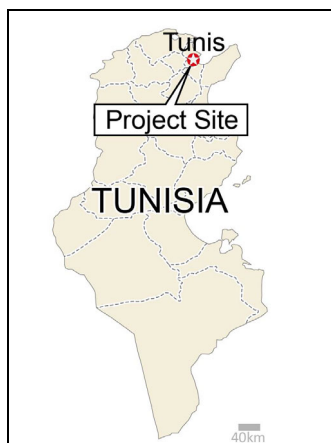


Country Name	Metropolitan Railway Electrification Project (I)(II)
The Republic of Tunisia	



Project Site



Electrified train procured by the Project at Borj Cedria Station

I. Project Outline

Background	<p>One of the objectives of the <i>Ninth National Development Plan (1997-2001)</i> in Tunisia was infrastructure development, focusing on the communication and transportation sectors as a priority. In the transportation sector development plan, the reduction of urban traffic congestion was one of the key areas identified as an investment target, due to rapid urbanization and population growth in the Tunis metropolitan area. The development of the railway network as urban public transportation in this area was regarded as a critical issue, together with restructuring the National Railway Company of Tunisia (Société Nationale des Chemins de Fer Tunisiens: SNCFT, hereinafter referred to as “SNCFT”) and upgrading the main railways of inter-urban areas. The Tunis metropolitan area, which has a population of approximately two million (1999), is the center of the country's economy, society, and public administration. The increasing population led the metropolitan area to expand rapidly, causing rush-hour traffic congestion coupled with serious environmental degradation. There was a need to take immediate countermeasures for these problems.</p>
Objectives of the Project	<p>The objective of the project is to respond to the increasing transportation demand in the southern part of the Tunis metropolitan area, by the electrification of the 23 km railway (Tunis – Borj Cedria), thereby contributing to the reduction of traffic congestion and to the alleviation of air pollution.</p>
Contents of the Project (Actual)	<ol style="list-style-type: none"> (1) Procurement of train cars (80 cars) (2) Electrification of the 23 km railway between Tunis and Borj Cedria (3) Development of related facilities (signal lights, tracks, facilities, and civil engineering) (4) Consulting services <div style="text-align: right;"> <p>Source: SNCFT</p> <p style="text-align: center;">Stations of Southern Suburb Railway Line</p> </div>
Loan Approved Amount/ Disbursed Amount	<p>(I) 13,171 million yen / 12,900 million yen (II) 4,596 million yen / 4,503 million yen</p>
Exchange of Notes Date/ Loan Agreement Signing Date	<p>(I) December 20, 2000 / February 7, 2001 (II) March 10, 2010 / March 11, 2010</p>
Terms and Conditions	<p>(I) Interest Rate: 1.40%; Repayment Period: 25 years (Grace Period: 7 years); Conditions for Procurement: Untied (II) <Main Portion> Interest Rate: 2.2%; Repayment Period: 25 years (Grace Period: 7 years); Conditions for Procurement: General Untied <Consulting Service Portion> Interest Rate: 0.75%; Repayment Period: 40 years (Grace Period: 10 years); Conditions for Procurement: Bilateral Tied</p>
Borrower / Executing Agency	<p>The Government of the Republic of Tunisia / Société Nationale des Chemins de Fer Tunisiens (SNCFT)</p>
Disbursement Completion	<p>(I) September 2011 (II) January 2018</p>

Project Completion	April 2012
Target Area	Tunis Metropolitan Area
Main Contractors	ALSTOM Transport (France) – Ansaldo (Italy)
Main Consultants	Nippon Koei (Japan)-JRC (Japan)-SCET (Tunisia)

II. Result of the Evaluation

Summary

The project responded to the increasing transportation demand in the southern part of the Tunis metropolitan area, thereby contributing to the reduction of traffic congestion and to the alleviation of air pollution. Transportation capacity was strengthened as train operating rate after railway electrification achieved 80% of the target, and annual running distance of train exceeded the target. The introduction of the new vehicles has also had a qualitative effect in terms of improved transport services and safety. Intended impacts were realized since traffic congestion would have been worse in the Tunis metropolitan area without the project; also, the shift of energy from diesel oil to electricity resulted in CO₂ emission reduction and the alleviation of air pollution. Therefore, effectiveness and impacts of the project are high. However, transportation capacity has been on a relative downward trend since 2017 because some trains have been out of service due to recent train collisions and the number of operating trains cannot be increased due to track deterioration. Efficiency is fair because the project period significantly surpassed the original schedule. The project is sustainable from policy, institutional, and basic technical perspectives. However, at the time of the ex-post evaluation, there are some concerns on perspective on financial aspect since sufficient budget is required to allocate to fix damaged vehicles and replace obsolete railway tracks in order to maximize the use of the train system and then to improve the transportation volume. In addition to avoiding train collision accident, further assured safety measures need to be taken continuously. As a result, sustainability of the project is evaluated to be fair. Considering all of the above points, this project is evaluated to be satisfactory.

