



# High-Quality Transportation for 2040: Planning, Investments, and Benefits

Sani Ziv and Oren Shapir\*



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\* Sani Ziv is a founding partner at Macro Analytics Economic Research and Consulting Ltd., and a lecturer on Israeli economy and real estate economy at The Academic College of Tel Aviv-Yaffo, [saniziv@mta.ac.il](mailto:saniziv@mta.ac.il). Oren Shapir is a senior economist at Macro Analytics Economic Research and Consulting Ltd. The authors thank Prof. Zvi Eckstein and Dr. Avihai Lifschitz for their professional guidance.

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### → Contact details:

Reichman University, P.O. Box 167, Herzliya, ISRAEL 4610101

Phone: 972-9-9602431

Email: [aaron.economics@runi.ac.il](mailto:aaron.economics@runi.ac.il)

Website: <https://www.runi.ac.il/en/research-institutes/economics/aiep>

## **High-Quality Transportation for 2040: Planning, Investments, and Benefits**

Transportation access in Israel is lagging significantly behind leading European countries, as a result of transportation infrastructures whose extent is around a third of their scope in countries similar to Israel. Furthermore, the current investment plan in Israel does not match the rate of population growth and the development of economic activity. This paper aims to propose high-quality, nationwide transportation accessibility objectives toward 2040, along with a national program of investment in transportation infrastructure supporting these targets, and to estimate their impact on the GDP and thereby on the welfare of the Israeli population. High-quality transportation accessibility targets toward 2040 will bring Israel to the level of leading European countries and will have a dramatic impact on the country in terms of GDP and quality of life.

We propose setting transportation accessibility targets which would match the level of transportation access in leading metropolitan areas around the world, and to formulate a long-term investment plan in accordance with these targets. Two targets were defined in the framework of this paper: reducing public transit travel time during peak hours by 30%, and increasing trips by public transportation as a ratio of total motorized trips in Israel from 20% to 40%.

The existing transportation investment plans do not meet these targets. We propose a comprehensive plan totaling around NIS 940 billion, which represents a transportation investment to GDP ratio of 2.1%, as opposed to the current level of 1.1%. Implementing these investment plans will allow Israel to reduce the gaps in transportation infrastructures in comparison to developed countries and reach travel times and numbers of trips resembling those of leading metropolitan areas around the world.

Even though the discussion regarding the lack of core infrastructures concentrates mainly on the Tel Aviv metropolitan area, we cannot overlook the fact that in other metropolitan areas, as well, traffic congestion and prolonged travel times hamper labor productivity. Increasing investment in infrastructures across all metropolitan areas, as well as connecting them by an efficient transportation system will make it possible to utilize the economic potential of each and every one of them, while also contributing to efficient social and economic population distribution.

Massive investment in transportation infrastructure that would achieve those goals, is likely to impact GDP and labor productivity substantially. We measure these effects using two models. The first is a model of agglomeration (describing the mechanisms that cause employees and firms to be co-located geographically) based on reduced travel times between business centers. The second is a macroeconomic model, in which transportation capital stock is used to increase overall productivity within a framework of a production function. In this paper we show that the additional annual growth across the economy as a result of this plan, compared to baseline scenario where transportation infrastructure investment is limited to maintaining existing infrastructures, is between 0.27% and 0.34%, depending on the model used. The GDP per employee in 2040 is projected to be 4.8% to 6% higher in comparison to the baseline scenario, and the return on investment ranges between 24% and 31%.

Implementing a massive transportation investment plan requires a multi-year plan spanning at least 20 years, comprising specific goals, detailed strategic planning, and anchored in a government resolution. Such a plan, accompanied by the advancement of detailed planning processes and execution according to national prioritization, would establish certainty and allow the private sector to allocate resources for investments in urban areas including employment centers, residential compounds, and leisure and recreational centers, as well as prepare the execution capabilities required for carrying out these projects. This component is crucial for the efficiency of investments at the national economic level and for the scope of business investments in all segments, particularly in office spaces, industrial facilities, services and commercial spaces.

