



Office of the State Comptroller
Annual Report 71A | 2020

Israel Railway Ltd.

**Execution of the
Railway Lines
Electrification Project
and Opening of the
Express Line to
Jerusalem
Follow-up Audit**

Abstract

Execution of the Railway Lines Electrification Project and Opening of the Express Line to Jerusalem – Follow-up Audit

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Background

Israel Railways company's primary activity is to provide passenger train transportation on regular service lines. Since 2000, Israel Railways company has been taking action to replace its diesel-powered trains with electric trains (hereinafter – the electrification project). Electrifying the railways should shorten travel time, increase the number of trains that may be operated in the network, improve compliance with train schedules, reduce the number of train malfunctions, save on energy costs, reduce the noise at the stations and reduce the level of air pollution. The first electrified line in Israel is the express line from Herzliya to Jerusalem, which is currently running from the Savidor Central Station in Tel-Aviv to Jerusalem.

Key figures

69 million

number of train passengers travels on all lines in 2019

3.1 million

number of express train passengers travels to Jerusalem from the end of September 2018 until year-end 2019

13.3%

percentage of electrified railway tracks route on the audit date (May 2020) out of the planned route (about 64 km out of about 480 km)

2025

forecasted completion date of the electrification project. In 2013, the forecasted project completion date was defined as 2019

ILS12.1 billion

estimated cost of the electrification project in October 2019

31%

cumulative budget utilization ratio at year-end 2019 out of the project's estimated cost (ILS 3.7 billion out of ILS 12.1 billion)


54%

average percentage of kilometers of electrified tracks in the 28 EU countries in 2017. Israel had no electrified tracks in 2017.

2.6%

average ratio of cancellations of the express train travels to Jerusalem between October 2018 and December 2019, compared to 0.5% for the other lines





Audit actions

 From November 2018 to May 2020, alternately, the Office of the State Comptroller audited the rectification of deficiencies in Israel Railways company's management of the electrification project that were raised in its previous reports of 2014 and 2017 (hereinafter – the follow-up audit). Aspects of the processes for opening the express line to Jerusalem were also examined, including a follow-up on rectification of deficiencies in this regard from previous reports. The audit was conducted in Israel Railways company, in the Ministry of Transportation and Road Safety and in the Ministry of Finance. Supplementary audits were conducted in the Israel Police, in the National Fire and Rescue Authority and in Magen David Adom.

Key findings




The electrification project





-  **Completion of the electrification project** – the previous reports found delays in the completion of the electrification project. The follow-up audit found that the delays are continuing. In 2017, Israel Railways company had assessed that the project would be completed in December 2021 but, in May 2019, postponed the project completion date to the end of 2029. In March 2020, Israel Railways company updated the project completion date to the end of 2025.
-  **Cumulative budget utilization** – the cumulative utilization ratio out of the estimated project cost was only about 31% at the end of 2019 (cumulative budget utilization of about ILS 3.7 billion out of the estimated project cost of about ILS 12.1 billion), and the length of electrified tracks route on the audit date (May 2020) out of the planned length was only about 13.3% (about 64 km out of about 480 km).
-  **Approval of work procedures in an electrical environment** – in the previous audit, the Office of the State Comptroller had recommended that the Israel Railways company should review its work procedures and their compatibility with the electrification process. The follow-up audit found that Israel Railways company's CEO at that time had approved the procedures for working in an electrical environment only on the launch date of the operation of the express line in September 2018, even though – according to minutes of Israel Railways company's board meetings – training and train trips were conducted while work was underway on site, action that, according the company's CEO at that time, constitute grave safety violations.
-  **Losses to the economy as a result of delays in the completion of the electrification project** – during previous audits, the Office of the State Comptroller had pointed out that postponement of the operation of the electrification project entails a loss




to the economy of hundreds of millions of shekels per annum. The follow-up audit found additional postponements in the project completion date and therefore, the Office of the State Comptroller is reiterating its comment in its previous report that, as a result of the postponement of the completion of the electrification project, damages reaching hundreds of millions of shekels are being caused to the economy in each year of project postponement.

