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Synthesis Report

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EUR 1.00 = TL 2.3210

Abbreviations

BEEPS	**Business Environment and Enterprise Performance Survey**	**PEFA**	**Public Expenditure and Financial Accountability**
BOT	**Built Operate Transfer**	**PFMC**	**Public Financial Management and Control**
CGE	**Computable General Equilibrium**	**PFMP**	**Public Financial Management Performance**
CPI	**Consumer Price Index**	**PPP**	**Public Private Partnership**
DHMI	**State Airport Authority**	**PSO**	**Passenger Service Obligation**
ECMT	**European Conference of Ministers of Transport**	**QTTI**	**Quality of Trade and Transport Infrastructure**
EBRD	**European Bank for Reconstruction and Development**	**SOE**	**State Owned Enterprises**
EU	**European Union**	**SPO**	**State Planning Organization**
GDP	**Gross Domestic Product**	**TCDD**	**Turkish Railways Company**
GFS	**Government Finance Statistics**	**THY**	**Turkish Airlines**
CGAR	**Compounded Average Growth Rate**	**TINA**	**Transport Infrastructure Needs Assessment**
HAVAS	**Turkish Airport Ground Handling Services Inc.**	**TOR**	**Transfer of Operating Rights**
HRS	**High Speed Train**	**TPER**	**Transport Sector Public Expenditure Review**
ITF	**International Transport Forum**	**TUDEMSAS**	**Turkish Railway Machines Industry Company**
KGM	**General Directorate of State Highway**	**TUIK**	**Turkish Statistical Agency**
KHBS	**Public Accounting System**	**TULOMSAS**	**Turkish Locomotive and Engine Industry Company**
LPI	**Logistics Performance Index**	**TUVASAS**	**Turkish Wagon Industry Company**
MENA	**Middle East and North Africa**	**USAS**	**Turkish Plane Services Inc.**
MOF	**Ministry of Finance**	**WCR**	**World Competitiveness Report**
MOT	**Ministry of Transport and Communication**	**WDI**	**World Development Indicator**
NUTS	**Nomenclature of Territorial Units for Statistics**	**WDR**	**World Development Report**
OECD	**Organization for Economic Co-operation and Development**		

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Table of Contents

Executive Summary ..... **i**

Introduction **1**

Link between Growth and Transport **5**

Role of Transportation in Economic Development 5
Role of Transport in Turkey's Development 6

Turkey's Current and Future Infrastructure Capacity Needs **9**

Transport Sector Capacity Expansion Plans **13**

Development of Transport Sector Expenditures 13
Transport Infrastructure Capacity Expansion Plans 15

Priorities for Efficiency Gains in Turkey's Transport Sector **18**

Overcapacity: a Risk in Roads and Passenger Railway Transportation 18
Aligning, Planning, Budgeting and Implementation 21

Financing Options for Transport Investments **25**

Fiscal Space for Increasing the Share of Spending Going to Transport is Limited 25
Potential Savings within the Sector 28
- Aligning Maintenance and Investments 28
- Increasing Efficiency of Transport Sector SOEs 30

The Potential Role of the Private Sector 38
- Private Sector Involvement in Motorway Services in New Transport Plan 38
- Analysis of the PPP Model in Turkey 39

Annex 1: Turkish Aviation Sector: A Success Story of Privatization and Implementation of Build-Operate-Transfer Projects **43**

Annex 2: Turkish Port Sector: Potentials and Possible Challenges **46**

Annex 3: Railway Sector: Ambitious Goals, Important Challenges **51**

Annex 4: Restructuring of German Railways **57**

References **61**

List of Figures

Figure 1: Transport as an Obstacle to Doing Business 3

Figure 2: Quality of Trade and Transport Infrastructure (QTTI) and Share in the Non-Fuel Exports, 2009 6

Figure 3: Turkey Urbanizes Rapidly, and Its Big Cities Even More Than the Average 7

Figure 4: Turkey's Motorization Might Increase Strongly 9

Figure 5: First Registrations of New Private Cars in Turkey 1994 – 2009 10

Figure 6: Household Motorization and Car Density is Strongly Increasing 10

Figure 7: Air Transport Passengers Carried Each Year in Proportion to Turkish Population 10

Figure 8: Air Transport, Freight (million ton-km) 10

Figure 9: Only Rail Transport Grows Below the Income Trend 11

Figure 10: Trade and Trade-related Transport Demands are Growing More Strongly than Income, Index (2000=100) 11

Figure 11: Developments of Public Sector Transport Expenditures, ... 13

Figure 12: Institutional Breakdown of Expenditure Increase in the Transport Sector 15

Figure 13: Car Ownership Grows More Strongly Than Per Capita Income in Middle Income Countries 18

Figure 14: Sources of KGM additional Spending, Average of 2006-2010 22

Figure 15: The Savings Rate is Substantially Decreasing 25

Figure 16: Real GDP Growth Rate under Different Scenarios 27

Figure 17: Road Maintenance as a Share of GDP has not Recovered from the Secular Decline 28

Figure 18: Rail Maintenance as a Share of GDP Declines Secularly in the Last Decade 28

Figure 19: TCDD Railway Maintenance High-level Status-quo 30

Figure 20: The Railway Company Receives Increasing Transfers to Cover Its Deficit 33

Figure 21: The Services of Turkish Airlines have Atrongly Increased Since the Privatization 43

Figure 22: Sources of Operating Revenues of TAV Airport PPPs 45

Figure 23: Subsidies to TCDD 51

Figure 24: Rail Transport Passengers has Stagnated in Recent Years 53

Figure 25: Turkish Passenger Transport has Declined Steadily 53

Figure 26: Rail Revenues & Expenses - 2010 53

Figure 27: Traffic Density 54

List of Tables

Table 1: Turkey's Quality of Transport Relative to Its Peer Countries 1
Table 2: Comparison of Turkey's Transport Infrastructure Quality with Developed Countries 2
Table 3: Provincial Export Performance and Access to Border Gates 7
Table 4: Economic Classification of Transport Expenditures 14
Table 5: Institutional Breakdown of Transport Expenditures 14
Table 6: Functional Classification of Transport Expenditures 14
Table 7: Existing Road and Railways Networks and Targets for 2023 15
Table 8: Targeted infrastructure expansion and equipment purchases 2011 – 2023 16
Table 9: Costs of Transport Sector Planned New Investments, 2011-2023 17
Table 10: Deviations of Transport Expenditures Compared to Approved Budget Allocation, Central Government 21
Table 11: Budget Allocation versus Actual Spending of the KGM, ... 23
Table 12: Turkey's External Finance as a share of GDP 25
Table 13: Fiscal Sustainability – Baseline Scenario 26
Table 14: Deficit Financing Scenario, The transport expansion is financed by public debt 26
Table 15: Actual versus Required Maintenance Cost, Highways 29
Table 16: Development of freight handling in the ports of TDI, in thousand tons 32
Table 17: Service revenues of TDI ports before and after privatization, in thousand $ 32
Table 18: Public-Private Partnerships in Turkish Airports 44
Table 19: The actual international passenger numbers exceed the guaranteed minimum traffic for Antalya Airport, million passengers 44
Table 20: The actual international passenger numbers exceed the guaranteed minimum traffic for İstanbul Atatürk Airport, million passengers 45
Table 21: The rail share in passenger and freight transport is low 45
Table 22: Railways infrastructure Expansion Plan by 2023 53
Table 23: Turnover of DB companies (€ mill.) 55
Table 24: Earnings before interest and taxes (adjusted, in € mill.) 59

List of Boxes

Box 1: Consolidation of Transport Expenditures 14
Box 2: CGE Model Results - Impact of Different Transport Investment Financing Options on Growth 27
Box 3: The EU Regulatory Framework 36
Box 4: Can High Speed Rail Change the Game? 37

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Executive Summary

1. **Turkey has almost doubled its public investment in transport infrastructure from around one percent to close to two percent of GDP over the past six years.** Transport accounts for the vast majority of the increase in public investment during the period and its share in total public investment increased from 13 percent in 2004 to 36 percent in 2010.

2. **The authorities plan further increases in transport spending over the next decade to 4-5 percent of GDP.** The government's plans include the tripling of the country's highway network from 2,250 km presently to 7,500 km by 2023, the building of over 12,000 km of new divided roads and more than doubling of the existing railway network to over 25,000 km. Government targets also foresee a modal shift from road transportation towards railways, mainly due to planned investments in high speed rail (up to 10,000 km of track).

3. **Compared to other middle income countries, Turkey's transport and logistics performance is not out of line, though total spending is on the high side.** The World Bank's Logistics Performance Index 2011 ranks Turkey 39th of 155 countries, and according to the World Economic Forum competitiveness report Turkey's transport infrastructure is better than Russia's, Poland's or Brazil's and only moderately below the EU average. However, across transport modes, railways and maritime ports are seen as a bigger obstacle to competitiveness and according to the 2008 Business Environment and Enterprise Performance Survey, just under half of exporting enterprises in Turkey saw transport as an obstacle to doing business. At over 4 percent of GDP, Turkey's planned spending on transport infrastructure including, on maintenance, would be higher than middle income countries on average.

4. **While continued transport sector investment will be needed to support rapid economic growth and growing urbanization, a focus on the efficiency of such spending is important to avoid resource misallocation.** The demand for transport services tends to rise faster than GDP as more and more people can afford cars, as urbanization increases and as the transport intensity of production rises due to a more and more complex division of labor. Transport demand is likely to continue to rise fast in Turkey, justifying emphasis on transport in the public investment plan. However, evidence from around the world indicates significant variation in the efficiency of transport investments. At spending levels above 4 percent of GDP, the fiscal and opportunity costs of resource misallocation could be very significant.

5. **This PER undertakes an analysis of current transport spending in Turkey and looks for potential efficiency gains in three main dimensions: (i) the inter-modal allocation of investment, (ii) the execution of spending and the efficiency of resource management in transport SOEs, (iii) the scope for risk-sharing with and the attraction of private sector financing.**

Intermodal Allocation of Investment

6. **Sound analysis of spending allocations across transport modes requires robust demand forecasts.** Unfortunately, existing data and available methodologies allow only fairly general conclusions. Detailed project by project demand forecasts and economic and social analysis would enhance the robustness of findings. Best practice in advanced industrialized countries includes a project specific appraisal process, using both objective economic criteria and independent evaluation and broad consultation.

7. **General demand forecasts suggest that (i) transport demand will continue to expand at a rate faster than GDP growth and adequate transport investment is thus an important factor promoting economic growth; (ii) railways are unlikely to gain market share over road transportation particularly for passenger traffic without service improvements and cost reductions or subsidies to bring down relative costs, and (iii) demand for port and airport capacity is likely to rise particularly fast.** Background work done for this review sought to verify both aggregate planned spending levels and the allocation of spending across transport modes by conducting demand forecasts. But more specific conclusions regarding inter-modal shifts and geographic patterns in the development of transport demand are difficult to draw.

8. **In the past, Turkey has concentrated transport investments in the roads sector, however, going forward, given the scale of planned additional road investments, detailed economic analysis is recommended.** Turkey's motorization rate at just over 190 cars per 1000 people remains well below saturation level and the EU27 average of close to 500 cars for 2010. The pace of new car registrations points to a doubling of the rate of motorization each decade and a corresponding increase in demand for road transportation. Vehicle density on Turkey's road network increased 60 percent between 2003 and 2008. But current planned investments imply a *decrease* in average road density over the next decade. This may not be warranted given current traffic levels at least in some parts of the country and the prospect that increases in motorization may start to tail off towards the end of the planning period, as Turkey reaches closer to average OECD income levels.

9. **Investments in roads have also been motivated by an objective to reduce large regional economic disparities and better connect eastern and inland regions with urban centers and coastal trading hubs.** The economic return to some of these investments may be modest**.** Eastern regions of Turkey face higher transportation costs than the coastal and western regions, with more than half of businesses pointing to transport as a major obstacle. Investments in connecting infrastructure to bridge regional economic gaps have been an important element of regional policies in many countries, including prominently in the EU. However, the economic benefits of such investments are often lower than those of investments promoting increased economic density in the metropolitan centers of economic activity (WDR, 2009). A model analysis of the economic returns to three highway projects in Turkey confirms this general conclusion. The highest economic benefits would result from the highway linking Gebze to Izmir in the west of Turkey. The returns to transport routes east-west and northeast-southeast are considerably lower. Non-economic benefits may still justify investments in

transport infrastructure to connect lagging regions, but such benefits should be explicitly determined during the appraisal process.

10. Investments in railways are planned to increase as a share of total transport investment, particularly on high speed passenger rail services. Given high fixed costs, this makes sense only for high density routes, such as Ankara-Istanbul. Other routes should be reconsidered as they look likely to be loss-making. The government plans to increase the attractiveness of railway transport for both passengers and freight, including through investment in high speed rail and a modernization of railway services. Unit cost estimates taken from other European countries suggest that high speed rail would be viable only at traffic densities considerably above those currently reached on the busiest Ankara-Istanbul route. The full cost of a return ticket on a 500 km route could be as high as Euro 418, considerably more than the current price of a plane ticket for the same distance. While environmental externalities may justify some subsidization of passenger rail traffic, subsidies could become unaffordably high for routes with lower traffic densities.

11. In freight services, railways have the potential to reverse some of the loss in market share to road haulage, but this would require modernization of the state-owned railways. Governance and management reforms are as important as investments in track and rolling stock and without this, further budget transfers to the railways should be limited. Losses in the state owned Turkish Railway Company (TCDD) have been increasing and budget transfers accounted for as much as 85 percent of total spending in 2010. The causes include a legacy of underinvestment in maintenance of existing track and rolling stock, loss of revenues from the spin-off of earning assets, rising fuel prices, and recent increases in investments not covered by revenues. While TCDD is credited with high technical competence, it is cost inefficient, arguably because of limited incentives for cost control given the present governance structure.

12. Good performance of the Turkish economy means that ports are likely to face continuous increasing demand, even as they already face a shortage of capacity. Port facilities are rated as an area of relative weakness in surveys of the quality of Turkey's transport infrastructure. Government plans call for around TL 50 billion of additional investments through 2023, or some 14 percent of total transport investments. International experience suggests that ports would lend themselves well to public private partnerships (PPPs), however, the needs for new infrastructure cannot be solely financed by the private sector and therefore will require significant public funding.

13. The overall competitiveness of the port sector would benefit from the establishment of an independent entity, in charge of regulating and monitoring current port practices. Several port facilities have been given on concession to the private sector in recent years. However, the current regulatory framework for ports creates the risk of monopolistic or oligopolistic market structures in ports, which is not conducive to private investment in the provision of additional port capacity. The privatization process initiated by the Turkish Authorities in 2005 needs to be completed with a particular focus on increased competition, and an independent assessment of its economic benefits would help the Turkish Authorities to adjust the concession model used in the port sector.

14. The port master plan needs to be updated. The lack of an updated national port master plan – in which ports are the key nodes of an integrated and efficient logistics network connecting Europe to Asia – does not allow maximizing the benefit of economies of scale in ports and generates risk of small and uncoordinated investments by the private sector. At a time when Turkey embarks on creating three major hub ports on its territory, an update of the Ministry of Transport and Communication (MOT)'s Coastal Infrastructure Master plan is urgently needed.

15. Public investment and planning should also pay attention to inter-modal connectivity and to sufficient spending on maintenance and rehabilitation. The rapid increase in transport investment and ambitious future plans for expansion contrasts with historical underinvestment in maintenance. For example, the actual spending on highway maintenance during 2005-2010 reached only around 45 percent of the required level. Railway maintenance spending has fallen sharply as a share of GDP in contrast with developments in Europe. Greater attention to maintenance will be required as recently built infrastructure matures. Moreover, issues of inter-modal connectivity should be considered as part of an overall transport master plan, since individual bottlenecks can render complementary infrastructure obsolete.

Resource management

16. The investment planning, budgeting and execution framework for transport investments shows some weaknesses that increase the risk of resource misallocation. There is no overall country-level transport master plan. A significant part of the increase in budget spending in the transport sector has been ad hoc, through mid-year spending appropriations going well above original budget forecasts. This has weakened the link between sector strategic planning and budget allocations, which is further hampered by weaknesses in budget execution and monitoring.

17. Planning would benefit from more rigorous cost benefit analysis of individual projects. Background work for the Report suggests individual road projects have vastly different aggregate economic impact and hence also vastly different scope for cost recovery. The economic returns of some planned investments may be marginal and all projects should thus be carefully evaluated and ranked before receiving funding. The opportunity cost of public transport investment is significant, both in terms of competing spending priorities (social sector, green growth, municipal services etc.) and in terms of potential crowding out of private investment.

18. The deviation between budget and actual spending for transport is high, suggesting weaknesses in the planning and budgeting process. The annual transport budget is set conservatively, but as a result of additional revenues during the year, actual budget allocations have deviated from budget plans by as much as 150 percent in the case of roads. Ad hoc budget allocations create significant implementation risks as time pressure may reduce competition and stretch the oversight capacity of the responsible line agencies. Given the scope of transport investments planned in Turkey, it can be argued that allocating budget windfalls during the year to simply accelerate the implementation of existing transport projects is low risk. However, this strategy in fact has several important drawbacks: (i) funding allocations may not

follow economic criteria undermining strategic prioritization during execution; (ii) procuring additional works under time pressure may limit competition and lead to higher than necessary prices as contractors and material suppliers are stretched; (iii) additional works also require additional supervision capacities by responsible line agencies. Unless this is already in place, the quality of oversight may suffer.

19. **Budget execution also suffers from the lack of a centralized system for commitment monitoring and resulting payment arrears.** Turkey has made significant strides in modernizing its Public Finance Management system over the past decade. But some problems persist at the level of execution. One of the key problems is the lack of a centralized system for monitoring budget commitments, resulting in temporary accumulation of accounts payable. This can affect the quality of services of contractors, but it also creates great problems for monitoring budget execution and alignment with strategic priorities. The budget classification system further hampers program level monitoring leading to a disconnect between the original sector plans and actual spending allocations.

20. **Poor incentives and outdated management structures have failed to promote cost effectiveness of railway services, resulting in lost railway market share in both passenger and freight segments, and increasing unit losses.** TCDD's organizational and governance structure remains that of a traditional railway company prior to the wave of reform in OECD countries after the 1970s. It offers both freight and passenger services with operations vertically integrated with infrastructure. TCDD does not have an independent board. Subsidies have been allocated both to cover operational losses and capital investments and occasionally to redeem debts. Budget constraints would appear to be soft and the vertically integrated and regionally separated governance structure creates few incentives for cost control. However to address these problems, the Government has recently initiated legislative changes and technical studies to provide a base for restructuring in the railway sector. With the Decree By Law no:655, Directorate General For Railway Safety Regulation was established to work as railways Safety Authority and Railways Competition Regulatory Authority. A draft railway law that would initiate structural reforms to the railway sector, including infrastructure separation and open access, has been circulated for government review.

Scope for risk sharing, private sector investment and cost recovery

21. **The government's investment plans foresee a significant role for private sector financing through PPPs.** Around one fifth of total transport investment, or over 1 percent of GDP annually, is supposed to be attracted from the private sector, the bulk of it in roads. But recent difficulties in concluding road tenders point to the challenges for PPPs resulting from demand risk and volatile international capital markets. Too much risk absorption by the public sector may dilute or indeed erase the benefits of PPPs.

22. **The best opportunities for risk sharing with the private sector exist in ports and airports.** Turkey has some successes in airports already from which it can learn for the development of maritime transportation. PPPs have been widely used in the financing and operation of transport infrastructure around the world. They work most effectively when demand is relatively stable and easy to forecast, key risks are of a technical nature, the scope

for using incentives to achieve cost reductions or quality improvements is high and results are relatively straightforward to monitor. Moreover, successful PPPs also rely on strong government capacity to design, tender and monitor PPPs and strong institutions that mitigate against the risk of opportunism or unilateral contract revisions mid-stream. A good case in point is airports. The private sector typically has an advantage over the public sector in cost efficient and technically advanced design, demand is relatively easy to forecast and relatively stable, and hence both construction and operation and maintenance risks can be successfully transferred to private investors. However, successfully attracting private investors also requires a robust and reliable regulatory framework. While Turkey's experience with PPPs in air transportation is positive, the impact of port sector privatization on overcoming capacity constraints in the sector remains to be seen.

23. **In the road sector, there is scope for partial or full cost recovery through tolls, which supports private sector participation in the road sector.** This is the case particularly for high density motorways between major cities, where few acceptable alternatives exist. For secondary roads and road links with underdeveloped regions, or for main roads where a good alternative secondary road exists, the scope for tolling is much lower and potential revenues are much more difficult to forecast.

24. **Present risk sharing models in road PPPs put too much risk on the government as a result of demand guarantees and share too little risk with the private sector.** At the limit, a PPP with no risk for the private sector comes down to public investment financed at private sector cost of funding. This almost inevitably is a bad deal. The government has opted for a Build-Operate-Transfer model of attracting private investment with contracts tendered on the shortest offered contract period. However, to make these PPPs bankable the government would need to offer demand guarantees which transfer the bulk of the project risk to the public sector. Incentives for quality improvements at levels of demand below the guaranteed level are muted and cost cutting incentives during operation would dominate. Moreover, a short contract duration, while creating a public asset at low cost to the government, reduces the incentives for private operators to maximize value during operation.

25. **In railways, sound governance of government-owned railways and increased private sector management and investment is possible, as shown by the example of Germany for instance, but would require an overhaul of railway management practices and governance.** The alignment of the legislative framework with the EU is an excellent opportunity to embark on railway reform. However, careful planning will be required as this would inevitably result in staff redundancies as operational efficiency is increased. The German railway reform which started around 20 years ago provides a good practice example.

Conclusion

26. **The focus of the Turkish authorities on transport investments over the past decade is welcome and results have been impressive.** Plans exist to further expand such investments. Making sure mechanisms and policies are in place for rigorous planning, costing, budgeting, implementation and monitoring of public investments and for smart risk sharing and private sector financing will be critical to assure the maximum return from investments, and that investments are made in the most critical sectors to enable the greatest economic growth.

