
7	Deir el-zor ~ Qamishli	■	■		
8	Qamishli ~ Al Yaroubiye	■	■		
9	Loco Workshop	■			
10	Aleppo PC Workshop	■			
11	Jublin FC Workshop	■			
12	Freight Information system	■			
13	Rolling stock procurement	■			

Legend :

- Substantial Work
- ▬ Auxiliary Work
- ▬ Signal and telecommunication facilities improvement already committed
- Signal station construction or double tracking conducted to cope with the shortage of the shortage of track capacity due to the increase traffic demand

(2) Staged Development Plan (New Line Construction) (GESR)

8 new line construction projects were set up together with rolling stock procurement. Priority was given to each project based on overall view points. Based on the priority, staged development plan as shown in Table 3.1.2 was prepared.

Table 3.1.2 Staged Development Plan (New Line Construction) (GESR)

No.	Project	Short-term	Medium-term	Long-term	
		2001 ~ 2005	2006 ~ 2010	2011 ~ 2015	2016 ~ 2020
1	Deir el-zor ~ Al Bukamal	■			
2	Damascus ~ Kiswa	■			
	Kiswa ~ Jordan Border		■	■	
3	Al Sharqia ~ Tadmor ~ Deir el- zor	■	■	
4	Adra ~ Kabon	■			
5	Maarret Ikhwan ~ Edlab	■	■	■	
6	Akkari ~ Lebanon Border	■			
7	Kadam ~ Hidjaz station	■	■		
8	West Entrance to Aleppo	■	■		
9	Rolling stock Procurement	■			

Legend :

- Substantial Work
- ▬ Auxiliary Work
- Signal station construction to cope with the shortage of track capacity due to the increase

(3) Development plan of GEHR

Development projects for GEHR were established and given priority in consultation with GEHR. The projects and their priority given are shown in Table 3.1.3.

Table 3.1.3 Development Plan of GEHR

No.	Project Name	Priority Ranking	Priority Order	Remarks
1	Rehabilitation of Daraa line and Constructio of Kadam-Hidjaz station	A	1	To be studied together with GESR project
2	rehabilitation of Surgaya Line	A	2	
3	Rehabilitation of Qatana line and other lines	B	3	
4	Damascus-Airport	(A)		Not included in the cost/benefit analysis of Master plan projects but discussed in the report on non-quantitabive basis
5	Tramway			Not included in the cost/benefit analysis of Master plan projects but discussed in the report on non-quantitaative basis

3.2 Socio Economic Frame Work

Socio economic model was formulated for forecasting the future socio-economic framework. Major outputs by the model are given in Fig. 3.2.1.

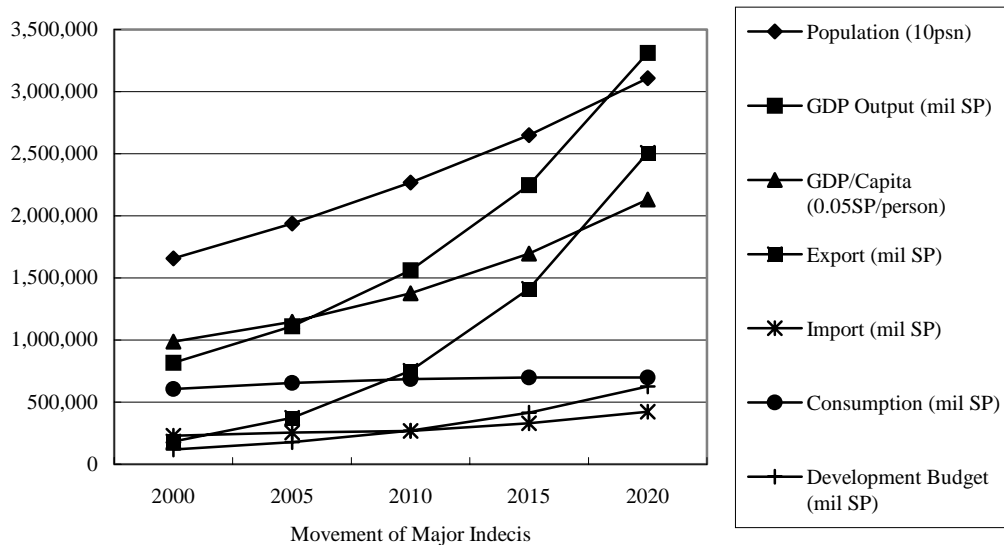


Fig. 3.2.1 Major Output from the Model

3.3 Demand Forecast

Demand forecast of passengers and freight by all transport modes and by railway are given in Fig.3.3-1 for each case of with-Master plan and without-Master plan (do nothing) case. Traffic volume by all modes are about 2.4 times for passenger and 5.0 times for freight in 2020 against those in 2000 while railway passengers and freight will be increased to 6.3 times and 6.9 times respectively in 2020 against those of 2000.

