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RAILWAY GROWTH AND DEVELOPMENT: TURKEY'S FAST TRACK TO THE FUTURE

Rosanne M. Leith



Introduction

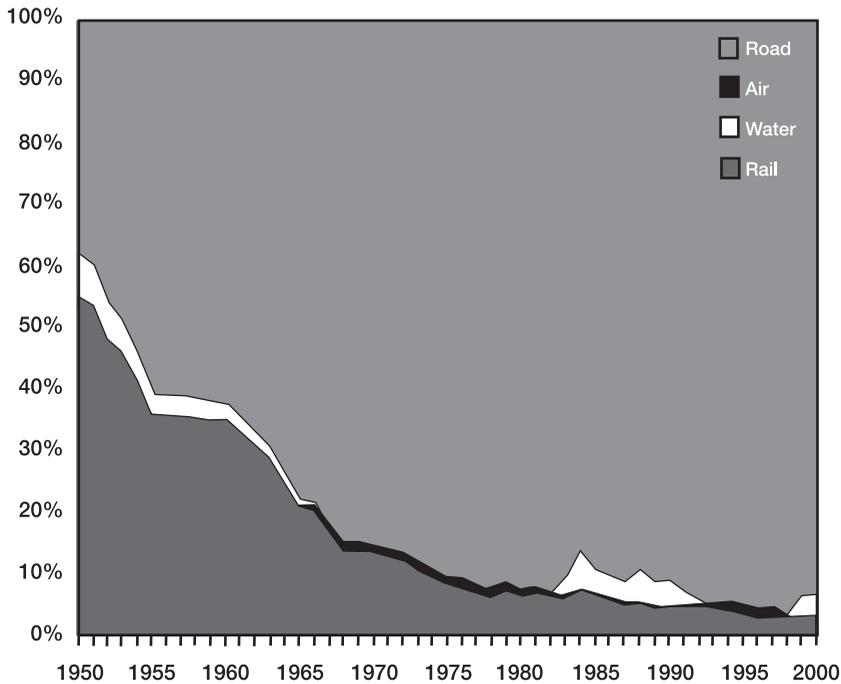
Just out of sight, waters rushed between the steep banks of the Bosphorus, running swiftly from the cold waters of the Black Sea to the warm waters of the Mediterranean. The skyline of Istanbul pressed up on either bank, straddling the historic divide between Europe and Asia. Below me opened an enormous pit: the dig site for what has been hailed as one of the engineering marvels of the century. The Marmaray Project has captivated the imaginations of the Turkish people and the rest of the world with the construction of the world's deepest sunk tunnel, which will house railroad lines running below the Bosphorus. The Marmaray project will realize a century-old dream of crossing the continental divide with a continuous railroad link.

While the Marmaray Project has received considerable attention by the international community, it is only one of numerous railroad infrastructure development ventures that Turkey has undertaken in recent years. Rail-

roads, considered a technology of the twentieth century, are the new hope for Turkey to catapult itself onto the global scene, serving to establish itself as a transportation superpower and securing its place as a vital artery between the East and West. Turkey has taken many strides to realize its transportation goals; however, continued dedication to the expansion and improvement of the railroad network is crucial to Turkey's economic and social development.

While railroad advancements have been a recent cause for attention, rail has had a long history in Turkey, the roots of which have been developed gradually over the last century. In this article I provide a brief overview of the emergence and growth of Turkey's railroads, followed by a discussion of its plans for the future. I then examine the potential benefits that railroad expansion could offer Turkey from both a domestic and an international perspective. This analysis is followed by a discussion of the possible obstacles that may stand in the way as Turkey seeks to bring its transportation vision to fruition.

Figure 1
Transportation Market Shares*
1950–2000



*The narrow black line separating road transport and water transport indicates the small share of the market attributed to air transport. From approximately 1965 to 1980 and again from 1990 to 1998, the contribution of water transport appears to disappear. At these times, the share of the market held by water diminishes to a fraction of a percent.

Source: Audigé, “Turkish Railway Restructuring Program.”