Overall Evaluation¹	B	Relevance	③ ²	Effectiveness & Impacts	③	Efficiency	②	Sustainability	②
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<Special Perspectives Considered in the Ex-Post Evaluation>

- In this project, an additional loan was provided because the prices of materials such as steel increased worldwide around 2007. In evaluating efficiency in terms of costs, the actual cost was evaluated in comparison to the total project cost at the time of the provision of the additional loan. The project period was analyzed in comparison to the original schedule at the time of the first project appraisal since there were already significant delays in the detailed design survey before the additional loan.
- At the time of the ex-post evaluation, the project cost had not yet been paid in full to the contractor by the Tunisian side. The unpaid amount did not seem to affect the evaluation rating; therefore, the project cost was evaluated based on the total cost as of February 2020.
- Commencement of railway operations was April 2012, whereas the ODA loan disbursement completion was January 2018. The payment was delayed due to a dispute over the payment amount and specifications of the work between SNCFT and the contractors.

1 Relevance (Rating: ③ High)

<Consistency with the Development Plan of Tunisia at the Time of Ex-Ante Evaluation>

The project is consistent with the development policy at the time of the ex-ante evaluation. In the *Ninth Five-Year National Development Plan (1997-2001)* transportation infrastructure development was stated as one of the key areas of focus; the suburban line in the southern part of the Tunis metropolitan area, included in this project, was prioritized as part of the railway sector development. In the *Tenth Five-Year Plan (2002-2006)* and *Eleventh Five-Year Plan (2007-2011)*, railway development in the Tunis metropolitan area continued to be a high priority as part of public transportation network development, which included buses and other means of transportation. In 2005, the government consolidated a policy for developing an express railway network that connected the center of Tunis and the suburban areas, and this project was recognized as one of the important projects in the initial stages of the development.

<Consistency with the Development Needs of Tunisia at the Time of Ex-Ante Evaluation>

The project is consistent with the development needs at the time of the ex-ante evaluation. The population of the Tunis metropolitan area is approximately 2.39 million (as of 2008), with a population growth rate of 1.5% per year. It is the center of the economy, society, and public administration in Tunisia. Due to geographical constraints, the increasing population led the metropolitan area to expand rapidly to the north and south, causing serious rush-hour traffic congestion problems and environmental aggravation. The number of private automobiles per 1,000 people rose from 60 in 1994 to 100 in 2002 due to a relaxation of the automobile import regulations, etc., at that time. Moreover, the traffic volume was predicted to rise by 2.6% per year by 2021, thereby exacerbating the problems even further.

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

The project is consistent with the Japan's ODA policy. Under the Japan's ODA policy for Tunisia and the priority areas for JICA assistance, the project is in line with the "level up assistance of industries" and "assistance to activities with environmental consideration." The project is to promote a part of economic infrastructure development in the transportation sector as a level-up of the industry, and to assist the improvement of the environment through the control of air pollution.

<Evaluation Result>

In light of the above, the relevance of the project is high.

¹ A:Highly satisfactory, B:Satisfactory, C:Partially satisfactory, D:Unsatisfactory

² ③: High, ②: Fair, ①: Low

<Effectiveness>

The project achieved the objective of responding to increasing transportation demand in the southern Tunis metropolitan area.