Summary of Issues and Policy Options in the Transport Sector		
Issue	Importance	Policy Proposal
The planned road and high speed train infrastructure investments may lead to a problem of overcapacity. In roads expansion plans for highways and divided roads should be reconsidered.	Targets and long term capacity expansion plans of the Ministry of Transport's strategy are ambitious. There is a risk of demand-supply mismatch. Given the size of the planned investments (in excess of 4 percent of GDP annually), the risk of large misallocation of scarce public resources is significant.	Establish a comprehensive and rigorous review of the market and cost effectiveness of all proposed public investments in transport and use it to prioritize investments (Transport Master Plan). Submit major transport investments to careful economic and social cost benefit analysis during appraisal.
A large share of public investments in the transport sector has been through ad hoc mid-year budget appropriations.	Weak links between the strategic planning process and the annual budget process, combined with ad hoc shifts in priorities over the course of budget execution undermine the efficient use of transport funds and can lead to high project costs.	Prepare a transport master plan to prioritize investments and ensure funding as part of the regular budget cycle. Conduct ex post review and audit of transport spending funded by ad hoc mid-year appropriations to ascertain cost effectiveness.
Transport investments annually in excess of 4 percent of GDP create a heavy burden on the budget.	Simulations in this PER suggest the crowding out effects of additional deficit spending in the transport sector would outweigh the direct and indirect positive effects on growth.	Increases in transport sector operational efficiency should precede extensive additional resources for the sector Fiscal space should be created through PPPs and through efficiency gains within the transport sector.
Turkey's roads and railways maintenance expenditures have been decreasing as a share of GDP. Even with an increase in the last few years, current road maintenance expenditures fall short of international recommended benchmarks.	Insufficient spending on maintenance and operation risks a loss of asset value and higher subsequent investments to replace the lost infrastructure. There is evidence in the railway sector of high technical efficiency of maintenance but very high unit cost. Improvements in the efficiency of maintenance spending could reduce operational losses and improve the quality of service.	Advance planning of maintenance, rehabilitation and construction activities of the KGM and TCDD. While routine maintenance activities can be easily incorporated into annual plans, the medium-term expenditures for periodic maintenance, rehabilitation, reconstruction, upgrades and new construction should be planned over a longer time-frame (e.g., 5 years.) Use an asset management system for better maintenance planning.
Opaque and complex railway subsidy regime and lack of incentives for efficiency in TCDD lead to low productivity, poor service and falling market shares in both freight and passenger transportation.	TCDD is the largest loss making SOEs in Turkey and the fiscal cost of subsidies from the budget has been increasing. Poor quality railway services are inconsistent with the government's plans of a gradual modal shift towards railways.	Restructuring of TCDD through unbundling of core and non-core services, commercialization and the introduction of clear incentives for cost minimization and quality services. Experience from other OECD countries can be used as a guide. Improvement in the corporate governance of TCDD as part of a general SOE reform, including independent boards, contractual incentives for managers, proper cost-center accounting to limit within company transfers and hardened budget constraints.
The proposed shift to high-speed rail for passenger transport is not borne out by an analysis of likely demand patterns.	High speed rail is economically viable only on routes with very high density and even here subsidies may be required to allow rail to compete with road and air transportation. Ambitious expansion of high speed rail risks multiplying the losses of TCDD.	Limit high speed rail investments to densely populated markets, where high speed rail services can be competitive with air and bus. High speed rail services should not be expanded at the risk of undermining the financial viability of TCDD. Investments in improved freight services may offer a higher rate of return.
Turkey's current PPP framework may leave too much risk with the government.	The need for generous demand guarantees to attract private investors to Turkey's PPP projects, particularly in the roads sector, creates the risk of substantial contingent liabilities and could end up costing more than straight budget financing.	Turkey should strengthen its basic PPP framework, improve government capacity for evaluating the costs and benefits of PPPs and create credible institutions that facilitate long-term contracts and thus encourage the private sector to share risk.

Introduction

1. **Turkey is an upper-middle income country with a population of 73 million.** It has a diversified economy with a strategic geographical position, located on the southeastern side of Europe and southwestern side of Asia. It is primarily urban. The urban share of the population increased from around one-third to over two-thirds since 1960, as GDP per capita more than tripled in the same period to about $9,000.[1] The urban population is expected to increase by roughly 5 percent per decade but with significant variation across urban centers.

2. **The economy has grown rapidly over the last decade, despite the impact of the global economic crisis.** Turkey grew around 7 percent annually during the 2002-2008 period. The global recession of 2008-2009 caused the economy to contract by 4.7 percent in 2009. However, Turkey recovered quickly, thanks in part to expansionary monetary and fiscal policies and in part due to the strong capital buffers built in the preceding decade. Growth was 8.9 percent in 2010 and is expected to have exceeded 8 percent in 2011, albeit declining sharply to around 2 percent in 2012. The Government's medium term growth target hovers around 5 percent until 2014.[2]

3. **Continued economic growth, combined with increases in the urban population, will place increasing demands on Turkey's transport infrastructure.** High middle income countries such as Turkey typically see very rapid increases in demand for transport services for several decades. Meeting this demand is hence an important development priority.

4. **Consequently public expenditures on transport sector have increased substantially in Turkey in recent years.** Public expenditures on transport have almost doubled from 1.06 percent of GDP in 2004 to 1.92 percent in 2010, and the transport sector accounted for the bulk of the increase in total public investments over this period.

Table 1: Turkey's Quality of Transport Relative to Its Peer Countries

	Turkey		Brazil		Russia		Poland		South Africa	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Roads Infrastructure	4.7	46	2.9	105	2.4	125	2.2	131	4.8	43
Air Transport Infrastructure	5.4	44	4.0	93	3.8	104	3.6	108	6.1	18
Railroad Infrastructure	2.7	63	1.9	87	4.1	31	2.7	62	3.3	47
Port Transport Infrastructure	4.1	72	2.9	123	3.7	93	3.3	114	4.7	49

Source: World Economic Forum, World Competitiveness Report 2010/2011. Geneva 2010

1 Gross National Income calculation based on World Bank Atlas methodology.
2 The targets are from the 2012-2014 Medium Term Program.

5. The quality of Turkey's current transport infrastructure compares favorably to peer countries. Turkey's transport sector has been growing both in terms of its size and the quality of the network, and currently compares well with similar middle income countries. According to the quality index for transport infrastructure, published in the World Competitiveness Report (WCR) 2010-2011, (Table 1), Turkey ranks above Brazil, Russia and Poland in the quality of its roads and air transport. Turkey also ranks higher than Brazil and equal to Poland in the quality of its railroads.

6. However, Turkey's infrastructure quality lags behind the levels of EU countries, particularly in the railroads and ports sector. As shown in Table 2, Turkey's overall infrastructure quality score is 5.1, which is only marginally below the average for EU countries as a whole. Its scores on railroad and port quality, however, are far below the EU average. The Turkish Government has recognized the need to improve railroad and port services as part of its transport development efforts.

Table 2: Comparison of Turkey's Transport Infrastructure Quality with Developed Countries

	Overall Infrastructure	Railroads	Roads	Ports	Airports
OECD	5.5	4.5	5.1	5.2	5.6
EU-27	5.2	4.4	4.7	5.1	5.3
Top 10 Exporters	5.7	5.6	5.6	5.7	5.8
Turkey	5.1	2.7	4.7	4.1	5.4
Turkey (export-weighted average by share of individual transport modes)	4.5				

Source: World Economic Forum, World Competitiveness Report 2010/2011, and Demir (2011).

7. Turkey's transport infrastructure still needs improvements to catch up with the OECD average and with the world's top 10 exporting countries. An alternative measure of transport quality weighs the index of the quality of individual transport modes with their weight in total exports. Turkey's weighted average Quality of Trade and Transportation Index (QTTI) score of 4.5 out of 7 implies that the effective quality of the country's transport infrastructure is low compared to Turkey's ambition of being one of the top 10 exporters by 2023. [3]

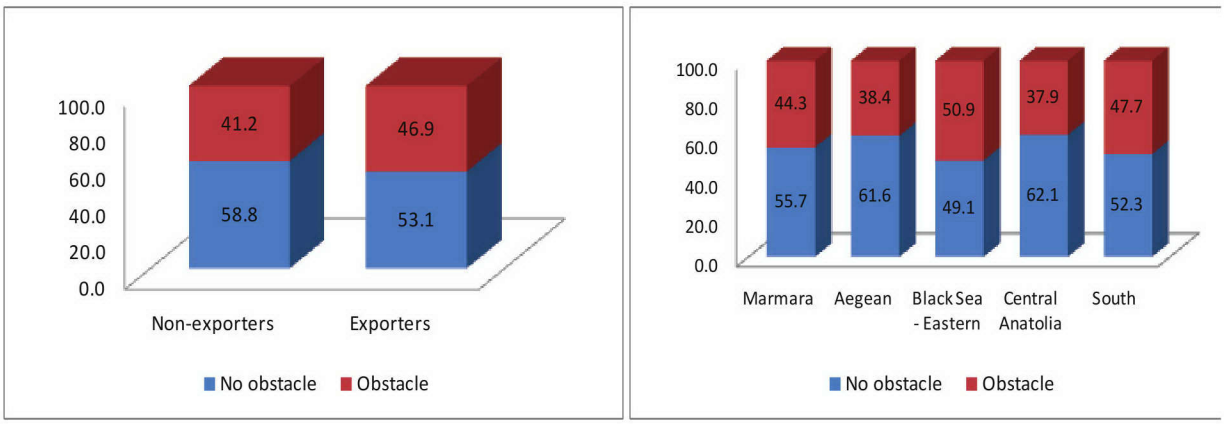
8. The need for transport infrastructure improvements is also reinforced by the results of business surveys. The Business Environment and Enterprise Performance Survey (BEEPS) shows that Turkey's quality of transport infrastructure is perceived as one of the obstacles to doing business, albeit a minor one. The 2008 EBRD-World Bank BEEPS reported that 43.5 percent of firms perceived transport as an obstacle to doing business; with 13.4 percent of them categorizing transport as a major obstacle. [4]

3 It is worth noting that this number deemphasizes the importance of land as a transport mode for Turkey's international trade since land transport is also heavily used for in-land transport, i.e. transferring goods from factory to port, airport, railway station, etc.

4 This number excludes those firms that have not responded to this question. 1,114 out of 1,152 firms have responded to the related question in 2008.

9. The perception of transport as an obstacle to doing business shows variation between exporters and non-exporters and across different regions in Turkey. Transport is reported as a more common obstacle for exporters than non-exporters, according to the perception survey (Figure 1). According to the BEEPS, 47 percent of the exporting firms report the quality of transport sector as an obstacle to doing business in Turkey while the proportion goes down to 41 percent among non-exporting firms. Another observation indicates the varying quality of the transport infrastructure across Turkey's regions. 61 percent of the firms located in the Black Sea and Eastern regions perceive transport as an obstacle to doing business while this share is below 40 percent in the Central Anatolia and Aegean regions (Figure 1).

Figure 1: Transport as an Obstacle to Doing Business



Source: The EBRD-World Bank Business Environment and Enterprise Performance Survey (2008)

10. The Logistics Performance Index (LPI) rates Turkey roughly in line with other high middle income countries but highlights its poor performance in railways.[5] The 2010 LPI report ranks Turkey 39th out of 155 countries with its score of 3.22. According to the LPI, more than 63 percent of the respondents believe that quality of railways in Turkey is either low or very low. This percent is around 18 percent for roads and ports. Therefore, Turkey ranks below some of its comparators such as China; Taiwan, China; Malaysia; Republic of Korea; South Africa and Czech Republic.

11. This public expenditure review for the transport sector (TPER) analyzes the transport sector, from a public finance point of view. The objectives of this TPER are to address the challenge of financing the sector's expenditures, and selectively focus on key efficiency and performance issues in certain sub-sectors. In particular, it addresses the challenges for public finances to provide the sector with the resources for its anticipated rapid growth while ensuring efficiency of public spending. The review takes stock of the current state of the Turkish transport sector and identifies challenges and opportunities going forward.

5 The Logistics Performance Index (LPI) which is constructed by the World Bank consists of the following measures: efficiency of the customs clearance process; quality of trade and transport-related infrastructure; ease of arranging competitively priced shipments; competence and quality of logistics services; ability to track and trace consignments; and frequency with which shipments reach the consignee within the scheduled or expected time.

12. The report relies heavily on some background studies prepared by academics and government experts and has five chapters.[6] After the introduction, the second chapter focuses on the role of the transport sector in Turkey's development. The third chapter discusses the implications of Turkey's anticipated growth for future transport demand. Understanding the financing options for capacity expansion plans constitutes the backbone of the fourth chapter. The fifth chapter discusses possibilities for creating fiscal space for additional transport expenditures through efficiency gains in the transport sector.

13. The report is focused on public finance aspects of transport policy – linkages with growth, competitiveness and trade performance are not addressed in detail. The report does not explicitly cover the impact of the transport sector on aggregate productivity or competitiveness. A well designed transportation policy is only one of the policies to ensure productivity and sustainable growth. The report does not cover logistics in a broader sense, including the performance of transport operators, customs, warehousing and inter-modal connections. Gender dimensions of transport policy, which have been shown to be important in other countries, are also not addressed. Finally, the report does not extend the analysis to local administrations which are responsible for local access roads and municipal transport.

14. The Turkish Government requested this TPER, noting the significant role of the sector in economic development and its increasing importance in the overall public expenditures especially in the investment budget. This report was prepared by the World Bank. The TPER is part of the Programmatic Public Expenditure Review covering the period 2009-2011.

6 Five background papers have been prepared in the context of TPER. These are; 1) Transport Costs and Turkey's International Trade, Banu Demir (Oxford University); 2) Impacts of Transportation Investments on Turkish Regional Economies: Market Potential Analysis, Kamil Taşcı, Mehmet Emin Özsan, and Hakan Erten (State Planning Organization); 3) Transportation Infrastructure Public Investments Economic Impact Analysis: A CGE Model Application for Turkey, Hakan Erten, Kamil Taşcı, and Mehmet Emin Özsan (State Planning Organization); 4) Demand Analysis for the Transport Sector, Füsun Ülengin, Özay Özaydın, Şule Önsel (Doğuş University), Burç Ülengin and ,Özgür Kabak (Istanbul Technical University); 5) The Potential Benefits and Costs of Public Private partnership in the Transport Sector with an Application to the Turkish PPP Law, Elisabetta Iossa (Brunel University) and David Martimort (Paris School of Economics); and 6) The Reform of Railroads: Lessons for Turkey, Guido Friebel, (Goethe University).

Link Between Growth and Transport

Role of Transportation in Economic Development

15. High quality transport infrastructure can stimulate economic development and growth by reducing transportation costs. Lower transport costs foster productivity and economic growth through three mechanisms: (1) lower transport costs enlarge the market areas of firms and reduce unit costs in production of goods and services with high fixed costs, (2) in industries with increasing returns to scale in production, lower transport costs lead to agglomeration economies because it offers consumers more consumption variety and allows a larger number of producers of specialized intermediate goods to localize in one city and (3) lower transport costs ensure access to international markets and imports of intermediate goods which strengthen growth through international knowledge spillovers.[7] [8] [9] Beyond the gains from international trade, access to international markets and connectivity to international production networks attracts foreign direct investments. Improving Turkey's transport infrastructure could therefore increase competitiveness and productivity for connected areas.

16. The reduction of transport costs through improved transport infrastructure reduces trade barriers for many countries.[10] The cost of transportation is one of the most important barriers in international trade.[11] Removing policy barriers to international trade is thus not sufficient to achieve the full benefits of international integration. High transport costs squeeze profit margins of domestic producers and thus reduce their competitiveness. Turkish producers have to pay higher prices for imported inputs and have to sell at lower producer prices to compete in world markets. Improved access to international markets will help to further specialization in sectors where Turkey is particularly successful. The reduction of transport costs leads to a more than proportional increase in international trade and substantial increases in aggregate income, particularly in developing countries.[12] [13] [14]

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7 World Development Report 2009, Reshaping Economic Geography.

8 In simple words, agglomeration economies refer to economic benefits arising from geographical concentration of economic activities. The sources of these benefits are, among others, a well-developed infrastructure, availability of specialized input services, presence of a labor pool.

9 Coe, D. T and Helpman, E. (1995) International R&D Spillovers, European Economic Review, 39, and Lee, Gwanghoon(2008) 'Panel Cointegration Estimation of International Knowledge Spillovers', Global Economic Review, 37: 1

10 Limão, N. and Venables, A (2001), "Infrastructure, Geographical Disadvantage, Transport Costs and Trade", World Bank Economic Review, Volume 15, Issue 3.

11 Anderson and van Wincoop (2004) estimate the tax equivalent of representative transport costs for industrialized countries to be 21percent.

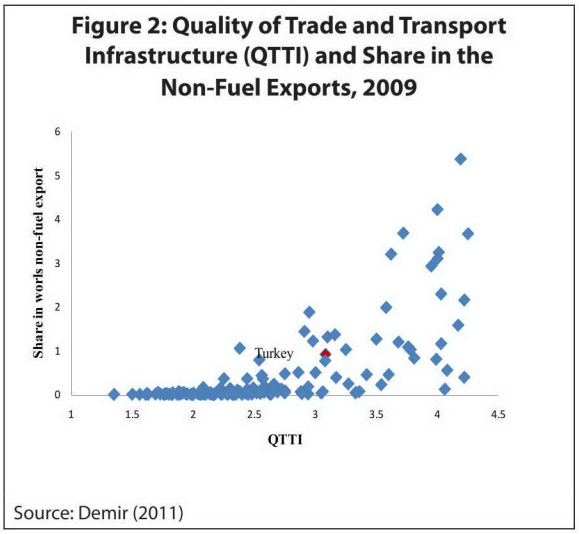
12 Behar and Venables (2011).

13 Among the barriers that remain, for instance, are distance, inadequate infrastructure, and heavy-handed customs procedures.

14 Canninag, D. (2007), " The Rate of Return to Transport Infrastructure", Transport Infrastructure Investment and Economic Productivity, Roundtable 132, OECD/ECMT.

Role of Transport in Turkey's Development

17. Turkey's current QTTI score suggests that transport infrastructure may be a barrier to the further expansion of exports. A country's QTTI score is strongly associated with export performance. Countries that account for a larger share in the world's nonfuel exports also rank higher on QTTI.[15]



18. Improvements in the quality of transport infrastructure could boost Turkey's international trade. Results of a gravity analysis support this statement for consumption, intermediate and capital goods. Elasticity of Turkey's trade with respect to the quality of its transport infrastructure is high. Transport infrastructure elasticity of trade is about 1.12 for consumption goods, 0.72 for intermediate inputs, and as high as 1.44 for capital goods.[16] Furthermore, the estimation results suggest that the quality of transport infrastructure has an even more pronounced role in facilitating Turkey's trade with neighboring countries. The diversification of trade with the Middle East and North Africa (MENA) and the Central Asian regions would benefit from improvements in transport quality, especially on the Eastern and Black Sea part. However, the extent to which this justifies additional investments in transport infrastructure in Turkey's eastern regions should be rigorously analyzed to avoid overinvestment.

19. Turkey's current main exports are transport intensive, and would benefit from improved transport quality and lower transport costs. [17] Turkey's exports have been rapidly expanding and the main export goods (road vehicles, apparel and clothing accessories, iron and steel, textiles) are transport intensive. The current level of exports would benefit from an increase in transport quality, given strong positive correlation between the two as illustrated in Figure 2.

20. There could be significant returns for Turkey in terms of exports and economic growth from improved transport infrastructure. To illustrate, assume that Turkey improves the quality of its transport infrastructure such that its scores reach those of Germany. Germany is the world's second largest exporter of nonfuel goods, with international trade accounting for more than four-fifths of the country's GDP. Its well-developed transport infrastructure scores 6.3 in quality. [18] In this simple calculation, if Turkey improves its transport infrastructure quality to the level of Germany, its trade flows with an average trade partner would more than double. Similarly, Clark et al. (2004) showed that if a country like Peru or Turkey decreases its seaport's

15 Because China, Germany, and USA each account for more than 9 percent of the world's non-fuel exports, they are omitted from Figure 1 because including them distorts the scale of the graph. Source of the exports data is UNCTAD and that of QTTI is the World Bank.
16 Demir (2011).
17 The main export goods are road vehicles, apparel and clothing accessories, iron, steel, and textiles.
18 Based on the Global Competitiveness Report, Quality of Infrastructure data.

inefficiencies to a level similar to Iceland or Australia, it would be able to increase its trade by roughly 25 percent. [19]

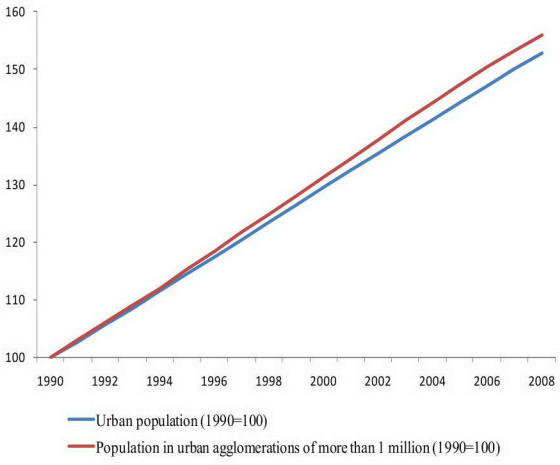
21. Within Turkey, provinces with better access to borders export more, suggesting another pathway to improved trade and economic growth from transport improvements. Better provincial export performance in Turkey is also associated with the easier access to borders. The top and the worst performing export provinces in Turkey are shown in Table 3 based on Turkish Statistical Institute (TUIK) provincial exports data for 2001–2009. Using distance and travel time data from Google Maps, this table also gives, for each province, the averages of the distance a car covers in an hour to arrive at a border gate. Since Google data are based on actual distance and time, it provides information on the access of provinces to major border gates. Table 3 suggests that the top exporters reach major border gates faster than the worst. The difference between the means of the two groups is significant at the 1 percent level. Compared to the worst performers, better performers save on average about 14 minutes for every 100 km when transporting products to borders.

Table 3: Provincial Export Performance and Access to Border Gates

Top Five Exporters	Average Speed	Worst Five Exporters	Average Speed
Istanbul	73.1	Tunceli	64.7
Bursa	73.2	Gumushane	64.3
Izmir	71.2	Bingol	62.1
Kocaeli	75.1	Ardahan	58.3
Ankara	74.0	Bayburt	63.3
Mean	73.3	Mean	62.6

Source: TUIK and Google Maps.

