



---

## PRESENCE OF PORT SERVICES IN RAIL TRANSPORTATION IN TURKEY

**Selçuk DURANLAR**

[selcukduranlar@trakya.edu.tr](mailto:selcukduranlar@trakya.edu.tr)

*Trakya University,  
Edirne Vocational School of Social Sciences,  
TURKEY*

**Key words:** *Turkey, Railway, Load, Port*

**Abstract:** *As road transportation has reached its saturation point worldwide and environmental awareness has increased, railway transportation has started to be given more importance in the last 20 years. Among the modes of transportation, railway is the only mode of transportation that offers alternative solutions to basic problems such as traffic density, traffic accidents and the environment. More cargo and passengers can be transported by rail with less energy expenditure compared to highways. In this way, less greenhouse gas is emitted into the atmosphere.*

*As a regional hub between continents and located on the transit corridor of Europe, Asia, Africa and the Middle East, Turkey is in a position to become one of the world's most important logistics bases. It is among the countries that will benefit most economically from global developments in the sector. Turkey's global goals include consolidation of logistics services, scaling up and creating hubs for intermodal transportation on transport corridors passing through Turkey on the east-west and north-south axes.*

*As the most important infrastructure for maritime transportation, ports are the interface between land and sea. Developments in logistics and supply chain management have forced container terminals and lines to rethink the logistics process, creating the need for container ships with large carrying capacities and large transshipment centers. Despite the changing service concept, ports play important roles.*

*In this study, the railroad connections of Turkish ports are investigated.*

### **INTRADION**

Current economic development is highly dependent on natural resources, such as coal and oil. Punctual delivery of products is a key indicator of service performance in the production of natural resources. The production sites of natural resources are usually located far from densely populated places. In terms of logistics, transported products play an important role in the production of natural resources. However, railway transport declined constantly over the past decades. *European Commission Eurostat (2015) Energy, Transport and Environment Indicators— 2015 Edition. European Commission Eurostat, Luxembourg.* This decline is attributed to diverse reasons, such as unstable weather conditions, complex infrastructure, and bureaucratic inefficiency. *Finger, M. (2014) Governance of Competition*

*and Performance in European Railways: An Analysis of Five Cases. Utilities Policy, 31, 278-288. <http://dx.doi.org/10.1016/j.jup.2014.03.003>*

Investment in transport infrastructure is one of the policies for which the public sector maintains a leading role. Particularly since [1], which defined a new role of public investment as a driver of productivity and ultimately, of the competitiveness of any economy, complementary to the traditional Keynesian perspective based on demand. *D. A. Aschauer, "Is Public Expenditure Productive?" Journal of Monetary Economics, Vol. 23, 1989, pp.7-7-100. doi:10.1016/0304-3932(89)90047-0*

Transportation is a major part of economic activities, so many economists have paid their attention to its connection with economic growth. And the railway's role in economic growth has always been controversial. Some traditional economists stress that the railway has an unprecedented maximum capacity and has a great impact on all aspects of the economy. They attributes the impact of railways on economic growth to reducing transportation costs and expanding markets and stimulating the development of modern industries, such as coal mining, cast iron and machinery *Rostow, WW (1990) Economic Growth Theorists from David Hume to the Present. Oxford University Press, Oxford.*

Given the endogenous characteristics of railway transport, its scheduling suffers from the vulnerability of the transport process; thus, the delivery time of the cargo train is always out of control. *Dollevoet, T., Corman, F., D'Ariano, A. and Huisman, D. (2014) An Iterative Optimization Framework for Delay Management and Train Scheduling. Flexible Services and Manufacturing Journal, 26, 490-515. <http://dx.doi.org/10.1007/s10696-013-9187-2>*

The activities and operations carried out at any port depend largely on the type and volume of cargo being shipped. The operations related activities are the following: 1) Transportation 2) Cargo handling 3) Building/grounds maintenance 4) Chemical storage and handling 5) Fueling 6) Ship air emissions 7) Painting and paint stripping 8) Rail maintenance 9) Vehicle and equipment maintenance 10) Ship breaking, repair and maintenance Considering the variety of processes carried by ports and the potential to consume a huge amount of energy and emit large quantities of multi-media pollutants (solid wastes, liquid wastes, and air pollutants), there is a great need for a knowledge-based system to manage environmental affairs of ports around the world. This is particularly important as the mismanagement of port activities and related emissions/waste discharges can impact the community in the immediate vicinity (*AAPA, 2014*).