[Operation of Electrified Railway]

As for the operation indicators, operating rate of the vehicles and running distance of trains were mostly achieved the target figures; however, the number of the operations was below the target figure (Table 1). The operating rate of the vehicles has consistently been more than 80% of the target figure of 95.9% (76.7%) for every year except for 2018 and 2019, when the figure slightly decreased to 74.9% and 75.8%. The running distance of train/year exceeded the target of 1,313,000 km between 2013 to 2019, which means that the trains were being fully operated. The number of operations per day (Table 1) increased to 142 in 2012 and 122 in 2013, in comparison to 112 in 2007, before the project; however, it did not achieve 80% of the target figure of 160 (128), except for the completion year in 2012. The reason of reduction of the number of the operations after 2013 was mainly because SNCFT reduced the number of trains, such as by stopping the operation of express trains, and instead, increased transportation volume per train by increasing the number of vehicles from four to eight per train, especially during the peak hours.

[Effectiveness of Electrified Railway: Response to Increasing Transportation Demand]

As the project purpose is to respond to increasing transportation volume, The number of passengers and the volume of transportation (passengers-km) before and after the implementation of the project were examined, and then the effect of the project, i.e., reduction of the running time, was verified. As a result, the number of passengers and the volume of transportation were increased; however, the running time was not reduced to the target figure.

Examining the number of passengers and the volume of transportation (passenger-km) in Table 2, these figures were increased each year from project completion to 2017. These indicators had a sudden decrease in 2011 in comparison to those in 2010, just before the start of the project, which is caused by the Jasmine Revolution that resulted in a change of government, nationwide anti-government demonstrations and political instability in the country. According to SNCFT, after the revolution, the number of free riders of the train increased for a while, but those people were not counted as passengers; therefore, the actual number at that time should have been more. Operations of the new trains commenced in 2012, just after the revolution, thus the number of passengers around that time may not have accurately reflected the actual number. The number of passengers increased again after 2014, when control of fare payment became more severe by SNCFT staff patrol.

In terms of responding to increasing transportation demand, effectiveness of the project is observed especially during the rush hour. Since data of rash ratio was not available, it was not possible to show a direct quantitative effect of the project; however,, station managers at Hammam-Lif and Borj Cedria who confirmed in the interview that a remarkable effect of the project was the enhancement of transportation volume during rush hours in the morning (07:00-08:00) and in the evening (18:00-20:00).

They also highlighted the reduction of travel time to Tunis station as a direct effect of the project. The time required to commute between Tunis and Borj Cedria stations was 46 minutes by local train and 32 minutes by express train in 2007. This was reduced to 35 minutes by local train and 25 minutes by express train in 2012 at the time of commencement of operations of the project. Compared to the time taken in 2007, the running time was reduced until 2015; however, the target running time for two years after the completion of the project was not achieved, and the actual running time has tended to increase since 2013. (Table 2). According to SNCFT, the reason for the gradual increase was the limit of speed due to the obsolete railway tracks.

For further improvement of operating rate and transportation volume, the measures to be taken are the replacement of obsolete railway track and the recovery of unusable vehicles by collision accidents in recent years. These issues limit the number of trains per day. In addition, the influence of damaged vehicles caused a relatively decreasing trend of running distance, operating rate, and transportation volume.

[Effectiveness of Electrified Railway: Improvement of Safety and Service]

In terms of qualitative effects, based on field observations and comments by SNCFT staff, improved signaling system and the introduction of new vehicles with strengthened structure and greater comfort enhanced the safety and service for passengers. The train also became more punctual along with timetable after the commencement of the project, which allowed passengers to save travel time. In addition, low-income household groups benefited from the project, because those living along the railway line were able to utilize the train whose fares were cheap without any increase in price for the past 10 years.



Inside the train procured by the project

<Impact>

Contribution of the project was confirmed in improvement of air pollution, alleviation of traffic congestion, and regional development.

[Improvement of Air pollution]

The energy shift from diesel fuel to electricity contributed to the intended impacts by improving air pollution through the reduction of particle matters and other gases. According to the data of SNCFT, in 2011, 2,552 TEP (Ton Equivalent to Petro) of diesel oil was consumed; after the commencement of the project, between 2012 to 2019, energy consumption was reduced to about 1,100-1,900 TEP per year. During this period, running distance of the train in 2011 was 864,000 km and the same indicator has been increased since 2012 (Table 1). This shows that the project contributed to the reduction of energy consumption and CO₂ emissions through energy shifting from diesel oil to electricity, reducing the consumption volume of fossil fuel.

