



TRANSPORTATION POLICIES AND TRANSPORTATION SAFETY IN TURKEY

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Abstract: *With the globalizing world, the disappearance of borders and the increase in transportation opportunities have begun to create a high level competitive environment for businesses. Even if this situation seems to be a situation that affects only businesses when evaluated in terms of micro economy, it has become a factor that affects that region and country when evaluated macro.*

Transportation is defined as the transfer opportunity provided for the mobility demands of goods and people from a certain starting point to a certain destination for different purposes. In order for this transfer to take place, there is a need for a goods / cargo to be transported, people or masses of people who need mobility, the means of transportation and the road system in terms of infrastructure. However, it also constitutes a major cost item for individuals/organizations. According to Lardner's Rule, known as the "Rule of Squares" in transportation and trade, halving transportation costs indicates that the market area where businesses can offer their products can increase four times. Variables such as transportation route, product characteristics, time factor, etc. are also determinant values.

The transportation sector is a major energy sector in Turkey with a share of 1/4 in terms of energy consumption. However, it is seen that it is quite inefficient compared to many world countries due to unplanned growth. In this study, it is emphasized that a transportation policy should be established in order to provide an economic and environmentally friendly structure.

1. INTRODUCTION

Cluster formation affects competition in three ways: by increasing the productivity and performance of enterprises in the region, by supporting the rapid increase in innovation and technology to increase the future production performance of enterprises, and by helping to grow and develop new business understanding within the cluster structure (Porter, 1998b: 80). In addition, cluster formation contributes to the creation of a common idea in line with the general needs of all firms and provides guidance on many issues such as science and technology, education, export and foreign investment promotion (Porter, 1998a: 35-36).

A transport system is an organisation that designs, plans, regulates and schedules the movement of goods from origin to destination using motor vehicles and loading units such as

pallets and containers, taking into account technical constraints within a given time (Khooban, 2011: 109). Land and railways and intercontinental air and sea corridors within the transport system represent concrete and visible transport networks and transport services such as loading, unloading, unloading, handling, storage and transfer operations are carried out at points expressed as "transport terminals" where many roads and routes intersect within a transport network in the transport system (Erkayman, 2007: 25). The characteristics of transport services can be summarised as follows within the framework of transport means and cost factors (Kaya, 2010: 4):

- The transport service cannot be stocked,
- It is a portable service,
- Fixed costs are high,
- Usually one-way transport is carried out,
- Investments are shaped according to geopolitical and geographical structure,
- The direction of investments is usually determined by technological developments,
- Meteorological conditions are effective in the provision of the service.

Digital transformation has influenced the whole world, including cities, for half a century. It is feared that the adventure of digitalisation, in which the world has perhaps been dragged unconsciously, will lead mankind to unexpected routes. Brand new communication infrastructures are being created. Digital technologies are spreading at the speed of bacterial division. Large-scale data flow warns citizens how to live and where to work (Leshner et al., 2019). It is necessary to read the concepts of communication and digitalisation together with the concepts of city, environment and urbanity. Accordingly, it has become a mandatory situation to look at cities from the perspective of smart transport, which is one of the sustainable transport policies.

The global logistics market size is calculated as USD 10.68 trillion in 2022. The development of the e-commerce industry has contributed to the development of the logistics sector. As the e-commerce industry has expanded, the demand for logistics services has also increased. In line with the increasing demand, the global logistics market size is expected to reach approximately USD 18.23 trillion by 2032 (GlobeNewswire,).

2. TURKEY TRANSPORT OUTLOOK

With the support of the US Marshall Aid and the establishment of the General Directorate of Highways in 1950, highways entered a state of rapid development. However, similar developments have not been experienced in other modes of transport. In passenger and freight transport in Turkey, road transport has increased every year and the share of passenger transport, which was 72.9% in 1960, increased to 94.8% in 1980. In freight transport, the shares were 37.8% in 1960 and 81% in 1980 (Republic of Turkey Ministry of Transport, 2005:13).

In order to partially shift this weight to other modes, the share allocated to railway investments has increased significantly in recent years. With the increase in investments in railways in order to create the most appropriate balance between transport modes, it is seen that the distribution of passenger and freight transport modes has changed positively for the projection years.

In the 10-year period, the contribution of the Transport and Warehousing activity area to GDP is around 8%. Since 2017, it is observed that the share of the Transport and Warehousing field of activity in GDP has increased and the transport sector, which increased its share in the economy in 2021, reached the highest rate of 8.8% in the ten-year period (UTIKAD, 2022: 41).