-  **Losses to Israel Railways company due to delays in completing the electrification project** – the delays in completing the electrification project are compelling Israel Railways company to operate and maintain old diesel-powered engines and cars, to purchase additional diesel-powered equipment, and might cause a delay the receipt of the new electrical equipment that it already purchased at high cost.

Operation of the Herzliya-Jerusalem express train line

-  **Mobile operation equipment** – when the Jerusalem express line was opened in September 2018, Israel Railways company did not have mobile equipment for operating it; therefore, it was compelled to operate the line using cars diverted from other train lines. This caused a reduction in their frequency and increased the congestion on the other train lines.
-  **Appropriate expression of the economic repercussions** – when the decision was made to divert the mobile equipment from other lines when the new line was opened, appropriate expression was not given to all the economic repercussions of the decision.
-  **Line operation with passengers without proper proof of reliability** – in its previous report, the Office of the State Comptroller pointed out the need to perform a thorough and exhaustive test-run process to map malfunctions. The follow-up audit found that the Jerusalem express train was operated in a test-run format, with passengers, without any proper proof of reliability, and that, during the test-run period, which continued for about a year, higher ratios of train cancellations were recorded than the average on the other lines (for example: the average train cancellation ratio on the Jerusalem express line between October 2018 and December 2019 was about 2.6% compared to about 0.5% on the other lines).
-  **Emergency situations in tunnels and on bridges** - Delay in purchasing dual-purpose vehicles for transporting emergency forces – at the time of the audit, about three and a half years after the initial examination of the possibility of using dual-purpose vehicles, and about a year and a half since the decision was made to budget the purchase of these vehicles, their purchase has not yet been completed. The budget for the purchase of trains for Magen David Adom has not yet been transferred, the Israel Police has not yet published a tender for purchasing the vehicles, and only the National Fire and Rescue Authority has showed progress in the purchasing process. However, as a result of the coronavirus crisis, at the time of the audit, the supply date of the vehicles to the National Fire and Rescue Authority is undetermined.

 **Emergency situations in tunnels and on bridges** – transporting emergency forces via a stand-by train is not optimal – it may prolong the duration of the evacuation and result in the loss of lives. The audit found that an additional full drill was not performed for the purpose of rectifying deficiencies found during the previous drills transporting emergency forces and evacuating casualties via the train; a shortage equipment necessary to Magen David Adom at the Navon Station was found; difficulties can be expected when evacuating casualties from the station's lower level to the entry level; and telecom links between Magen David Adom and the other emergency forces have not been arranged.



The electrification project

Appointment of a director of the Electrification Administration on behalf of Israel Railways company and an increase in the project's output – in September 2019, Israel Railways company appointed a manager on its behalf to the role of manager of the Electrification Administration to coordinate all of its activities, including the work on completing the express line. The changes in the project's management led to an increase in the project's output as of the second half of 2019.

Appointment of a safety officer and preparation of a safety program – the Office of the State Comptroller alerted in a previous report about the possibility of diminished work safety during the electrification project. The follow-up audit found that in September 2019 Israel Railways company had appointed a safety officer in its development division and that it took action to prepare a work safety plan with company A.

Project acceleration actions – Israel Railways company signed an agreement with company A for the purpose of accelerating the project, and the planned project completion date has been brought forward by four years (from 2029 to 2025).






Operation of the Herzliya-Jerusalem express train line

Drawing of conclusions – Israel Railways company performed a process for drawing conclusions with regard to the opening of the Jerusalem express line, including on the subject of tests and test-runs of the line.










Emergency situations in tunnels and on bridges – transporting emergency forces using specialized vehicles (Zibar) – Israel Railways company and the National Fire and Safety Authority have provided specialized vehicles to transport first-responder rescue forces of Israel Railways and the Fire and Safety Authority to the site of the incident.