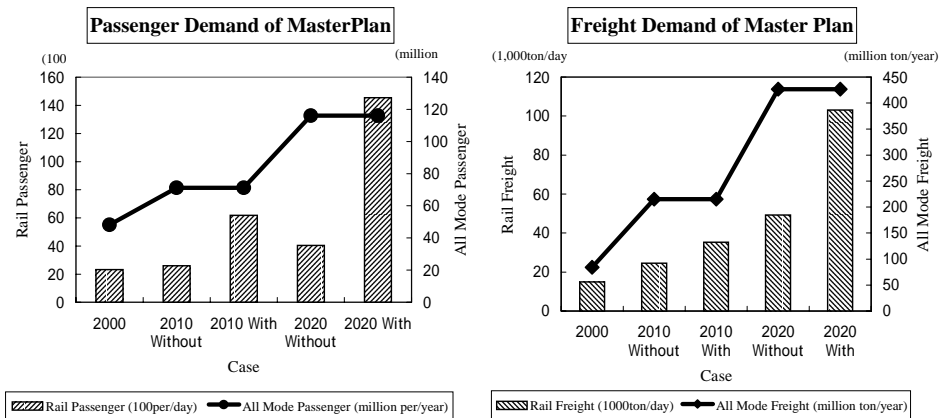


Fig. 3.3.1 Demand Forecast of Railway Traffic

Railway traffic shares are about 5% for passenger and about 9% for freight both in 2020 for with-Master plan case as shown in Fig 3.3.2.

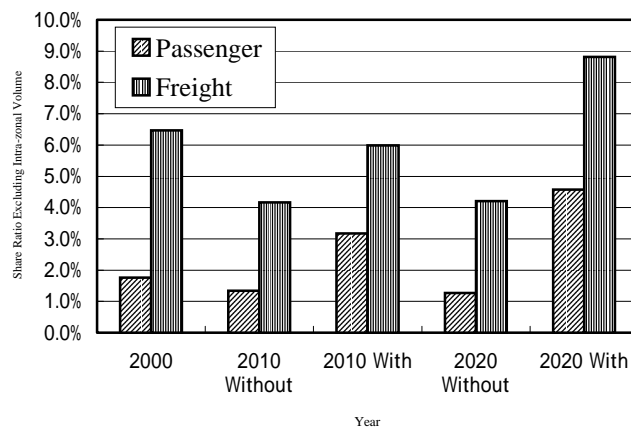


Fig. 3.3.2 Master Plan Modal Share of Railway

4. Evaluation of the Master plan

4.1 Economic and Financial Analysis of Master Plan

4.1.1 Economic Analysis

(1) Benefit

- Difference of [Road vehicle operation cost + Rail Operating Cost] between without-case and with-case
- Difference of rail and road travel time cost between without-case and with-case

(2) EIRR = 16.9%

Opportunity cost of capital in Syria = 12%

Master plan is economically feasible

4.1.2 Financial Analysis

(1) Fare and Rate

The same as the current prices

Freight = 0.8869 SP/ton-km

Passenger = 0.1755 SP/person-km

(2) FIRR = 2.0%

(3) Loan Condition

- (a) Interest: 2.2% p.a.
 Grace: 10 years
 Repayment: 30 years semiannual equal installment
- (b) Interest: 0.75% p.a.
 Grace: 10 years
 Repayment: 35 years From 11th ~20th year: 2.5% of total loan amount per year
 From 21th~35th year: 5% of total loan amount per year

(4) In case the low interest loan such as the above can be borrowed from the international financial institution or foreign government and the government supports the local currency portion not covered by foreign loan, Master plan is financially feasible.

4.2 Natural Conditions and the Environment

(1) Environment Protection Law

New draft environment protection law requiring EIA is under consideration since 1994 both in parliament and presently in the cabinet of ministers.

At this time no clear legal requirement for EIA.