[Reduction of Traffic Congestion and Regional Development]

According to the comments from SNCFT and the Ministry of Transport, the project contributed to the alleviation of traffic congestion and to an improvement in the environment; the situation would have been much worse without the project. In addition, it has also had an impact on regional development in the target area. The population in the Tunis metropolitan area increased from 2.38 million in 2008 to 2.64 million in 2014, an increase of about 11 percent. Interviews with station managers at Hammam Lif and Borj Cedria stations confirmed that there was a positive impact in residential area expansion and in the development of some small commercial activities such as coffee shops around these stations, which were not observed before the project. The surrounding area of the Borj Cedria station, which is owned by SNCFT, was converted to a parking lot, and they earned its revenue. Some people drive their car to the station to take a train, using the small coffee shops in the surrounding area. Impact on regional development may include other factors than the railway; however, based on the opinions above, the project may have partly contributed to the regional development.



Shops (above)
Parking area (below) around Borj Cedria Station

<Other Positive / Negative Impacts>

Based on information from the SNCFT monitoring, there were no negative impacts on the natural environment during the project implementation and after commencement of the operation. Regarding the social environment, there was no resettlement required by the project; private land acquisition was necessary; however, this was implemented smoothly since the land was not in use for any other purpose.

<Evaluation Result>

This project has mostly achieved its objectives and brought about intended impacts. Therefore, the effectiveness/impacts of the project are high.

<Quantitative Effect>

Table 1: Operation Indicators

Indicator		Baseline		Target	Actual							
		1999 Project appraisal	2007	2012 2 years after completion	2012 Completion year	2013 1 year after completion	Target 2014 2 years after completion	2015 3 years after completion	2016 4 years after completion	2017 5 years after completion	2018 6 years after completion	2019 7 years after completion
Operating Rate (% / year)	Haulage train	61.2	78	95.9	80	81.5	85.5	84.3	79.8	78.2	74.9	75.8
	Passenger car	84.4	81	95.9	80	81.5	85.5	84.3	79.8	78.2	74.9	75.8
Running Distance of train / year (1,000 km)		995	985	1,313	1,250	1,569	1,801	1,813	1,851	1,763	1,680	1,548
Number of operations (number of trains / day)		118	112	160	142	122	116	109	110	111	105	100

Sources: JICA and SNCFT document

Table 2: Effect Indicators

Indicator		Baseline		Target	Actual							
		1999 Appraisal (Phase1)	2007	2012 (2 years after completion)	2012 Completion year	2013 1 year after completion	Target 2014 2 years after completion	2015 3 years after completion	2016 4 years after completion	2017 5 years after completion	2018 6 years after completion	2019 7 years after completion
Number of passengers (thousand)		n.a.	25,902 (2010) 20,702 (2011)	n.a.	23,410	23,740	24,417	24,216	26,645	26,648	25,870	24,142
Volume of Transportation (1,000 passenger-km)		n.a.	352,258 (2010) 280,858 (2011)	n.a.	320,332	325,901	334,988	332,989	366,832	366,087	355,488	331,984
Running time necessary for the whole section (23 km) (min)												
Local		48	46	35	38	41	42	44	48	49	48	50
Express		32	32	25	29	-	-	-	-	-	-	-
Semi-express train		-	37	30	33	n.a.	32	34	38	39	39	-

Sources: JICA and SNCFT document

Note: Express train has not been operated since 2013 due to the change of the number of vehicles per train, responding to rush-hour demand. Semi-express train has not been operated since 2019.

3 Efficiency (Rating: ② Fair)

The output of the project was mostly as planned. Although there was a cancellation of some equipment and others; however, it did not affect the effectiveness.

The actual total project cost was 18,606 million yen, which was within the planned total cost of 21,825 million yen at the time of Phase 2 (85% of the planned project cost). The project period was 135 months, which significantly exceeded the first plan of 58 months (232% of the plan). The main delay occurred in the period of detailed design during the first loan and construction period. This was due to a difference in interpretation of the work in the contract between SNCFT and the consultant, and between SNCFT and the contractor, which required some time to reach an agreement and thus delayed in detailed design and construction work.

<Reference: Results of Calculations for Internal Rates of Return >

The results of the recalculation of the Financial Internal Rate of Return (FIRR) and Economic Internal Rate of Return (EIRR) at the time of the ex-post evaluation are as shown in the table below. FIRR and EIRR at time of ex-post evaluation are smaller than the calculation results at the time of Phase 2. The reason for this is that there was a delay in the completion of the project and the start of operation and the assumption that the fare will be raised was already in IRR at the planning stage, but it was not actually raised.