AAPA (American Association of Port Authorities) (2014). Trade and Economic Growth. <http://www.aapa-ports.org/Industry/content.cfm?ItemNumber=1024>

## **RAILWAY TRANSPORTATION**

In the early years of the Republic, railways were given due importance and turned into a state policy, and the railways inherited from the Ottoman Empire were nationalized. Between 1923 and 1950, a total of 3,764 km of railway construction was completed and the rate of use of railways in freight transportation reached 68%. After 1950, as a result of the post-World War II situation and Marshall Aid, highway-oriented transportation policies were implemented, and only 945 km of railway lines were constructed between 1951-2003, with an average of 18 km per year, and this transportation route was completely neglected.

11 ports have rail connections (Haydarpaşa, Derince, İzmir, Bandırma, Mersin, Samsun, İskenderun, Tekirdağ, Zonguldak, Yılport and Evyap) International transportation by rail in Turkey has increased in recent years. Reciprocal block freight trains are operated between Turkey-Europe, Turkey-Middle East, Turkey-Central Asia countries. The "Pakistan-Iran-Turkey Railway Line", which will make a significant contribution to the development of

the South Trans-Asia Railway Line, one of the transit corridors between Europe and Asia, will connect Pakistan and India to Europe, Middle East, Central Asia and China.

The total length of our Enterprise's conventional lines throughout the network is 9.158 km as 8.402 km for main lines, 756 km for second, third, fourth, fifth and sixth lines. The total conventional line length reaches 11.590 km by adding 2.432 km auxiliary track including 1.993 km station track and 439 branch lines to this line. The length of the Rapid line is 219 km and High Speed Line is 1.213 km. Total length of our railway lines is 13.022 with the Conventional and High Speed Lines.

Our lines are in line with international standards in terms of rail gauges and have a normal line gauge of 1.435 mm. 35.093 million gross tonne-km train traffic was produced in 2021 with an increase of 8% in comparison to 2020, on the TCDD railway infrastructure.

-Iskenderun Port: It has an important location in the north east of the Mediterranean Sea. It is a suitable port for transit cargo traffic to Middle Eastern countries.

- Bandırma Port: The port constitutes the connection pillar of the Marmara region to the Aegean and Central Anatolia. In cabotage transportation, it is a port where Ro-Ro ships carrying truck-weighted cargo with Istanbul connection are also served, and in the future, it will also serve train ferries carrying wagons between Tekirdağ / Bandırma.

- Derince Port: It is located in the Gulf of Izmit in the east of the Marmara Sea. In connection with the ports of Romania / Constanta and Ukraine / Ilyichevsk, train ferries are connected to this port by rail and sea, and wagon loading and unloading is carried out in the name of combined transportation.

-Samsun port It has a ferry bridge system that can serve sea-rail and road transportation between the Balkans, Northern Europe, CIS, Russia and Middle East countries. In the past, political developments in the countries bordering the Black Sea, the Iran-Iraq war and the instability in the Middle East have greatly damaged the transit freight transportation from this port to these countries. However, the history of this region seems to prove that there is potential for its future once again.

### **RAIL TRANSPORTATION SHARE IN OUR PORTS**

The share of railroad transportation at our ports with railroad connections is lower than the cargo handled at these ports. This situation is reflected as a result of the fact that the hinterland areas of the railway infrastructure connections were once confined to small areas. Since the final destination points of incoming and outgoing cargoes are short distances and the distribution network is multi-point in these areas, large cargo potentials cannot be captured on single lines. Therefore, road-dominated connections are effective. The fact that around 2.000 companies with 43.000 vehicles operate in international road transportation in Turkey, that the road infrastructure is more developed, and that nearly 50% of Turkey's exports are carried out by this mode, probably constitute another reason for this.