- This Study examines the environmental impact of the planned railway projects based on JICA guidelines
- Standards developed are on a provisional basis, and are not legalized yet.
 Developed Provisional Standards are for
- air quality
- potable water quality
- wastewater from industrial establishment

(2) Screening of Master Plan GESR Project

Project Environmental Item	Rehabilitation	New Line Construction	Workshop Construction	Rolling Stock Procurement
Social Environment	D	A	B	D
Natural Environment	D	C	D	D
Pollution	B	B	B	B
Overall Evaluation	C	EIA Necessary	EIA Necessary	C

Where:

A: Serious impact is predicted

B: Some impact is predicted

C: Extent of impact is unknown and further examination is necessary

D: No impact is predicted, EIA is not necessary

(3) Screening of GEHR Project

Project Environmental Item	Damascus ~ Daraa Rehabilitation	Surghaya Line Rehabilitation	Qatana, Bosra Muzeireeb Lines Rehabilitations	Airport Railway
	(including Hijaz ~ Qadam underground)			
Social Environment	C	D	C	B
Natural Environment	C	D	D	C
Pollution	B	B	B	B
Overall Evaluation	EIA necessary	C	C	EIA necessary

Where: A, B, C, D are the same definitions as (2) above.

5. Conclusion and Recommendation

5.1 GESR

(1) Master Plan Investment for Each 5 years

Year	Short-term	Medium-term	Long-term		Total
	2001-2005	2006-2010	2011-2015	2016-2020	
Estimated Affordable Budget of GESR (*)	27,342	44,501	48,617	48,809	169,269
Master plan investment(**)	64,575	36,366	35,668	29,452	166,061

(*) Budget includes estimated value for 2001

(**) Engineering cost (5,405million SP)is excluded.

Total amount of investment for Master Plan may be afforded by Syrian economy, but investment in the first 5years is suggested to be leveled off.

(2) Cost/Benefit Analysis of Staged Development Plan

EIRR = 16.9% (Basic case)

FIRR = 2.0% (Basic case)

Master plan is feasible from national economic point of view.

Master plan is financially feasible in case low interest international or foreign loan is available and government supports local currency portion not covered by foreign loan.

(3) Master plan should be implemented as soon as practical

(4) The followings should be promoted so that Staged Development Plan (Master plan) can be effectively realized.

Ensuring of railway reliability (punctual train operation)

Ensuring of convenience for railway users

Improvement of maintenance of railway facilities

Improvement of management and training

5.2 GEHR

(1) Role of GEHR

The following role of GEHR should be promoted in close cooperation with related Agencies and GESR and with due consideration on practical investment

- Tourism promotion
- International transport with Jordan
- Possibility to contribute to Damascus urban transport in future including airport access line

(2) Gauge conversion

GEHR is now seriously planning to modernize the existing lines through gauge conversion from meter gauge to standard gauge. Gauge conversion to standard gauge has merits of integrating all Syrian railway network into unified gauge network and of promoting international transport. However, since it needs considerable investment cost, and economic justification of gauge conversion is not yet confirmed, improvement of existing meter gauge track with minimum investment has been proposed in the Report.

(3) Improvement of existing lines

Related with tourism and international transport, minimum necessary investment for safe train operation for the 1st and 2nd priority projects (1,677 million SP) should be considered in the first place. Later investment for 3rd priority project (443 million SP) should be considered. At the same time, railway management and staff training should be improved. In case economic feasibility of gauge conversion to standard gauge will have been confirmed, improvement of existing railways can be switched to modernization of railways through gauge conversion to standard gauge.

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Abbreviation and Glossary

ADT	Average Daily Traffic
AOC	Administration and Operation Cost
ATP	Automatic Train Protection
ATS	Automatic Train Stop
B/C	Benefit Cost Ratio
BOD	Biochemical Oxygen Demand
CCITT (ITU-T)	International Telecommunication Union
CIF	Cost, Insurance and Freight
COD	Chemical Oxygen Demand
CONOCO	Continental Oil Company
CT	Closed Track Circuit
CTC	Centralized Traffic Control
DC	Diesel Car
DEL (LDE)	Diesel Electric Locomotive
DGMO	Director Generals of Middle East Railways
DHL	Diesel Hydraulic Locomotive
DL	Diesel Locomotive
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
FC	Freight Wagon
FIRR	Financial Internal Rate of Return
FS (F/S)	Feasibility Study
GCEA	General Council for Environmental Affairs
GDP	Gross Domestic Products
GEHR	General Establishment of Hidjaz Railways
GESR	General Establishment of Syrian Railways
GORS	General Organization of Remote Sensing
GRDP	Gross Regional Domestic Products
HID	High Intensity Discharge
HMIS	Highway Maintenance and Inspection System
HVAC	Heating, Ventilation and Air Conditioning
IEC	International Electro Technical Commission
IRI	International Roughness Index
ISO	International Standard Organization
JICA	Japan International Cooperation Agency
JR	Japan Railway