FIRR	9.1% (Phase 1)	3.3% (Phase 2)	1.1 % (Ex-post evaluation)
Calculation Items and Conditions			
Cost	Project cost, Operation and maintenance cost		
Benefit	Revenue, Subsidies		
Project Life	20 years from the commencement of operation (Phase 1 & 2) 30 years from L/A signing (Ex-post evaluation) = this period is the same as 20 years from commencement of operation.		

EIRR	25.3% (Phase 1)	32.7% (Phase 2)	30.6 % (Ex-post evaluation)
Calculation Items and Conditions			
Cost	Project cost, Operation and maintenance cost (excluding tax)		
Benefit	Travel time saving, Reduction of congestion on existing roads, Saving of vehicle operating cost, Reduction of road accidents, Saving O&M cost, Saving diesel vehicle investment cost without project, Reduction of air pollution, Reduction of noise		
Project Life	20 years from the commencement of operation (Phase 1 & 2) 30 years from L/A signing (Ex-post evaluation)		

Source: Calculation Results at Phase 1 and Phase 2 are from JICA Documents

<Evaluation Result>

Although the project cost was within the plan, the project period exceeded the plan. Therefore, efficiency of the project is fair.

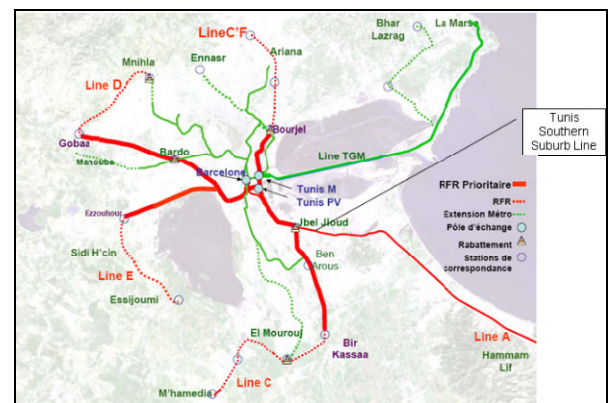
4 Sustainability (Rating: ② Fair)

<Policy Aspect>

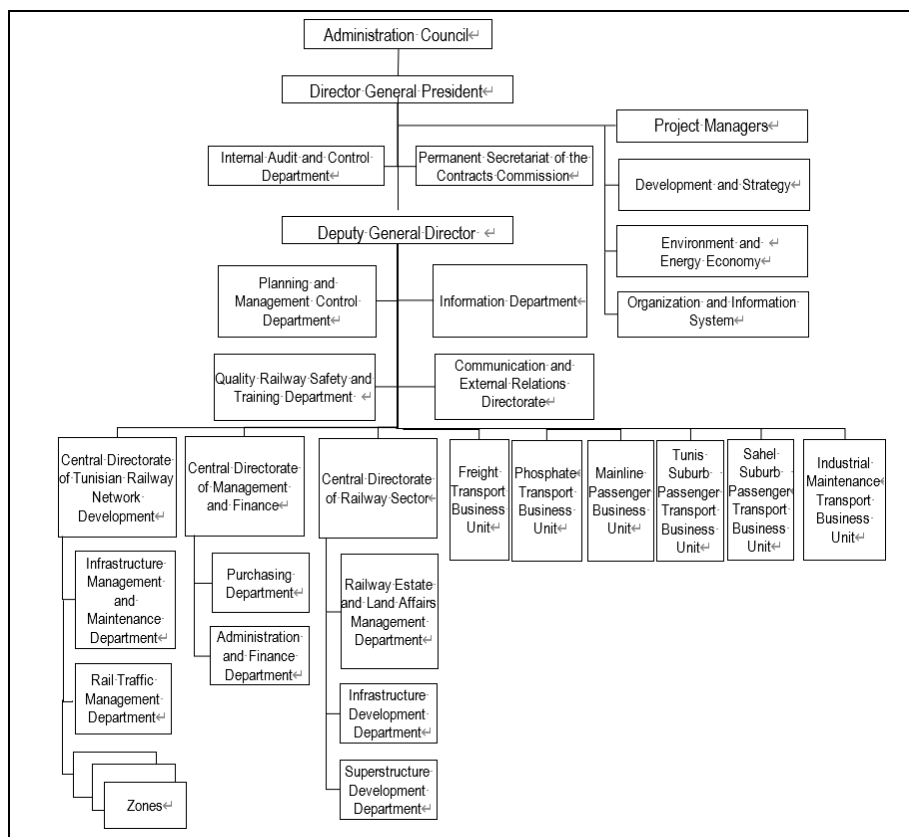
The project is sustainable from a policy perspective. In *Study on National Transportation Master Plan toward the Horizon 2040* and *Transportation sector plan 2016 to 2020*, the SNCFT railway plan 2016-2020, include a plan to extend the Tunis southern suburb line to Soliman (+8 km). The plan 2016-2020 has been delayed and will be postponed to the next five-year plan (2020-2025), which was under preparation as of February 2020. In addition, this line will eventually become part of "Line A" of the five lines (A, C, D, E and F) of the rapid rail network (RER) (refer to the map of the rapid railway network). The Tunis southern suburb line has been prioritized in the operations of all railway networks of SNCFT.