Figure 3: Turkey urbanizes rapidly, and its big cities even more than the average



Source: World Bank, World Development Indicators 2011

22. Turkey could benefit from further agglomeration economies as a result of improved transport infrastructure. Turkey's western regions produce 81.5 percent of Turkey's gross value added (GVA), while the eastern regions only 18.5 percent. Improving Turkey's transport infrastructure could further increase competitiveness and productivity for connected areas, as shown in recent empirical studies (Donaldson (2009), Banerjee, Duflo and Qian (2009). Urban areas near Istanbul and Izmir benefited from agglomeration economies and lower transport costs.[20] Istanbul (TR 10), Ankara

19 Clark, X, D. Dollar et A. Micco (2004), "Port efficiency, maritime transport costs and bilateral trade". Journal of Development Economics, 75, p.417-450.

20 WDR 2009, p. 21.

(TR51) and Izmir (TR31) comprised about 45 percent of GVA during the 2004-2006 period.[21] Istanbul produced value added of about US$ 184 billion dollars during 2004-2006 period, almost 28 percent of the total economy for the period. After these three metropolitan cities, the fourth and fifth largest GVA contributing regions are two important automotive manufacturing centers, Bursa, Bilecik, Eskişehir (TR41) and Kocaeli, Sakarya, Düzce, Bolu, Yalova (TR42). At the other extreme are four regions that each produce less than 1 percent of national GVA; three are in the eastern part of the country.

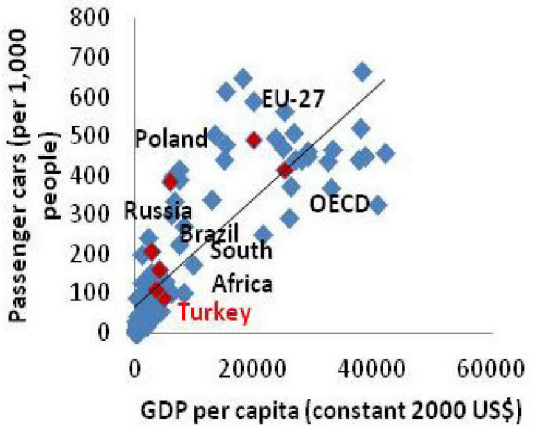
23. **The strong empirical association between the quality of transport infrastructure and economic growth as well as the prospect of reducing regional inequalities provides a strong rationale for transport investments in Turkey.** However, the large potential gains should not distract from the similarly large risks of misallocation of scarce public resources. Not all regional transport links have the same economic and social benefits. Not all capacity expansion of the road network will help generate additional exports, and there may be significant differences in the economic viability of various transport modes. How to get the most out of public resources in the transport sector and how to mobilize private investment as additional support are the key questions that are analyzed in the remainder of this report.

21 Each of these three metropolitan cities is also a NUTS II region by itself: TR10 (Istanbul), TR31 (Izmir), and TR51 (Ankara). The spatial classification of Nomenclature of Territorial Units for Statistics (NUTS II) is standard for subdividing countries for statistical purposes. NUTS division is designed and regulated by the European Union, and EU funds are distributed on the basis of NUTS division. NUTS classification has three levels; NUTS III regions refer to 81 provinces, NUTS II regions for 26 regions, and NUTS I for 12 regions in Turkey. NUTS II and I are simple aggregations of NUTS III regions.

Turkey's Current and Future Infrastructure Capacity Needs

24. Estimating the demand for different transport modes is challenging. The results in this section are illustrative only and do not substitute for the development of a national, intermodal transport master plan, and detailed cost-benefit analyses for individual transport projects. This section draws on background studies commissioned for this TPER but given data and methodological limitations, the results are indicative only.

Figure 4: Turkey's motorization might increase strongly



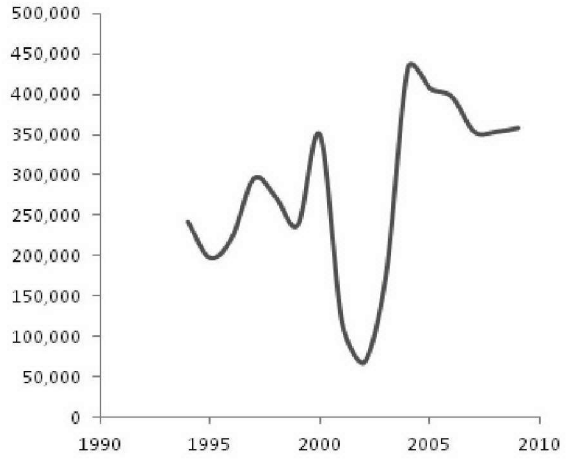
Source: World Bank, World Development Indicators 2011

25. While demand for all modes of transport infrastructure is expected to increase as Turkey continues to grow, this is especially the case for highways. As illustrated by Figure 4, motorization is strongly income elastic in middle income countries and it should therefore increase significantly in line with Turkey's per capita income level over the coming years (see also International Transport Forum (ITF)) Levels of car ownership typically grow strongly with GDP, first at an increasing and then at a declining rate. But fast-growing economies such as China, India, Brazil and Turkey are still a long way from ownership and use levels that can be observed for advanced economies. According to the ITF, middle income countries like Turkey are far from their "saturation level of car driving".[22]

26. While car ownership in Turkey has been sharply increasing over the last decade, annual average km per vehicle is still low compared to developed countries. Turkish car ownership was increasing before the economic crisis, and the trend has continued since then.[23] Current growth rates of motorization in Turkey imply a doubling of motorization per decade. As Figure 5 shows, the number of brand new cars bought by Turkish consumers was between 350,000 and 600,000 cars per year for the period 2003-2011. Not surprisingly, use of the road network has also increased. The volume of freight carried on the road network increased by 17 percent between 2000 and 2009. Approximately 90 percent of all freight is currently carried on roads, and the number of passenger miles increased by 9 percent from 2000-2009. As a result, as Figure 6 shows, vehicle density increased by 60 percent from 2000-2008. However, compared to many advanced economies, Turkey's road traffic density, with the exception of a few key intercity links such Ankara-Istanbul or along the Agean cost, is not very high. Annual average km per vehicle in Turkey was 5,308 km in 2010. This figure is less than one fourth of the many developed countries including UK, France and US. [24]

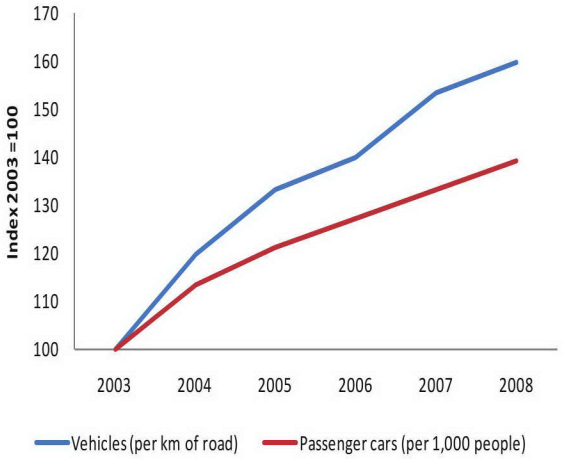
22 ITF, Transport Outlook 2010, The potential for innovation.
23 The same time period also witnessed the appreciation of the Turkish Lira, which also boosted the demand for imported cars.
24 Data and calculation provided by Ministry of Development.

Figure 5: First registrations of new private cars in Turkey 1994 – 2009



Source: OECD/International Transport Forum Annual Statistics 2005 – 2009.

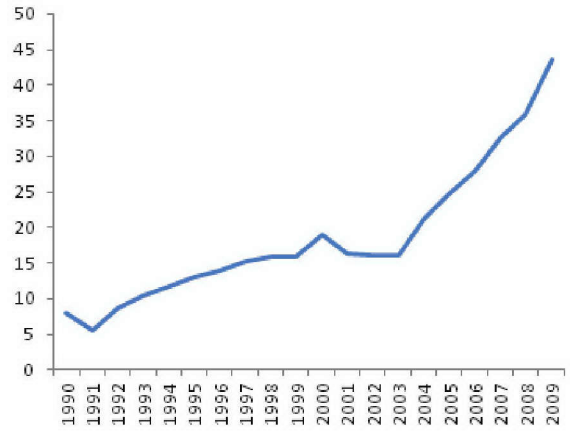
Figure 6: Household motorization and car density is strongly increasing



Source: World Bank, World Development Indicators 2011.

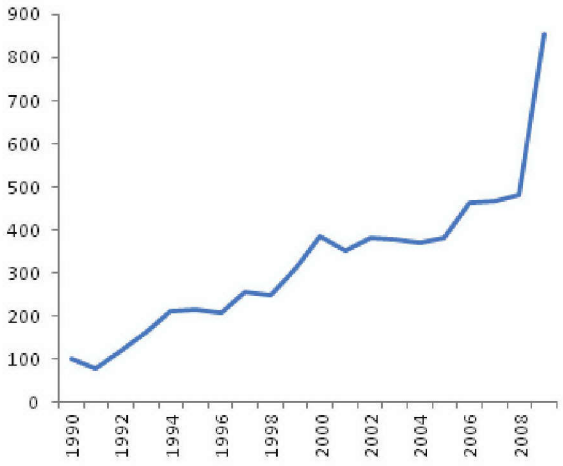
27. Maritime transportation also experienced a dramatic increase in freight over the past decade. Turkey experienced a rapid surge of 180 percentage points for container port traffic during 2000-2009. In 2008, the annual increase in domestic freight transportation reached 9.3 percent.

Figure 7: Air transport passengers carried each year in proportion to Turkish population (percentage points)



Source: World Bank, World Development Indicators 2011 and own calculations.

Figure 8: Air transport, freight (million ton-km)

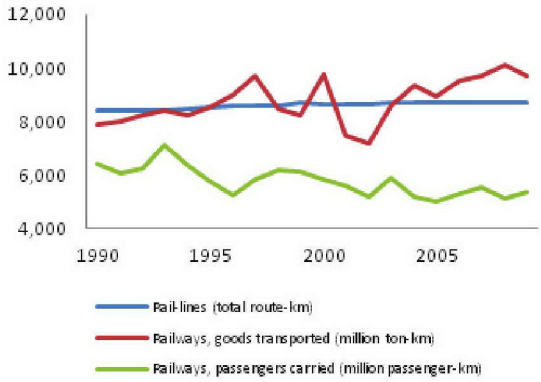


Source: World Bank, World Development Indicators 2011 and own calculations.

28. Air transport is expanding more strongly than other transport modes for both passenger and freight. Figure 7 shows a large boost in air transport passengers in proportion to the Turkish population. However, air transport demand is concentrated mainly in a few airports. According to the SPO, around 91 percent of passenger traffic in Turkey occurs at only 9 airports (out of the 45 civil airports operating in the country), namely Atatürk, Antalya, Esenboğa, Adnan Menderes, Dalaman, Bodrum/Milas, Adana, Trabzon and Sabiha Gökçen airports. In less than 20 years, air transport freight increased eight-fold, from 100 million ton-km to more than 800 million ton-km (Figure 8).

29. In the railway sector, freight traffic increased but passenger traffic declined. As shown in Figure 9, freight traffic increased by 22 percent between 1990 and 2009. Passenger traffic (as measured in passenger kilometers) declined from 6.4 billion to 5.4 billion. As the overall length of the railway network did not change during this period, freight densities increased while passenger densities declined. Turkey's railway density remains low compared to the EU: 11 km per 1000 km against 55 km for the EU-27 average. The next section critically examines railway investment plans in light of declining demand for passenger rail services.

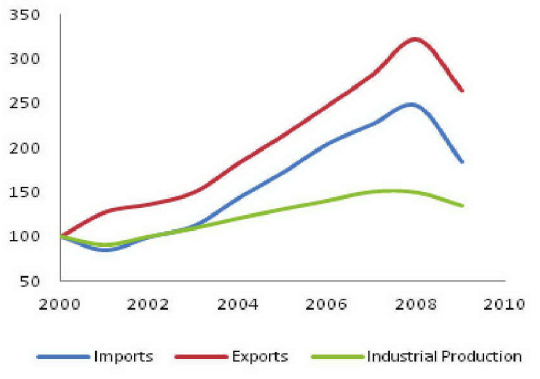
Figure 9: Only rail transport grows below the income trend



Source: World Bank, World Development Indicators 2011

30. With the exception of the year 2009, port traffic has been steadily growing in strong correlation with the overall good performance of the Turkish economy. During the period 2004-2010, the total traffic has grown year-on-year at a CAGR[25] of 11.25 percent, whilst containerized cargo growth was 14.5 percent during the period 2002 and 2010. The graphics below illustrate these trends for the period 2004-2010.

Figure 10: Trade and trade-related transport demands are growing more strongly than income, Index (2000=100)



Source: International Transport Forum, Annual Statistics 2010

31. The Turkish port system is rapidly reaching its limits[26] and a clear need exists for additional port capacity in Turkey. The need for additional capacity is becoming

25 Compounded Average Growth Rate

26 Based on Ministry of Transport and Communication Report 2010, theoretical capacity of 425.7 million tons for general cargo and dry bulk and 11 million TEU for containerized cargo

increasingly urgent, especially as any new port facility requires between three to five years before being fully operational. Whilst the overall theoretical port capacity still exceeds the total traffic observed in 2010, it is most probable that some port facilities are already facing congestion. The expected demand for container port capacity by 2020 is estimated to 20 million TEU.

32. **Demand for international transport is expected to increase at a higher rate than domestic transport demand.** Annual international air traffic demand is now growing at a higher rate than domestic air traffic. In 2008, the yearly increase of international air passenger traffic reached 13.7 percent, against 12.2 percent for domestic traffic.[27] The relatively higher increase in demand for international transport can also be observed in the railways sector (Figure 10). The freight growth rate was almost constantly higher for international transport of goods than for national transport between 1995 and 2008.

27 State Planning Organization (SPO), 2010 Annual Program

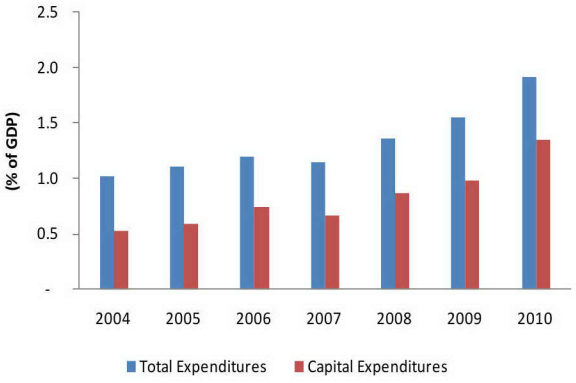
Transport Sector Capacity Expansion Plans

Development of Transport Sector Expenditures

33. Improving the quality of transport infrastructure has been one of the key policy priorities of the Government since 2002. The Government has been putting more emphasis on the transport sector in order to enhance the country's external competitiveness, as laid out in all key policy documents – development plans, annual programs, and medium term plans. Rapid urbanization, the strong upward trend in motorization, and increased transportation demand driven by economic growth prospects provided additional impetus for the Government to enhance transport infrastructure quality since 2002.

Figure 11: Developments of Public Sector Transport Expenditures,

2004-2010, percent of GDP



The data covers transport function related expenditures of the Ministry of Transport, DG of State Highway, Undersecretariat of Maritime, DG of Civil Aviation, TCDD, DHMI.

Source: Ministry of Finance, TCDD, DHMI and staff calculation

34. In line with the Government's policy priorities, public expenditure allocated to the transport sector has almost doubled as a share of GDP since 2004.[28] [29] As illustrated in Figure 11, public expenditures on transport increased from 1.06 percent in 2004 to 1.92 percent of GDP in 2010. Increased capital spending was the main contributor to this increase (comprising 95 percent of the increase over the period). The share of transport in public sector investment rose from 13 percent in 2004 to 36 percent in 2010 and transport experienced the fastest increase in public investments over the period.

28 Urban transport is outside of the scope of this study; therefore, definition of public sector throughout this study does not cover local administrations. Moreover, transport sector definition is used in line with the Government's functional budget classification and therefore does not include natural gas and petroleum pipeline related expenditures. The institutions that are covered in this study are Ministry of Transport, Directorate General of State Highways, Undersecretariat of Maritime, Directorate General of Civil Aviation, Turkish Railways Enterprise excluding its subsidiaries (TCDD), and Directorate General of State Airports Authority.

29 Consolidation of the transport sector expenditures is based on the GFS2001 methodology. Annex 1 provides a detailed explanation of the data, coverage and methodology.

Box 1: Consolidation of Transport Expenditures

The definition of the public sector used in this study is in line with international standards and the Public Financial Management and Control (PFMC) Law. However, urban transport is outside the scope of this study, therefore, transport spending of local administrations was not covered in this study. Moreover, natural gas and petroleum pipeline related expenditures were not included in the calculations.

The data for Ministry of Transport, Directorate General of State Highways, Undersecretariat of Maritime, and Directorate General of Civil Aviation data were extracted from central government budget statistics. The Treasury's and institutions' own data were used for the Turkish Railways Enterprise (TCDD) and State Airports Authority (DHMI). Affiliated institutions of the TCDD; TULOMSAS, TUDEMSAS, TUVASAS were not included in this study. Additionally, General Directorate of Coastal Security has not been included in the calculations as well.

In order to eliminate double counting in the consolidation of the data, current and capital transfer, and lending transactions between the central government and SOEs have been counted only once at the final spending agency's accounts. For example, transfers for duty losses (a subsidy to cover the cost of uneconomic lines operated for social purposes) from the central government to TCDD were deducted from the central government's expenditures since it is already part of the revenues and expenditures of the TCDD.

Table 4: Economic Classification of Transport Expenditures

(percent of GDP)	2004	2005	2006	2007	2008	2009	2010
Total Public Sector	1.06	1.11	1.20	1.14	1.36	1.55	1.92
Compensation of Employees	0.30	0.28	0.25	0.25	0.23	0.24	0.22
Good and Services Purchases	0.22	0.24	0.21	0.24	0.24	0.28	0.31
Current Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Capital Expenditures	0.53	0.59	0.73	0.66	0.86	0.99	1.35
Capital Transfers	0.00	0.00	-	-	0.03	0.06	0.04

Source: MOF, TCDD, DHMI and staff calculation

Table 5: Institutional Breakdown of Transport Expenditures

(percent of GDP)	2004	2005	2006	2007	2008	2009	2010
Total Institutional Breakdown	1.06	1.11	1.20	1.14	1.36	1.55	1.92
KGM	0.61	0.67	0.72	0.67	0.86	0.99	1.15
TCDD	0.33	0.33	0.35	0.33	0.34	0.38	0.52
Ministry of Transport	0.04	0.05	0.06	0.07	0.08	0.09	0.13
Undersecretariat of Maritime	0.00	0.00	0.00	0.01	0.01	0.01	0.01
DG of Civil Aviation	-	-	-	0.00	0.00	0.00	0.00
DHMI	0.07	0.06	0.07	0.07	0.07	0.09	0.10

Source: MOF, TCDD, DHMI and own Calculation

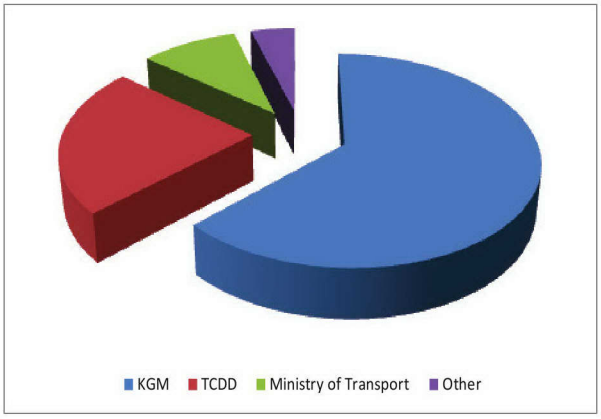
Table 6: Functional Classification of Transport Expenditures

(percent of GDP)	2006	2007	2008	2009	2010
Transportation Services	1.20	1.14	1.36	1.55	1.92
Highways infrastructure	0.67	0.59	0.78	0.90	1.04
Highways Operations	0.06	0.08	0.08	0.10	0.12
Sea Transportation Infrastructure	0.01	0.01	0.01	0.01	0.01
Sea Transportation Operation	0.00	0.01	0.01	0.01	0.01
Railways Infrastructure	0.11	0.10	0.11	0.14	0.28
Railways Operations	0.27	0.28	0.28	0.30	0.34
Aviation infrastructure and operations	0.07	0.08	0.08	0.10	0.11
Other Transportation Services	0.01	0.01	0.01	0.00	0.00

Source: MOF, SPO, TCDD, DHMI, and staff calculation

35. Roads and railways received more than 90 percent of the increase in public sector transport expenditures between 2004 and 2010. Of the increase, around 65 percent was allocated to the Directorate General of the State Highways' (KGM) budget for highways and divided-roads, and roughly one forth went to the Turkish Railways Company's (TCDD) (Figure 12).

Figure 12: Institutional Breakdown of Expenditure Increase in the Transport Sector between 2004 and 2010



Source: Ministry of Finance, TCDD, DHMI and staff calculation

36. However, there has been no modal shift from roads to railways in the share of total spending. One key Government policy priority was to achieve a modal shift from the road sector to railways, as stated in key strategic policy documents and Transport and Telecommunication Strategy 2010.[30] The Government policy preference for railways and port investments is laid out in various documents. Despite these policy objectives, the share of roads and railways in total transport spending remained at 61 percent and 31 percent, respectively. It should be noted that the shares remained constant, despite a relative decline in demand for railway services.

Transport Infrastructure Capacity Expansion Plans

37. The Ministry of Transport's new transport strategy sets ambitious targets for 2023. [31] Similar to previous policy documents, Turkey's 2010 transport strategy advocates a modal shift between roads and railways. In the new strategy, the Government's target is to increase the share of railways from 5 to 15 percent in freight transportation and from 2 to 10 percent in passenger transportation by 2023. These targets require a reduction in the share of road transport from 80 to 60 percent in freight and from 90 to 72 percent in passenger transportation. These targets also imply that the government projects a dramatic increase in railway demand once the railway infrastructure is improved as a result of the new transport strategy.