LED	Light Emitting Diode
MOF	Ministry of Finance
MOT	Ministry of Transport
MP (M/P)	Master Plan
MRT	Mass Rapid Transport
NDP	Net Domestic Products
NEAP	National Environmental Action Plan
NEEDS	Nikkei Economic Evaluation Data System
NPV	Net Present Value
OD	Origin-Destination
OJT	On the Job Training
OLTC	On Load Tap Changer
OT	Open Ticket Circuit
PABX	Private Automatic Branch Exchange
PC	Passenger Coach
PC sleeper	Prestressed concrete sleeper
ROC	Rail Operating Cost
ROI	Return on Investment
ROE	Return on Equity
ROUC	Rail Operating Unit Cost
ROW	Right of Way
SDH	Synchronous Digital Hierarchy
SL	Steam Locomotive
SS	Suspended Solides
TQC	Total Quality Control
TTC	Travel Time Cost
TTUC	Travel Time Unit Cost
TTUV	Travel Time Unit Value
UIC	International Railway Union
UN	United Nations
UNDP	United Nations Development Programme
VOC	Vehicle Operating Cost
VOUC	Vehicle Operating Unit Cost

Introduction

Introduction

1. Background of the Study

Starting from the 1st Five-year Economic Development Plan which began in 1961 and up to the 9th Five-year Economic Development Plan (2001-2005) which is in progress at present, the Syrian Government has been systematically promoting the development of agriculture, mining and manufacturing industries and so forth, leading to the steady enhancement of the productive capacity of Syria.

On the other hand, the railways which should be a major transport infrastructure to support socio-economic development of the country and are having a route network of about 2,800km consisting of GESR lines (gauge, 1,435mm; track extension, about 2,450km) and GEHR lines (gauge, 1,050mm; track extension, about 340km) are unable to sufficiently display their functions at present, due to such reasons as the shortage of rolling stock and superannuation of railway facilities. As a result, even the transport of commodities suitable for railways specializing in large-volume transport is depending on roads.

Under these circumstances, the Syrian Railways have such tasks as: renewal and additional introduction of rolling stock; rehabilitation and modernization of railway facilities; and expansion of the route network by new line construction which considers international transport as well as the national integration.

At the same time, it is necessary to promote railway management improvement by such measures as: development of railway transport demand; enhancement of work efficiency of employees through education and so forth; improvement of facility maintenance and operation; and transport cost reduction.

2. Objective of the Study

In the Study, against the background described above, and in accordance with the Scope of Work agreed upon between the Syrian Government and the JICA Preparatory Study Team on December 1, 1999, a master plan which has a target year of 2020 and covers the entire regions of Syria should be drawn up for the rehabilitation and modernization of GESR and GEHR.

A feasibility study should be carried out, thereafter, concerning the highly important and very urgent short-term project selected from the master plan.

Furthermore, technology transfer should also be made to the Syrian-side counterparts through the study activities.

3. Outline of the Study

The period of the Study is broadly divided into the three phases, as shown in Fig. 1.

In the 1st phase, based on the results of data and information collection and site surveys, the present situation and major issues of the Syrian Railways should be identified.

In the 2nd phase, a Master Plan with a target year of 2020 (including the staged development plans for the years of 2005, 2010 and 2020), should be proposed, together with the short-term urgent project on which a feasibility study should be carried out.

In the 3rd phase, the following two feasibility studies should be carried out concerning the short-term urgent project selected as a result of discussions with the Syrian side.

- (1) Feasibility Study on the Rehabilitation/Modernization of Tartous, Homs and Al Sharqia section
- (2) Feasibility Study on the Locomotive Workshop Modernization

The flow of the above study activities is shown in Fig. 2.

4. Final Report

This Final Report consists of the following three volumes and summaries of respective volume.

Volume I : Master Plan on the Development of Syrian Railways (Master Plan)

Volume II : Feasibility Study on the Rehabilitation/Modernization of Tartous, Homs and Al-Sharqia Section

Volume III : Feasibility Study on the Locomotive Workshop Modernization

The Master Plan in Volume I has been prepared by re-arranging the contents of the original plan proposed in the Interim Report, based on the results of consultations with the Syrian side.