<Institutional Aspect>

There was no problem in terms of institutional aspect of operation and maintenance (hereinafter referred to as "O&M") of railway developed by the project. At the end of 2018, the total number of SNCFT staff was approximately 4,600, of which 509 were management staff and 1,889 were technical experts. This figure had not changed much from about 4,500 at the end of 2011, before the commencement of the electrified trains as part of the project. The SNCFT organization structure as of February 2020 is shown in the chart below. The Tunis Division of the Northeast Zone office, which was under the Central Directorate of the Tunisian Railway Network Development, was in charge of the O&M of the electrified railway facilities, including signaling. However, the Tunis Suburb Passengers Transportation Business Unit (hereinafter referred to as "UABT," located near Erriadh station at the end of the suburb line, was in charge of the O&M of the vehicles procured in this project.



Railway Map of Rapid Rail Network



Source: Translation of SNCFT Document

Figure 1: SNCFT Organization Chart

As of February 2020, there were a total of 40 staff in charge of O&M for the electrified train system. The number of personnel in each facility is shown in Table 3. UABT consisted of three divisions: the management and control division, the production division and the commercial division. There were 18 managers, 88 technical experts and an additional 185 technicians and other workers. Representatives in these departments/units were interviewed, and there were no discrepancies found in the number of staff or their assignments.

Table 3: Number of personnel in charge of each facility by Profession

Facility	Engineer	Superior Technicians	Technicians	Other workers
Signaling	1	2	10	5
Railway	-	-	7	9
Catenary, substation, posts	1	3	1	1

Source: SNCFT

<Technical Aspect>

It is considered that most of the technical knowledge about the operation of the electrified railway section and the maintenance of equipment procured in this project is generally acquired; however, there are some issues in the reliable implementation of safe driving. The O&M personnel employed as managers and technical experts (superior technicians) all received a university or technical college education. At the time of project appraisal, it was suggested that staff receive adequate training from experts because this is the first case of high-density operations for SNCFT. O&M personnel in charge of vehicles and signaling system confirmed in interviews that they had received sufficient training from suppliers through the project and that they had adequate technical capacity. Station managers who were interviewed also confirmed that there were no technical issues or challenges identified.

In addition to training and manuals provided by the suppliers, SNCFT had its own training system in place including introductory courses in each area of expertise. At the time of the ex-post evaluation, the 2019-2021 training plan was in place, and a full range of training was systematically provided, including signaling and telecommunications, electric lines, railways, mechanical knowledge for vehicle maintenance, etc.

However, between 2015 and 2018, there was one collision accident per year. SNCFT has identified that the cause of the accident was that the train drivers did not respect the driving rules, and SNCFT took countermeasures by providing training on safety measures after the accidents. In this regard, it is necessary to continuously focus further on taking safety measures.

<Financial Aspect>

SNCFT faces challenging issues in financial aspect. The table below highlights SNCFT's main financial results. Net loss has been



Operation Control Room with equipment procured by the Project

increasing for the last five years. This was mainly due to the fact that fares had been set at very low prices and had not been raised in the past 10 years or more, alongside a sudden increase of free riders for some time, which led to a decline in revenue.. Furthermore, a sharp decrease in freight transportation revenue after the Jasmine Revolution in Tunisia seriously affected the SNCFT financial statement. As for the Tunis southern suburb line, necessary daily O&M costs for the facilities have been allocated to date. According to SNCFT, financial difficulty has prevented the repair of the damaged vehicle in the project's section and replacement of obsolete railway tracks in a timely manner, which has resulted in speed restrictions on trains and therefore has limited the number of operations and transportation volume per day.