As the most preferred mode of transport in Turkey, international road freight transport is second only to international maritime freight transport in terms of value and weight. The reasons for the preference of road transport are the low investment cost and the possibility of uninterrupted transport between origin and destination points. Turkey is an important transit country due to its proximity to Asia, Europe and Africa. It is located at the centre of international transport corridors connecting Central Asia, the Caucasus and the Russian Federation to Europe. Turkey increases its importance thanks to its advantage of width on the east-west axis.

International road routes also provide connections to ports and border gates. As of 2021, 90% of freight transport in Turkey is carried out by road (TCDD, 2021:83)

As of 31 December 2022, the road network under the responsibility of the General Directorate of Highways is 68,700 km in total, of which 3,633 km (5%) are motorways, 30,954 km (45%) are state roads and 34,113 km (50%) are provincial roads. Of the total road network, 28,986 km (42%) are divided roads. While the length of roads in Turkey was 68,526 km in 2021, the length of roads under the responsibility of the General Directorate of Highways reached 68,689 km as of 1 January 2023.

Table.1 Imports by Mode of Transport, 2013-2024 (general trade system) Value: Thousand US \$)

Year	Total	Sea	Rail	Road	Air	Other
2024	26 218 363	13 905 086	159 078	4 876 448	3 105 019	4 172 732
2023	361 766 457	195 166 044	1 996 885	66 941 854	53 840 604	43 821 069
2022	363 710 575	193 796 320	2 967 903	59 447 025	38 582 413	68 916 915
2021	271 425 553	157 390 931	2 891 134	48 896 681	26 057 025	36 189 782
2020	219 516 807	114 838 355	2 144 863	41 883 477	39 260 478	21 389 634
2019	210 345 203	112 967 845	1 447 897	37 177 012	29 238 406	29 514 041

<https://data.tuik.gov.tr/Bulten/Index?p=Dis-Ticaret-Istatistikleri-Ocak-2024-53534>

According to the provisional foreign trade data produced in cooperation with the Turkish Statistical Institute and the Ministry of Trade within the scope of the general trade system, maritime transport ranked first in imports, while road transport ranked second. Railway transport has a share of less than 1% by weight in both imports and exports of Turkey in the last 10-year period. In the last 10-year period examined, the share of railway in imports has been in a continuous downward trend until 2017.

Table.2 Exports by Mode of Transport, 2013-2024 (General Trade System) Value: Thousand US \$

Year	Total	Sea	Rail	Road	Air	Other
2024	19 991 424	11 367 881	140 010	6 622 539	1 752 936	108 059
2023	255 538 193	143 226 221	1 960 107	83 132 697	25 508 659	1 710 510
2022	254 169 748	150 294 432	2 457 286	78 837 775	20 687 774	1 892 481
2021	225 214 458	133 714 269	1 648 442	68 749 376	18 735 586	2 366 785
2020	169 637 755	100 907 927	1 287 765	53 127 588	12 732 561	1 581 914
2019	180 832 722	109 114 264	971 021	54 461 860	14 849 231	1 436 347
2018	177 168 756	108 802 681	753 544	52 222 468	14 127 905	1 262 157

<https://data.tuik.gov.tr/Bulten/Index?p=Dis-Ticaret-Istatistikleri-Ocak-2024-53534>

According to the provisional foreign trade data produced within the scope of the general trade system in cooperation with the Turkish Statistical Institute and the Ministry of Trade, maritime transport ranked first in exports, while road transport ranked second. While the share of railway in export transport by weight was 0.63% in 2012, it was 0.77% in 2021 and 0.94% in 2022 with a slight increase.

It is observed that there are no major changes in the distribution of Turkey's foreign trade transports in terms of value according to transport types when the rates for 2021 and 2022 are compared.

