



**REPUBLIC OF TURKEY
MINISTRY OF TRANSPORT
GENERAL DIRECTORATE OF TURKISH HIGHWAYS**



MOTORWAY DEVELOPMENT PROGRAM of TURKEY

HEEP AREA V ANNUAL MEETING

Suceava, ROMANIA

13/18-06-2011

OUTLINE

1. Turkish Road Network
2. General Overview of Road Investments
3. Target PPP Motorway Projects-Vision 2023
4. Decision Making Procedure of PPP Motorway Projects in Turkey
5. Financial Feasibility of PPP Motorway Projects
6. *Gebze-İzmir Motorway Project*
7. *North Marmara Motorway Project*
8. Conclusion

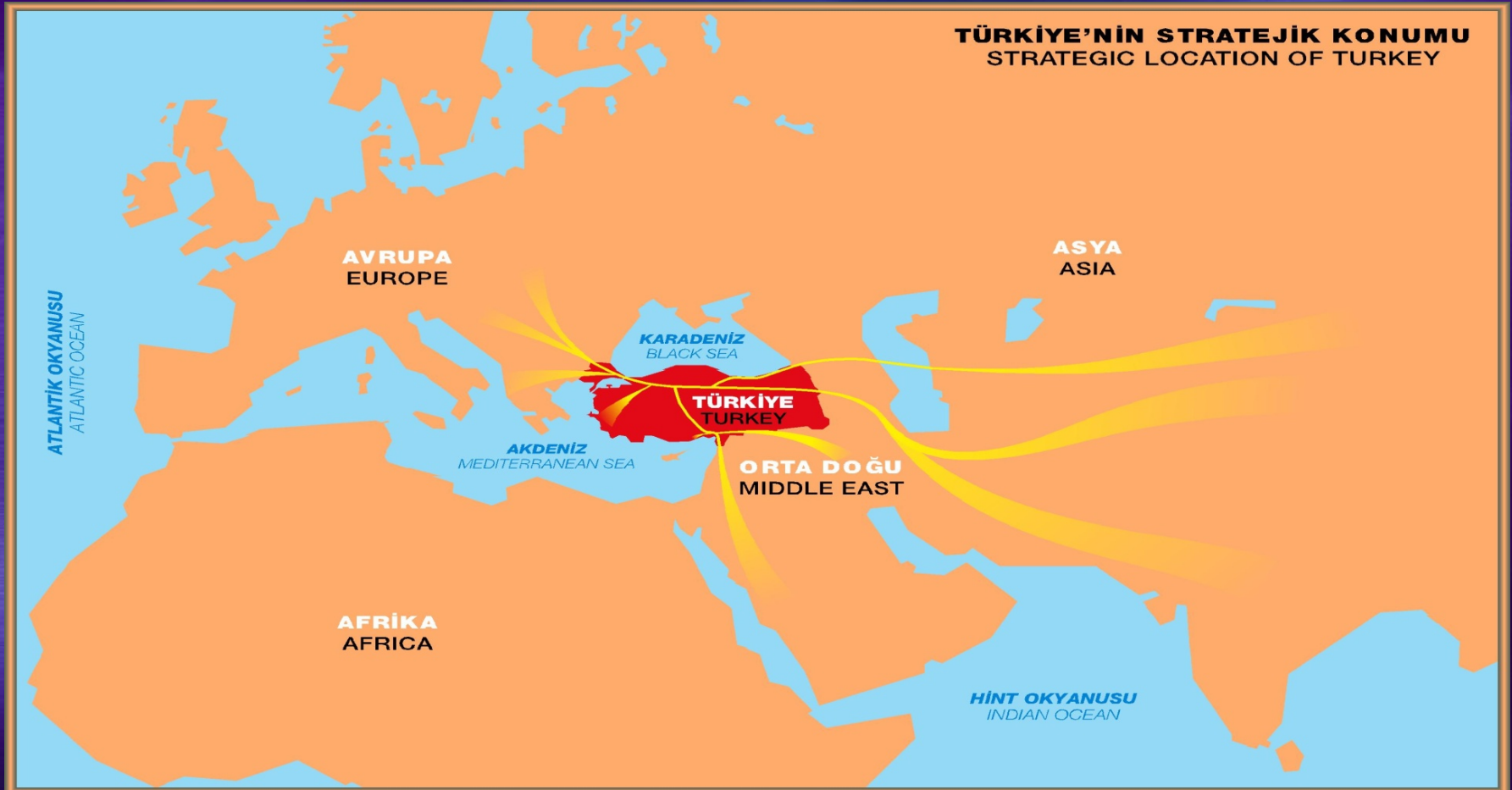


MOTORWAY DEVELOPMENT PROGRAM of TURKEY



1. Turkish Road Network

- The lands of Turkey are located at a point where the three continents; Asia, Africa and Europe are closest to each other, and straddle the point where Europe and Asia meet.
- Being located on a passing channel of intercontinental links Turkey has always been an important channel of international trade links



1. Turkish Road Network

- The public roads in Turkey classified in four-tier system: motorways (multi-lane access-controlled highways), state roads, provincial roads and rural roads.
- General Directorate of Turkish Highways (KGM) is responsible for the planning, maintenance, construction and operation of motorways, state and provincial roads.