Table 7: Existing Road and Railways Networks and Targets for 2023

	Existing Network (kilometers)	Target for 2023 (kilometers)
Highways network	2,236	7,500
Divided Roads	21,340	32,000
Railways	12,000	30,000

Source: Current data are as of June 2012, and the targets are from the 2010 Transport and Telecommunication Strategy Report.

30 The key policy documents are Eight and Ninth Development Plans, Transport Master Plan Strategy (2005), Strategic Coherence Framework, Transport Infrastructure Needs Assessment 2007 (TINA), and Transport Operational Program (2007-2009)

31 Transportation and Telecommunication Strategy -Target 2023 Report, Ministry of Transport, 2010.

38. In line with these targets, the Government's long term capacity expansion plans are also ambitious. The Government announced plans to expand highways by three times, from 2,236 km to 7,500 km, and almost double the length of divided roads, by the end of 2023. Similarly, the plan provides for a more than doubling of railway infrastructure capacity by 2023.

39. The Government is planning to make substantial capital investments during the 2011-2023 period to meet the announced capacity expansion targets. The 2010 Transport and Telecommunication Strategy provides a very detailed infrastructure expansion plan for all transport modes. Since the major expansion is planned for roads and railways, this Report focuses only on these subsectors for the different scenarios. The details of the Government's new roads and railways infrastructure investment plans are provided in Table 8.

Table 8: Targeted infrastructure expansion and equipment purchases 2011 – 2023

Road (km)		Rail	
Divided road	11,523	High-speed railway (km)	10,000
Highway	5,302	Conventional railway (km)	5,000
Hot-mix bituminous paving	58,436	Double railway (km)	800
Single-platform road	9,100	Electrification (km)	8,000
Pavement maintenance	124,000	Signaling (km)	8,000
Bridges	78	Rehabilitation (km)	500
Tunnels	84	Connection lines	40
Total	208,523	Logistics center	16
		High-speed trains	180
		Locomotives	300
		EMU	120
		DMU	24
		Freight wagons	8,000

Source: Government of Turkey, Ministry of Transport and Communications, Transport and Communication Strategy – Targets for 2023. Ankara, 2011.

40. The planned new transport investments would require an additional annual average investment budget allocation of more than 3 percent of GDP, based on the Government's calculation. The government estimates total cost of TL 381 billion (in 2010 prices) for the new investments that are planned until 2023 (Table 9). Of the total cost, the Government is aiming to raise 33 percent (TL 125.7 billion) from the private sector through PPP projects. The need for additional annual fiscal resources of 2 percent of GDP poses a significant fiscal challenge. Moreover, the transportation expenditures by the local governments are not included in this picture. Additionally, new investments will bring pressure on operational expenditures. If we assume the current ratio of operational expenditures to capital expenditures will stay as it is, these new investments will require additional operational spending of 0.75 percent of GDP on top of the 2 percent for infrastructure cost.

Table 9: Costs of Transport Sector Planned New Investments, 2011-2023

Transport modes	Road	Rail	Maritime	Air	Total
Costs (mill. 2010 TL)	166,048	100,000	53,000	62,000	381,048
Private share in PPPs	43,000	25.000	47,700 *	10,000	125,700
Expected private investments	-	-	-	23,000	23,000

*The strategy document states that 10 percent of the investment will be undertaken by the public while the rest is expected to be met by the private sector.
Source: Government of Turkey, Ministry of Transport and Communication, Transport and Communication Strategy – Targets for 2023. Ankara 2011.

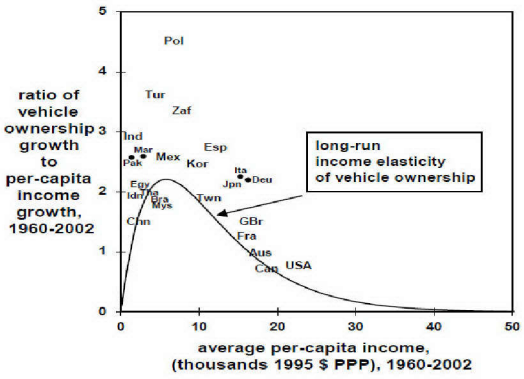
Priorities for Efficiency Gains in Turkey's Transport Sector

41. Given the size of planned additional investments a careful analysis of the efficiency of current spending in the transport sector is warranted to avoid possible waste of resources. Key areas for potential efficiency gains analyzed below include: better integrated multimodal transport planning and fiscally-constrained programming; leveraging private sector financing, and enhancing the operational efficiency in the different transport sub sectors. Good international public finance practice suggests that increases in transport sector operational efficiency should precede extensive additional resources for the sector. Increased public spending will not yield the expected outcomes unless operational measures are taken to improve the efficiency and effectiveness of all sector expenditures.

Overcapacity: A Risk in Roads and Passenger Railway Transportation

42. Rapid expansion of the transport network could create a supply-demand mismatch. As analyzed below, this is a particular risk in the railway sector, but also affects some of the road expansion plans, particularly in less developed parts of the country. The opportunity costs of public resources could be high, as these funds might instead be spent on improving municipal infrastructure, upgrading skills and other social priorities.

Figure 13: Car ownership grows more strongly than per capita income in middle income countries



Source: Dargay, Gately and Sommer (2007)

43. The government's plans to increase the transport infrastructure in the next decade are very ambitious compared to expansion experiences in other countries. For instance, for the new EU member states, the Commission targeted around 1.5 percent of GDP for transport investments to catch up with the endowment in Western Europe. Even these lower figures caused some absorption difficulties and resulting inefficiencies in some of the new member states. While Turkey's higher projected growth rates may justify somewhat higher investment levels, spending in excess of 3 percent of GDP may run into the same risk of inefficiencies.

44. Overinvestment in transport infrastructure has consequences for the efficiency of the public sector. Because transport infrastructure investment is lumpy, with high planning and implementation costs, some initial overcapacity is desirable, especially if transport demand is expected to increase rapidly as it is the case in Turkey. Persistent overcapacity would,

however, drastically drive up the costs of transport per passenger-km or ton-km due to rising operation and maintenance spending and the costs of amortizing capital that cannot be easily redeployed. This could in fact hamper rather than improve competitiveness. Major risks arise from a misallocation of capacity across modes and across regions.

45. **How much infrastructure is needed over the coming planning period depends on transport demand determinants and trends**. A major determinant for passenger and freight transport is aggregate population growth and its regional distribution. The future geographical distribution of the population is a consequence of natural local population growth and migration between regions and cities. A second important determinant of passenger and freight transport is income growth. The evidence on the mobility increase in middle income countries indicates that the income elasticity of transport demand is high and often higher than one for some time. That is, transport growth is often greater than income growth. Freight transport demand has additional determinants such as the sectoral composition of the economy. A high share of the manufacturing sector will mean that more freight capacity will be needed. For upper middle income countries, the rapid growth in services may lead to a leveling off of demand for freight capacity. At the same time, Turkey's unique position as a possible transit hub may continue to boost the demand for freight services for some time.

46. **The demand for the different transport modes will be influenced by the relative price and quality of the services.** For road freight transport the most important input price driving the service price is the price of diesel fuel, for rail it is the price centrally set by TCDD. The future relative prices will be driven by the development of fossil fuel prices (and possible international agreements to introduce charges for emissions) as well as the extent of public support for the railway sector. On the quality of services, a survey of freight customers, found that TCDD's service is characterized by slow speed, delivery delays, poor customer communications, bureaucratic ordering and payment processes, lack of IT systems for shipment information, and rigid tariffs. The survey results were incorporated into a Marketing Strategy, which recommends improving service on these dimensions to attract more traffic while selectively increasing tariffs.[32]

47. **A simple forecast of road transport demand relative to capacity expansion plans of the Government suggests a significant risk of excess investment.** Assuming GDP grows at 5.2 percent and the income elasticity of transport demand is 1.5 (historically at the high end for Turkey), road transport demand would increase by 128 percent from 2011 to 2023. Motorway capacity is planned to expand by 233 percent in the same time frame which implies a significant decline in road density. This seems unwarranted given current congestion levels, which are not high.

48. **The planned expansion of the secondary road system would also contribute to the excess capacity problem**. The system of divided lane roads is expected to increase from 19,700 km to 32,000 km, according to the 2011 Transport and Communication Strategy. The low current capacity utilization rate on divided lane roads would suggest that excess capacity would continue to exist on the double lane roads beyond 2023.

32 Italfer & Trenitalia, Marketing Strategy Report (December 2011).

49. Given Turkey's current rail system performance and structure, railway demand is unlikely to grow at the rate of demand for road transport services. Taking the EU-25 as a benchmark, model calculations show that the transportation demand for railways will lag behind road transportation. Simulations prepared for this report suggest a key reason is the poor state of railway services which discourages freight operators as well as passengers. [33] Thus with increasing income, passengers tend to value speed of transport more and railways struggle to compete with either roads or airplanes on speed.[34] 95 percent of Turkey's tracks are single line. Additionally, the lengths of the main railway routes are 28 percent longer than the alternative routes by road. The low density of the railway network, the low quality of rail services, and limited inter-model logistics services at stations inland, are the main deficiencies affecting Turkey's rail transportation sector.

50. The observed shift away from rail passenger transport risks overcapacity in the new high speed rail sector. The expansion plan for the high speed rail sector focuses on passenger transport. If past trends in a modal shift from rail to road in passenger transport continue, 10,000 km of high speed rail track might be underutilized. The high fixed costs of the high speed rail track, discussed in the last Chapter and the high price elasticity identified in the background paper on Turkey's transport demand imply a high risk of decreasing occupancy rates and strongly increasing costs per passenger – km. This risk can only be mitigated by a strong demand for speed. While the demand for speed increases with increasing incomes, at high costs the aviation sector becomes the dominant competitor in the transport sector.

51. Railways are unlikely to be able to compete with road transportation in terms of price and with airway transportation in terms of quality and estimated time. Although the new transport strategy places a greater weight on public investment in railways, the railways look likely to be squeezed between relative cheap road transport (including intercity bus routes for passengers) and much faster and higher quality air transport. The authorities would do well to reconsider expansion plans for high speed rail against its likely competitive disadvantages.

52. Indeed, simulations prepared for this report suggest that passenger rail services become competitive only if their relative price to road transportation declines. Under a "no policy change" scenario, the only possibility of increasing the share of railway usage is the relative decrease of railways prices with respect to road prices.[35] Four different demand scenarios, based on an integration of multivariate statistical model, have been simulated. None of the scenarios provide a change in modal share as drastic as the Ministry of Transport's 2023 target. The 2030 modal share of railways in freight transportation, even in the pro-rail scenario, is projected to only reach 10 percent, compared to the target of 15 percent. The pro-rail scenario assumes a 20 percent reduction in railways costs as a proxy for a price reduction. The railway company's current financial situation of low operating revenues would further erode under a price reduction scenario, reducing the feasibility of this option.

33 The railway will only experience an increase in relative demand if the quality of railway infrastructure is set at the "High" level. When the investment to other transportation modes are considered, it can be seen that a "Medium" level of investment made to other modes will also result with an increase in the railway freight demands due to the increase in the intermodal transportation potential. Similarly, increasing passenger demand for railways seems only possible through increasing the quality of infrastructure through high speed train investment

34 Huenemann (2001) When China had an annual GDP growth of 8 percent, the income elasticity of passenger rail transport was only 0.2.

35 Ulengin (2011)

53. It is unlikely that there is a risk of creating overcapacity in the port sector. Turkey's international trade has increased more strongly than income growth. At the same time maritime transport has not shown a clear upward trend, with demand varying considerably year on year. Considering the significance of the maritime sector for international transport, the planned investment volume of TL 51 billion between 2011 and 2023 seems to be low. The flat development of transport demand may reflect bottlenecks in the port sector, leading to repressed demand. This may also explain the relatively low scoring of Turkey's port sector in the Competitiveness Report of the World Economic Forum.

54. The investment plans in the airport sector do not signal the danger of creating overcapacity either. The demand for air travel increases strongly in fast growing middle income countries the income elasticity of air transport in low and middle income countries has been estimated to be around 2. That is, a 10 percent income increase will lead to a 20 percent increase in air transport demand in particular for middle income countries.[36] In the longer run, air transport demand sensitivity to income growth may also decrease similar to the pattern in road transport, indicating a saturation of the market. In any case, there does not seem to be a major potential in saving public expenditures by cutting back investment in air transport infrastructure.

Aligning Planning, Budgeting and Implementation

55. Better alignment of planning, budgeting and plan implementation in the sector are other areas for efficiency gains. In the last few years, the Government has been injecting money into the transport sector through adhoc decisions and outside of the normal budget cycle. This comes at the risk of poor implementation, rising costs and loss of quality.

Table 10: Deviations of Transport Expenditures Compared to Approved Budget Allocation, Central Government

(percent)	2006	2007	2008	2009	2010
Transport Services	21	51	97	94	109
Roads	39	65	141	129	153
Sea	11	-10	3	-9	-20
Railways	-12	26	26	30	60
Aviation	-33	-36	21	130	17
Other	-11	-13	-13	-15	-7

Source: Ministry of Finance

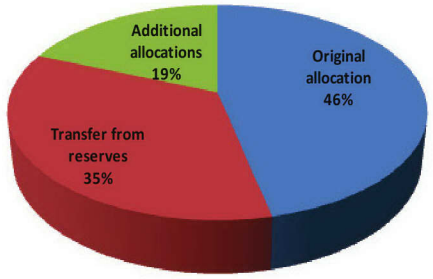
56. The Government should prepare an integrated transport sector master plan, ensuring it is coordinated across relevant government agencies. Medium and long-term objectives should be made consistent, investment projects prioritized accordingly, and the activities of all concerned government agencies aligned with these objectives. As discussed below, a transport master plan should also help mitigate against the risk of substantial deviations of actual from planned investment expenditures in the sector as a result of ad hoc mid-year decisions.

36 InterVISTAS Consulting Inc. (2007). Estimating air travel demand elasticities. Final report. Geneva: www.iata.org/whatwedo/Documents/economics/Intervistas Elasticity Study.pdf.

57. Weak links between the strategic planning process and the annual budget process, combined with ad hoc shifts in priorities over the course of budget execution, undermine the efficient use of transport funds. Adhoc policy interventions weaken medium term priorities of the sector although all transport sector institutions are required to follow medium term planning and budgeting. The Ministry of Transport, DG of State Highway, Undersecretariat of Maritime, and the DG of Civil Aviation are central budget government institutions and therefore subject to same budgetary processes. These institutions prepare 5-year strategic plans which provide the basis of medium term and annual budget preparation. The Ministry formulates its strategic plan to reflect the sector priorities and related institutions prepare their individual strategic plans. However, since the budget classification system does not facilitate budgeting and monitoring expenditures by programs, it is difficult to follow spending allocated to a particular program and therefore to establish the link with objectives set forth in the strategic plans. Since there is no transportation master plan, the link between institutional strategic plans is not clearly articulated. Finally, there is no link between institutional strategies and annual budget allocations to the sector.

58. Marked budget volatility undermines effective planning, project selection, and implementation. Annual budget allocations are frequently exceeded over the course of budget execution for the road sector. Central government transport expenditure reports show large deviations compared to originally approved budget allocations. Table 10 shows the difference between approved budget and expenditure outturn for the transport functions of the central government. Since 2006, the credibility of the transport related budget has been decreasing as expenditure deviations are getting as large as 110 percent of the original budget. [37]

Figure 14: Sources of KGM additional Spending, Average of 2006-2010



Source: MoF and own calculations

59. The unplanned and therefore unbudgeted investment spending of the KGM is the main source of the large budget deviations in the transport sector. Table **11** reflects actual spending as opposed to the original budget allocation to the KGM. Taking the original budget allocation of the KGM as 100, the final accounts reflect total expenditures of 276, 238, and 259 for 2008, 2009, and 2010, respectively. These large differences between actual and original amounts arose mainly from reserve appropriation and additional allocations (see Figure 14). Windfall revenues due to higher growth, savings from other budget items such as reduction in social security transfers, and unspent allocations of the other institutions were the major sources of in-year appropriation increases of the KGM. Even though the majority of the allocations for annual KGM investments are transfers from the "contingency allocations", there is no certainty at the beginning of the year about their magnitude since the Government has an authority to increase the reserve appropriation.

37 Turkey initiated the functional breakdown as part of introducing Government Financial Statistics (GFS) 2001 consistent budget classification in 2006. Transport services are reported as part of the economic affairs and services section of the functional classification.

Table 11: Budget Allocation versus Actual Spending of the KGM, (budget allocation=100)

	Original Allocation	Transfer from Reserve Appropriation	Additional Allocation	Year-End Expenditures
2006	100	39	0	139
2007	100	32	31	163
2008	100	59	117	276
2009	100	83	55	238
2010	100	159	0	259

Source: Ministry of Finance, Final Accounts

60. These deviations over the course of budget execution are in part due to ad hoc changes in Government priorities. In KGM, planning and project preparation does not match de facto resource allocation. Initiating new roads investments that were not included in the annual investment program or increasing the budget allocations of the existing investments put KGM under pressure to prepare and initiate these projects. The budgets are prepared using the base budget as per the budget preparation instructions of Ministry of Finance (MOF). The spending amounts in KGM however show significant deviations from the approved budget allocations due to additional new investments that were not included in the original plans. Moreover, the majority of these investments reflect the additional demands and changing priorities of the Government during the year. These additional investments are usually approved by the Higher Planning Council or the Council of Ministers as they significantly alter the allocations set forth in the Budget Law. Consequently the KGM budget allocations show increases up to three times the original allocated amounts in a particular year (Table 11).

61. The lack of appropriate planning and budget preparation, combined with ad hoc changes in spending priorities over the course of budget execution could result in an inefficient use of public resources and high project costs. Ad hoc road project inclusion and within year budget allocation could put pressures on KGM to initiate the projects and spend money without the completion of full feasibility studies and without ensuring the necessary implementation capacity. Procuring additional services under time pressure may drive up costs and exceed available resources for supervision of works, negatively affecting quality. At a minimum, a thorough *ex post* audit of additional spending by KGM is recommended to ascertain the efficiency of such ad hoc budget increases compared to planned spending.

62. A delay in the release of budget funds could create another risk for KGM budget implementation. Funds released with delay create unpredictability for contractors and may lead to arrears, which in turn increases costs. The Public Financial Management Performance (PFMP) benchmarking study prepared in 2009 reported the absence of a central system for monitoring accounts payable or monitoring overdue payments in the Turkish accounting system.[38] KHBS (public accounting system) does not have a contract management system for contracts where payments are made in installments. There is no regular information flow

38 The PFMP report that is based on the Public Expenditure and Financial Accountability (PEFA) framework was prepared to understand the strength and areas for improvement and develop strategies for further improvement in public financial management areas.

from the spending units to the accountant office when a contract is signed. The commitments can only be monitored after the first payment is registered. Lack of a commitment module in the KHBS led the central budget institutions to pursue alternative ways of monitoring their commitments. For example, KGM`s efforts in monitoring its commitments for investment projects are carried out by general or regional directorates through individualized processes. However a consolidated monitoring system of the KGM`s commitments is not currently in place**.** This represents a fiduciary risk and also weakens KGM's oversight over contract execution.

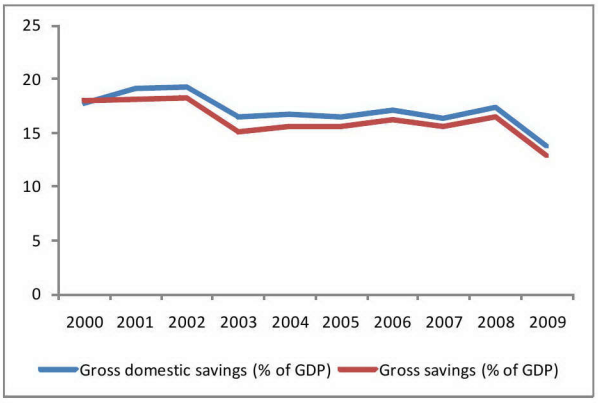
63. The establishment and use of an asset management system is a prerequisite for better maintenance planning. This involves regularly collecting and computerizing data on pavement conditions and traffic counts. An economic decision model such as the Highway Design and Management Model can then be used to identify priorities for maintenance, taking into account overall budget constraints. KGM should use such a database and an economic decision model to identify priorities and allocate scarce public resources accordingly.

64. Efforts should also be made to improve project planning. KGM's current planning and budgetary process is weak, as evidenced by the large gaps between actual and planned road works. Maintenance, rehabilitation and construction activities should be planned in advance using a medium-term development plan for the network. While routine maintenance activities can be easily incorporated into annual plans, the medium-term expenditures for periodic maintenance, rehabilitation, reconstruction, upgrades and new construction should be planned over a longer time-frame (e.g., 5 years.)

Financing Options for Transport Investments

Fiscal space for increasing the Share of Spending Going to Transport is Limited

Figure 15: The savings rate is substantially decreasing



Source: World Bank, WDI and Global Financial Development

65. Transport sector investment plans should be consistent with the medium term fiscal framework, and all new investments should undergo detailed economic analysis. The financing needs for the Ministry of Transport's planned medium and long term transport investments are high, and the options to finance the expansion from general government resources seem limited. The planned public transport investments require an additional three percent of GDP financing including maintenance expenditures. Given the fact that the current level of transport expenditures is already two percent of GDP, a further substantial increase in this share seems unwarranted.

66. While public debt has trended down, there is little scope to deficit finance additional transport investments. [39] A computable general equilibrium (CGE) model analysis for Turkey supports the conclusion that financing the additional investment by increasing public borrowing would at least dampen the growth enhancing effect of additional transport investment due to crowding out of private investment activity (Box 2 discusses results of four financing scenario alternatives of the new investments). [40]

Table 12: Turkey's External Finance as a Share of GDP

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Financing via international capital markets (gross inflows, percent of GDP)	3.03	2.48	3.05	3.54	4.24	4.94	3.44	2.15	1.66

Source: World Bank, Global Development Finance, 2011

67. Financing the new investments through purely domestic or external borrowing may not be desirable for Turkey. Savings rates in Turkey are low and have been decreasing, suggesting limited domestic capital is available for public borrowing without crowding out the private sector (see Figure 15). Financing transport infrastructure expansion through international capital markets also may not be a desirable option. Although Turkey's annual

39 Turkey's total Gross Public Debt stock is 45 percent of GDP by the end of 2010.
40 Erten (2011).

external public financing as a share of GDP has been decreasing in the last few years (Table 12), overall external imbalances are still high and external financing risks including for the government may thus limit the feasibility of large external public borrowing.