Turkey’s Railroads: Yesterday and Today

The construction of Turkish railroads began in 1856 while Turkey was a part of the Ottoman Empire. Of the 5,300 miles of railroad constructed for the empire, more than 2,500 miles were built within the boundaries of what would become the Republic of Turkey in 1923. The public railways that were built connected several major international population centers, with the primary goal of strengthening political connections between vital regions in the empire. Other railroads were constructed by private companies to link growing manufacturing cities and thus promote the efficient transport of goods and raw materials.

The dissolution of the Ottoman Empire and formation of the Turkish Republic in the aftermath of World War I gave way to a golden

age for railroads in Turkey. The State Railways of the Republic of Turkey (TCDD: Türkiye Cumhuriyeti Devlet Demiryolları) was founded as a subsidiary of Turkey’s Ministry of Transportation (the government body that oversees all of Turkey’s transportation modes) following the nationalization of railroads in 1924. The TCDD’s main charge is the organization and management of railroad operations. Under the TCDD’s guidance, Turkey constructed approximately 80 miles of railroad per year from 1924 to 1950. (“Rail Projects in Turkey,” p. 5) This construction improved and expanded rail networks between important Turkish cities that had been viewed as a lesser priority in the larger scope of the Ottoman Empire. However, investments in the new construction and maintenance of railroads gradually declined as the automobile industry expanded greatly in the 1950s (Figure 1).

Between 1950 and 2003, Turkey built an average of only 6 miles of railroad per year, and many existing tracks fell into disrepair. (“Rail Projects in Turkey,” p. 5) By the new millennium, the tables had tipped enormously in favor of road transportation. Turkey’s reliance on railroads had decreased from 55 percent to 4 percent of total transportation usage while its reliance on road transport had increased from 37 percent to 93 percent. (“Turkey — Development Projects”)

Turkey’s unbalanced dependence on highway transportation has prompted the birth of a new railroad era in recent years. The renewed attention to railroad development has been fueled by concerns about intense traffic congestion, safety, environmental sustainability, a steadily increasing transportation demand (eight percent annually since 1950), and requirements for EU accession. (“Turkey — Development Projects”) Since 2002 the TCDD has adopted a radical new plan and has laid out a framework to update and expand railroad infrastructure throughout the country. The multifaceted plan targets the revival of old routes, capacity and convenience improvements to urban networks, the construction of high speed routes between major population and industry centers, and the completion of a continuous rail network linking Europe and Asia.

Since 2003 the government has invested \$6 billion in the TCDD, but officials estimate that a total investment of \$20 billion over the next ten years will be required to make essential improvements to railroad infrastructure. (“Rail Projects in Turkey,” p. 5) An investment of that size could yield substantial social and economic benefits for Turkey and its people. Additionally, such an investment would make Turkey an invaluable participant in the international community by helping to establish better political, social, and economic ties with its surrounding countries.

Structuring Turkey’s Railroad Reform

Turkey began its railway reform in 2002; and while its improvement efforts saw some success, Turkey soon recognized the need for outside assistance. In 2005 the World Bank became the major advisor and financier behind Turkey’s railroad improvement efforts. To organize and

monitor its investment, the World Bank has developed a plan with the help of the TCDD. The plan arranges the funds provided by the World Bank into a two-phased Adaptable Program Loan (APL). APLs are a popular instrument used by the World Bank to help countries with long-term investment projects. They allow for smaller initial commitment fees, realistic project phasing, and the flexibility to handle difficult organizational changes. Turkey’s first APL (APL1) was instituted in 2005 (and updated in 2009) and has an estimated cost of \$194.9 million. The World Bank will provide \$143.7 million of the total, and other funding will be provided by the Turkish government and private investors. (“Railways Restructuring Project,” 2009, p. 2) The development components that comprise APL1 include the modernization and capacity improvements to Turkey’s most active railroad lines, organizational adjustments to the TCDD staff intended to promote efficient operations, and efforts to better public relations. (“Railways Restructuring Project,” 2009, p. 2) Since the APL1 was first adopted, Turkey has used the investment to further its objectives in many ways, as I explain in the subsequent paragraphs.