Advancement of projects related to transportation infrastructure encounters planning and implementation barriers, which hinder the advancement of these projects within a reasonable timeline. Our principal recommendations in this regard are: enacting a National Infrastructures Law providing for executive powers and a funding plan; establishing metropolitan authorities tasked with transportation management; and removing barriers related to execution and professional workforce.

# 1. Summary and Conclusions

The congestion in Israel's roads is rapidly increasing and is already very high by international comparison. The low level of transportation infrastructures is manifested in overcrowded traffic, prolonged travel times, and a low rate of public transport use. The average speed of public transport in Israel stands at 15 km/h, compared to around 30 km/h in leading metropolitan areas around the world. Congestion in the Tel Aviv metropolitan area is among the highest worldwide, and only 10% of trips in metropolitan areas are made in public transport – around a quarter of the corresponding rate in leading metropolitan areas around the world. This outcome is the result of insufficient investment in transportation infrastructures over the last decades, as evident in the ratio between the stock of public capital and the GDP in Israel, which is 40% lower in comparison to European countries of similar size.<sup>1</sup>

Furthermore, due to the rapid population growth in Israel and the economy's high growth rate, the next two decades will witness a rapid increase in demand for trips as well as demand for freight transport. Without substantial investments in transportation infrastructures, road congestion and travel time are expected to increase. Simulations<sup>2</sup> showing what transportation in Israel would look like in 2040, on the basis of the existing transportation infrastructure, revealed that the number of trips in metropolitan areas is expected to double and travel time will increase by 44%. Travel time in public transport within the metropolitan areas is expected to increase by 17%, reaching 69 minutes per trip on average.

In light of these shortages, **we propose an investment plan for transportation infrastructures, with an emphasis on public transport infrastructures, in order for Israel to reduce by 2040 the transportation infrastructure gaps in comparison to developed countries.**

As a basis for this plan, we recommend setting transportation accessibility targets in line with the transportation accessibility levels of leading metropolitan areas around the world, and formulating a long-term investment plan to match these targets. In the framework of this paper, two targets were defined reducing travel time in public transport during peak hours by 30% and increasing the trips by public transportation as a ratio of total motorized trips in Israel from 20% to 40%.

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<sup>1</sup> A group of countries which are similar in size to Israel and include Austria, Belgium, Denmark, Ireland, Finland, Sweden, and The Netherlands (Eckstein and Lifshitz, 2017).

<sup>2</sup> Based on the Strategic Plan for Transportation.

The investment plan (“**Target Achievement Plan**”) was drafted to achieve these targets. The plan is based on estimates and assessments taken from the strategic plans for Tel Aviv, Jerusalem, and Haifa, with extensive investment in the Be’er Sheva metropolitan area, and further investment in intercity transport infrastructures, including the acceleration of plans that are currently scheduled, on the strategic planning level, for execution by 2050. According to our estimates, achieving the aforementioned targets will require an overall investment in transportation infrastructure of around NIS 940 billion between 2023 and 2040, a figure which represents 2.1% of the projected GDP for this period and means doubling the percentage of transportation investment as a share of GDP compared to the level of investment during the last two decades – 1.1%.

**Table 1: Necessary Investment in Land Transportation, 2023–2040, 2022 Prices**

		Land transportation roads	Land transportation mass transit systems	Land transportation total
<b>Approved plans</b>	<b>Investments (in NIS billions)</b>	172.5	404.8	577.4
	<b>% of annual GDP</b>	0.39%	0.92%	1.31%
<b>Target achievement plan</b>	<b>Investments (in NIS billions)</b>	315.5	620.8	936.3
	<b>% of annual GDP</b>	0.72%	1.41%	2.12%

In order to assess the economic impact of the investment plan, we used two different methods:

1. Agglomeration approach: this approach associates the concentration of workers and businesses, and the increase in the speed and number of trips between different areas, with agglomeration effects in terms of increased labor productivity. We previously used a similar approach to estimate the effects of the Tel-Aviv Metro project on labor productivity and GDP in the Tel Aviv metropolitan area (Ziv and Shapir, 2020).
2. Production function approach: under this approach, per capita infrastructure capital is used as a productivity-enhancing factor in an aggregate production function, similar to physical capital, human capital, and labor.