- Special Provincial Administration is in the charge of village and forest roads.
- Urban roads are under the administration of municipal authorities.
- The road network excluding urban roads is about 354000 km in length.

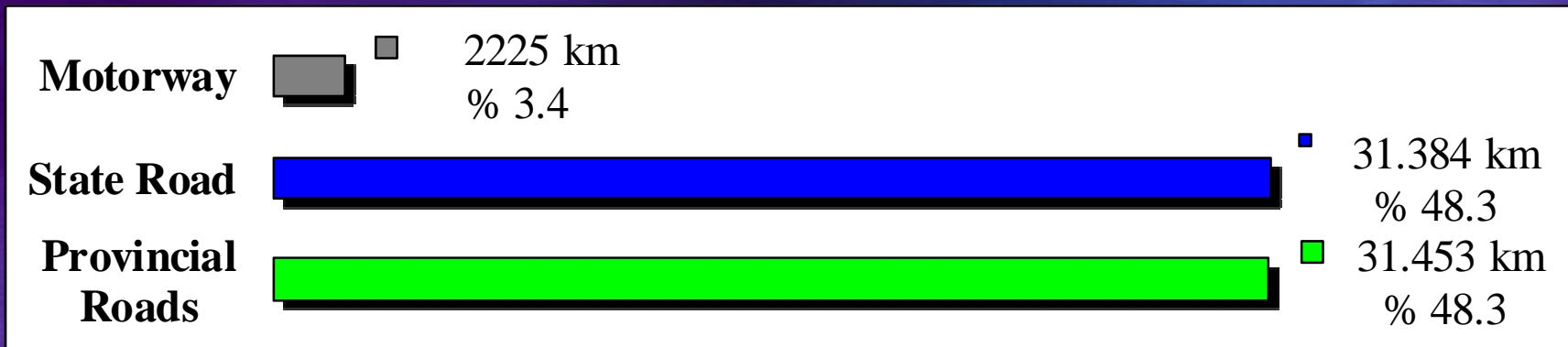


1. Turkish Road Network

- **Motorways are the divided state roads with full control of access and two or more lanes for the exclusive use of traffic in each direction to provide uninterrupted flow, on which opposing traffic is separated by a median and collection of tolls are performed at designated points.**
- **State roads are highways of primary importance connecting provincial centers, sea, seaports, airports and railway stations to each other.**
- **Provincial roads are highways of secondary importance linking districts within a province to each other , the provincial center, the districts in the neighboring provinces, the state roads, railway stations, seaports, and airports.**



1. Turkish Road Network



- The density of road network excluding urban roads is close to 50 km / 100 km²

- Total asset value of Motorway, State & Provincial Roads is approximately 50 Billion €

- The density of motorways per 1000 km² is approximately 2.5 compared to the EU 15 average of 17 and the new EU members average of 2.7.