The initial upgrade effort began with a plan to continually improve the efficiency and capacity of the existing lines. Before improvements began, much of the Turkish rail network was single track, and only 20 percent of track was electrified. Freight train systems were the most direct beneficiaries of this plan, being the first to see such improvements as track electrification, signalization, and the purchase of modern trains. The TCDD also plans to expand the freight network by adding approximately 1,250 miles of track from 2009 to 2013 that will include cities (especially in the Eastern provinces) that were previously excluded from the railroad network. (“TCDD – Foreign Affairs”) The cities would then be provided with an inexpensive means of transporting goods to the more densely populated Western regions. Additional access to the West is anticipated to promote the industrial development of the East. Turkey’s full vision for railroad expansion will not come to fruition, however, for many years. At the Ministry of Transportation’s 2009 summit meeting, officials identified numerous strategic goals including expansion plans that continue until 2035. These plans include the

addition of 1,850 miles of high speed rail and 598 miles of conventional rail to the network between 2023 and 2035. (“TCDD – Foreign Affairs”)

The investment in the physical development of Turkey’s railroads has not gone without a keen eye toward administrative shortcomings that have hindered the industry’s growth in the past. The organizational changes outlined in APL1 seek to improve the TCDD’s operational efficiency. Historically, the TCDD has used its monopolistic control of the railways to conceal its weak financial condition and poor network maintenance policy. The TCDD’s revenues have failed to cover even its payroll, much less other operating expenses, in recent years. With no internally generated revenue available to reinvest in network expansion, most expansion has been driven by government funding. Additionally, Turkish trains are notoriously slow and inadequately maintained. The TCDD’s poor maintenance record has not only discouraged the use of trains by potential customers, but has also led to serious safety concerns. In 2004 Turkey’s most severe train derailment occurred, killing 36 people and injuring 81. (“Railways Restructuring Project,” 2005, p. 2) While this accident claimed more lives than other rail accidents, the TCDD’s recent history has been dotted with numerous accidents that have brought the TCDD’s commitment to safety into question. A full reorganization of the railroad administration is expected to alleviate these problems by promoting streamlined operations, a safe maintenance policy, and strategic expansion planning. The most prominent component of the reorganization effort is the creation of a subsidiary company called Detas (Turkish Railway Transport) to manage freight and passenger train operations. (“On the Fast Track to Reform”) The establishment of Detas will allow the TCDD to focus solely on infrastructure improvement and development. Additionally, the Ministry of Transportation is organizing three committees to monitor competition, supervise development, and handle safety concerns. The increased industry oversight and balance of power provided by these new committees will allow for healthy growth. Administrative changes to the TCDD have begun already and will continue in coming years. While it is more difficult to

measure the impact of changes made in its staffing and strategic planning sectors, improvements in these sectors are vital for giving Turkey’s railroad industry the administrative base it needs to increase and sustain its profitability and viability in the future. The improvements Turkey is making today will increasingly lead the railroad industry toward a more modernized structure that will not only be beneficial to the network’s users, but will also push Turkey closer to fulfilling EU accession criteria. Once the World Bank feels that both infrastructure and administrative improvements have reached acceptable levels, the second APL (APL2) will be triggered.

APL2 includes less specific objectives than APL1 that will allow for broader reform of the TCDD and the railroad industry as a whole. Policy makers designed APL2 to provide the financial and advisory support needed to build on the advancements made during APL1 as well as to make continued railroad building sustainable for the future. (“Railways Restructuring Project,” 2009, p. 2) The cost of APL2 has not yet been determined as a more detailed objective description will only be available once further progress has been made on APL1 (triggering APL2). The following sections describe the most important projects that have commenced as part of APL1 since its adoption in 2005. The discussion includes the benefits that the completion of these projects will offer Turkey both domestically and as a participant in the international community.