68. The Government's medium term fiscal plan aims at a strong fiscal position through a gradual improvement in the public sector primary balance. A baseline fiscal sustainability scenario, based on the Government's medium term fiscal plan, projects an improved fiscal situation through a gradual increase in the public sector primary surplus and a reduction in the public debt to GDP ratio until 2017.[41] Table 13 presents the baseline scenario established using the Government's 2012 Medium Term Program targets for growth, primary surplus, inflation until 2014. For the 2015-2017 period, the baseline assumes that the annual real GDP growth and annual CPI inflation will stay at 5 percent. These assumptions, together with a gradual improvement in the fiscal stance of the rest of the public sector, will result in an average primary surplus of around 1.5 percent of GDP over the projection period.

Table 13: Fiscal Sustainability – Baseline Scenario

Baseline	2010	2011	2012	2013	2014	2015	2016	2017
Real GDP growth rate	9.0	8.0	4.0	5.0	5.0	5.0	5.0	5.0
Public primary surplus	0.8	1.2	1.0	1.2	1.4	1.4	1.4	1.4
Public debt (percent of GDP)	45.0	40.2	37.6	34.8	31.7	28.1	24.6	21.2

The primary surplus to GDP ratio in the baseline scenario assumes that the dynamics of fiscal revenues are governed by the following formula: where is the output elasticity of government revenues, is the annual CPI inflation in year t, and is the annual growth rate of real GDP.
Source: Own calculations using Bank model, based on projections of SPO background paper and the Medium Term Plan.

Table 14: Deficit Financing Scenario, The transport expansion is financed by public debt (74 percent domestic, 26 percent foreign) 1/

	2010	2011	2012	2013	2014	2015	2016	2017
Real GDP growth rate	9.0	8.0	4.2	6.2	5.9	5.5	5.1	4.6
Public primary surplus	0.8	1.2	-0.6	-0.1	0.1	0.1	0.0	0.0
Public debt (percent of GDP)	45.0	40.2	39.2	37.2	34.9	32.3	30.1	28.1

Scenario calculation assumes that planned transport infrastructure investment during 2012-2023 period will be spent equally.
Source: World Bank staff calculations using Bank model, based on projections of SPO background paper

69. Deficit financing of transport expansion plans is incompatible with the baseline scenario. Deficit financing of the planned transport infrastructure expansion would result in a significant increase in the public debt to GDP ratio by around 10 percentage points above the baseline. An illustrative scenario, which assumes that expansion of transport investments will be fully financed by public debt through 74 percent domestic and 26 percent foreign borrowing, is presented in Table 14.[42] Under this scenario, the Government would not be able to reach its baseline macroeconomic targets. In conclusion, for lasting effects on economic growth, the expansion in transport infrastructure, taking fiscal constraints into account, should probably rely mostly on savings generated within the sector. Some debt financing may be warranted for high priority investments, but careful economic analysis should guide all additional allocations of public resources to the sector.

41 In the case of the primary surplus-to-GDP ratio, the output elasticity of central government revenues was assumed as 0.91 and the output elasticity of expenditures is assumed to be unity, implying that their share in GDP will remain constant over the period 2016-2023.

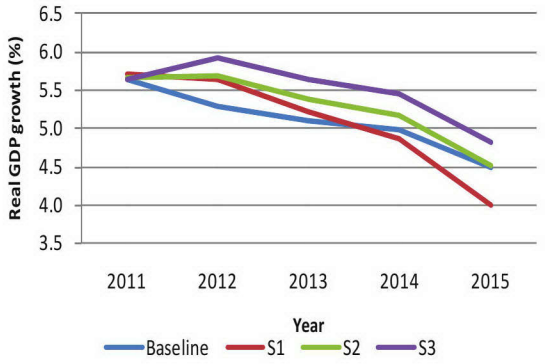
42 The fiscal sustainability analysis was carried out using the World Bank standard public debt sustainability tool developed by Budina and Wijnbergen (2007).

Box 2: CGE Model Results - Impact of Different Transport Investment Financing Options on Growth

To support the debt sustainability analysis, a CGE model was run to estimate the impact of increased public investment spending in the transport sector on the economy more widely. The background paper of Erten (2011) uses a Social Accounting Matrix that has 10 sectors and 4 factors, differentiating between private and public capital stock. This is the first CGE study on transport in Turkey.

The CGE model was also used to explore the impact on growth of different means of financing the transport infrastructure investment. Given its general equilibrium structure, the public sector finances is included explicitly in the model. This raises the question of how the additional investment in transport infrastructure will be financed. If, for instance, the additional investment is financed by a deficit, then private investment could be crowded out, which might dampen, if not offset, the growth enhancing effect of an additional investment in transport.[43]

Figure 16: Real GDP Growth Rate under Different Scenarios



Source: Erten, Tasci, Ozsan (2011)

The general equilibrium interaction between the additional transport investment and the resulting fiscal stance produces different growth outcomes. The resulting growth rates under different scenarios are presented in Table 14. The three scenarios are a pessimistic investment scenario (S1) that assumes a fully-debt financed transport investment of one percentage point of GDP; a more realistic scenario (S2) that is characterized by an investment commitment of one percentage point of GDP, which is only partially financed by debt; and an optimistic scenario (S3) where government undertakes the planned transport investment (of one percentage point of GDP), which is financed by a combination of additional public debt, increased private savings and an influx of foreign savings. Accordingly, the highest growth rate, compared to the baseline scenario, is achieved under S3. Here, in contrast to the first two scenarios (S1 and S2), additional public investment does not crowd out private investment despite a loose fiscal stance compared to the baseline scenario. The growth-enhancing effect of the transport investment is almost fully realized with the help of a boost in private and foreign savings. On the other hand, under the pessimistic scenario, the growth-enhancing effect of transport investment is dampened due to the crowding out of private investments by government borrowing during the period 2011-2014. After 2014, the growth-reducing effect of higher public debt outweighs the growth-enhancing effect of additional transport investment.

70. **Financing transport investments from additional revenues (e.g., from raising taxes or tolls) also faces significant limitations.** Annually planned additional investments in transport are equal to 15 percent of the 2010 general government tax revenues. [44] A 15 percent increase in tax revenues is significant, and could not be achieved through adminsitrative improvements in tax administration – tax policy changes would be required.[45] Moreover, there is not much room to increase the already high indirect tax rates compared to OECD countries.[46] User fees or toll revenues are a negligable part of overall revenues, and - while potentially important for selected projects such as bridges and high density roads – are unlikely to raise the resources necessary to achieve the government's transport expansion plans.

43 Within a general equilibrium framework, it would also provide insightful results to compare the relative importance of transport investments with other planned expenditures in different sectors. However, since the primary focus of the report is to analyze the sector from a public finance point of view, this issue has not been explored.

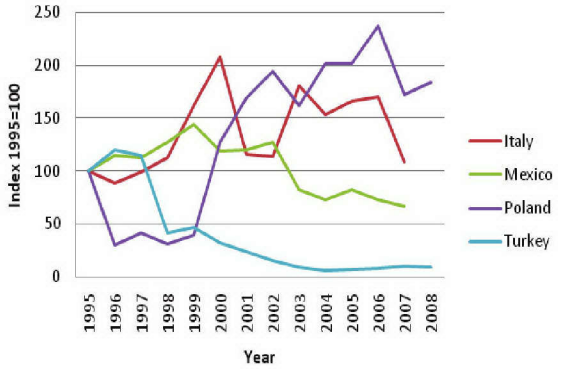
44 Ministry of Finance, 2010 Public Accounting Bulletin.

45 Ministry of Finance has announced that they will amend the income tax legislation in the near future without providing any detail about the new package.

46 Pınar Ardic, Burcay Eris, and Gurcay Sondan, An Evaluation of Indirect Taxes in Turkey, Boğaziçi University (January 2010).

71. Good international public finance practice suggests that increases in transport sector operational efficiency should precede extensive additional resources for the sector. The increased allocation to transport sector expenditures from the budget will not yield the expected outcomes unless operational measures to improve the efficiency and effectiveness of all sector expenditures are taken (discussed in further detail in Chapter V). In addition, the involvement of private finance (possibly through PPP arrangements) is relevant for selected infrastructure projects but PPPs are not a panacea for limited fiscal space, and improvements in the institutional framework will be needed to manage risks to the public sector.

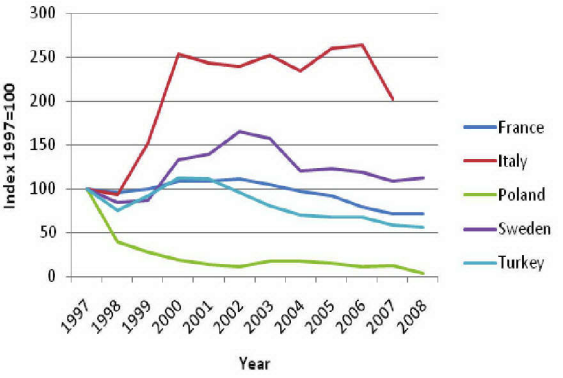
Figure 17: Road maintenance as a share of GDP has not recovered from the secular decline



Source: ITF, Annual Statistics 2011

72. Institutional capacity constraints also need to be considered to determine viability of the planned infrastructure investments. There are currently 383 investment projects in the sector of which 248 projects are in the road sector. The average completion period of the existing project stock is calculated as 6.28 years based on 2011 budget allocation assumption. This number goes up to 7.25 years for the existing project stock in the road sector. The significant backlog of unfinished projects points to absorption capacity constraints that may worsen further with additional resource allocation.

Figure 18: Rail maintenance as a share of GDP declines secularly in the last decade



Source: ITF, Annual Statistics 2011

Potential Savings within the Sector

Aligning Maintenance and Investments

73. Potential savings in the transport sector could be generated through ensuring maintenance of existing assets. There are many country examples where a lack of maintenance allocations has led to additional investment needs to replace lost assets or to losses in asset values that are a multiple of maintenance expenditures. [47]

47 Gwilliam (2007).

74. **The right level of maintenance depends on the size and the quality of infrastructure, its age structure, geographic factors and the intensity of usage.** Moreover, a major part of maintenance is routine activity adding to the fixed costs of infrastructure. With increasing GDP, the stock of infrastructure should increase, because of the greater demand for transport services and the greater availability of funding. This implies a parallel increase in funding for operation and maintenance.

75. **Turkey's roads and railways maintenance expenditures have been decreasing as a share of GDP.** Figure 17 shows that road maintenance expenditures have increased modestly in recent years, but only after a sharp decline from the mid '90s. Rail maintenance expenditures have stagnated in real absolute terms in recent years and declined as a share of GDP (Figure 18). This decline should be seen in relation to a fairly stable stock of infrastructure and a relative decline in demand for railway services.

76. **Current road maintenance expenditures are far below required levels.** The KGM unit price for routine annual maintenance is $50,000 for every kilometer of highways. Similarly, the unit price for major maintenance that needs to be undertaken every 5 to10 years is $700,000 per kilometers. Based on these assumptions, Table 15 provides the required versus actual maintenance costs. Turkey has only been spending half of what is required for routine and major maintenance costs in highways.

Table 15: Actual versus Required Maintenance Cost, Highways

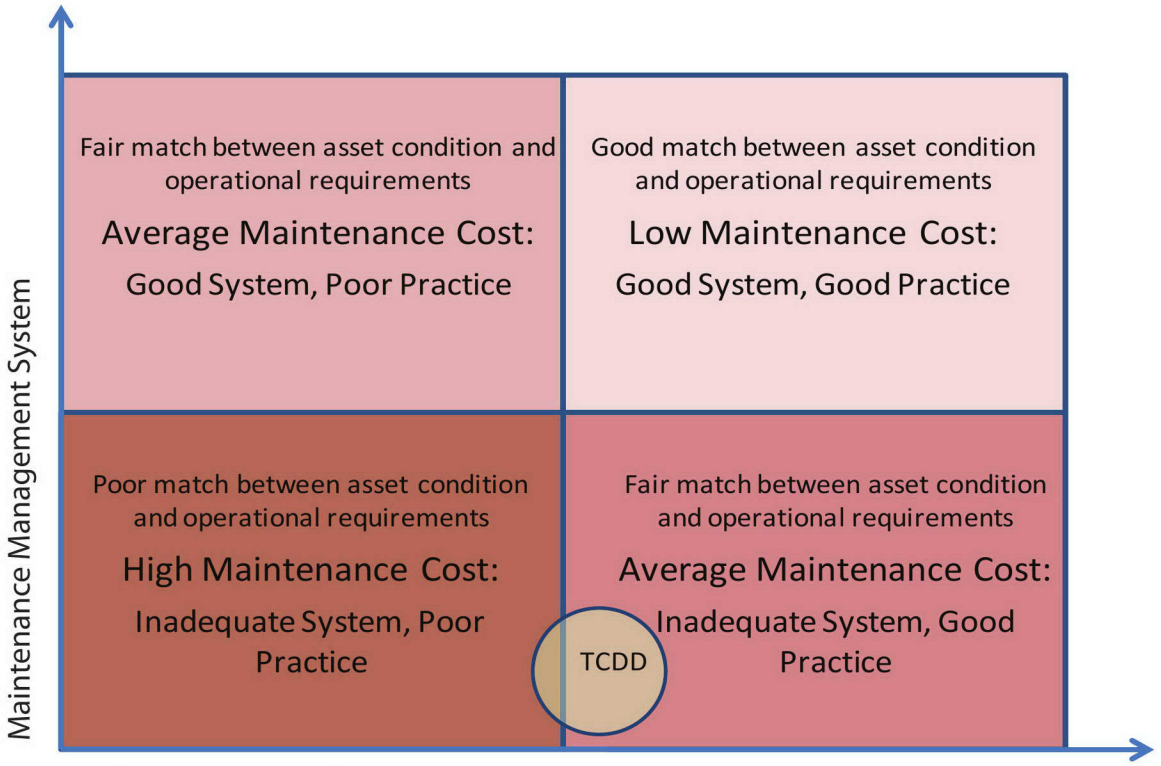
(TL million)	2005	2006	2007	2008	2009	2010
Actual Maintenance Cost	150	170	125	173	196	199
Routine	109	123	100	93	117	125
Major	41	48	26	80	79	74
Required Maintenance Cost	335	410	372	373	449	468
Routine	112	137	124	124	150	156
Major	224	273	248	248	300	312
Actual/Required (percent)	45	42	34	46	44	43
Memo item						
Highways Network (km)	1,667	1,908	1,908	1,922	1,936	2,080

Source: KGM, WB Staff calculations

77. **Railway maintenance is technically effective but achieved at high cost.**[48] A benchmarked audit of TCDD maintenance practices found that assets are maintained at a fair level, in line with modest demand levels. However, the cost of maintenance is high compared to international norms: 18 percent more for rolling stock, 58 percent more for track and 30 percent more for electrification than international averages. The high costs result from the lack of a formal Maintenance Management System, the failure to prioritize maintenance expenditures according to business requirements, and the operation of many more maintenance facilities than needed to meet business needs. Figure 19 illustrates that maintenance inefficiencies exist in the Maintenance Management System more than in the execution of the System (practice).

48 TCDD Maintenance Review, R&H Railway Consultants, December 2009.

Figure 19: TCDD railway maintenance high-level status-quo



78. The desired increase in transport infrastructure capacity could be achieved with lower public (and/or private) expenditures. An increase in future maintenance expenditures relative to planned investment could lead to a net increase in transport capacity. The absence of data on transport infrastructure capital stock and its physical depreciation makes it difficult to derive precise statements on the losses in infrastructure capital assets. However, the long-term decline in maintenance expenditures relative to GDP against the background of substantial capacity additions is of concern. In the extreme, future maintenance spending may help to keep a larger share of the capital stock in operation as would be added through an equivalent amount of new investment and hence reallocating funds from investment to maintenance would results in higher transport capacity.

Increasing Efficiency of Transport Sector SOEs

79. Increasing the productivity of State Owned Enterprises (SOEs) in the transportation sector is a large potential source of savings and thus resources for additional investment. Turkey has taken major steps in reorganizing the transport sector. The privatization of Turkish Airways has created a large, profitable European airline with resources sufficient to expand the fleet of aircraft without any public support. A number of airports have been successfully privatized, too. TCDD, the State Owned Enterprise for the railways, is no longer directly

responsible for the operations of ports. This may in turn create incentives for private owners to invest in capacity expansion. The largest savings that remain untapped could come from a reform of the railways. While the lessons from the privatization of Turkish airlines and of the ports are not easily transferable to the railways, there is ample international experience that suggests that railway reform yields substantial financial as well as quality benefits.

80. The privatization of Turkish Airways and the ensuing aviation sector reform process increased productivity and led to substantial cuts in costs. The reform process in the aviation sector, which included privatization of Turkish Airlines and successful implementation of Build-Operate-Transfer projects for the airports, can be considered as a success story. Annex 1 presents a detailed discussion of the developments in the aviation sector and highlights the major steps taken in the reform process.

81. The port sector reform faces challenges despite the strongly increasing demand and the potential of the sector to generate substantial cash revenues. Annex 2 displays a detailed analysis of the port sector. It is clear that the potential of the port sector is not being utilized to full extent. The delays in the privatization of the ports, mainly due to competition policy concerns, were one of the causes for this underutilization. The sector had long suffered from a lack of capacity, which created windfall gains for private operators with limited incentives to expand capacity. To avoid these inefficiencies, regulation should be redesigned. Price regulation to prevent scarcity rents may be appropriate or concessions that include specific investment requirements.

82. The performance of the privatized ports suggests privatization led to significant improvements in both revenues and the level of services provided but this has been highly uneven. As Table 16 shows the increase in services has been unequally distributed between the privatized ports. Some have even lost demand since privatization. Table 17 indicates that revenues have increased more strongly than operational throughput.

Table 16: Development of freight handling in the ports of TDI, in thousand tons

	Before Privatization			After Privatization		
Ports	Loading	Unloading	Total	Loading	Unloading	Total
Tekirdag	131	728	859	530	1,394	1,924
Hopa	240	173	413	41	457	498
Giresun	81	169	250	10	187	197
Ordu	22	59	81	13	32	45
Sinop	5	5	10	-	-	-
Rize	174	118	292	275	71	346
Antalya	261	1,379	1,640	3,161	640	3,801
Alanya	-	-	-	0	-	0
Marmaris	-	-	-	4	16	19
Cesme	46	74	120	2	27	29
Kusadasi	-	-	-	-	-	-
Trabzon	258	739	997	706	1,255	1,961
Dikili	304	-	304	259	107	366
	1,522	3,444	4,966	5,001	4,184	9,186

The figures before privatization refer to the date of the signing of the concession contract.
The after privatization numbers refer to 2009.
Source: Privatization Authority

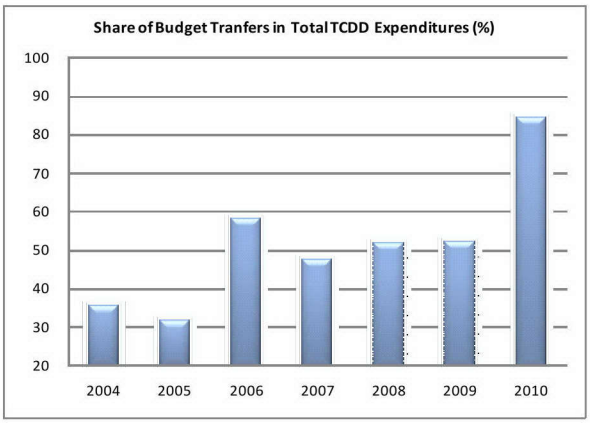
Table 17: Service revenues of TDI ports before and after privatization, in thousand $

	Before Privatization				After Privatization			
Ports	Loading Unloading Services	Passenger Services	Other Port Services	Total	Loading Unloading Services	Passenger Services	Other Port Services	Total
Tekirdag	3,378	-	1,033	4,411	7,259	-	5,016	12,275
Hopa	162	-	149	311	2,194	-	843	3,037
Giresun	439	-	195	634	591	-	537	1,128
Ordu	202	-	5	207	230	-	48	278
Sinop	25	-	1	26	-	21	18	39
Rize	140	-	175	315	1,058	-	575	1,633
Antalya	2,318	276	1,966	4,560	11,472	69	15,032	26,573
Alanya	-	89	45	134	-	484	369	853
Marmaris	-	1,516	234	1,750	27	1,355	1,133	2,515
Cesme	688	938	1,019	2,645	821	94	1,193	2,108
Kusadasi	-	1,806	1,211	3,017	-	1,359	2,146	3,505
Trabzon	3,283	37	2,175	5,495	6,813	222	5,076	12,111
Dikili	511	72	185	768	1,045	46	225	1,316
	11,146	4,734	8,393	24,273	31,510	3,650	32,211	67,371

The before privatization figures refer to the year before transfer, the after privatization figures are of 2009.
Source: Privatization Authority

83. To meet the ambitious goals specified in the new transport strategy, the railway sector needs substantial reform. The Ministry of Transport and Communications' Strategic Plan calls for the construction of 10,000 km of high speed lines by 2023, at an estimated cost of TL 60 billion.[49] This compares to 6637 km of lines currently operational in all of the EU. For a midsized railway company by European standards, the expansion plans may be over ambitious even with generous government transfers. In addition, the existing stock needs upgrading.

Figure 20: The railway company receives increasing transfers to cover its deficit



Source: MOF, SPO, TCDD, DHMI, and staff calculation

84. TCDD has been the largest loss making SOEs in the Turkish system and its financial performance is worsening. Operating revenues as a share of total expenditures are decreasing, the difference being covered by increased budgetary transfers. The Undersecretary of Treasury is the only shareholder of TCDD. Changes in the financial performance of the rail sector have therefore direct consequences for public expenditures in transport. While the real revenues from freight and passenger services have gone up, expenditures have increased more. The pricing policy of the TCDD, reductions of revenues from privatized ports, and increases in infrastructure expenditures such as speed train investments are contributing factors to the decreasing coverage of spending by operating revenues. As it is shown in Figure 20, the share of budgetary transfer in total expenditures reached as much as 85 percent in 2010 from 35 percent in 2004.

