



By: *Gordon Feller*

Turkey's US\$1.1B International Rail Project



To strengthen its role as a global trade hub, Turkey's government has quietly embarked upon an ambitious US\$1.1B undertaking which it calls the International Rail Logistics and Network Resilience Project.

The project's core objective is to improve logistics efficiency along the Divrigi-Kars-Georgia border railway corridor and to enhance the operational resilience of Turkey's national railway network. The World Bank is providing US\$ 400M of the total.

Turkey's challenge of sustaining past growth includes reducing substantial spatial economic disparities by investing in lagging regions. In 2018 Turkey had the widest spatial disparity in income per capita at the provincial/small region level in the OECD, and the second widest at the larger regional level, measured as the ratio of the top 20% richest regions to the bottom 20% poorest regions.

World Bank research shows that a particularly effective way of stimulating economic activity in lagging regions is by providing them with improved basic transport connectivity to/from leading regions—what the Bank refers to as “spatially connective policies”.

In particular, Turkey has the opportunity to better connect its eastern provinces with neighboring trade partners, and Turkey's leading regions in the western half of the country.

Turkey is highly exposed to the impacts of climate change. According to the Global Facility for Disaster Reduction and Recovery's ThinkHazard! assessment and to the World Bank's Intended Nationally Determined Contribution Profile for Turkey, the country faces the risk of more frequent extreme weather events due to climate change - including river, urban, and coastal flooding; landslides; extreme heat and droughts; land degradation; forest fires; and coastal erosion.

Turkey's road network is vulnerable

A 2021 survey of 64 Turkey-domiciled firms found that 27% of them had suffered detrimental financial impacts from water-related events, such as flooding and drought, during the most recent 12-month period, with an estimated economic value of US\$ 174 million.

Partially in recognition of its exposure, Turkey ratified the Paris Agreement in October of 2021, adopted its first Nationally Determined Contributions (NDCs) in 2022, and committed to achieving a net-zero economy by 2053. This has placed climate change mitigation at the very top of Turkey's economic development agenda.

Turkey's high vulnerability and exposure to climate and natural hazards generate risks, but also pose an opportunity to invest in resilient infrastructure.

According to the World Bank's Country Climate and Development Report (CCDR), Turkey is significantly more vulnerable to climate and natural hazards like earthquakes than the rest of the OECD, with an assessed high level of vulnerability across 9 of 10 risk categories compared to 2 of 10 for the median OECD member.

Turkey's economy heavily relies on its transportation and logistics system as a facilitator of economic growth

Regarding infrastructure specifically, the CCDR found that Turkey's road network is more vulnerable to disruption than that of European comparators across the income spectrum (such as upper-middle income Serbia and high-income Germany), and that its railway network is, in turn, significantly more vulnerable to disruption than its road network.

While Turkey's resilient transport infrastructure investment needs are higher than those of other OECD countries, the expected gains are also higher. The CCDR estimates that ensuring all new transport infrastructure assets are built to higher

resilience standards would increase investment needs by nearly 11%, but it could also reduce average annual repair costs by a factor of 7.

As a trading nation at the crossroads between East and West, as a large domestic market, and as a manufacturing base for major overseas markets like the EU, Turkey's economy heavily relies on its transportation and logistics system as a facilitator of economic growth.

An opportunity to reduce transport and logistics costs

Given Turkey's territorial size, serving domestic and import-export markets often involves the transportation of freight over long distances, making Turkish logistics both transport intensive and compatible with multimodality.

For example, the most heavily used domestic trade lane is 854 km from point of long origin to destination. The average truck trip distance in Turkey is 282 km, more than twice as much as in the EU (135 km). This suggests the potential for a more balanced freight transport task with more intense use of rail freight.

Yet Turkey's freight transport task is lopsided, with a dominant trucking share and scant participation of rail; this generates avoidable transport costs, increases logistics costs of some supply chains, and, critically, is inconsistent with the country's climate aspirations.

Turkey has an opportunity to reduce transport and logistics costs, mitigate the impacts of climate change, and reduce the health impact of local pollutants

Of the approximately 400 billion ton-km transported in Turkey in 2021 across all modes, 73% took place by truck and only 4% by rail. That is well below the rail freight market share of other upper middle-income countries of

similar commodity mix and length-of-haul profile as Turkey.

This is economically costly in terms of shipper borne out-of-pocket transport costs, as trucking in Turkey is 2.6x more expensive per ton-km than rail freight; as well as in terms of the economic value of greenhouse gas and local pollutant emissions.