The Future of Railroads in Turkey

Domestic Benefits

In the short term, the expansion of the freight rail industry will encourage the balancing of transportation modes for goods and raw materials. Heavy reliance on road transportation for product movement in recent decades has caused traffic congestion, overburdening of the road system, and pollution problems. While road transport undoubtedly allows for the most convenient method of door-to-door transport, rail transportation remains the most cost-effective option for moving goods and raw materials over long distances. Despite its advantages, freight rail transportation

remains underutilized due to the decaying condition of the tracks and its reputation for being slow and unreliable. A limited selection of routes, frequent derailments, and outdated technology have all but pushed railroads out of the transportation market. These shortcomings have caused the TCDD to experience the largest financial losses of any of Turkey's public sector enterprises in recent years. In 2004, the TCDD's losses reached \$783 million. ("Railways Restructuring Project," 2005, p. 2) However, from 2002 to 2007, freight railroad's share of transportation rose by 46 percent. ("Rail Projects in Turkey," p. 5) This shows that businesses are eager to take advantage of improvements to existing tracks and new routes laid since the railroad revitalization movement started in 2002.

An important benefit of expanding railroad networks is increasing the number of locations that have access to an inexpensive means of transporting goods over long distances. This is particularly vital to Turkey's development because it will stimulate industrial development in regions that have previously lacked access to consumers in other regions. Industrial development, especially in rural areas, would also serve to combat the uneven distribution of wealth and population that has plagued Turkey for decades. The vast majority of Turkey's urbanized areas are concentrated in its westernmost regions. ("Joint Poverty . . .," p. 31) The Eastern regions (especially the Southeastern regions) are mostly enormous expanses of rural landscape, punctuated by small farming towns. The large population concentration in the West is accompanied by a large concentration of wealth. According to "Turkey's Statistical Yearbook 2008," the average income for Turks living in urban areas is more than double that of Turks living in rural areas. (p. 352) Better access to Western cities provided by the development of freight transportation systems will help to slow the growing population density problems in the cities while promoting industrial development in rural areas in the East. Industrial development would bring more job opportunities to Eastern regions, causing the growth of existing cities as well as the formation of new cities.

Continued increases in freight rail usage promise benefits for Turkey's environment

and fuel dependency as well. Trains are from four-to-seven times more fuel efficient than trucks, so moving even a small percentage of the volume of goods now transported by trucks to trains would significantly reduce the quantity of oil consumed. In Istanbul alone, traffic congestion costs the city just under a billion dollars in fuel annually. (Ergün) Reducing the number of personal cars on the road would also be a major benefit for Turkey, which imports 90 percent of the oil it consumes. ("Rail Projects in Turkey," p. 5) Like many countries, decreased dependency on foreign oil will serve to aid Turkey's domestic and international development.

The current passenger rail system also requires improvements to make it an effective, attractive option for public use. To address this problem, the TCDD's plan includes extensive high speed rail construction to connect major cities. High speed rail promises to be the fastest mode of transportation between cities; trains that can travel up to 155 miles per hour (mph) would make the trip from Ankara (the capital city) to Istanbul in just three hours. This would be a major improvement over traditional modes of transportation in terms of time and cost. Driving takes five to six hours; and, although air transportation takes only one hour of flying time, the actual travel time between cities can be four to five hours. The TCDD also plans to include connections to the major industrial cities of Izmir and Konya. Easier access to these cities will encourage the movement of people between Middle and Western Anatolia.

The new focus on railroad development could not have come at a more critical time. In the wake of a growing middle class, automobile ownership in Turkey has increased radically. In Istanbul alone, a city of 12.8 million persons (Istanbul Municipality Populations 2009), 800 cars are added to the road each day. (Ergün) When it comes to moving within and between cities, Turks have few options but to use the roadways via intercity buses or passenger cars. Inconvenient access and underdeveloped passenger train systems have discouraged the use of urban rail, and the intercity rail lines have been notoriously slow. The increased dependence on personal transportation has led to a rapid rise in rush hour con-

gestion and limited access between cities. Additionally, gasoline prices have remained prohibitively high, reaching over \$11 per gallon in 2008, the highest in the world. ("Think Gas Prices Are High? . . .") Although the use of personal automobiles has risen dramatically, the number of car owners per 1,000 people in Turkey still remains far below the average of European countries. Expansion of the passenger rail systems could therefore provide a much needed change of direction before an even wider distribution of car ownership is realized. As car ownership becomes increasingly common, pollution and congestion problems will only intensify. Providing Turks with reliable rail travel as an alternative to personal cars would encourage the shift to a more sustainable form of transportation. The impact of improved rail travel is already being realized. Similar to the results seen in the freight networks, recent improvements to passenger rail networks have resulted in an 11 percent increase in use from 2002 to 2007. ("Rail Projects in Turkey," p. 6)

