

## TRANSPORT CHALLENGES OF TBILISI AND THE STRATEGIC IMPORTANCE OF THE BYPASS HIGHWAY

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### ABSTRACT

The city of Tbilisi, like other major urban centers worldwide, faces persistent challenges caused by rapid population growth, an expanding vehicle fleet, and limited transport infrastructure capacity. These factors have led to chronic congestion, environmental pollution, and a decline in urban mobility efficiency. Addressing such multidimensional challenges requires a systemic and long-term approach that integrates infrastructure modernization, sustainable transport planning, and the redirection of transit flows away from the city's dense core. Within this context, the Tbilisi Bypass Highway Project has emerged as a strategically significant initiative designed to alleviate traffic pressure, improve connectivity, and promote balanced urban development.

Technically, the project consists of a 51-kilometer four-lane highway with a design speed of 120 km/h, incorporating 48 bridges with a total length of 11.6 kilometers and six tunnels totaling 10.7 kilometers. Divided into four construction lots, the project involves a series of complex engineering works, including large-scale interchanges, tunnels, and crossings that together form a continuous high-capacity route around the city. Beyond its engineering scope, the bypass highway will substantially reduce traffic intensity within Tbilisi, optimize public transport

Furthermore, the project is expected to generate long-term economic, spatial, and environmental benefits. By redirecting transit vehicles outside the capital, it will stimulate regional investment, enhance logistics efficiency, and contribute to the city's decentralization and sustainable expansion. The bypass will also strengthen Georgia's position as a key regional transport corridor linking national and international high-speed road networks. Overall, the Tbilisi Bypass Highway represents not merely an infrastructural intervention but a strategic foundation for the sustainable, resilient, and balanced development of Georgia's capital city and the broader region.

**Keywords:** Tbilisi Bypass Highway; urban transport planning; traffic congestion; urban decentralization; transport corridor.

Like many other large cities across the globe, Tbilisi faces significant challenges associated with urban traffic congestion. In the contemporary urban environment, the growing number of vehicles—driven by rapid population growth—places an increasing burden on city infrastructure. As a result, existing road

networks often struggle to accommodate high traffic volumes, leading to substantial time losses, increased environmental pollution, and a decline in residents' quality of life and urban comfort.

Addressing the issue of traffic congestion requires a multifaceted and long-term approach. Effective solutions must combine the development of modern transport infrastructure with improvements in public transportation efficiency, as well as the encouragement of sustainable mobility alternatives that reduce dependency on private vehicles. Nevertheless, international experience demonstrates that even comprehensive measures cannot fully eliminate congestion in cities characterized by active transit movement.

Tbilisi exemplifies this challenge. Owing to its geographical location—situated at the intersection of east–west and north–south transport corridors—the city functions as a major transit hub within the region. Consequently, its streets accommodate not only local traffic but also vehicles from other regions and countries passing through the capital. This situation places additional pressure on an already overloaded road network and exacerbates the existing congestion problem.

To mitigate these challenges, it is crucial to divert transit traffic away from the urban core. This can be achieved through the creation of alternative bypass routes, dedicated highways and peripheral roads designed to enable drivers to circumvent the city without entering densely populated central areas. Such infrastructure contributes to improved traffic flow, enhanced road safety, and reduced environmental stress.

The construction of the Tbilisi Bypass Highway represents a project of strategic importance for the city's transport system. Its implementation is expected to significantly decrease traffic intensity in central districts, increase average travel speeds, and reduce both air pollution and noise levels. In turn, these improvements will contribute to a higher quality of life for residents and commuters alike.

Beyond its environmental and social benefits, the project also holds substantial economic potential. By lowering logistical costs and facilitating faster interregional connectivity, the bypass highway will stimulate business activity, attract investment, and enhance Tbilisi's competitiveness as both a tourist destination and an investment hub.

In essence, the Tbilisi Bypass Highway should be regarded not merely as an infrastructure initiative but as a vital component of the city's sustainable development strategy—one that aspires to create a cleaner, more efficient, and more livable urban environment for future generations.

The project consists of **four independent sections**, collectively forming a **51-kilometer highway**. Together, these sections constitute one of the most significant infrastructure initiatives undertaken in Georgia, aiming to relieve Tbilisi's transport network, redirect transit traffic beyond the city limits, and optimize the broader regional transportation system.