The contribution of the plan was assessed in comparison to a current-situation ("do nothing scenario"). This scenario is based on the investments required to maintain the existing network, including the completion of projects currently in process, without the metro project or any new projects.<sup>3</sup>

The results of the two models show that a comprehensive investment plan in transportation infrastructures, in the scope specified above, will generate high return rates across the economy in terms of labor productivity and GDP. The agglomeration approach pointed to additional annual growth of 0.27% per year and an increase of 4.8% in the GDP per worker in the year 2040, compared to the baseline scenario. The additional GDP in 2040 would be NIS 152 billion, representing a return rate of 24% compared to the investment made. The production function approach pointed to additional growth of 0.34% per year and an increase of 6% in the GDP per worker in 2040, compared to the baseline scenario. The additional GDP in 2040 would be NIS 197 billion, representing a return rate of 30% compared to the investment made.

In addition, we explored a more limited scenario, where the metro rail network is built and other investments are implemented according to currently approved plans (**Approved Plans Scenario**). In this scenario, the aggregate volume of investment in transportation infrastructures is around NIS 577 billion, representing around 1.3% of the GDP per year. This scenario does not achieve the accessibility transportation targets, and its benefit in terms of GDP is lower. This scenario produced additional GDP ranging between NIS 66 billion and NIS 88 billion per year, and an increase in GDP per worker ranging between 2.1% and 2.6%.

**Table 2: Impact on GDP and GDP-per-Worker in 2040**

		Rate of change in GDP per worker compared to baseline scenario	Additional GDP compared to baseline scenario (2022 NIS Billions)	Additional annual growth
<b>Agglomeration approach</b>	<b>Approved plans</b>	2.1%	66.0	0.12%
	<b>Target achievement plan</b>	4.8%	152.4	0.26%
<b>Macroeconomic model</b>	<b>Approved plans</b>	2.7%	87.7	0.16%
	<b>Target achievement plan</b>	6.1%	196.8	0.34%

<sup>3</sup> Based on the Strategic Plan for Transportation.

Implementation of a massive plan of investment in transportation infrastructures is only possible through a nationwide plan spanning at least 20 years. This approach is recommended by the OECD and becoming increasingly common in many countries. **Therefore, we recommend mandating a multi-year plan for transportation infrastructure development in a government resolution which would include targets and detailed planning.**

A multi-year plan, when it is accompanied by legislation and prioritization of planning and operational processes, signals to the business sector and to households a long-term government commitment, and provides private actors with the certainty which allows them to adapt urban development plans accordingly, including employment centers, residential compounds, and leisure facilities, as well as developing transportation accessibility. This component is crucial for the efficiency of investments in the national economy and for the volume of private investments in all sectors, particularly in office spaces, industrial facilities, services and commercial spaces.

Advancement of projects related to transportation infrastructure encounters barriers which hinder the fulfillment of these projects within a reasonable timeline. For example, there are barriers in terms of execution capability and barriers in terms of the availability of professionals with expertise and technical competence. Even when a project is approved and funded, there is a shortage of leading infrastructure contractors capable of executing large-scale projects. Therefore, increasing the execution capability of transportation projects is an essential precondition for implementation of the infrastructure investment plan. Our principal recommendations in this regard are: enacting a National Infrastructures Law comprising executive authorities and a funding structure; establishing metropolitan authorities tasked with transportation management; and removing barriers related to execution and professional workforce.