TOTAL NATIONAL ROAD NETWORK (KM): 65062

ROAD NETWORK WITH DUAL CARRIAGEWAY (KM)

TOTAL

19 775



STATE & PROVINCIAL ROADS

5718 bridges with a length of 247 Km

160 single & double tube tunnels

Total length of tunnels 89.3 Km

MOTORWAYS

- **1584 bridges and viaducts with a length of 159.8 km**

- **2x3 lane 29 double tube tunnel with a length of 22.8 Km**

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1. Turkish Road Network



TURKISH HIGHWAY NETWORK

- MOTORWAYS ——— (thick red line)
- MOTORWAYS UNDER CONSTRUCTION ——— (yellow line)
- STATE ROADS ——— (black line)
- PROVINCIAL ROADS ——— (green line)



CONVERSION OF SINGLE CARRIAGEWAY ROADS INTO DUAL CARRIAGEWAY

- **General Directorate of Highways started the implementation of a highway upgrading program in 2003 involving the upgrading of existing single carriageway into dual carriageway.**
- **The primary objectives of dual carriageway road construction are to reduce traffic accident fatalities and serious injuries due to head-on collision, and to improve the level of service affected by inadequate capacity.**
- **The length of dual carriageway roads opened to traffic has reached to 19775 km including motorways. The roads were planned to be paved with surface treatment at first in order to provide traffic safety urgently. Later on, considering heavy traffic volume and budget constraints, these sections have been repaved with bituminous hot mixed asphalt.**

ROAD NETWORK WITH DUAL CARRIAGEWAY (2003)