85. The worsening financial performance of TCDD underlines the importance of railway reform and SOE governance reforms more generally. TCDD suffers from weak incentives for cost control due to a non-transparent subsidy system and centrally mandated investment plans with apparently little regard for commercial viability. Railway reform should contain several elements. First, the railway should be organized by lines of business (passenger, freight and infrastructure) and transparent accounting should be introduced for each business unit. Second, the deficits of TCDD should be transparently financed from the general government budget, with contracts that clearly link funding to performance. Currently TCDD obtains subsidies through a variety of channels (including duty losses) not all of which are consistent with EU state aid rules (Box 3 summarizes the EU regulatory framework for railways that Turkey aims to align with). Third, railway management should be rewarded for achieving commercial target such as traffic growth, operational efficiency, profitability and good asset condition.

86. Without operational restructuring and greater efficiency the railway cannot become competitive in the freight and passenger transport market and its reliance on fiscal transfers will worsen. In a multimodal transport system, freight rail transport has the

49 Ministry of Transport and Communications, Transport and Communications Strategy – Target 2023, 2011, pp. 74-78.

potential to be the least costly transport mode for long distances while the same is true for passenger rail transport in medium distances. Energy efficiency and environmental reasons strengthen the rationale for a strong railway network. These advantages depend however on the organizational and technical efficiency of the railway companies. Where this is achieved through railway reform, ambitious expansion programs can at least be partially financed from operating revenues.

87. **The Government has recently initiated legislative changes and technical studies to provide a base for restructuring in the railway sector.** With the Decree By Law no:655, Directorate General For Railway Safety Regulation was established to work as railways Safety Authority and Railways Competition Regulatory Authority. A draft railway law that would initiate structural reforms to the railway sector, including infrastructure separation and open access, has been circulated for government review. The restructuring has been supported by a EC sponsored twinning project with Germany and technical studies carried out under the World Bank financed Railways Restructuring Project.

88. **While the high speed rail network may become the preferred mode of travel in some corridors such as Ankara-Istanbul, the high speed rail expansion program should be reviewed carefully as not all planned investments appear to meet economic viability criteria.** Each proposed line should be reviewed to ensure that (a) high speed rail (HSR) service will be competitive with air and road alternatives, (b) the market is large enough to use the capacity (i.e., minimum of one train per hour), and (c) HSR is cost effective relative to air and road transport alternatives. Box 4 provides international experiences on these areas.

89. **High speed trains require high speed infrastructure, meaning that new dedicated track needs to be built at a cost substantially higher than the conventional rail line.** Infrastructure maintenance costs are comparable with conventional rail but the building costs and the acquisition, operation and maintenance costs of specific rolling stock make this transport alternative an expensive option. The higher costs of the high speed rail line must be compensated for by the economic benefits in terms of lower transport costs, time savings in transport, reduced congestion costs and reduced environmental costs. [50]

90. **High speed rail is competitive with road and air travel for distances of 250 – 750 km.** HSR typically competes effectively with air and bus/auto transport for trips of duration of approximate 1 – 3 hours, when at least hourly train service is offered. A review of the HSR services under construction in Turkey found that the service would be quite competitive with bus. Bus riders are very price sensitive, however, so pricing will determine how many bus riders will shift to rail. HSR service would be also competitive with air to Istanbul because of greater comfort on the train, provided that the train terminus is in Haydarpaşa. Should the terminus be in Gebze, requiring passengers to change to a commuter train for the last segment of the trip, HSR service is unlikely to be competitive with air. Some of the high speed rail links planned for the future, e.g., to Kars, are too long a distance for HSR service to compete with air.

50 De Rus (2008).

91. High speed rail services rarely cover their full costs. The capital costs of high speed rail are very high—ranging from US$ 35 – 70 million per km—depending on terrain and urbanization, while operating costs of high speed rail are comparatively lower. In higher income countries with high ticket prices and well developed traffic (e.g., France), high speed rail can cover its operating costs but rarely pays for its capital costs. In developing countries, 20 million passengers per year are typically necessary to cover operating costs and pay interest on debt. Approximately 40 million per year are necessary to pay back capital costs.[51] (An estimated 12 million trips per year are made between Ankara and Instanbul.) This implies that high speed rail is most financialy viable for city pairs with high volumes of travel, and that government should anticipate paying operating subsidies for services with lower traffic volume.

92. High speed rail in Turkey will require substantial operating subsidy. To attract riders, the HSR services will need to be priced to compete with bus. (For example, the HSR service from Ankara to Eskişehir is priced at TL 20.) Together with moderate expected traffic volumes, especially outside the Ankara – Istanbul line,[52] ticket revenues for high speed rail are not expected to cover operating costs. A forecast of HSR operating results shows losses increasing from TL 65 million in 2011 to TL 427 million in 2016 as services to Konya, Istanbul, Bursa and Sivas are added.[53]

93. Proposed HSR line should be reviewed for market and cost effectiveness. As smaller and more distant cities are added to the HSR network, the investment costs will rise while the competitiveness of HSR services and hence the demand for the newly built capacity will decrease. This raises the question of whether building the full 10,000 km HSR network envisioned in the Strategic Plan is the most cost effective way to meet the mobility needs of Turkey.

94. Reform experiences in other countries can provide alternatives for Turkish railways transport policy. The situation of the Turkish railways is not uncommon. Many state managed or heavily regulated railways have failed to respond effectively to the challenges of increasing competition by the road sector and the aviation sector. Often, this inability was due to the fact that the incumbent railway company remained a public administration with weak incentives to seek revenue and cost cutting opportunities. Many countries have achieved large savings in fiscal transfers to the railways by restructuring the incumbent companies[54] Restructuring can take many forms, and can be accomplished for both state-owned and private railways. The key is to create an environment in which the railway functions in a commercial fashion, mindful of its markets and profitability.[55] Annex 4 discusses the restructuring of US, French, German and Russian Railways, and highlights the restructuring of the German railways as an appropriate model for Turkey.

51 Paul Amos, Dick Bullock and Jitendra Sondhi, High-Speed Rail: The Fast Track to Economic Development, July 2010. Available at http://www.worldbank.org/en/news/2010/07/27/world-bank-report-commends-chinas-development-high-speed-rail.

52 An estimated 12 million trips per year are made between Ankara and Istanbul by all modes.

53 Ecorys, Consultancy Services for Rationalization and Preparing a Passenger Service Obligation (PSO) Contract for Passenger Services in Turkey.

54 Friebel (2011).

55 Options for structural reform, principles of governance of state owned railways, commercial railway management practices and case studies of reform can be found in Railway Reform: A Toolkit for Improving Rail Sector Performance www.worldbank.org/railways.

Box 3: The EU Regulatory Framework

Over the last two decades the European Union has transformed the regulatory environment of European railroads. In case of an accession of Turkey to the EU, these directives will be binding for Turkey as well. The EU is increasingly taking steps to make sure that the directives are implemented and their implementation is monitored, not only by EU bodies, but also by members of the scientific community, the media and consulting firms, see for instance, the IBM Liberalization Index (2007).

Three railway reform steps of regulation and liberalization were identified by Di Pietrantonio and Pelkmans (2004). The first step stipulates the separation of accounts between infrastructure and operations. (Directive 91/440). The second step of EU reforms came into force in March 2003, and is usually referred to as First Railway Package. It focuses on rail freight, and aims at introducing open access to networks at least on the TERFN (50 percent of EU railway networks and 80 percent of traffic) and later on the whole network (by 2006 according to the Second Railway Package). Following this, a number of technical directives were added in order to deal with technical and legal barriers though the Directive on Interoperability of High-Speed (96/48) and the Directive on Conventional Rail (2001/16). A third step of reforms was made with the Second Railway Package, which regulates the harmonization of safety requirements and certifications currently in place in different member states, and creating obstacles for market entry. The package also set the groundwork for the creation of a European Railway Agency for Safety and Interoperability, which began its work in 2004.

Through the last years, the EU has continued its work on changes in the regulatory framework. The Third Railway Package, which was adopted in October 2007, stipulated open access for international rail passenger services. Importantly, this includes cabotage by 2010. Cabotage means that operators may pick up and set down passengers at any station on an international route, including at stations located in the same member State. With the third railway package a European driver license was created, and the certification of cross-border drivers is foreseen as from 2011. Rail passengers' rights were also strengthened, including minimum quality standards and compensation rights.

The degree of implementation of the EU rules still differs to quite some extent. One attempt to measure it is the so-called liberalization index (IBM, 2007) which undertakes this task by measuring to what extent the law in the books, the law in practice, and competition in the market are in line with the directives. According to the index there four countries for the most advanced group Sweden, the UK, Netherlands and Germany, while Luxembourg, France, Greece and Ireland form the bottom group.

Box 4: Can High Speed Rail change the game?

Although infrastructure maintenance costs for high speed rail are comparable with conventional rail, building, operation and maintenance costs of specific rolling stock make this transport alternative an expensive option. Thus, it is expected that higher costs of high speed rail line must be compensated by the economic benefits, which include time savings in transport, reduced congestion and environmental costs.[56] Building high speed rail tracks brings three types of costs, planning and land acquisition costs, the construction of the rail track and superstructure costs. A study of 45 high speed rail lines in Europe showed that construction costs per km ranged from € 9 million to 40 million depending on the geography and terrain conditions, with an average value of € 18 million.[57] Planning and land acquisition costs add another 10 percent to the core investment costs. A study of infrastructure maintenance for five European countries (Belgium, Netherlands, Italy, France and Spain) revealed average maintenance costs for single track high speed rail of € 30,000 per year and km.

On the other hand, operating costs of high speed rail services (expenditures for train operations, maintenance of rolling stock and equipment, energy, and sales and administration) are high and vary across rail operators depending on the specific technology used by trains and traffic volumes. In the case of Europe, almost each country has developed its own technological specificities. Trains have different technical characteristics in terms of length, composition, seats, weight, power, traction, tilting features, etc. The estimated acquisition cost of rolling stock per seat goes from € 33,000 to 65,000. The train operating costs per seat goes from € 41,000 to 72,000 while rolling stock maintenance varies from € 3,000 to 8,000. Adding operating and maintenance costs and taking into account that a train runs from 300,000 to 500,000 km per year and that the number of seats per train goes from 330 to 630, differences in costs per seat-km can be large between countries. Taking these average numbers as reference values and assuming a demand for a 500 km distance of 5 million passengers – trips per year, the average fixed cost per year is € 210 and the operations costs per round trip are € 218. If the high speed train operations were to be self – financing the ticket price for a 500 km round trip would have to be € 418. These costs could easily be higher as the assumptions on demand and trip length are favorable ones.

Finally, it is obvious that other modes of transport would be strong competitors to the high speed railways. Airline ticket prices would cost substantially less than the hypothetical ticket price. Bus tickets would even have lower prices but road transport would lead to higher travel times. The competitive position of high speed rail depends on congestion, whether the higher speed of the train and congestion in intercity road transport leads to substantially shorter travel times. High speed trains may also provide higher levels of comfort than road or air transport. The higher costs of high speed rail may also justify subsidies if the lower external costs (costs of local air pollution, transport safety costs and higher energy – efficiency) are not reflected in charges for the competing modes. Subsidy requirements will strongly increase with decreasing load factors of trains. Extending the high speed rail to regions which are not densely populated and to connections between smaller cities or cities that do not have intensive travel and trade relations could lead to high subsidy requirements per passenger – km. High speed rail has to be judged against this backdrop as means to improve the economic and financial viability of the current Turkish railway system.

56 De Rus (2008)
57 UIC (2005)

The Potential Role of the Private Sector

Private Sector Involvement in Motorway Services in New Transport Plan

95. In addition to generating savings for transport sector expansion within the sector itself, private sector involvement in motorway services may provide another source of financing. In Turkey, private partners are mainly expected to Build-Operate- and Transfer the new investment in motorway capacity. The existing motorway system is planned to be operated in partnership with the private sector. The Transport and Communications Strategy 2011 foresees expenditures of around TL 200 billion (in 2010 prices) of which TL 43 billion are to be financed as private shares in Private Public Partnerships (PPPs).

96. The revenues from the bidding for these services contracts through PPPs are intended to be used to upgrade the system of secondary roads to double lane roads. These plans suggest that in principle the expansion of the motorway system and the upgrading of the secondary roads could be self-financing: the private partners for the expansion would cover investment as well as operation and maintenance costs by charging road users, while fees earned on existing concessions by the Government would finance the upgrading of secondary roads. However, the feasibility of such an investment plan is still an open question. Uncertain traffic projections and Government's willingness not to have contracts longer than 15 years make new road BOT contracts difficult to finance privately, requiring government guarantees.[58] Additional uncertainty is introduced by the very fact that the authorities plan to use PPP revenues to upgrade secondary roads to double lane standards, essentially running in parallel to motorways and hence reducing the revenue potential for private motorway concessions. The required level of government risk sharing may well be so high as to create implicit liabilities equivalent to the cost of full public financing.

97. Private sector involvement through PPPs does not always contribute to development objectives. First, to recover the high fixed costs of infrastructure facilities, the prices for the transport services may exceed the marginal cost of infrastructure service provision. In this case, total welfare could be increased by lowering tolls to the level of marginal cost but private operators would lose money if they did. Second, in case of a weak competition, high tolls could generate excessive rents or operators could provide low quality services to maximize profits. Maximum toll levels and quality benchmarks are required to create appropriate incentives. Third, it is not clear that private finance will have lower costs than public finance. The credit rating of governments is in general superior to the credit rating of private investors. Private involvement lowers the cost of a transport project only if the PPP contract contains high powered incentives to lower cost and hence more than compensates for the private sector risk premium.

58 The contract period are set according to outcome of the tender. However, the Government uses the demand guarantee as a tool to keep the contract period not more than 15 years.

98. To benefit from private involvement in infrastructure financing and operation, governments must have the capacity to structure appropriate contracts, to monitor and enforce contract provisions and to commit to contract stability. Poorly prepared tenders can often lead to failure or result in contracts that impose high costs on the public sector. Poor monitoring and enforcement systems could lead to private sector opportunism and costly and lengthy litigation. The inability to commit to contract stability because of weak institutional capacity raises private sector risk premia and will drive up costs, possibly above the level where private sector involvement could create social value.

Analysis of the PPP Model in Turkey

99. Although Turkey is one of the countries in the region with the most experience in PPP, and there is progress in the legal process as well as the transparency of the PPP projects, the institutional and legal framework has the potential to create risks for maximizing economic and social benefit from the PPP operations in Turkey. The current legal structure varies by sectors and institutions. There are more than six different pieces of legislation that set the legal ground for PPP operations in the transport sector. These legislation cover different aspect of PPPs such as definition of a concession (the Constitution), general rules and principles of Built Operate and Transfer (no:3996), dispute resolution and appeals process (law no: 4501), privatization (law no:4046), state owned enterprises (decree by law no:233) and treasury guarantees (law no:4749). Specific authority to regulate on PPPs is provided to different institutions but there is no single monitoring and supervising agency. Thus, a starting point for a successful PPP model should be to establish an effective institutional framework to serve regulation and monitoring functions. The Government has been working on a new draft framework legislation that is expected to address these issues.

100. A second critical issue in the PPP analysis of Turkey is whether the projects are justified on economic grounds. Preparation period of feasibility studies for PPP projects, which in average are 1-2 months, needs to be increased to improve the economic analysis supporting these projects. The 2011 Council of Ministers Decision that lays out minimum standards for feasibility studies including risk, economic and fiscal analysis is a very positive step to ensure that PPPs are not driven by short term fiscal motives (lack of space in the public investment program) but follow the same rigorous economic analysis as for other public investments. The reason is simple: if the project does not generate a strong social rate of return, even modest government commitments may be unjustified. If its private rate of return is not well established, private investors will need to be enticed with generous offers of risk sharing which at the margin may even exceed the costs of full public financing.

101. Consequently PPP projects should be aligned with the overall transport strategy, public investment program and therefore annual budget cycles. PPP projects presently are not part of the public investment programs of the government and therefore are not required to be aligned with budget cycles. However, to ensure maximum complementarity, PPP projects should be integrated into the public investment planning process rather than treated as a residual investment category outside the budget.

102. The model for PPPs that is planned to be employed for the expansion of the Turkish motorway system implies significant residual public costs. According to the currently favored model to Build-Operate-Transfer the motorway projects, private operators will not set the toll levels. The road agency KGM plans to prescribe tolls of $ 0.05 to $0.06 per vehicle-km for light duty vehicles. Charges for light trucks and heavy duty vehicles will be considerably higher. The prices have not been justified by economic arguments, such as marginal infrastructure and congestion costs. The targeted toll levels are low by comparison to other countries. The toll levels are lower than average tolls in other countries. The average toll for a trip from Paris to Marseille is about € 0.07 per km of a light duty vehicle, while tolls on congested routes are higher, for example € 0.17 per km between Cannes and Marseille. While affordability concerns may justify lower toll levels in Turkey, if costs are not commensurately lower, the difference will need to be covered by support from the government.

103. Potential private parties to the BOT PPPs bid on the shortest length of the contract. With the ending of the concession period the highway is transferred to the road authority in the condition of the facility at the end of the construction period. The length of the contract is expected to be at least long enough for the bidder to cover her or his costs and earn a "fair" rate of return on the capital invested. The bidder who offers the shortest contract period will be offered the contract. The shortest contract period offered implicitly creates an asset to the public sector at least costs, given expected demand for the motorway and given the toll level prescribed by the road authority. The realization of the least costs requires that the cost estimate as part of the bid is "credible". Any upward revision of the cost figures at a later stage has to be ruled out except in strictly limited force majeure cases.

104. The private partners are expected to mobilize private capital to finance the projects. It is to be expected and desirable that the investors will be able to mobilize foreign savings to be invested in the highway projects. Given the constraints to access long-term international finance, this makes it unlikely that the duration of loan contracts will extend over the entire length of the winning concession. The duration of loan contracts is expected to be about 15 years. How can investors then be attracted to finance the highway PPPs? In Turkey, the instrument likely to be used is a demand guarantee from KGM.

105. The appropriate level of demand guarantee that will ensure 'bankability' of the PPP projects creates a contingent liability for the public sector. In principle, the demand guarantee protects the investor from the risk of not covering full costs of the project if demand falls short of expectations. Should demand shortfalls threaten cost coverage and a normal rate of return, the demand guarantee will lead to transfers by the amount of the demand shortfall times the tolls prescribed by KGM. As the tolls are set in foreign currency, investors are also protected against a devaluation risk of the Turkish Lira. The demand guarantee does not only serve to deflect risks from the investor, but also to achieve financial closure. As part of the PPP model in highways the demand guarantee is planned to shorten the payoff period to align it to the duration of the loan. However, in some cases this may lead to a guarantee based on unrealistically high future demand levels.

106. The demand guarantee that is provided by KGM in the ongoing PPPs is not based on a rigorous future demand analysis and thus generates fiscal risk for the public sector. At the limit, without a proper demand analysis taking into account traffic levels as well as alternative routes the distinction between a demand guarantee and a revenue guarantee gets blurred. The latter obviously entails a considerable contingent liability for the government. The issue is complicated in the specific case of PPP projects in roads, because the demand guarantees have been offered by KGM, a special budget public institution. The administrative guarantees issues by KGM does not require formal Treasury Guarantee and therefore are not monitored as part of Turkey's contingent liabilities. A recent amendment in the Law no: 3996 that regulates PPP implementation for highways introduced a Treasury guarantee together with the administrative guarantee of KGM. This legislative change is expected to differentiate the price of PPP contacts with and without Treasury guarantee. While this may help implicitly prioritize among PPP projects in the road sector, a more explicit assessment and monitoring of the contingent liabilities created by KGM would appear to be warranted.

107. The currently favored model does not exploit fully the advantages PPPs may offer compared to traditional public procurement. While the payment mechanism based on the demand guarantee may help to find investors and lead to financial closure of the contract in a short period of time, it allocates risk strongly to the public sector. In principle, the private sector is the claimant to a residual economic surplus: if the private partner is able to cut costs, she or he is rewarded by higher profits. Likewise, efforts to improve the quality of the service can improve the competitive position of highways towards other modes and towards other classes of roads. If this increases revenues more than costs, this results in a profit increase of the private partner. However, whether such incentives work, depends on whether the demand guarantee is binding and on how much competition is in the market.

108. Price setting by KGM can avoid the creation of monopoly rents by the private parties. Such opportunities for rent creation result if competition in the market is weak and the operators set prices. Price regulation by KGM removes, however, a major part of the incentives to improve performance by increasing revenues. The only way to increase revenues is by improving the quality of services. Whether these incentives are effective depends on whether demand levels are higher than the level of the demand guarantee, and demand increases strongly as a response to quality improvements. If demand is lower, cost cutting considerations may dominate quality choice. To avoid an under-provision of maintenance and a low quality of infrastructure services, the public partner has to incur potentially high monitoring costs. The monitoring is only effective if penalties can be implemented as a reaction to underperformance.

109. The short contract duration defined by the feasible longest loan contract duration, reduces incentives for operators to perform. In principle, the net present value of the private partner becomes the smaller the shorter the contract period. This is countered by the demand guarantee. As demand will in many cases not suffice to pay off the investment in the time period of the loan contract, the demand guarantee assumes de facto the role of a revenue guarantee, weakening incentives to expand business and improve service quality. [59] Moreover,

59 Iossa and Martimort (2008)

experience from other sectors suggest that a real strength of PPPs is to specify the problem or standards to be met, and enlist the private sectors creativity and knowledge of innovative solutions to create a unique, cost effective solution to the problem presented. The current PPP model aims instead at maximizing asset values transferred to the state by bidding on contract duration but contains few incentives for the private sector to innovate.