### **Turkish Port Capacities**

In recent years, the private sector has started to take an active role in port management activities in our country and the sector has been experiencing vitality. Turkish ports have started to come to the forefront in the Mediterranean corridor, where approximately 20% of the world's container traffic takes place.

With the decision of High Council for Privatization dated 30.12.2004 and numbered 2004/128, some of the ports operated by our Enterprise as Mersin, İzmir, Iskenderun, Samsun, Bandırma and Derince Ports, were included in the privatization process by the method of transfer of operational rights. In this scope, the operational rights of Mersin, Iskenderun, Samsun and Bandırma Port Enterprises were handed on for a period of 36 years and the operational rights of Derince Port Enterprise were handed on for a period of 39 years. As for

İzmir Port, with the decision of High Council for Privatization dated 03.02.2017 and numbered 2017/5, it was decided to be transferred to Türkiye Wealth Fund Management Co. and to be operated by TCDD until the completion of the transfer process to third parties. In the year of 2021, 2021 program was realised at the rate of 97% with the total handling of 9.933 thousand tonne in Haydarpaşa and İzmir Ports with a 12% decrease compared to 2020.

**Table.1. Capacity of Ports**

Ports	Ship Acceptance Capacity Ship/Year		Container Handling Capacity (1,000) TEU/ Year	Container Handling Capacity (1,000) Tonne/Year	Dry Bulk+Mixed Goods Handling Capacity (1,000)Tonne/Year	Storage Area (m <sup>2</sup> )	
	Passenger Ship	Freight Ship				Open Area	Closed Area
<b>Haydarpaşa</b>	<b>0</b>	<b>1.169</b>	<b>489</b>	<b>4.503</b>	<b>1.913</b>	<b>343.42</b>	<b>17.835</b>
<b>İzmir</b>	<b>900</b>	<b>2.767</b>	<b>1.165</b>	<b>11.300</b>	<b>1.369</b>	<b>635.00</b>	<b>25.805</b>
Total	<b>900</b>	<b>3.936</b>	<b>1.654</b>	<b>15.803</b>	<b>3.282</b>	<b>978.42</b>	<b>43.640</b>

Source: TCDD, Annual Report 2021

İzmir Port: The port has a large industrial and agricultural hinterland on the western shore of the Aegean Sea and is noteworthy because İzmir is the third largest city in the country. It is also an important export port in addition to imports.

Haydarpaşa port It is located on the Anatolian coast of Istanbul, which has a large hinterland in terms of industry and industry of our country. It has an important water transit route covering the Black Sea and European countries. The port has two ferry stations for ferries running between Haydarpaşa and Sirkeci

**Table. 2 Loading and Unloading Activities in Turkish Ports in 2020-2021 (Thousand Tons)**

		<b>2020</b>	<b>2021</b>
<b>HAYDARPAŞA</b>	LOADING	357	325
	DRAINING	441	392
	TOTAL	798	717
<b>İZMİR</b>	LOADING	5.188	4.654
	DRAINING	5.247	4.562
	TOTAL	10.435	9.216
<b>TOPLAM</b>	LOADING	5.545	4.979
	DRAINING	5.688	4.954
	TOTAL	11.233	9.933

Source: TCDD, Annual Report 2021

Regarding the amount of loading and unloading according to the regimes; export tonnage was decreased by 10% and import tonnage as decreased by 13% in 2021 compared to 2020 and the total tonnage amount has decreased by 12%, from 11.233 thousand tons to 9.933 thousand tonne.

The Black Sea Region constitutes an important supply in the development of rail freight transportation and logistics sector. Samsun and Trabzon ports, the newly opened Gelemen logistics village, and the Karasu port, which is under construction, together with other ports in the region, keep the advantages of their geographical location alive in combined transportation.

The EU-funded TRACECA: "Europe, Caucasus, Asia Transport Corridor" is a project that emphasizes the importance of railroads in Northern Europe and the Middle East. In this parallel, the Samsun-Sivas railway connection function is available, and the Trabzon-Erzincan railway infrastructure connections to be created will further strengthen the region. A Bogie changing station is currently being set up in Samsun port in this context (39 technical assistance projects worth 57.4 million Euros and 13 investment projects for rehabilitation worth 52 million Euros have been financed).