Rail networks within urban centers have also been a source of concern for the TCDD. Currently, the TCDD has plans to modernize transportation systems in 17 major cities. The most prominent of these is the Marmaray project in Istanbul. This multibillion dollar project seeks to connect the two halves of Istanbul with a submerged tunnel beneath the Bosphorus Straits. Being called the world's most challenging tunnel project, the system when completed will carry 75,000 passengers per hour, increasing the percentage of commuters using rail from the current 3 percent to 27 percent by 2025. ("Marmaray Project") The system will reduce congestion on the main roadway arteries while simultaneously decreasing pollution and increasing road safety.

The increased utilization of passenger trains is expected to have several social benefits as well. First, it will increase the movement of people between cities. This will in turn promote the exchange of ideas, cultures, and goods, all of which are important to the economic and social development of the country. It is also anticipated that if the problems of slow speed, inadequate station access, infrequent service, and relatively higher cost of passenger rail use are alleviated, young people in rural areas will be more likely to pursue a college edu-

cation in cities. The combination of industrial development in rural areas and an increasing number of students furthering their education will pay significant dividends toward Turkey's advancement as a global participant.

International Benefits

The expansion of freight and passenger railroad networks also has the potential to benefit Turkey on the international level. As the most direct link between Europe and Asia, Turkey finds itself in an advantageous location between net exporting countries (the Middle East and Asia) and net importing countries (Europe). This unique position gives Turkey the opportunity to act as a major transportation hub, one which is faster than alternate routes that may go through countries to the north or the south. Unfortunately, the current status of railroad networks in Turkey discourages international use. New routes and existing route improvements would undoubtedly further Turkey's role in international transportation as a regional hub in trade, tourism, and services. An influx of freight and travelers across Turkey's borders will spur activity in many related industries (such as minerals and raw materials, agricultural goods, packaged food products, heavy machinery and parts, white goods, and textiles, as well as tourism), thereby creating new jobs for Turkish citizens and providing new sources of government revenue.

As already noted, the Marmaray Project will connect the two separate railway networks on either side of the Bosphorus. The link will reduce the bottleneck that has limited the movement of people and goods between Europe and Asia. As it stands, the Bosphorus can now only be crossed by bridge or ferry. Freight trains seeking to move between the continents must unload their cargo on one side of the Bosphorus, transport it across the water via bridge or boat, and then reload it onto trains on the opposite side. This inefficiency has not only discouraged the use of railroads, but has also caused neighboring countries to avoid transporting goods across Turkey's borders by rail. During the day, the Marmaray tunnel will be used for commuter traffic, but it will open from midnight to 6:00 a.m. to allow for freight train

access. In 2008 the transportation of international goods accounted for 14 percent of Turkey's freight transportation. ("Annual Report 2008") Removing the bottleneck in Istanbul, along with the previously mentioned infrastructure improvements planned for the entire country, would greatly expand Turkey's role in international transit.

Other projects throughout the country have also gradually improved Turkey's access to neighboring countries, especially in the East and Northeast. Turkey's railroad network is the final link that will complete the most direct railroad route between Asia and Europe. On the European side, railroad lines are planned to connect the westernmost rail lines of the Marmaray Project to European railroad networks through Greece and Bulgaria. On Turkey's eastern border, construction started in 2007 on the Baku-Tbilisi-Kars (BTK) railway that will link Azerbaijan, Georgia, and Turkey. The railroad will then continue on through Iran, eventually terminating in China. This route, coined the "Iron-Silk Road," will provide a continuous railroad network connecting Europe to the Far East, reviving the historic Silk Road trade route.¹ This advantageous connection to the Far East will undoubtedly attract the attention of Western European countries as they seek the most direct access to Asian exports. Officials at the TCDD have predicted that the Iron-Silk Road will contribute nearly \$12 billion to TCDD revenues in its first year of operation. ("TCDD – Foreign Affairs") As Turkey's railroad industry develops its reputation as a reliable, economical link between continents, it has significant potential to become one of the most profitable government funded entities, rather than the least profitable.