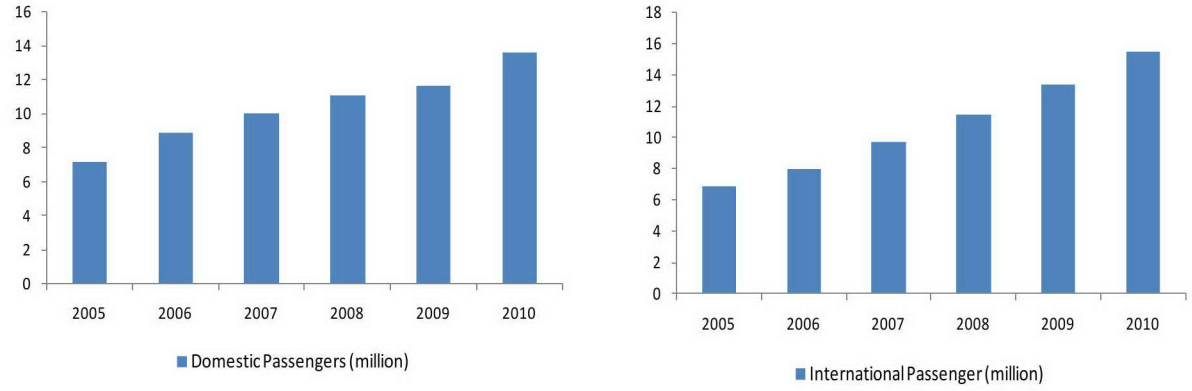
Annex 1: Turkish Aviation Sector: A Success Story of Privatization and Implementation of Build-Operate-Transfer Projects

1. **The aviation sector was one of the first sectors where government sold shares to private owners.** The Government's withdrawal from the commercial activities became a policy in 1986. The process started with the government's withdrawal from the catering and handling services. 70 percent of Plane Services Inc. (USAS) shares have been privatized by block selling in 1989, with the remaining 30 percent share being privatized later in October 1993. Airports Ground Handling Services Inc. (HAVAS) has been privatized by block selling of the shares, 60 percent in 1995 and the remaining 40 percent in 1998.

2. **Turkish Airlines had a long history of institutional changes.** Turkish Airlines was established in 1933 and since 1938 operated as a Department of the Ministry of Transportation. In 1955 it was corporatized as a state owned enterprise, managed and operated under private law as Turkish Airlines Inc. In 1994 the Turkish Airlines Corporation was redefined as a State Economic Enterprise under the jurisdiction of the Privatization Administration. By 2006, 49 percent of Turkish Airline shares belonged to the Privatization Administration in order to be privatized, and 51 percent were offered to the public.

3. **The privatization led to substantial cuts in costs.** THY has boosted the domestic and international passenger and freight services since then. Figure 21 shows that domestic passenger numbers almost doubled while the number of international customers more than doubled. THY reported revenues of $ 8 billion for 2011, up from $ 6.5 billion in 2010. Turkish Airlines has reported a net profit of $ 189 million for 2010. It plans to increase the seat capacity of the airline by 16 per cent in 2011 and extend its fleet to 177 carriers. The carrier aims to launch at least 50 new routes in the next few years.

Figure 21: The services of Turkish airlines have strongly increased since the privatization



The airport sector reform has reduced public expenditure demands
Source: Turkish Airlines, 2011

4. Turkish airports are the first transport facilities that have been established as Build-Operate-Transfer projects. Public Private Partnerships in the airport sector go back to the year 1993. The tender for the Antalya Terminal 1 was the first PPP of the Turkish State Airport Authority. The private partners have been responsible for financing the projects. As Table 19 shows the investment volumes have been high. PPPs in airports are more frequent than PPPs in other types of transport infrastructure including the road sector. They have in general been successful. As Table 8 shows, some of the private partners in airport PPPs have been foreign companies as well.

Table 18: Public-Private Partnerships in Turkish Airports

Airport	Year	Private Partner	Investment (mill. $)
Istanbul Airport	1997	TAV	306
Antalya Terminal 1	1994	Fraport (and Bayindir)	65.5
Antalya Terminal 2	2004	Celebi-ICTAS	71.1
Ankara Esenboga	2004	TAV	188
Izmir Adnan Menderes	2004	Havas-Bayindir	125
Dalaman	2003	Aksa-Turkuaz-Manas	72.4
Milas-Bodrum	2006	Teknotes-Aerodrom-Beograde	N/A

Source: DHMI, DG Airports

5. Airports were endowed with demand guarantees but never had to resort to them. To attract investors to join airport PPPs, the Turkish government has provided demand guarantees, shifting the business risk to the public sector and protecting the bidders for airport PPPs from the risk of losses. The examples of Antalya Terminal 1 and Istanbul Atatürk show that the actual traffic exceeded the minimum traffic levels guaranteed by the government from year one and in later years by far. Interestingly, airports have not been returned to public operation after the end of the BOT contract. The operation contract for Istanbul Atatürk airport ended in June 2005. The State Airport Authority then invited bids for long-term lease contracts. TAV offered the highest bid ($2.1 billion) and won the competition with an ultimate lease amount of $ 3 billion. The lease period has a length of 15.5 years.

Table 19: The actual international passenger numbers exceed the guaranteed minimum traffic for Antalya Airport, million passengers

Year	Guaranteed international passengers	Actual international passengers
1996	1.322	—
1997	1.430	—
1998	1.537	2.840
1999	1.645	2134
2000	1.752	3.416
2001	1.860	4.359
2002	2.024	9.751

Source: DHMI

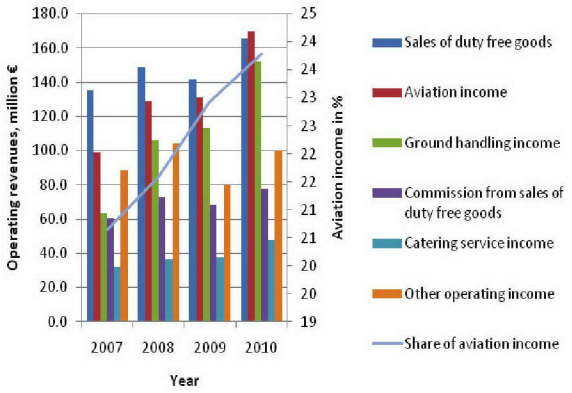
Table 20: The actual international passenger numbers exceed the guaranteed minimum traffic for Istanbul Atatürk Airport, million passengers

Year	Guaranteed international passengers	Actual international passengers
2000	4.000	4.851
2001	4.120	4.347
2002	4.244	8.506
2003	4.371	8.908
2004	4.502	10.169

Source: DHMI

6. The success of the airport sector is not based on the provision of infrastructure services alone. The airport sector is sometimes taken to be an example for other types of transport infrastructure. Before one can conclude from the success of the PPPs in the airport sector to other types of infrastructure one has to keep in mind, that nodal infrastructure facilities in transport like airports and ports face often only weak competition. The fees for infrastructure services are only a small share of the overall costs of airlines. Moreover, airports benefit from network economies, such that airlines are reluctant to relocate to smaller airports to avoid higher charges. As a consequence, the price response of demand for airport services is particularly low. All these mean that airports are often in a position to earn high rents. What is even more important is that airports present different profit opportunities than other infrastructure services do shows the revenue services of the airports owned by TAV. For most years sales revenues from duty free shops are the dominant revenue source. The share of aviation revenues has increased slightly in recent years but has not exceeded 24 percent of total revenues.

Figure 22: Sources of operating revenues of TAV airport PPPs



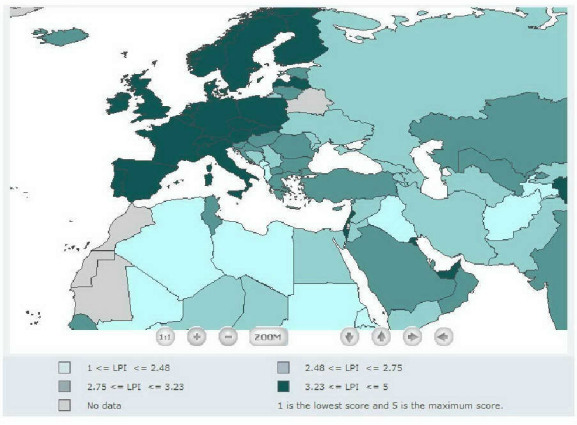
Source: TAV Financial Statistics, 2011

Annex 2: Turkish Port Sector: Potentials and Possible Challenges

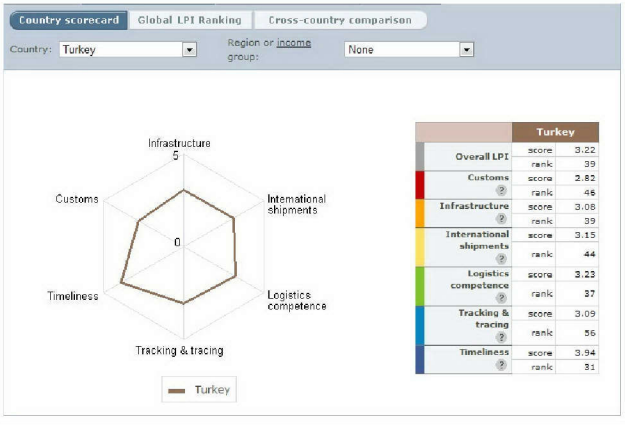
1. **85 to 90 percent of annual international trade of Turkey is handled by the maritime sector.** There are about 175 ports and wharves in Turkey, either privately or publically operated, servicing domestic and foreign trade. More than 100 of the ports are already private, the rest being about equally split between the Government and Municipalities. Well aligned with the Turkish motorway network, the majority of the maritime traffic is handled by four major port complexes (in decreasing order): (i) Istanbul-Izmit[60]; (ii) Izmir; (iii) Adana-Mersin; and (iv) Samsun. Whilst the traffic operated by these ports is quite significant, the size of their infrastructure remains modest when compared to European major ports. The container capacity of Turkish ports is about 10 million TEUs by the end of 2010. The rapid increase in international trade will lead to additional demands for port capacity.

2. **The latest data available for 2010 show Turkey ranks 39 out of 155 countries surveyed on Logistics Performance.** The map below illustrates the positioning of Turkey within the region in term of Logistic Performance Index (LPI) and the adjacent table provides a breakdown of the seven criteria used to compute the LPI.[61] From this data it can be inferred that Turkey is performing reasonably well in terms of logistics overall efficiency, i.e., still below more advanced EU countries but at par with neighboring countries such as Greece, Bulgaria, Romania and Hungary. Tracking and tracing cargo as well as international shipments and Customs performance are three areas to focus on in the future. Infrastructure is the next priority, especially with regards of port limited capacity and poor linkages with the hinterland either through roads and/or railways connections and services.

LPI Mapping 2010



Turkey Performance 2010

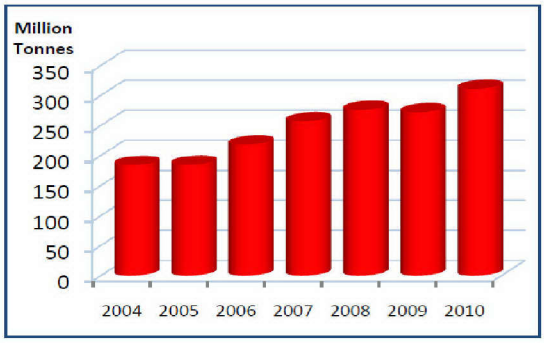


60 Including Ambarli port (40 percent of all containers), Pendik Ro-Ro Terminal (50 percent of all Ro-Ro traffic) and Izmit Autoport car handling facility (30 percent).

61 The Logistics Performance Index, developed by the World Bank, is based on a worldwide survey of operators on the ground (global freight forwarders and express carriers), providing feedback on the logistics "friendliness" of the countries in which they operate and those with which they trade.

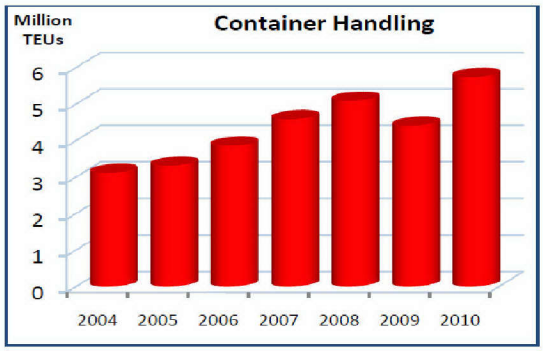
3. **With the exception of the year 2009, port traffic has been steadily growing** in strong correlation with the overall good performance of the Turkish economy. During the period 2004-2010, the total traffic has grown year-on-year at a CAGR[62] of 11.25 percent, whilst containerized cargo growth was 14.5 percent during the period 2002 and 2010. The graphics below illustrate these trends for the period 2004-2010.

Seaborne Trade (Million Tons)



Source: MoT

Container Handling (Million TEUs)



Source: MoT

4. **The Turkish port system is rapidly reaching its limits**. The need for additional capacity is becoming increasingly urgent, especially as any new port facility requires between three to five years before being fully operational. Whilst the overall theoretical port capacity still exceeds the total traffic observed in 2010, it is most probable that some port facilities are already facing congestion. The expected demand for container port capacity by 2020 is estimated to 20 million TEU.

5. **Port capacity is expected to become an increasingly serious constraint for the competitiveness of Turkish international trade.** Whilst the privatization of some of the Turkish ports may have resulted in operational performance improvements, e.g., Mersin Port with the mobilization of a reputable international container terminal operator, it remains to be seen if the private operators are either able or willing to finance costly additional capacity for which the life cycle exceeds the duration of the concessions[63] and the environment is uncertain. (For the first time in more than three decades, global containerized cargo contracted in 2009.) The Government of Turkey is said to have refused any form of guaranty under the "Transfer of Operating Rights" (TOR) concession scheme, shifting all the risks of the investment to the private sector.

6. **A clear need exists for additional port capacity in Turkey and the three proposed (EU supported) hub ports is the right response to this issue.** In the meantime, the capacity of the existing ports needs to be also increased (both through improvement of operational performances and investments). Whether private concessionaires have any legal obligation to increase capacity is unclear, as these concession agreements are not public. Unfortunately,

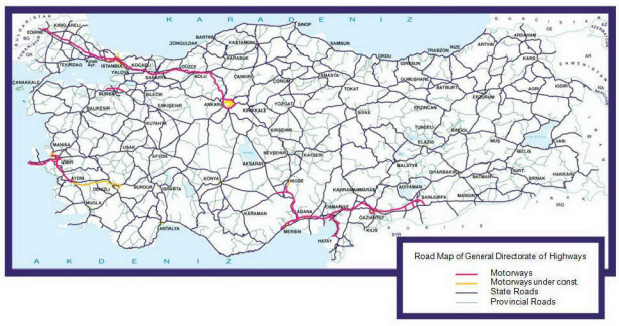
62 Compounded Average Growth Rate
63 The life expectancy of a berth is 50 years vs. the concession duration of 36 years.

private concessionaires have an incentive to delay the increase of the port capacity in order to: (i) postpone any new investment as long as possible; and (ii) to justify tariff increases for captive cargo because of congestion and capacity shortage.

7. **Competition in ports may occur within ports or between ports.** *Intra-port competition* results when terminals within a port are managed by different service providers. The best illustration of this intra-port competition is the port of Buenos-Aires in Argentina, where the port has been split into six terminals concessionned to six different operators in 1995. *Inter-ports competition* occurs when good road and rail connections link shippers to multiple ports. Good examples are the UK and the ports between Le Havre and Rotterdam.

8. **Competition among Turkish ports is limited. Whilst twelve different container terminals operate around the Marmara Sea, creating intense competition, port competition in other regions is limited.** The TOR concession model used in privatization of the TCDD ports does not allow for intra-port competition, as all facilities are concessionned to a single entity. The model adopted for the privatization of the ports in Turkey substitutes a private monopoly for a public TCDD monopoly. The current level and quality of the land transport network (roads and railways see maps below), combined with the large geographical size of Turkey, limits inter-ports competition. Thus, a minimum regulation is needed for these ports.

Road network (Source MOT)



Railway network (Source MOT)



9. **Currently, the port sector in Turkey is not subject to any form of regulation.** Two basic forms of regulation occur in the port sector – technical regulation and economic regulation. Technical regulation is generally enforced by a Port Authority (usually local) that has the power to deliver operational licenses, manage the port space and control port operators. Economic regulation focuses on how the market works. Economic regulation typically involves intervention in the functioning of markets in terms of setting or controlling tariffs, revenues, or profits; controlling market entry or exit; and overseeing that fair and competitive behavior and practices are maintained within the sector. The determination of when economic regulation of ports is necessary and how to tailor the intervention to the particular port competitive environment is a key issue to be addressed by the legislator.[64]

64 Reference: World Bank Port Reform Toolkit 2007

10. **Port efficiency is one of the most important determinants of international trade and may require a strong, independent regulator.** Depending on the competition individual ports face, the efficiency may require price regulation to avoid charges to create rents for local monopolies. This regulation would have to be combined with mechanism to avoid a shortfall of port capacity. In cases of intense oligopolistic competition, the regulator would have to serve a coordination function of investments of individual ports to avoid the creation of overcapacity. Both regulatory functions are likely to be required in Turkey. The intensity and form of competition between ports differs according to their status as hubs or point-to-point ports and both regulatory functions may be required at the same time. The regulatory functions have to be defined and strengthened institutionally. Neither the privatization authority nor TCDD as potential regulators have currently the required capacity.

11. **The risk of a lack of capacity to create rents depends on the price setting autonomy of port operators.** The less operators face competition (and the less effective price regulation there is) the more they will tend to increase profits by high prices for the port services. The more operators are able to create such rents the more they will benefit from limiting the expansion of port capacity. With intense (spatial) competition there is the opposite danger of the creation of overcapacity. Before the dramatic increase in international trade, the port overcapacity was seen as the dominant example of port development. As in all forms of spatial competition and strong decreasing average costs with increasing demand, there is a tendency to create pre-emptive overcapacity to capture the entire geographical market. Such a form of competition can lead to competitive cycles of capacity creation and destruction leading to major macro-economic losses, including public expenditures to bail out ports and investments in complementary infrastructure.

12. **The privatization process initiated by the Turkish Authorities in 2005 needs to be completed with a view to increase competition either intra- or when possible inter-ports.** Private concessionaires – on the basis of their respective concessions agreements – need to increase the capacity of the facilities for which they are responsible. It is probable that this significant investment effort cannot solely be financed by the private sector and will need to be supported financially by the Public Sector as well. Meanwhile, the Turkish Authorities would benefit from carrying out an independent evaluation of the economic benefits resulting from the port privatization process. It would allow the decision maker to have more detailed information on both operational performance improvements and levels of the tariffs in the various ports of Turkey. The independent assessment should also include a port user survey to nuance its findings and to take into better account the needs of the local economic actors.

13. **An independent entity should be established to promote port competitiveness.** As a result of the limited or weak competition environment prevailing in a few major Turkish ports, e.g., Mersin, Iskenderun and Samsun, an independent entity (possibly as part of the Maritime Under secretariat's mandate as mentioned in the priority 26 of the 2011 Annual Program[65]) is needed to promote port competitiveness as well as control eventual anticompetitive behavior resulting from shortcomings in the market place. Regulators typically have the power to adjudicate disputes between port operators or between port users and operators.

65 Measure 65: Port management model will be created for Turkish ports.

14. **The mandate of the Regulator should have several objectives.** These could include – but not necessarily be limited to — the following key missions: (i) to monitor and to publish both port traffic statistics and operations efficiency indicators; (ii) to promote efficiency in operations and to facilitate new investment; (iii) to analyze and to compare the various port tariffs in place and to prevent any pricing or service discrimination; (iv) to protect consumers and port users, particularly against monopolistic or other abuses by the operator(s); and (v) to protect and -- wherever possible -- to promote fair competition in port services delivery, including protection of those competing against a dominant operator.

15. **In order to consolidate its role of International Trade Gateway between Europe and Asia, Turkey needs to develop new port hubs.** The three priority projects are: (i) a new container terminal of 4 million TEUs capacity in Çandarli (near Izmir); (ii) an additional container terminal of 11 million TEUs capacity in Mersin; and (iii) a bulk and general cargo port in Filyos (20 km. East from Zonguldak on the Black Sea) with a capacity of 10 million tons of dry bulk, 3.6 million tons of general cargo and 1 million TEUs. These three priority projects are eligible for EU funding through the IPA (Instrument for Pre-Accession) program.

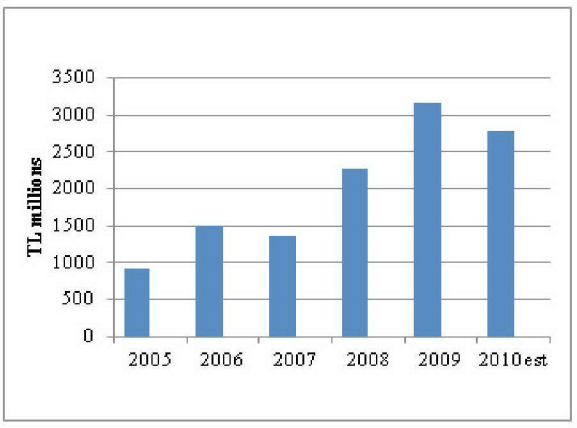
Annex 3: Railway Sector: Ambitious Goals, Important Challenges

1. **Turkey is a large country with a relatively small railway network compared to other European railways**. The network comprises roughly 8,600 km of mainlines and 2,300 km of branch and station lines.[66] Some 533 km of new high speed rail track have been added from 2004 to 2009, as part of the connection Ankara – Istanbul and the initial step of building up a comprehensive high speed rail network. Turkish Railway (TCDD) carried 24 million intercity passengers, 60 million suburban passengers, and 24 million tons of freight in 2010.

2. **Turkish Railways (TCDD) is a state enterprise with limited autonomy, responsible to multiple government agencies.** TCDD is a Public Economic Enterprise, organized in accordance with Turkish Decree Law 233. 100 percent of the TCDD's shares are owned by Turkish Treasury and Treasury finances its capital and operating deficits; the Ministry of Transport and Communications supervises TCDD. TCDD's governing body is a Board of Directors consisting of a Chairman and five members. The Chairman of the Board is the Director General of TCDD; two board members are from the railway management, two from the Ministry of Transport and Communications and one from Treasury.

3. **The governance structure could be strengthened to align incentives and provide for greater board independence.** The current governance structure separates responsibility for supervising the railway's activities from responsibility to finance the activities, which can create a lack of incentive for the supervising agency to maximize the efficiency of the financing provided to the railway. In addition, the board structure, with half the members from railway management and the post of Chairman held by the General Director of the railway, does not create the independence of the board from management that is considered good practice.[67] Treasury has been working of developing a new governance framework for the state owned enterprises, which may address some of these issues.