The Feasibility Study on the Rehabilitation/Modernization of Tartous, Homs and Al Sharqia Section in Volume II and the Feasibility Study on the Locomotive Workshop Modernization in Volume III are studies on the Short-term Urgent Projects proposed in the Interim Report and agreed upon with the Syrian side on December 11, 2000.

The main contents of the Rehabilitation/Modernization of Tartous, Homs and Al Sharqia Section in Volume II are the feasibility study on rehabilitating and modernizing the present track facilities, electric facilities and so forth on the existing line of about 270km between these stations with due consideration of the coordination with the Master Plans.

Especially, for the steep gradient section of about 40km between Akkari and Al Khansa constituting a bottleneck in transport, two alternatives (routes) have been studied. The one is the construction of a line parallel to the existing line (two cases according to the difference in traction systems), and the other is the construction of a separate route line. The results of the feasibility study have been compiled into Volume II.

The main contents of the Locomotive Workshop Modernization in Volume III are the feasibility study of the modernization plan of the existing Jubrin Locomotive Workshop. The construction of new workshop has been proposed instead of modernizing the existing one because the existing one is narrow, its layout is inefficient and facilities are old.

Based on the results of site surveys and consultations with the Syrian side, the construction of a new locomotive workshop in Muslimia and the establishment of inspection and repair facilities there for diesel locomotives and diesel railcars have been studied. The results of the above study activities have been compiled into Volume III.

The Draft Final Report was submitted and explained to the Syrian Government on July 3rd, 2001.

Japanese Side

(1) Advisory Committee

Name	Assignment	Position
Hiroshi SAEKI	Leader	Director, Environmental office, Railway Bureau, Ministry of Land, Infrastructure and Transport
Susumu AOKI	Railway policy/ Business/Financial Affairs	Deputy Director, Railway Industries Division, Railway Bureau, Ministry of Land, Infrastructure and Transport
Tatsuji NORIDUKI	Rolling stock/ Operation safety	Assistant Director, Engineering Planning Division, Railway Bureau, Ministry of Land, Infrastructure and Transport

(2) JICA Coordinator

Name	Position
Takao KAIBARA (2000.4 ~ 2000.9)	Director, Fist Development Study Division, Social Development Study Department, Japan International Cooperation Agency (JICA)
Toshio HIRAI (2000.9 ~ Present)	Director, Fist Development Study Division, Social Development Study Department, Japan International Cooperation Agency (JICA)
Hideo KUMAGAI	Deputy Director, Fist Development Study Division, Social Development Study Department, Japan International Cooperation Agency (JICA)
Kazuyuki SHIBAYAMA	Staff, Fist Development Study Division, Social Development Study Department, Japan International Cooperation Agency (JICA)
Katsuhiko EBINA (2000.4 ~ 2000.6)	Resident Representative, Syria Office, Japan International Cooperation Agency (JICA)
Katsuhiko OZAWA (2000.6 ~ Present)	Resident Representative, Syria Office, Japan International Cooperation Agency (JICA)
Teruhiko KAWABATA (2000.4 ~ 2000.12)	Assistant Resident Representative, Syria Office, Japan International Cooperation Agency (JICA)
Kiyoshi YASUDA (2000.12 ~ Present)	Assistant Resident Representative, Syria Office, Japan International Cooperation Agency (JICA)

(3) Study Team

Name	Assignment
Sadaaki KURODA	Team Leader
Yoshio SHIBUYA	Deputy Team Leader/Basic plan
Jyoji KAWADA	Train Operating Plan
Hideo YOKOO	Rolling Stock/Workshop Plan
Misao HISANAGA	Workshop Plan (Inspection and Repair)
Naonori YAMADA	Track and Structure Plan
Yasumasa MATSUBAYASHI	Telecommunication/Signalling plan
Taro IWATA	Management/Financial analysis
Chihiro HAMAZAKI	Business/Training
Hajime TANAKA	Deputy Team Leader/Development Plan/Economic analysis
Tetsuo HORIE	Demand forecast/ Economic analysis
Masami NAGAYOSHI	Track design and Track Layout of Workshop
Kazunori ISHIKAWA	Signalling and Telecommunication design
Ryokichi NAKAMURA	Workshop Facilities Design
Yutaka TAKAHASHI	Building Design
Masayuki TAMAI	Building Facilities Design
Mahmoud-Salih RIAD	Environment/Natural condition/Regional development plan
Toshihiro HOTTA (2001.6 ~ 2001.7)	Environment/Natural condition
Yoshitsugu ISHIKAWA	Interpreter/Translator