According to its technical parameters, the Tbilisi Bypass Highway represents one of the largest and most complex infrastructure initiatives in Georgia's modern transport development agenda. The total designed length of the highway is 51 kilometers, with a projected design speed of 120 kilometers per hour. The roadway will consist of four traffic lanes, each with a width of 3.75 meters, meeting modern international engineering and safety standards for high-speed motorways. Within the framework of the project, the construction of 48 bridges with a total length of 11.6 kilometers and six new tunnels with a combined length of 10.7 kilometers is envisaged, ensuring the continuity and efficiency of transport movement across diverse geographical terrain.

The project is divided into four main construction lots, each designed to serve a specific functional and geographical segment of the bypass network:

- Lot II (Natakhtari–Avchala) covers a length of 6.5 kilometers and envisions the construction of a dual carriageway with four lanes, two interchanges, and a two-lane tunnel with a total length of 3.4 kilometers. The estimated construction cost for this segment is approximately USD 150 million.
- Lot III (Avchala–Airport) represents the longest and most financially significant section of the entire project, extending 22.5 kilometers. This section includes the construction of 16 bridges, four interchanges, four new tunnels, and the adaptation of four existing tunnels, ensuring smooth connectivity between northern Tbilisi and the airport corridor. The estimated cost for this lot is USD 300 million.
- Lot IV (Airport–Lochini District) is 10.9 kilometers in length and includes the development of three interchanges, sixteen bridges (comprising overpasses, underpasses, and crossings), and two pedestrian bridges located on the GEZ (Customs Clearance Economic Zone) and Kakheti highways. One of these structures will span the Lochini River, highlighting the engineering complexity of this section. The construction cost is estimated at USD 100 million.
- Lot V (Lochini–Rustavi) completes the route with an 11-kilometer section that incorporates two interchanges and nine bridge crossings, including six on the main route and three on secondary roads. The total estimated cost for this final lot is USD 70 million.

Summary information is given in the table 1 below.

In a broader perspective, the implementation of the Tbilisi Bypass Highway Project holds exceptional strategic importance within Georgia's national transport and urban development policy. This initiative goes far beyond the simple expansion of physical infrastructure; it represents a comprehensive strategic intervention aimed at ensuring the sustainable, balanced, and environmentally responsible growth of the capital city.

*Table 1. Summary of Construction Lots and Costs*

Lot	Section	Length (km)	Key Features	Estimated Cost (USD million)
II	Natakhtari – Avchala	6.5	2 interchanges, 2-lane tunnel (3.4 km)	150
III	Avchala – Airport	22.5	16 bridges, 4 new + 4 adapted tunnels, 4 interchanges	300
IV	Airport – Lochini	10.9	3 interchanges, 16 bridges, 2 pedestrian bridges	100
V	Lochini – Rustavi	11	2 interchanges, 9 bridge crossings	70
Total	—	51	—	620

The new highway will significantly relieve the capital's central districts from heavy traffic congestion, which in turn will improve mobility efficiency, optimize public transportation, and enhance the overall environmental condition of the city. Diverting transit vehicles away from the dense urban core will decrease traffic intensity, free up major arterial roads, and contribute to reduced air and noise pollution. These improvements will directly influence the daily life, comfort, and productivity of residents.

Beyond its transport-related effects, the project will serve as a catalyst for new economic and spatial development opportunities. The areas adjacent to the bypass are expected to gain considerable investment potential, encouraging the establishment of modern infrastructure, residential and commercial zones, industrial parks, and service centers. Such developments will foster urban decentralization, ensuring a more balanced distribution of economic and social activities across the metropolitan area. This decentralization will not only reduce urban pressure on Tbilisi's central districts but will also enhance accessibility and connectivity for suburban populations, leading to a more equitable and resilient urban structure.

Moreover, the Tbilisi Bypass Highway will form an integral part of Georgia's national and international high-speed highway network, strengthening the country's role as a vital regional transport and logistics corridor. Its integration into broader Eurasian transport routes will simplify logistics operations, stimulate trade, and increase the nation's competitiveness both economically and strategically within the South Caucasus region.

Ultimately, the Tbilisi Bypass Highway Project stands as a strategically indispensable infrastructure initiative that simultaneously addresses Tbilisi's infrastructural, economic, and ecological needs. It will establish a long-term foundation for sustainable urban growth, improved environmental performance, and the creation of a cleaner, more accessible, and more balanced metropolitan environment — a legacy that will serve future generations and strengthen Tbilisi's position as a modern, well-connected capital in the region.

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