Table 4: SNCFT Main Financial Result

Items	2014	2015	2016	2017	2018
Operating Income	162,599,306	153,626,643	165,780,149	164,119,580	157,822,605
Operating Expenditure	209,811,159	213,372,050	223,589,712	228,523,267	226,228,644
Operating Result	△47,211,853	△59,745,407	△57,809,563	△64,403,687	△68,406,039
Net Loss (After Tax)	△58,765,710	△70,266,742	△73,232,421	△81,281,747	△91,069,322

Unit: Tunisian Dinar

Source: SNCFT financial statements

<Current Status of Operation and Maintenance>

At the time of the ex-post evaluation, 16 vehicles needed to be fixed because of the collision accidents. It was also necessary to upgrade and replace the obsolete railway tracks. SNCFT is gradually working on them; however, because of budget constraints, it is not possible to replace them all.

The trains are periodically maintained according to the manufacturer's recommendations with different frequencies and contents: 1) Weekly visit; 2) Limited visit; 3) General visit; 4) Whole general visit.

From the field visits and interviews with station managers and SNCFT head office, and there were no problems identified for project facilities including signaling system, electric line and posts, substations, etc.

Necessary spare parts were available although it took time to communicate with suppliers.

<Evaluation Result>

The project is sustainable in policy, institutional and technical aspects. With regards to the financial aspect, a basic O&M budget was allocated; however, it was not sufficient to fix damaged vehicles and replace the obsolete railway tracks, which constrained full train operation and finance. Therefore, the sustainability of the project effect is fair.

III. Recommendations & Lessons Learned

Recommendations to Executing Agency:

Countermeasures for better Operation and Maintenance

Due to obsolete railway tracks, the speed of the trains was limited. Also, the damage to the 4 vehicles by recent accidents restricted the number of operations and transportation volume per day. During the next five- year plan (by 2025), in order to maximize the use of trains and the electrification system, a recommendation would be to continue the efforts to further improve the operation and to implement necessary investment on upgrading the railway track, recovering damaged vehicles, and implementing safety measures continuously. In order to secure the budget to realize further improvements, an increase in train fare should be considered to increase revenues, while also taking into account low-income passengers. At the same time, in order to ensure the passengers' safety, it is critical to continue the efforts to prevent accidents by thoroughly implementing countermeasures based on analyzing the causes for the collisions in recent years.

Recommendation to JICA:

None

Lessons Learned:

Necessary Study Items for Middle-income Countries during Project Formation Period

Due to a difference in understanding and interpretation of work content between the executing agency and the consultant/contractor, disputes arose between them, and the project period was significantly extended. In general, in middle-income countries that are influenced by European technical standards, the requirements of the quality of engineering services tend to be high and strict. The consultant/contractor assumes a high risk in the contract when working in a country that implements severe penalties once failing to meet the executing agency's requirements. Based on the experience of this project, in order to avoid significant delays, it would be better to consider the following issues during the project formation period:

➤ Clarification of Work Specifications and Quality of Experts

At the time of the project formation study, when preparing the consultant's draft terms of reference for project implementation, it is necessary to carefully discuss details with the executing agency in the local context of the target country. The results of the discussion need to be clarified in terms of study items and required professional qualifications. For example, in this project case, issues that should have been noted include technical matters in the electrification of the train system and geographical conditions, etc.

➤ Importance of Contract Management

Based on legal issues and the customs of the target country, it is necessary to be cautious and to pay particular attention to the wording and interpretation of the contract with the consultant and contractor. This is especially true in countries where the official

language is not English, because the risk of miscommunication is high. It is better to have a clear understanding of the contract risk early on from the time of project formation and to prepare in advance the points to be noted and have countermeasures in place when procuring consultants and contractors for project implementation. From the time of the project formation study, it is important for the development assistance agency to identify the risks during the project implementation and to prepare countermeasures with the participation of a contract management expert, who is familiar with the legal system and practices of the target country, as part of the study team.



Carthage Bridge constructed by the project,
a view from Tunis Station



Haman Lif Station in target railway in the project