Syrian Side

(1) Steering Committee

Name	Position
Dr. Eng. Shafik Daoud	Chairman Vice Minister of Transport
Mr.Mokhles Abou Hammoud	Member Director of Planning, MOT
Eng.Akil Esmaeil	Member Director of Railway, MOT
Eng.Iyad Ghazal	Member General Director, GESR
Eng. Salah H Ahamad	Member General Director, GEHR
Dr.Eng. Joseph Saydnawi	Member Damascus University
Eng. Eihsan Sondouk	Member Ministry of Industry
Eng. Reem Abed Rabou	Member Ministry of Environment
Dr. Gamal Assatl	Member Ministry of Supply and Internal Trade
Mr. Moaffak Aletr	Member Ministry of Oil and Mineral Resources
Mr. Farag Bishara	Member State Planning Commission

(2) Managing Committee

Name	Position
Abdul Mounem Alboum	Chairman Deputy General Director, GESR
Dr. Eng. Ahamad Al-Mansour	Coordination and Follow up
Dr. Eng. Fadel Sukkar	Coordination and Follow up
Ibraheem Khodar	Directorate of Traffic and Transportation, GESR
Mijham Abdul Hannaan	Directorate of Rolling Stock and Traction, GESR
Mohammad Tahbuub	Directorate of Fixed Structures, GESR
Shaadin Wafaie	Directorate of Technical Affairs, GESR
Abdul Rahmaan Abu Saleh	Directorate of Signal and Telecommunication, GESR
Subhy Arafah	Directorate of Financial Affairs, GESR
Mohmmad Labaabeedy	Directorate of Marketing, GESR
Osama Abyad	Directorate of Rolling Stock and Traction, GEHR
Ahmad Abuurah	Directorate of Legal Administration, GEHR

(3) Counterpart Team

1) GESR

Name	Assignment
Abdul Mounem Alboum	Chief of Counterpart Team Demand Forecast
Ibraheem Khodar	Transportation
Ismaeel Badrkhaan	Transportation
Hassan Shahhud	Transportation
(Dr.Eng) Haisam Ibraheem	Rolling Stock
Mijham Abdul Hannaan	Rolling Stock
Ahmad Asshawa	Rolling Stock
Misheel Kurou	Rolling Stock
Saad Kassar	Rolling Stock
Saamir Al-Banna	Rolling Stock
Mahmood Al-Atrash	Rolling Stock
Marwaan Deery	Rolling Stock
Maiyaua Qassar	Rolling Stock
Ammaar Kaadaan	Technical Affairs
Shaadin Wafaie	Technical Affairs
Zakariyaa Kulzeeyah	Technical Affairs
Mohammad Al-Beek	Technical Affairs
(Dr.Eng) Ismaeel Al-Abram	Maintenance of Railway Structure
Mohammad Tahbuub	Maintenance of Railway Structure
Waleed Karahajuul	Maintenance of Railway Structure
Adnaan Basheer	Maintenance of Railway Structure
(Dr.Eng.) Qusaai Kaiyaallie	Signal and Telecommunication
Lamaa Miumaar	Signal and Telecommunication
Waheed Malhees	Signal and Telecommunication
Lamyaa Khankaan	Signal and Telecommunication
Abdul Rahman Abu Saaleh	Signal and Telecommunication
Jammeel Hallaq	Signal and Telecommunication
Saamnee Qutainee	Signal and Telecommunication
Mikhael Jurjus	Education and Training
Adnaan Waahidy	Education and Training
Junieton Awaanees	Finance
Ihsaan Khaalidy	Finance
Mohammad Labaabeedy	Marketing
Stepan Palouljian	Marketing
Mahmoud Hajji Hasan	Marketing
Subhy Arafah	Accounting
Aaliyah Wafaie	Accounting
Jaidau Saalih	Accounting
(Dr. Eng) Maad Al-Madlajee	Planning
Hasan Al-Ahmad	Planning
Juuzeeef Misree	Legal
Bakree Muqaddam	Legal