3. ENERGY EFFICIENCY and ENVIRONMENTAL SENSITIVITY

Policies for increasing energy efficiency and environmental awareness are listed below:

- Increasing energy efficiency (use of regenerative energy, etc.) in railway transport,
- Increasing the number of electric and hybrid vehicles,
- Reducing the average vehicle age,
- Internalisation of external costs (traffic accidents, congestion, emissions and noise, etc.),
- Establishment of environmentally friendly railway freight terminals,
- Carrying out studies to prevent noise in railway vehicles.
- Providing incentives for the rejuvenation and development of the Turkish maritime fleet,
- Developing the necessary legal arrangements for the protection of natural resources, as there will be irreversible losses if our natural resources are not properly protected while developing our maritime industry,
- Preparation of all kinds of measures related to marine pollution within the legal framework,
- Development of measures and response plans that can be taken against radioactive pollution that may occur in the seas,
- Providing incentives for green port implementation and reducing the use of environmentally harmful machinery and equipment,
- Measures should be taken for low emission zone studies in the seas around our country.

At national, regional and local level, mobility strategies including sustainable, environmentally friendly, efficient, low emission and emission-free transport systems (electric transport vehicles, bicycle, pedestrian etc.) should be determined and their use should be encouraged.

Urban mobility indices should be determined according to the characteristics of the cities (such as geographical situation, population, economic situation, season, income level, vehicle ownership, distribution of trips according to types, current state of transport infrastructure, current state of public transport systems) and the aspects open to improvement should be identified and they should be encouraged to improve themselves accordingly. Ensure the widespread use of public transport by reducing the use of individual vehicles

The national roll-out of congestion charging, low emission zones, park and ride, public transport corridors, etc. should be encouraged.

A consensus should be reached on the principles of reducing oil dependency in transport (traditional fuel use), increasing the level of cost-oriented energy efficiency, mobility and efficiency due to the decrease in oil resources and environmental factors. Tüm lojistik araç ve ekipmanların modernizasyonu sağlanarak, araçların yaş ortalaması ve emisyonları dünya standartları düzeyine çıkarılmalıdır. Lojistik faaliyetlerde en az doğal kaynak kullanan ve en az atık oluşturan ürün, hizmet, süreç ve sistemler geliştirilmesine yönelik eko-inovasyon uygulamaları teşvik edilmelidir.

Within the scope of logistics centre planning, taking the loads out of the cities for the purpose of collection and distribution and allocating the existing lines for urban passenger

transport is another important issue that should be included in the list of priorities for investments. Planning freight transport from a single centre and covering periods of at least one year and including infrastructure maintenance and repair in these plans will enable all units to make preparations within these plans. Carrying out transport safely and with the foreseen delay times within the scope of these plans, and mutual sharing of the damages incurred in contrary situations will ensure the transition to a "customer oriented" system in freight transport. On the other hand, in order to develop freight transport, customer-specific tariff systems should be developed within the understanding of flexible tariff system, based on transport time, load quantity and distance rather than transport mode. This system should also include the ability to make multi-year agreements (Ministry of Transport and Infrastructure, 2053 Transport and Logistics Master Plan2022:27).

Intelligent Transportation Systems (ITS) are information communication based systems that include monitoring, measurement, analysis and control mechanisms with multi-directional data exchange between the user, vehicle, infrastructure and centre developed for the purposes of reducing travel times, increasing traffic safety, efficient use of existing road capacities, increasing mobility, efficient use of energy and reducing environmental damage. The aim of Intelligent Transport Systems is to increase road safety, road capacity, mobility, travel comfort and speed, while reducing the negative effects of transport on human, environment and energy resources, thus increasing the current and future efficiency of individuals and institutions.

CONCLUSION

Multimodal transport systems for efficient use of resources should be supported. Large ports should be connected to Organised Industrial Zones, logistics centres, mines and large enterprises by rail.

Rail transport should be improved, for example; making it compulsory to carry freight transport over 300 kilometres by rail, not charging SCT and VAT on energy resources used in railways, making it compulsory to carry some types of cargo that must be transported by railways, tonnage limitations for cargo to be transported by road, tightening of inspections.

The development of freight transport is related to the line capacity in terms of trains/day. The increase in this capacity depends on many parameters; factors such as line geometry, healthy infrastructure maintenance, quality of personnel and quality of towed and hauled vehicles come to the fore. In parallel with the increasing number of electrified lines, the traction of trains on electric locos should be emphasised. The widespread use of signalling and electrification will also have positive effects on freight transport.

Commercial speed on railways should be increased for freight transport and railway connection of our ports with neighbouring countries should be provided in order to improve transit transport.

A free, fair and sustainable competition environment should be ensured in railway transport, passenger and freight railway terminals should be brought to an adequate level and modernised. Railway facility network structure (in terms of location, size and function) should be restructured.

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