Key recommendations

-  It is recommended that Israel Railways company should continue analyzing and implementing ways to advance and accelerate the electrification project in conformance with the timetables, budgets and requisite standards. The Ministry of Transportation and the Ministry of Finance should increase their supervision and control over Israel Railways in order to prevent additional delays in the timetables.
-  It is recommended that, when setting the electrification dates and prioritizing the operation dates of the various lines in the project, the Ministry of Transportation should also consider the benefits to the economy of the alternatives for advancing electrification of the lines in the project. It is advisable that Israel Railways company should analyze the economic repercussions to the company when electrifying each of the lines, for the purpose of prioritizing the electrification of the various lines in particular, and the service to passengers in general.
-  It is recommended that Israel Railways company and the Ministry of Transportation should set criteria for optimal allocations of the mobile equipment to lines to be opened, considering the demands for the various lines, the operating and economic implications and a possible adverse impact on the quality of the service deriving from shifting the equipment between the various lines.
-  It is recommended that Israel Railways company and the Ministry of Transportation should prescribe clear and transparent criteria for ensuring proper service reliability prior to opening future passenger train lines on test-runs and not on test-runs, including when changing a diesel-powered line to an electricity-powered line.
-  Israel Railways company, the Ministry of Transportation, the National Fire and Rescue Authority and Magen David Adom should take action to improve emergency forces' ability to respond rapidly to emergency incidents along the route of the express line at bridges, in tunnels and at the Navon Station in Jerusalem.



Follow up on the execution of the electrification project and the opening of the Herzliya-Jerusalem express line						
Audit item	Audited body	The deficiency / the recommendation in the audit report	Extent of rectification of the deficiency found in the follow-up audit			
			Not rectified	Somewhat rectified	Considerably rectified	Fully rectified
The electrification project						
Delays in completing the construction of the electrification infrastructure above the tracks and in Israel Railways' facilities	Israel Railways company	Prolongation of the tender could cause project delays				
Economic and operating repercussions of delays in completing the electrification project	Israel Railways company	Postponing the project operation by five years entails a loss of hundreds of millions of shekels per annum				
	Ministry of Transportation	Performing an updated economic cost benefit analysis when material changes occur in the project's contents and costs				
Towing of electric trains to a garage for maintenance	Israel Railways company	One garage was adapted to repair electric engines				
Mapping of additional infrastructures	Israel Railways company	The company has no precise data about the infrastructures located adjacent to tracks designated to be electrified				
Appointment of a manager to manage the project	Israel Railways company	A foreign manager and an Israeli manager headed the Electrification Administration, and the spheres of responsibility and divisions of tasks between them were not clearly defined				
Work safety during the Electrification Project	Israel Railways company	Israel Railways' ambition to launch the Tel-Aviv-Jerusalem express line in March 2018 is liable to adversely affect safety				
		As part of Israel Railways' preparations for the electrification project, all of Israel Railways' existing procedures should be analyzed and adapted for electrification				
The Herzliya-Jerusalem express line						
Lack of quality-of-service criteria for initiating a test-run of the line with passengers	Israel Railways company	A thorough and exhaustive test-run process to map malfunctions should be performed				
Shortage of telecom links at Magen David Adom for communicating with other emergency forces	Ministries of Health and Finance	Magen David Adom is not connected to the telecom systems of the other emergency forces				



Summary

The electrification of the national railway track network is Israel Railways company's largest and one of its most important projects in recent years. The previous audit found deficiencies in the management of the project, which caused numerous delays in its completion. The follow-up audit conducted by the Office of the State Comptroller found that the project's completion date has been postponed several times, and the updated forecasted completion date is at the end of 2025. Towards the end of the audit, Israel Railways and the Ministries of Transportation and Finance took action to accelerate the project and to advance its completion date by four years – from 2029 to 2025. The Office of the State Comptroller recommends that these bodies should analyze the economic implications, including the benefits to the economy, when prioritizing the electrification of the various lines. Israel Railways company, the Ministry of Transportation and the emergency forces (the National Fire and Rescue Authority, Magen David Adom and the Israel Police) should draw conclusions from the deficiencies discovered during the preparations for emergency events when operating the Jerusalem express line, because if they are not rectified, they might result in loss of life due to the duration of evacuations during an emergency on the express line and on other lines.