A Bumpy Road to Come: Impediments to Railroad Development

The realization of Turkey's railroad expansion and improvement efforts promises substantial benefits for the country. The plan, however, will not be simple to complete. Many

¹Used as early as the third century, the Silk Road refers to a network of trade routes connecting China to the Middle East and Europe. Its name, coined in 1877 by German explorer Baron Ferdinand von Richthofen, is in reference to the lucrative Chinese silk trade. (Wood, p. 9)

improvements have already been made, but much more investment is yet needed. As the global recession continues, funding becomes more difficult to obtain.

One of Turkey's largest sources of external funding is the European Union. Transportation is one of the five major negotiation issues for EU accession, and railway development offers an environmentally-friendly approach to encourage the movement of goods and people. While Turkey remains far below the European average for railroad density,² EU officials are seeking Turkey's commitment to close that gap. If EU assistance slows due to the global economic crisis, Turkey will need to shoulder more of the financial responsibility. While the completion of the system will no doubt pay large dividends, the initial investment required for infrastructure development is substantial and quite possibly prohibitive for Turkey without significant external assistance.

As discussed previously, the TCDD's poor management practices have inhibited growth and profitability. Like many government-funded entities, the TCDD has had little incentive to make sound business decisions because it is not governed by forces of market competition as is a privately owned organization. The TCDD has a long history of running unprofitable lines, failing to cut costs, and maintaining a poor organizational strategy. Since 2002, however, the TCDD has begun to make gradual changes. It has cut its work force from 40,000 in 2004 to 27,000 in 2008. Also, the TCDD has begun to respond to consumer demand forces rather than following a political agenda. Much of its new responsiveness to consumer demand can be attributed to its taking of periodic customer surveys that focus on customers' experiences with railroad use and suggestions for improvements. Fulfillment of the EU's accession requirements for transportation also requires several major changes to the TCDD's current operations, including more detailed bookkeeping to identify the major cost centers in the TCDD's operations, and the separation of passenger and freight entities. These changes will increase effi-

²Railroad density is a measure of the concentration of railroads in a country or region. It is calculated as the total length of railroad infrastructure per 1,000 inhabitants. ("Eurofound: Info for Indicator — Railway Density")

ciency and allow strategic network expansion decisions to be made on the grounds of more accurate information. TCDD officials anticipate that the plans to improve railroad operational efficiency will be successful and insist that there are no plans at this time to privatize any railroad lines. ("Marmaray Project") However, if the plans prove unsuccessful, at least a partial privatization of the railroad industry may be in order.

Conclusions

On the brink of flexing its muscles as a strong player in the world economy, Turkey has many difficult decisions to make in terms of furthering its economic growth and promoting social development. The EU accession process has prompted Turkey's recent focus on transportation improvement, specifically on the development of the railroad sector. However, the benefits of railroad expansion and improvement in Turkey stretch far beyond meeting EU accession criteria. They have the potential to greatly impact all facets of life in Turkey, from industrial development to social policy to Turkey's role in the international community. With the guidance and support of the World Bank, Turkey has undertaken one of the most extensive infrastructure development projects since the found-

ing of the Turkish Republic, seeking to raise its railroad network to meet modern standards after more than 50 years of neglect. A combination of upgrading existing track and building new freight and high speed track will make the system much more attractive to both passengers and shipping companies. In addition, international trade through Turkey's borders will be revitalized as the reputation of Turkey's railroads becomes one of reliability, efficiency, and economy. Despite the considerable benefits that lie in store for Turkey if these improvements come to fruition, the commitment to continued railroad development will be challenging. The realization of a fully modernized system will take continual work over most of the next two decades, upwards of \$20 billion in funding, and significant managerial changes to combat the inefficiencies that have hindered Turkey's railroad development in the past. The alternative, however, to making this commitment is a dangerous complacency that will leave Turkey lagging behind the rest of the world. Turkey must invest in its railroads continually and strategically, not just over the next few years, but also into the foreseeable future. It is one of the most important steps Turkey must take if it wishes to achieve the sustained economic and social development it needs to enter the ranks of world powers.

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