Western Region; Marmaray, which connects the west of Turkey to the east, more precisely Europe to Asia, will significantly increase the development of the logistics sector by providing very important developments in rail freight transportation. Because the most important time losses in transshipment and transit-related transportation at the Bosphorus crossings will be eliminated. Wagons that will pass north of the Black Sea via Central Europe will prefer to pass through the Bosphorus because it will be more advantageous.

The fact that the Thrace Region has a border with Europe, the Muratlı - Tekirdağ railroad connection and the sea connection will make this region very attractive for the logistics sector. European cargoes can be sorted in this region and transported to the final destination by block trains, and by using the ports in the region, overseas transit cargoes will meet with ships and rail-sea rail combined transportation will be realized. With the start of train services between Derince and Bandırma Ports connected to Tekirdağ, internal transportation for domestic demand can be carried out as well as transit freight transportation will be more prominent and the rail-sea road infrastructure connections of our ports will be supported to a great extent.

With the process of globalization and transition to the information society in the world, competition is increasing and the differences in development between countries are becoming more apparent with the influence of global forces. With increasing competition and the human development approach of the information society, human, environment, R&D, innovation, sustainability, resource management and institutionalization constitute the dynamic elements of industrialization and development in terms of countries, regions and enterprises, and new policy searches in development come to the agenda. The transition from national development to local development understanding in the globalization process increases the search for micro solutions. In the maritime economy, one of the new models that has found an application area with the consideration of the multiplier effect of ports in the development of the region and the country is the Port Centered Logistics formation. Port Centered Logistics applications will clearly contribute to the country and regional development process in the direction of institutionalization, system, productivity increase, increasing returns, economies of scale, cost minimization, and can be considered as a new, modern approach that brings system definition from the traditional management approach in ports. In the process of global change and transformation, the increase in international trade, increasing demand, industrialization and urbanization phenomenon increase the need for Port Centered Logistics formation (Esmer 2022:33).

## **PORT ASSETS**

The total of Tanker, Bulk, Container, Dry Cargo, Passenger ship types, which constitute 90% of the world merchant fleet in terms of DWT, increased by 2.9% in 2021 compared to the previous year and reached 1,882,784 DWT. Greece, China and Japan continue to have the world's largest merchant fleet in terms of capacity. They control about 48.6% of the world tonnage. Panama continues to be the country with the largest registry in the world with 343 million DWT and 6,657 vessels. Liberia with 327 million DWT is followed by Marshall Islands with 282 million DWT.

In 2021, the number of ships calling at Turkish ports increased by 4.9% compared to 2020 and reached 51,199. The number of foreign flagged vessels increased by 7.4% compared to the previous year, while the number of Turkish flagged vessels decreased by 0.7%.

**Table.3. Distribution of Cargo Types Handled at Turkish Ports (Tons)**

	Dry Bulk Cargo	General Kargo	Liquid Bulk Cargo	Container	Vehicle	Total
<b>2018</b>	133.653.221	63.977.765	139.717.069	114.231.465	8.574.040	460.153.560
<b>2019</b>	150.344.563	52.672.991	155.253.914	118.768.010	7.128.934	484.168.412
<b>2020</b>	164.479.123	54.627.400	146.652.396	121.710.948	9.172.785	496.642.651
<b>2021</b>	170.629.055	61.462.127	150.531.376	131.859.620	11.824.606	526.306.784
<b>2022</b>	165.295.741	64.567.384	171.201.149	130.244.809	11.301.200	542.610.283

Source: <https://www.turklim.org/sector-istatistikleri/>

In Turkey, liquid bulk cargoes accounted for 31.5% of total cargoes by ton weight. Dry bulk cargoes accounted for 30.4% of the total. Containerized cargoes ranked third with 24%. The worldwide trend is valid here. The total decrease stemmed from the decrease in dry bulk cargo.