Name	Assignment
Abdul Hakeem Badwee	Management
Reem Abd Rabo	Ministry of Environment
Gaaliya Noor Deen	Public Corporation of Railway Construction
Maarie Hawwaam	Public Corporation of Railway Construction
Mohammad Abboud	Public Corporation of Railway Construction
Osamah Amir	Public Corporation of Railway Construction
Mohammad Qassab	Public Corporation of Railway Construction
Ahmad Neenou	Public Corporation of Railway Construction

2) GEHR

Name	Assignment
Osama Abyad	Transportation, Rolling Stock
Ahmad Sulaimaan	Infrastructures
Labeeb Hamdaan	Workshop, Environment
Wafeeq Al-Homsee	Infrastructure
Husain Naasir	Transportation
Faisal Murshid	Electric Facilities
Nabeel Abdul-Karrem	Finance, Passenger, Freight Service
Rifaat Sulaimaan	Finance
Ahmad Aabuura	Administration

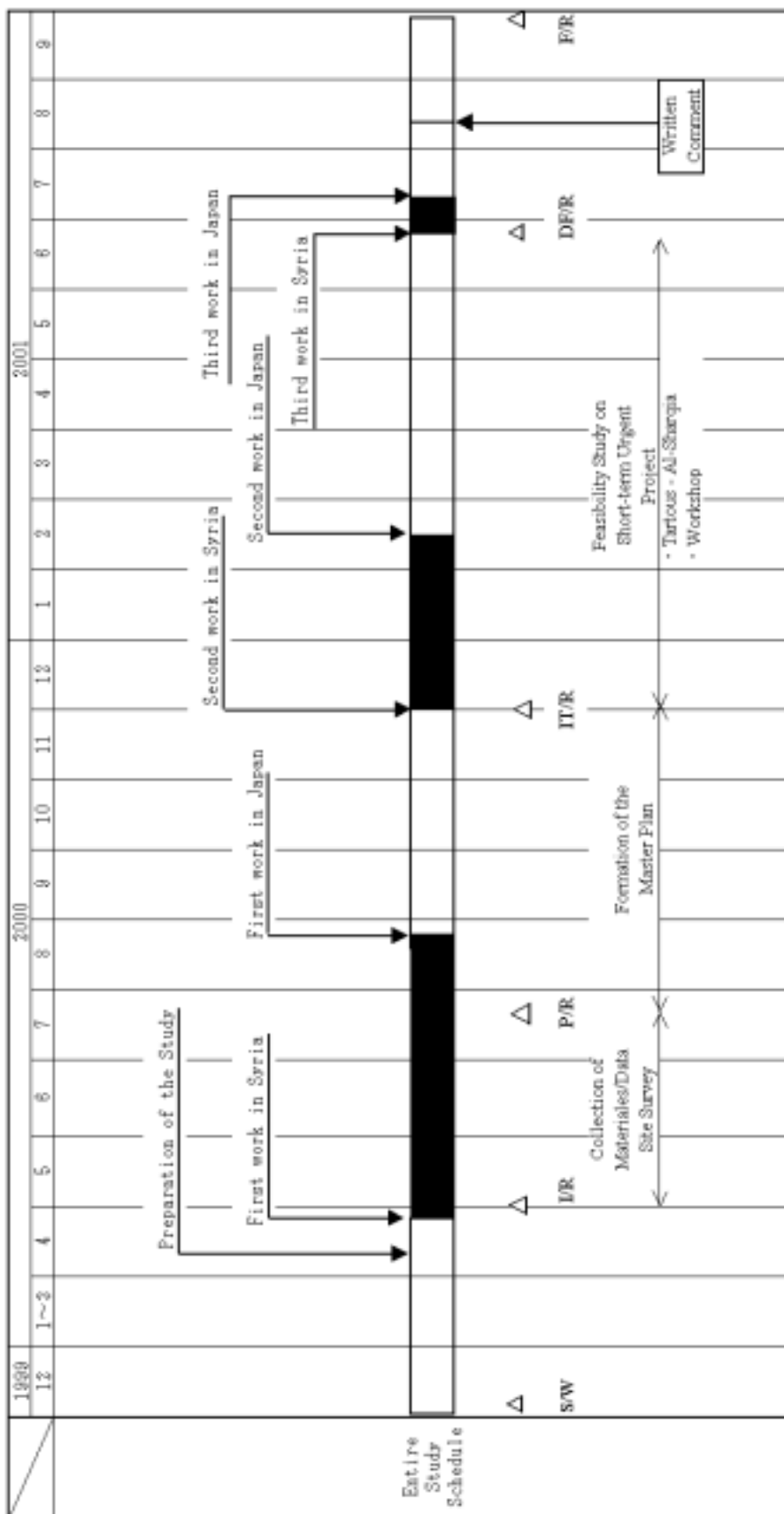


Fig. 1 Work Schedule of the Master plan study on the Development of Syrian Railways in Syrian Arab Republic

