



Report of the State Comptroller of Israel |
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Ministry of Transportation and Road
Safety

The Progress of the Light Rail Project in the Tel Aviv Metropolitan Area



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Background

The Tel Aviv metropolis covers about 1,500 square kilometers, about 60 km from north to south and about 30 km from east to west, and is in similar size to major metropolitan cities in Europe. 80% to 90% of travel by motorized vehicles in the large metropolitan cities in Israel (Tel Aviv, Jerusalem, and Haifa) is by private vehicles. Travel using public transport is distributed as follows: about 767 million passengers by bus (about 87%), around 68 million passengers by Israel Railways (about 8%), and about 45 million passengers using the light rail (about 5%).

According to the OECD data, the estimated scope of the transportation infrastructure in Israel is equal to about 50% of the gross domestic product of Israel, compared to about 70% on average in the OECD states. Given the scarce use of public transportation and the low investment in the transportation infrastructure in Israel, the country suffers from the most significant traffic congestion among the OECD countries, and according to the OECD, 2019 results in the loss of about NIS 20 billion GDP.

In 2005–2016, the Israeli governments adopted several resolutions to promote the mass transportation system, intended to improve the accessibility of public transportation and its availability. According to the latest plans, the planned mass transportation system in the Tel Aviv metropolis will consist of three light rail lines, currently in various stages of construction and three metro lines, currently in the stages of planning and legal and planning regulation. At the audit time, the light rail lines are expected to be opened to the public in 2022, 2026, and 2027, gradually, after their construction was postponed several times.



Key Figures

**NIS
48.1
billion**

construction estimation cost of the three light rail lines in the Tel Aviv Metropolitan Area (the Red, Green, and Purple)

**NIS
18.71
billion**

construction estimated cost of the Red Line from October 2021 compared to an estimate of NIS 10.7 billion presented to the government in December 2010

12

updates number in the total budget and the budget items of the Red Line from December 2010 to October 2021

5 years

delay in the opening date of the Red Line from 2017 to 2022

**NIS
11.2
billion**

the estimated total cost of the Purple Line of the light rail in the Tel Aviv Metropolitan Area is about NIS 0.41 billion per km – about 28% higher than the maximum cost of similar projects in other countries (from a World Bank study)

**2026
and
2027**

the years in which the Purple and Green Lines are expected to open, respectively. A postponement of one to two years from the date set in the NTA work plan in 2018 (opening at the end of 2025). As of the audit completion, another postponement may occur in these two lines

**NIS
1.14
billion**

the utility estimated net loss due to a one-year delay in the opening of the Purple and Green Lines (at 2021 prices and at a capitalization rate of 4%) by the calculations of the Ministry of Finance and the State Comptroller's Office

**98
hours per
year per
passenger**




the loss of time due to traffic congestion in Tel Aviv compared to 41 hours in Madrid and Amsterdam and 69 hours in Berlin as of 2021



Audit Actions

From July 2021 to April 2022, the State Comptroller's Office examined the construction project of the light rail lines' progress – the Red, Purple, and Green Lines. The audit was conducted at the NTA – Metropolitan Mass Transit System Ltd. Company (NTA), the Ministry of Transportation, and the Ministry of Finance. A supplementary audit was conducted in Tel Aviv, Ramat Gan, and Bnei Brak municipalities. This audit report joins a series of reports from 2005, 2013, 2014, and 2018 in which the State Comptroller's Office examined NTA's activities.

Key Findings

-  **The Framework Agreement Between Ministries of Transportation and Finance and the NTA Company** – over 20 years after the Company's establishment, the framework agreement between the Ministries of Transportation and Finance and the NTA Company has not been signed. This is even though the government decided in 2010 and 2016 to sign an agreement, and even though the State Comptroller recommended it in its audit reports published in 2013 and 2018.
-  **Postponements in the Date of Operation of the Light Rail Lines** – the completion date of the construction of the Red Line was postponed at least six times for about five years in total (five of the six postponements occurred in 2010–2013 before the beginning of the leading construction works, that began in 2015). The government did not decide on a target date for the Purple and Green Lines operation. The opening of the Purple Line has been postponed from 2025 to 2026, and the opening of the Green Line has been postponed from 2025 to 2027, and another postponement of at least a year may occur due to over a year delay in announcing the PPP project winner, mainly due to the delay of Kfar Shalem evacuation by about a year and a half – from August 2020 to January 2022.
-  **Increase in the Cost Estimate for the Red Line Project** – since the initial cost estimate for the Red Line Project was determined in the government resolution of December 2010 at NIS 10.7 billion, at least 12 updates were made to it, and in at least eight of them the total project cost estimate was updated. In the last update in October 2021, the cost estimate was about NIS 18.71 billion, about NIS 8 billion higher than the original cost estimate (about 75%). Net of the effect of price increases (an addition of




NIS 0.671 billion) and a decrease in VAT from 18% to 17% in 2016 (a decrease of NIS 0.128 billion) increased the cost estimate by about NIS 7.46 billion (about 69.7%). There are many reasons for the deviation in the cost estimate for the light rail lines, the Red, Green, and Purple, that are under construction, including: under budgeting of the contingencies not according to the Transport Projects Procedure and the exclusion of costs from the cost estimate, mainly in the early stages of the project; Absence of linkage to the input indexes baskets; Items that were not included in the project estimate, items that were not priced and items that were underpriced and resulted in shifting between the various budget items.