Figure 23: Subsidies to TCDD



Source: Treasury

4. **The railway subsidy regime is complex and lack incentives for efficiency.** TCDD receives compensation for duty losses on certain trains operated and railway lines kept open for social purposes. TCDD also receives compensation through the budget of the Ministry of Transport and Communications budget for its cost of repair and maintenance of railway infrastructure.

66 TCDD, Turkish State Railways Annual Statistics, 2005 – 2009.

67 OECD, OECD Principles of Corporate Governance (2004), pp. 63-64. OECD recommends that "The board should be able to exercise objective independent judgment on corporate affairs." To accomplish this, it recommends that a "sufficient number of board members will need to be independent of management" and separation of the post of board chairman and chief executive "may be regarded as good practice, as it can help to achieve an appropriate balance of power, increase accountability and improve the board's capacity for decision making independent of management."

Together these payments make up the operating subsidy. Treasury also makes capital transfers to TCDD each year, which cover capital investment and TCDD staff costs. From time to time, Treasury also pays TCDD debts. The subsidies provided to TCDD simply cover TCDD costs—none of them are structured to provide incentives to operate efficiently or provide good service. Only the duty losses payments are associated with the provision of specific services.

5. **Subsidy to railways has been increasing substantially, and will continue to increase absent reforms.** As shown in Figure 23, Government transfers to TCDD have increased from TL 650 million in 2005 to over TL 3 billion and 0.33 percent of GDP in 2009. As high speed rail services are added to Konya, Istanbul, Bursa and Sivas, operating losses on high speed rail are expected to increase by some TL 400 million, further increasing TCDD's subsidy requirements. Reforms in the subsidy structure to link payments to services and provide incentives for cost control are needed to keep subsidy requirements within reasonable bounds.

6. **TCDD has a traditional railway organization structure, typical of most of the world's railways pre-1970**. TCDD provides both passenger and freight services, with operations vertically integrated with infrastructure. The main railway operations are managed through seven regional directorates. The railway owns three subsidiaries that manufacture and maintain locomotives, wagons and passenger rolling stock, as well as facilities that produce track components. The railway also owns seven major ports; these are in the process of being concessioned.

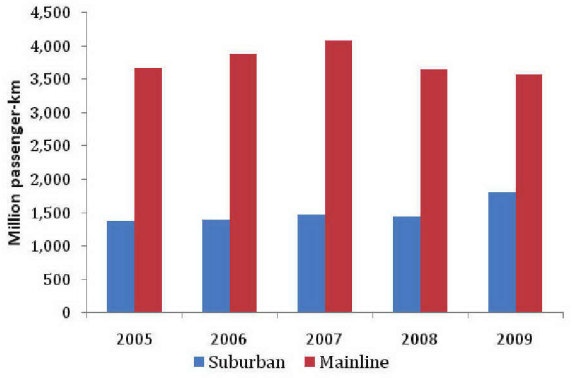
7. **The traditional organization structure has not proven effective, especially when the railway must compete with aggressive truck and bus/auto operators.** Modern railways have moved from the traditional structure to a market-focused, line-of-business structure. With modern communications, regional organizations have become obsolete and have been eliminated as costly and inefficient. Railway rolling stock and infrastructure components are now purchased from a competitive market, not from in-house suppliers, reducing costs. These measures reduce the railway's cost structure, allowing it to price competitively with road.

8. **While the market for passenger transport services in Turkey has grown rapidly, demand for railway has not kept pace.** Since 1985, passenger traffic in Turkey has increased over 125 percent, while rail traffic has remained flat**.** Market share for passenger rail declined during that period from 3.7 percent to less than 2 percent. TCDD plans to reverse this loss through the development of a high speed rail network supported by a revised schedule of linked intercity and regional trains. This network will be costly to build[68] and require on-going operating subsidies for operations.

9. **The situation looks slightly better for rail freight transport. Since 1985, rail freight transport has increased 28 percent.** Rail share is quite low at 5 percent, but has slightly increased in the last two years. Domestic freight traffic has demonstrated steady growth in the last five years. International traffic took a hit in 2009, likely reflecting the impact of international financial crisis. However, with the strong increase in international trade, traffic appears to be starting to recover in 2010. TCDD is looking to expand its freight business through development of logistics centers.

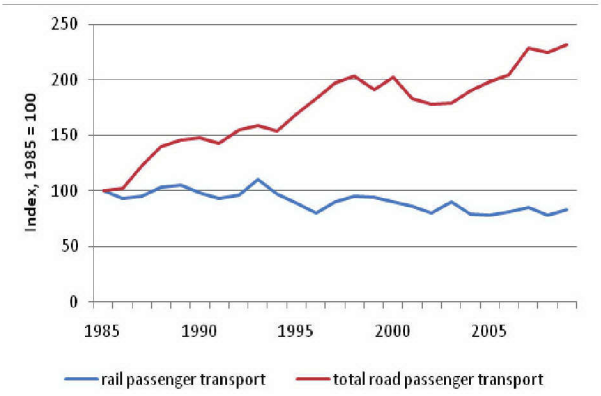
68 High speed rail typically costs US$ 35 – 70 million per km to construct, depending on terrain.

Figure 24: Rail transport passengers has stagnated in recent years



Source: TCDD Annual Statistics, 2005-2009

Figure 25: Turkish passenger transport has declined steadily



Source: OECD/ITF Annual Statistics, 2005-2009

Table 21: The rail share in passenger and freight transport is low

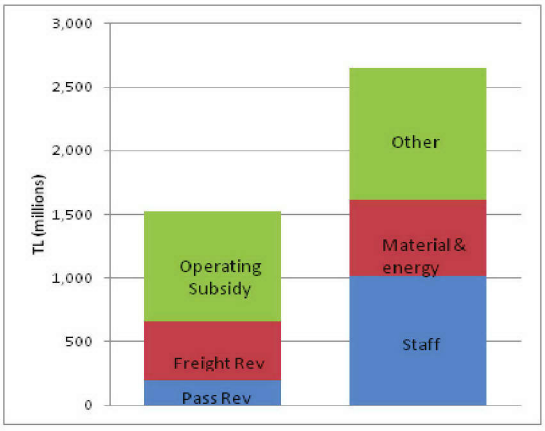
	2004	2005	2006	2007	2008	2009
Rail share in passenger transport (percent)	2.1	1.9	2.0	1.9	1.7	1.7
Rail freight transport share	5.5	5.0	5.0	5.0	5.3	5.4

Source: Turkstat, Transportation of Freight and Passenger by Transportation Type.

10. Railway operations are heavily loss making in Turkey. As shown in Figure 26, revenues from customers amount to approximately 25 percent of total operating costs, and only 65 percent of staff costs. TCDD received operating subsidies amounting to TL 868 million in 2010, but this covered only another third of TCDD operating expenses, leaving TCDD in a loss making position.

11. Both passenger and freight services make losses. While TCDD accounts do not provide transparent separation of cost between passenger and freight, reasonable allocations of costs between services demonstrate that both passenger and freight services are loss making. A freight marketing study for TCDD found that for rail freight business, "each TL of turnover generates almost 3 TL of losses.[69]" The losses occur because TCDD has a very high cost structure together with low rates. Costs need to be cut in half and rates increased by an average of 25 percent to turn freight profitable.[70]

Figure 26: Rail Revenues & Expenses - 2010



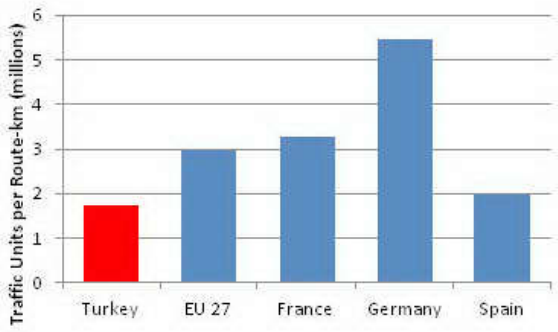
69 Italfer, Consultancy Services for TCDD Freight Marketing Research, Interim Report, (2010), p. 22.
70 Italfer, Consultancy Services for TCDD Freight Marketing Research, Draft Final Report, (2010), p. 27.

12. TCDD needs to reduce costs now. Once Turkey aligns its railways legislation with the EU, the freight market will be opened to competition from railways with commercial cost structures and the Government of Turkey will not be able to subsidize TCDD freight operations. If TCDD has not reduced its cost structure by that time, railways with lower costs will compete away its business and it will rapidly fail.

13. Many factors contribute to TCDD high cost structure. TCDD operates with a relatively low density of traffic, so the fixed cost of maintaining the rail network are spread over relatively few traffic units. Staff productivity is low, and TCDD faces institutional barriers to deploying staff effectively. The regional organization structure and lack of incentives for productivity result in poor planning and utilization of assets, failure to prioritize expenditures according to business requirements and operation of far more facilities than needed.

14. TCDD's network has very low traffic density. The Turkish railway network carries a relatively light traffic load. The number of traffic units [71] per route-km is roughly 40 percent less than the EU 27 average, and less than a third than in Germany. About 90 percent of the TCDD network is single track. Nonetheless, track productivity—the amount of traffic carried per track-km—is low (25 percent below the EU 27 average). This implies that the track is sufficient in most of the network to carry the existing traffic and more. The network does have some capacity bottlenecks. These can be addressed through a combination of better train scheduling (least expensive solution), signaling and double tracking.

Figure 27: Traffic Density



Source: UIC Railway Database, 2010

15. TCDD staff productivity is low. TCDD employs about 32,600 staff: 2,500 in ports, 4,100 in manufacturing, and the remainder (26,000) in the main railway activity. Staff productivity is lower than the EU 27 average, even though TCDD carries much less passenger traffic than typical in the EU.[72] Some 59 percent of TCDD employees are civil servants or contract staff with equivalent rights. Such employees are very difficult to redeploy from redundant tasks to jobs and locations where the railway needs staff. For example:

- A review of TCDD maintenance practices identified redundant maintenance facilities that should be closed.[73] Because TCDD cannot require staff to move from these locations, it can only stop new hiring at the facilities and close them some years hence when the last staff working at the facility retires.

71 Defined as passenger-km plus freight ton-km.

72 Passenger traffic is more labor intensive to supply than freight traffic. Passenger traffic makes up 56 percent of traffic in the EU 27 railways, but only 33 percent of TCDD traffic.

73 TCDD Maintenance Review, R&H Railway Consultants, December 2009.

- TCDD has closed 70 stations and restricted hours at 300 stations, reducing track capacity, because of a shortage of switchmen to staff the stations. At the same time, it has excessive headquarters staff.

- TCDD is investing in assets such as signaling and computer systems that will reduce its need for staff. This will not translate into cost savings, however, because it lacks the freedom to adjust staff according to need.

16. **TCDD's regional organization structure and lack of incentives for productivity encourage a high cost structure.** A benchmarked audit of TCDD maintenance practices found that assets are maintained at a fair level, suited to the relatively low level of traffic handled. However, the cost of maintenance is high compared to international norms: 18 percent more for rolling stock, 58 percent more for track and 30 percent more for electrification than the international averages. The high costs result from the lack of a Maintenance Management System, the failure to prioritize maintenance expenditures according to business requirements, and the operation of many more maintenance facilities than needed to meet business needs.[74]

Table 22: Railways Infrastructure Expansion Plan by 2023

Description	Amount
New high speed rail lines	10,000 km
New conventional rail lines	5000 km
Double tracking	800 km
Electrification	8,000 km
Signaling	8,000 km
Track renewal	500 km per year
Rail links to ports & industrial sites	40
Logistics centers	16
New rolling stock	180 High Speed Trainsets
	300 Locomotives
	120 EMUs
	24 DMUs
	8000 Wagons

Source: MOT, Strategy upto 2023 (2011)

17. **TCDD faces a capital investment backlog**. A lack of capital investment over the last few decades has resulted in an old fleet that is expensive to maintain. Approximately 40 percent of the locomotive fleet, 55 percent of the passenger coach fleet and 21 percent of the freight wagon fleet need to be replaced within the next five years at a cost of approximately TL 3.5 billion. TCDD is engaged in a "catch up" program of track renewal, targeting the renewal of 500 km per year, compared a "steady state" program of 220 km per year. In addition, an estimated TL 35 million is needed to renew electrification nearing the end of its functional life.

74 R&H Railway Consultants, TCDD Maintenance Review, December 2009.

18. The Ministry of Transport and Communications has articulated an ambitious investment program for railways that would cost as estimated TL 100 billion (TL 8 billion per year).[75] Approximately TL 70 billion is planned to be financed by government, the remainder by the private sector. This program is associated with the goal of railways carrying 10 percent of passenger traffic (five times its current share) and 15 percent of freight traffic (three times its current share) by 2023, so it represents the investments thought to be necessary to make a quantum leap in the volume of rail service.

19. Investment alone is not sufficient to reach the market share goals set for railways. To substantially increase the railway's market share, the railway needs to attract much more business than it has in the past. This requires commercial management, a competitive cost structure and a focus on markets and customers that is currently lacking. Railway reform, not just investment, is needed.

20. Changes in Turkish legislation to aligning railways with the EU structure and to strengthen governance of state enterprises provide an opportunity to create a more commercially managed railway. As with any railway reform, the starting point is creating a commercial governance structure, in which the government owner provides incentives for managers to meet goals of market growth, efficiency, safety and good assets condition, and then allows management to function without political interference. Reforms are also needed to adopt a line-of-business structure, eliminate the regional structure and divest the railway companies into a competitive market. With the railways functioning in a commercial way, public services must be provided under a commercial contract; this is typically done through a multi annual service contract for infrastructure and a public service contract for passenger services. Such changes will create a much needed drive for efficiency. To realize improvements, however, barriers to efficiency and effectiveness need to be removed. Key among these for Turkish Railways are restrictions on staff deployment and requirements to purchase rolling stock from high cost domestic producers.

75 Ministry of Transport and Communications, Strategy up to 2023, (2011).

Annex 4: Restructuring of German Railways

1. **The German railways have found a way out of mounting deficits as a result of a soft budget constraint.** The core of the reform is the corporatization of the railway company, delegating economic responsibility and allowing for the reward of productivity increases. A transfer of € 7 bn. in 1993 and the prospect of the accumulation of debt of € 160 bn. in the following decade kicked of the following changes: The stock of old debt was turned into general public debt. Old debt is serviced by taxes. The earmarking of profits of the Deutsche Bahn AG to reduce the stock of debt was given up in 2002.

2. **Regulatory policies to achieve transparency were deemed successful.** The government influence on the railways was reduced to regulatory policies and their implementation by a regulatory agency. To obtain transparency, sub-companies were established with their own profit responsibility for long-distance passenger transport, regional and local passenger transport, freight transport and rail infrastructure. The accounting systems of all these companies are separated. The infrastructure company charges the railway operators for access to the infrastructure. The regional and local passenger transport is subsidized. All of these companies have made profits in recent years.

3. **Public transfers to the railway sector have been massively reduced by defining profit centers and delegating business responsibility.** Subsidies are defined ex ante and have replaced the coverage of deficits ex ante. The reduced ex post transfers to the railway sector have helped to expand and upgrade the transport infrastructure overall, in particular in East Germany.

4. **The restructuring of German railways was caused by three complexes of economic problems of the rail sector by the time of unification.** The Bundesbahn, the railway company in West Germany, was a public sector agency, was able to keep its market shares in passenger and freight transport only by having increasing deficits. It had accumulated a stock of debt that was considered as unsustainable. The Bundesbahn had a deficit of € 7.9 billion in 1993 alone. Deficits had been rapidly increasing over the past years. The debt stock had reached a level of more than € 20 billion in the same year. Scenarios without reform saw the annual deficits of the merged Western Bundesbahn and the Eastern Reichsbahn increase to more than the same amount. Without reform the unified Deutsche Bahn was expected to have added more than € 160 billion of accumulated debt in the decade from 1994 to 2003.[76]

5. **In 1994 the Deutsche Bahn AG was founded as a public limited company.** The DB AG was freed of its debts and received full entrepreneurial autonomy. The Federal Government owns 100 percent of the shares. The stock of debt was transferred to a special fund, the Finanzüberleitungs Institution. Interest payments were planned to be covered by transfers from the Federal Budget, while repayments should be funded by future profits of the DB AG. In 1999, however, all debt was transformed into general Federal Debt. The debt service of the old railway companies became part of the General Debt Administration.

76 Haefner (1996)

6. **The new railway company Deutsche Bahn AG was freed from old debt.** Following the EC directive 91/440, obliging EU member countries to provide a sound financial basis for their railways, the German government transformed all long-term debt of the Bundesbahn and the Deutsche Reichsbahn (about € 35 billion) to a separate government property (Finanzüberleitungs institution). Interest on the old debt was paid out of general tax revenues. The stock of debt was planned to be successively reduced by profit transfers by the new railway company. Such a transfer was done only in 1999 (€ 2.45 billion). The old stock of debt was turned into general Federal debt, without being accounted as former railway debt. From 2000 to 2002 a calculated debt service was accounted as a compensation for the transformation of the railways debt into Federal debt. By 2002, the Deutsche Bahn AG was fried of all debt obligations that had existed before the restructuring.

7. **The Deutsche Bahn AG implemented a plan to decrease overstaffing of the railways and to increase labor productivity.** Before the restructuring of the railways, the Bundesbahn had 236,000 employees. The Eastern Company had more employees (253,000) while it had half the network size and the number of trains of the Bundesbahn. The number of employees of the Deutsche Reichsbahn was drastically reduced, by almost 100,000 before the reform in 1993. From 1994 to 2003 the staff of the DB AG was planned to be reduced by another 100,000. The employees of the Bundesbahn were civil servants of the German Federal Republic. With the foundation of the DB AG the civil servants were no longer employed by the railway company but by a special government agency, the Bundeseisenbahnvermögen (BEV). The civil servants were hired out to the DB AG with salaries as well as tax and social security obligations similar to comparable jobs in the private sector. The difference between the public and private sector wage payment would also be covered by the BEV. The DB AG was relieved of all pension obligations to former staff of the Bundesbahn. This relieved the new railway company of € 25 billion in pension obligations.[77]

8. **Institutional changes aimed at providing DB AG with Business responsibility.** The foundation of the joint stock company reduces the influence of the government on business decisions to the influence of a shareholder according to corporate law. Transport policy shaped actions of the DB AG through regulation, before the regulation of the railways was delegated to the regulatory agency for all network industries (Bundesnetzagentur). With the foundation of the DB AG, rail transport operations were separated from infrastructure services. The operations companies had to pay track access charges to the infrastructure company DB Netze. Operations were subdivided into a company for long-distance passenger transport (DB Reise & Touristik), a company for regional and local passenger transport (DB Regio) and a company for freight transport (DB Cargo, later Railion AG). These were later turned into independent joint stock companies (AGs).

9. **The freight company has expanded into other modes and into international transport.** The expansion enables the company to operate the mode that ensures minimum costs depending on the type of good and the distance of the haul. In 2002, the DB AG bought the Stinnes AG, owner of the logistics and trucking company Schenker. The acquisition was the first big step for the DB AG to become an international, multi-modal logistics company. It acquired the US logistics company Bax Global Inc. in 2006. In 2010 the European commission

77 Link (2003)

approved the acquisition of the British transport company Arriva. The freight company is now subdivided in Schenker Rail and Schenker logistics (comprising trucking, air and maritime freight transport).

10. **Table 18 shows that the reform had very different effects on the transport services provided by the DG AG.** The long-distance passenger transport services did not increase much during the more than 15 years since the reform. Regional and local passenger transport expanded more strongly and the biggest increase in business activity occurred in the freight sector. Turnover increased however continuously, and profits before taxes and earnings before interest and taxes suggest that the DB AG is a financially sound rail company. The different companies of the holding contribute very differently to the success of the DB AG, as can be seen from Table 18 and Table 19.

Table 23: Turnover of DB companies (€ mill.)

	2007	2008	2009	2010
Long-distance passenger transport	3,265	3,523	3,565	3,729
Regional passenger transport	6,532	6,687	7,587	7,559
Urban transport	1,879	1,962	1,252	1,272
Rail freight	3,905	4,654	4,055	4,584
Non-rail freight (Schenker Logistics)	14,022	14,680	11,292	14,310
Services	99	112	1,237	1,274
Rail tracks	617	725	4,369	4,580
Railway stations	328	344	1,025	1,044
Energy networks	454	554	2,308	2,501
Others	208	211	864	796
DB Holding	31,309	33,452	29,335	33,364

Source: Annual business reports of the DB AG

Table 24: Earnings before interest and taxes (adjusted, in € mill.)

	2007	2008	2009	2010
Long-distance passenger transport	186	306	141	117
Regional passenger transport	830	857	899	729
Urban transport	197	205	71	62
Rail freight	357	307	-189	12
Non-rail freight (Schenker Logistics)	421	381	199	304
Services	145	131	125	129
Rail tracks	592	670	558	601
Railway stations	186	210	217	217
Energy networks	185	74	103	82
Others	-729	-658	-439	-442
DB Holding	2,370	2,483	1,685	1,811

Source: Annual business reports of the DB AG

11. **The largest turnover comes from non-rail logistics services, DB Schenker logistics.** It is followed by the revenues from regional passenger transport and rail freight transport. Profits before taxes and interests are highest in regional passenger transport and the supply of rail infrastructure services. The "profit" numbers are however not independent of public transfers. The company reporting the highest profits is DB Regio, with an EBIT of € 729 mill. in 2010. Policy responsibility for regional passenger transport had been delegated to the German Federal States (Länder). The Länder contract regional and local rail transport services with companies of the DB AG or with other private service providers. The Länder receive federal transfers to fund the regional or local passenger transport. Initially, the transfers aimed at sustaining the pre-reform regional and local traffic. They reached a level of almost € 4 bn. in 1996, increasing to about 6 bn. in 1997. They were incrementally increased to reach € 7 bn. in 2005. They decreased for the first time in 2008 to € 6.6 bn. In 2010 DB Regio received € 4.264 bn. in transfers, which means that the regional rail traffic received a net transfer of € 3.535 bn.

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