Depending on specific origin-destination-commodity itineraries, the use of rail freight compared to trucking could also reduce inventory carrying costs if the trucking journey is more circuitous, congested, or unreliable compared to readily or potentially available rail freight journeys.

Turkey therefore has an opportunity, perhaps unique in magnitude among developing countries, to reduce transport and logistics costs, mitigate the impacts of climate change, and reduce the health impact of local pollutants by promoting rail freight adoption and shifting freight from trucks to rail.

Rail freight has a critical role to play

Rail freight has a critical role to play, particularly in the short term, towards meeting Turkey's net-zero economy target. In Turkey, as in the rest of the world, transport sector decarbonisation cannot be achieved without decarbonising the transportation of freight.

In 2019, half of Turkey's transport-sector GHG emissions originated from freight transport; 95% of freight transport emissions came from trucking-related emissions; and more than two-thirds of trucking emissions (68%) were generated by heavy-duty trucks, which are comparatively more difficult to decarbonize than light-duty commercial vehicles.

During the early period in the runup to the 2053 net zero target - e.g., over the next 10-15 years - facilitating the use of rail freight, and shifting long-haul truck freight to rail, are

among the most effective ways to decarbonize freight transport.

The challenge of attracting freight to the railways in Turkey has a strong infrastructure investment component, both at the last-mile and, increasingly, in the main linehaul network.



Turkey's railway network, 13,000 km in length, needs both expansion and modernization - Istanbul high speed train

Bank-led surveys of Turkey-based shippers and logistics service providers show that a key cause for the country's low incidence of rail adoption is a generalized lack of access to the railway network at the last mile to/from cargo nodes—maritime ports, organized industrial zones, and large manufacturing facilities—intense in the transportation of, especially but not only, bulk freight.

While this gap is being partially addressed by the ongoing World Bank-financed Rail Logistics Improvement Project (RLIP) (US\$350 million in IBRD financing), fully servicing rail freight shippers end-to-end will also need investments in the main portion of the network.

Turkey's railway network, 13,000 km in length, needs both expansion and modernization. In particular, the Divrigi-Kars-Georgia border international corridor on the eastern end of the network, linking Turkey with the South Caucasus via the Baku-Tbilisi-Kars (BTK) railway line and, via the Caspian Sea, with Central and East Asia, is operated with traffic control systems that lag behind the standard of most of the rest of the network.

Most of this 660-km railway section is also non-electrified, constrained in terms of train speeds and station lengths, and in urgent need of rehabilitation.

The development relevance of the Divrigi-Kars-Georgia border international railway corridor goes beyond its need for rehabilitation: it is also an integral part of the intercontinental Middle Corridor (MC) and a linchpin to Turkey's regional trade aspirations.

Regional integration

The Turkish government has made it a policy priority to develop the railway portion of the MC within its territory. The Ministry of Transport and Infrastructure's Transport and Logistics Masterplan 2053, adopted in 2022, includes under its "main sectoral targets" becoming "a logistics base in the Middle Corridor".

This would deepen regional integration and facilitate trade between Turkey and the nations of Central Asia; increase the logistics efficiency of the MC as an alternative to the Northern Corridor (NC), which has been compromised following Russia's invasion of Ukraine; and provide shippers with multiple routing options for international freight.

The provinces that host the Divrigi-Kars-Georgia border railway corridor are highly exposed to extreme weather events and natural hazards. Specifically, there is a high risk of urban floods, landslides, and wildfires in all four main host provinces, as well as a medium to high risk of earthquakes.

This underscores the need for Turkey to invest in connectivity infrastructure that can withstand the impact of these hazards and provide higher levels of operational continuity as a matter of improved service delivery.

The safety and service continuity of railway operations in Turkey - for both passengers and freight - have deteriorated recently

At the national level, and after years of improvement, the safety and service continuity of railway operations in Turkey - for both passengers and freight - have deteriorated recently and are a source of concern as a resilience driver that needs to be strengthened.

After reaching an all-time low of 34 in 2017, the number of railway operating accidents nationally—collisions, derailments, people falling from trains, and other incidents—has grown consistently since, to 53 in 2021.

While collisions at level crossings have steadily decreased within the last decade, thanks to increased focus on conversion of level crossings from unprotected cross-sign crossings to automatic-barrier-controlled level ones, derailments and collisions have more than doubled during the last decade, from a total of 16 to 38.

Fatalities have not generally exceeded 4 persons annually. Nevertheless, they reached 38 in 2018, due to a major passenger train derailment near Corlu-Tekirdag, which resulted from erosion of an embankment following flash flooding.

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