An International Comparison of the Costs of the Green, Purple, and Red Lines

– it was raised that the cost estimate of the light rail's Purple Line Project is high compared to figures in other countries at 2000 prices (from the World Bank research data) and after standardizing the length of the lines (price effect):





- **The Estimated Cost of the Purple Line** is about NIS 11.2 billion (about NIS 0.41 billion per km), about NIS 4.64 billion (NIS 0.17 billion per km) in 2000 prices, higher by about 26.5% and 133.5% than the maximum and minimum values, respectively, according to similar projects in other countries. I.e., the at grade Purple Line estimate is significantly higher than the comparison figures in the World Bank study.
- **The Estimated Cost of the Green Line** is about NIS 18.3 billion (about NIS 0.47 billion per km), about NIS 7.64 billion (NIS 0.2 billion per km) in 2000 prices, lower by about 5.5% and about 99.4% higher than the maximum and minimum values, respectively, according to similar projects in other countries.
- **The Estimated Cost of the Red Line** is about NIS 18.7 billion (about NIS 0.78 billion per km), about NIS 7.89 billion (NIS 0.33 billion per km) in 2000 prices, in the cost range of similar projects in other countries, and about 23.7% lower and about 113.5% higher than the maximum and minimum values, respectively, according to similar projects in other countries.

I.e., the cost of building an at grade light rail project in Israel is higher than the cost of building similar projects in other countries, and the cost of building more complex light rail projects with a significant underground component is closer to the building cost in other countries.


 **The Documentation of the Changes in the Projects' Construction Budgets** – for five out of nine estimate updates made by NTA to the Red Line in 2014–2020 examined in the audit, the circumstances of the change's updates were found (about 56%). No documentation was found for the circumstances of four updates (about 44%). Full details were attached to two of the five approvals, and for three others – approvals were received via email from the Ministries of Transportation and Finance. In November 2020, the NTA approved a detailed procedure for managing and updating the light rail project



budget. The procedure defines the level of authority required for budget approvals in the NTA, but it does not contain instructions for reporting the budget changes to the Ministries of Transportation and Finance.

-  **The Construction Time of Light Rail Lines in Israel in an International Comparison** – the construction time of the at grade Purple Line in the Tel Aviv metropolis is expected to be significantly longer than the construction time of most of the audited lines with similar characteristics in other countries: about 3.7 months per km on the Purple Line in Israel (a total of about 8 years) compared to about 2.5 months per km on average in other countries (about 48% more than the average on lines in other countries).
-  **Metropolitan Transportation Authority** – even though each light rail line passes through many local authorities in the metropolis and the transportation connections between them are close, there is no Metropolitan Transportation Authority in the metropolis, nor does it have a light rail project administration coordinating everything related to the project. Establishing metropolitan transportation authorities is essential for promoting an overall view of transportation solutions provision, effective response to overall and local needs, coordinating between local authorities, and creating collaborations for promoting public transportation projects.
-  **The Signing of Agreements and Differences in the Existing Agreements Between the NTA, the Ministries of Transportation and Finance, and the Local Authorities** – agreements were signed with the local authorities along the Red Line route, except for Ramat Gan. It was found that drafts have been drawn up, but no agreements have yet been signed with the local authorities along the Green Line route – Holon, Rishon Lezion, and Herzliya. Moreover, it was found that no agreements were signed with the local authorities along the route of the Purple Line. Differences were found in the agreements between the NTA, the Ministry of Transportation, the Ministry of Finance, and the local authorities, among other things on the following: differences in the rate of participation of the NTA in financing the relocation of infrastructure and in environmental development in the different authorities (such as funding of 85% of the cost of relocating of the entire infrastructure in Petach Tikva, funding of 100% of the cost of relocating the infrastructure at the light rail stations in Bnei Brak and 50% between the stations therein, and failure to determine NTA's rate of funding in agreements with other local authorities).
-  **Support for Businesses Along the Light Rail Route** – businesses adjacent to the underground section of the Red Line in Ramat Gan and Bnei Brak area do not benefit from a fund similar to the one established by the Tel Aviv Municipality in cooperation with the Ministry of Finance. They receive no assistance that businesses in Tel Aviv are eligible for, even though a part of the aforementioned fund's budget is a state budget allocated by the Ministry of Finance. This results in inequality between businesses in different municipal jurisdictions.