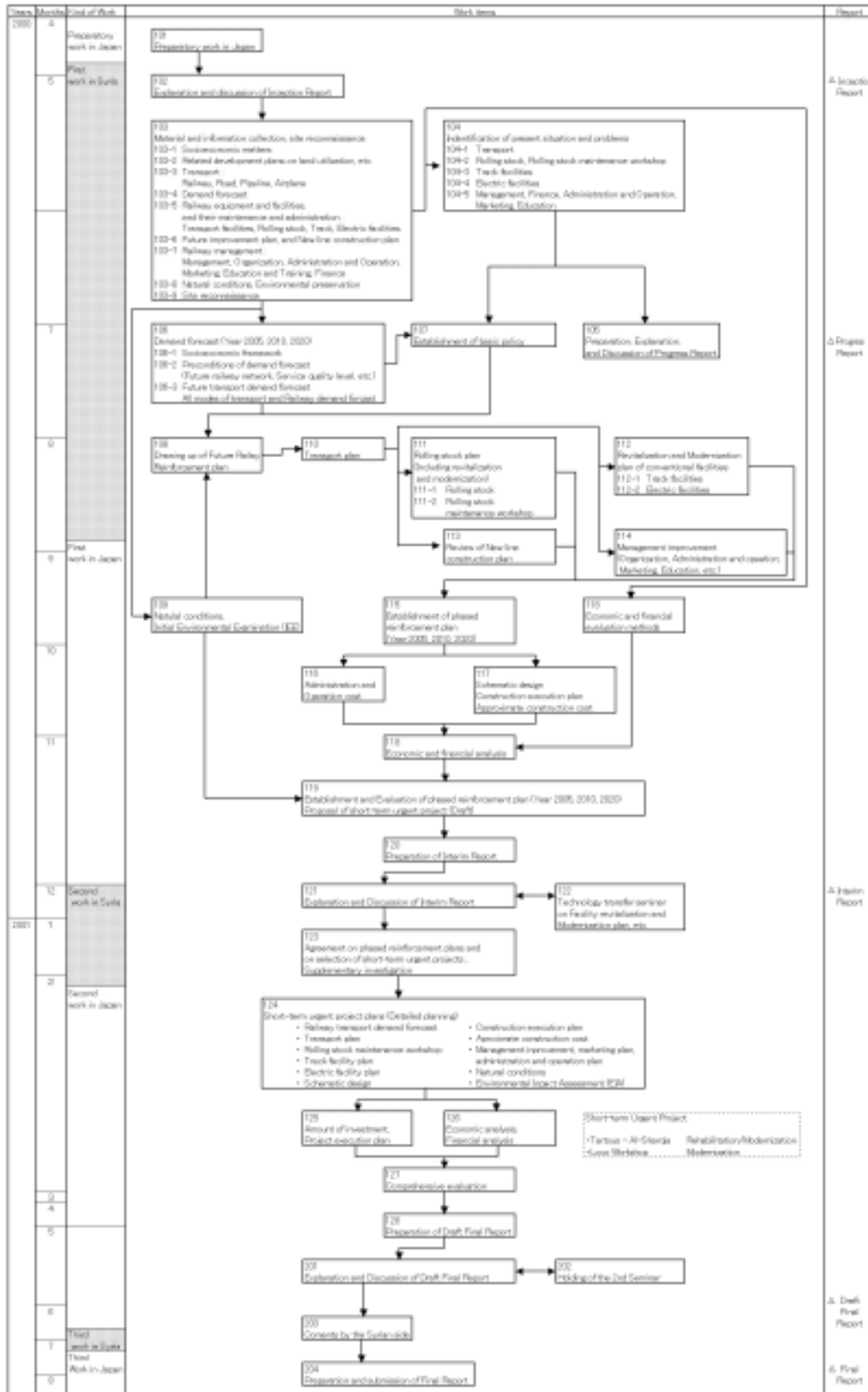


Fig. 2 Overall Framework and Flow of the Master Plan on the Development of Syrian Railways in Syrian Arab Republic