The data on the amount of cargo handled in ports in February 2023 is as follows; The total amount of cargo handled in ports decreased by 10.9% compared to the same period of the previous year and amounted to 37 million 994 thousand 576 tons. In December 2022, 9.8% of the 809 thousand 259 TEU containers subject to foreign trade handled in our ports were carried by Turkish flagged ships.

**Table.4 Regional Distribution of Containers Handled at Turkish Ports (TEU)**

	Marmara	Akdeniz	Ege	Karadeniz	Toplam
<b>2018</b>	6.843.524	2.365.581	1.555.613	79.282	10.844.000
<b>2019</b>	7.159.361	2.685.110	1.674.159	73.209	11.591.839
<b>2020</b>	7.034.053	2.768.691	1.711.906	112.000	11.626.651
<b>2021</b>	7.670.831	2.902.350	1.905.742	112.545	12.591.469
<b>2022</b>	7.414.283	2.788.227	1.894.085	118.673	12.215.269

Source: <https://www.turklim.org/sector-istatistikleri/>

The Marmara Region ranks first in container handling, accounting for 60.69% of the total. The importance of the region is increasing day by day.

In February 2023, the amount of loading for export purposes decreased by 22.2% compared to the same month of the previous year and reached 8 million 950 thousand 650 tons, while the amount of unloading for import purposes decreased by 5.3% compared to the same month of the previous year and reached 18 million 601 thousand 228 tons. In February 2023, foreign trade transports decreased by 11.5% compared to the same month of the previous year and reached 27 million 551 thousand 878 tons.

## CONCLUSIONS

Due to reasons such as the high infrastructure and operating costs of port management and the lack of widespread and insufficient private capital, the operation process in our ports has started to be carried out by the state. We also add legal reasons to this. Large publicly owned ports belong to TCDD and TDI, which are state-owned enterprises.

Considering that it should have all modes of transportation due to its geopolitical location, it is too late to make infrastructure investments.

Logistics services in Turkey need to be established efficiently with which modes of transportation and infrastructure. The presence of railways, which is an environmentally friendly transportation mode, should be increased.

In short-distance freight transportation in Turkey, port back areas need micro logistics centers to be established close to production areas. Therefore, they should be connected by rail. Analyses related to freight transportation should be made in determining priorities in public transportation investments. The likely outcome of these analyses will be to increase the share of railroad transportation in total transportation. New railway connections must be built.

Qualified investments in ports should be determined according to the characteristics of the ports in terms of container and other cargoes. Ports that are squeezed into the city should be saved from this situation.

### REFERENCES

- [1] AAPA (American Association of Port Authorities) (2014). Trade and Economic Growth. <http://www.aapa-ports.org/Industry/content.cfm?ItemNumber=1024>
- [2] Esmer S., Oral E.Z., Tunç M., (2022)“LİMAN MERKEZLİ LOJİSTİK (LML): TÜRKİYE LİMANLARI DEĞERLENDİRMESİ” 11. Uluslararası Lojistik ve Tedarik Zinciri Kongresi, Bildiri Kitabı, s:32-41
- [3] European Commission Eurostat (2015) Energy, Transport and Environment Indicators—2015 Edition. European Commission Eurostat, Luxemburg.
- [4] Finger, M. (2014) Governance of Competition and Performance in European Railways: An Analysis of Five Cases. *Utilities Policy*, 31, 278-288. <http://dx.doi.org/10.1016/j.jup.2014.03.003>
- [5] Dollevoet, T., Corman, F., D’Ariano, A. and Huisman, D. (2014) An Iterative Optimization Framework for Delay Management and Train Scheduling. *Flexible Services and Manufacturing Journal*, 26, 490-515. <http://dx.doi.org/10.1007/s10696-013-9187-2>
- [6] D. A. Aschauer, “Is Public Expenditure Productive?” *Journal of Monetary Economics*, Vol. 23, 1989, pp.7- 7-100. doi:10.1016/0304-3932(89)90047-0
- [7] Rostow, WW (1990) *Economic Growth Theorists from David Hume to the Present*. Oxford University Press, Oxford.