 **Difficulties and Obstacles in the Interface Between Infrastructure Companies and NTA** – difficulties in coordinating the infrastructure between NTA and the Israel Electric Company (IEC) and other infrastructure companies appear throughout the forums and in various reports about the progress of the Red Line in recent years, and currently regarding the progress of the Green and Purple Lines. From the government approval date of the Red Line execution by the NTA in 2010 until the audit completion in April 2022, no service contract agreements were signed between the NTA, the IEC, and other infrastructure companies, some of which are government companies.



In November 2020, a detailed procedure for the management and updating of the budget of the light rail projects was approved by NTA.

The Ministry of Transportation is preparing to adjust the bus service in anticipation of the light rail Red Line operation.

Key Recommendations

-  It is recommended that NTA, the Ministry of Transportation, and the Ministry of Finance sign the framework agreement and establish working procedures for updating the budget and schedules and reporting thereon. It is further recommended that the Ministry of Transportation, NTA, and the local authorities along the Purple and Green Lines route – Holon, Rishon Lezion, Herzliya, Yahud-Monoson, Or Yehuda, Kiryat Ono, Givat Shmuel, Ramat Gan, Givatayim – which have not yet signed agreements to transfer the right to use the land, will sign the agreements between them.
-  It is recommended that the Ministry of Transportation integrate the schedules and their supervision mechanisms noted in the government's resolutions on transportation projects. It is further recommended that NTA, the Ministry of Transportation, and the Ministry of Finance meet the schedules to prevent delays in the operation of the Green and Purple Lines, to benefit from the operation of the lines, and save additional costs due to delays in the schedules. It is also recommended to consider ways of shortening the work processes for the execution of the light rail projects in the metropolitan area.
-  It is recommended that NTA present a budget estimate as accurately as possible to allow government budget decisions to be based on adequate data enabling the examination of the project's economic viability and accordingly allocating resources.
-  To promote the light rail project and minimize harm to residents along its route, it is recommended that the Ministry of Transportation establish a Metropolitan Transportation Authority in Tel Aviv metropolitan area. Until then, consider alternative ways for interim



solutions to remove the existing barriers. For example, develop a mechanism to settle disputes between the local authorities and the Ministry of Transportation and appoint a permanent forum consisting of the representatives of all parties. It is further recommended that NTA promote service contract agreements with the IEC and other infrastructure companies to assist the project advancement.



It is recommended that the Ministries of Transportation and Finance examine the light rail project costs disparities of the at grade route compared to other countries, consider ways to minimize them, and use the analysis to support alternatives for future transportation projects, including the selection of the project's route.



Mass Transit System in the Tel Aviv Metropolitan Area



Source: NTA - Metropolitan Mass Transit System Ltd.



Summary

Israel is upgrading mass transit systems by integrating light rail lines in the major metropolises of Tel Aviv and Jerusalem.

The audit found deficiencies in the promotion of the light rail project in the Tel Aviv metropolis. The completion date for the construction of the Red Line was postponed about five years cumulatively over six times, (five of the six postponements occurred in 2010–2013 before the start of the leading construction works, that began in 2015); The opening of the Purple Line was postponed from 2025 to 2026, and the opening of the Green Line was postponed from 2025 to 2027 and another year delay may occur in these two lines; In the Red Line Project, at least 12 updates were made to the project estimate, and in at least eight of them the total project cost was updated; In the last update, the cost estimate was NIS 18.71 billion, about NIS 8 billion, (75%) higher than the original cost estimate and after deducting the effect of increases in price indexes and a change in VAT, about NIS 7.5 billion (about 70%) higher¹; Many changes were made to the Green and Purple Lines amounted to hundreds of millions of NIS, both in the total estimate and in the main budget items of the project; Some of the changes are not documented and were not reported to the Ministries of Transportation and Finance; Differences were found in the rate of NTA's participation in the financing of infrastructure relocation and environmental development in the various authorities; Differences were found in the tools to assist businesses adjacent to the underground sections in different local authorities; There are no service contract agreements between the infrastructure companies and NTA. Examining the cost estimates of the Green, Red, and Purple Lines against international comparative numbers indicate that the cost of construction of an at-grade light rail project in Israel is higher than the cost of its construction in other countries, and the construction cost of more complex light rail projects, in which there is a sizeable underground component, is closer to the cost of establishing them in other countries. Rectifying the deficiencies noted in this report may improve the quality of life of public transportation users in the Tel Aviv metropolis, reduce the difficulties experienced by the metropolis residents on the route of the lines during the construction phase and save high costs for the economy. It is recommended that the Ministries of Transportation and Finance draw conclusions from the segments carried out in the light rail project and apply them to the future planned parts of the light rail and mass transit projects such as the metro. It is also recommended to present the conclusions learned from similar projects along with the requests for approval of transportation projects or budgetary changes in projects by the Ministries of Transportation and Finance.

1 Linkages and rate differences in the project amounted to approximately NIS 0.671 billion and a decrease in VAT from 18% to 17% in 2016 amounted to approximately NIS 0.128 billion. The estimated cost, net of the effect of price increases and VAT, increased by approximately NIS 7.5 billion (about 70%).