1.775 Km

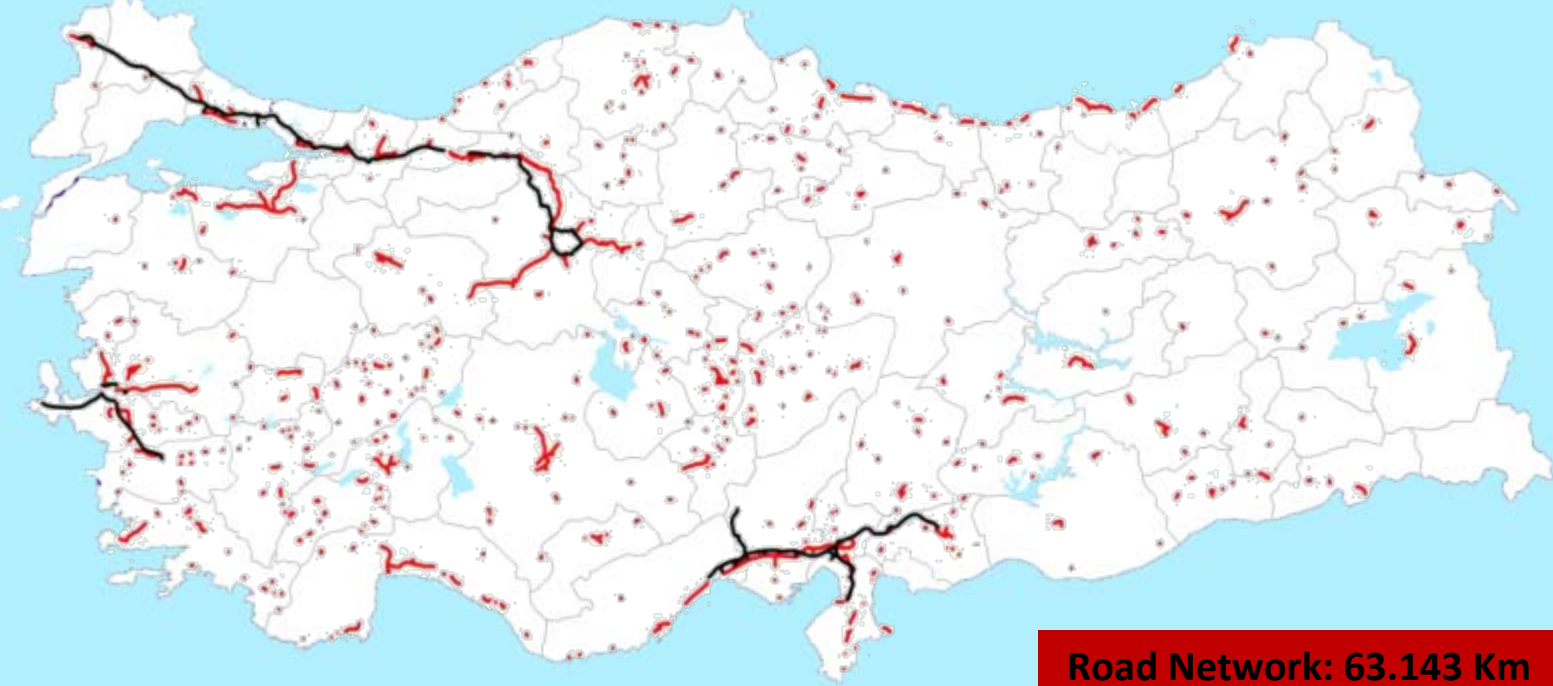
Motorways

4.326 Km

Dual Carriageway

6.101 Km

Total



ROAD NETWORK WITH DUAL CARRIAGEWAY (June, 2011)

2.225 Km

Motorways

17.550 Km

Dual Carriageway

19.775 Km

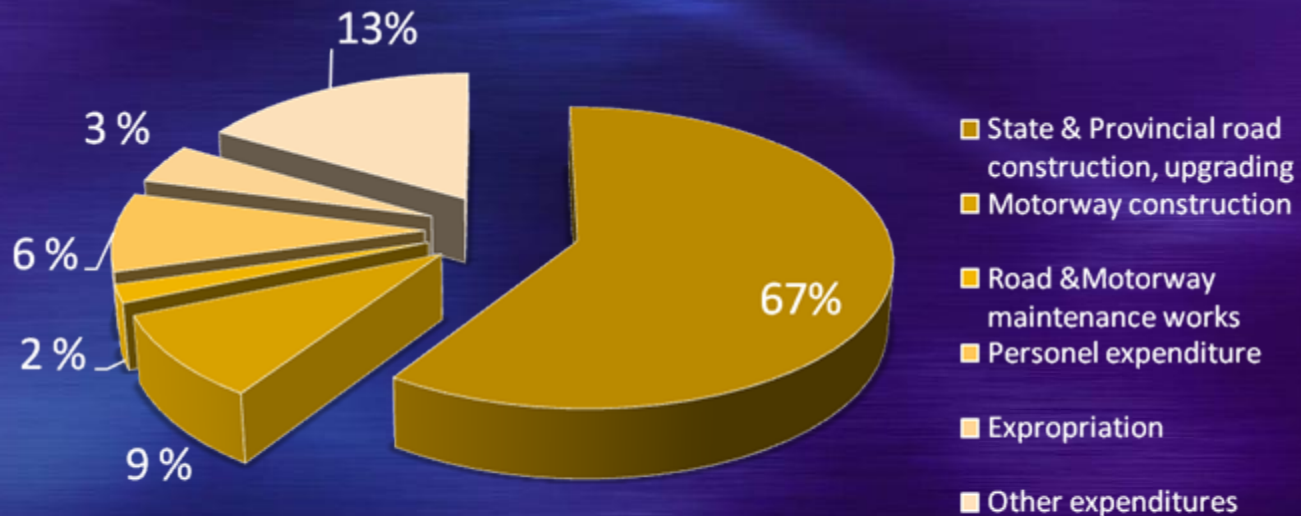
Total





THE BREAKDOWN OF 2010 BUDGET

In 2010, Total budget of Turkish Highway amounted to 6.3 Billion Euro. Out of total budget, 67 % has been allocated on state and provincial road construction, upgrading and 9 % on motorway construction, 2 % on road & motorway maintenance works, 6 % on personel expenditure, 3 % on expropriation and the remaining 13 % on other current expenditures. The share of road transport investments in the Gross Domestic Product (GDP) is close to % 1.





2. General Overview of Road Investments

- ✓ Efficient road infrastructure is a key ingredient for national and area development

- ✓ It supports economic activities like
 - industrial activities,
 - agricultural activities,
 - national and international trade

- ✓ An efficient road network creates opportunities for accessing
 - employment,
 - markets,
 - education and health facilities,as well as contributing to national security.



2. General Overview of Road Investments

- ✓ The main objective of Road projects is to expand and improve the Turkish Road Network to meet the demand of the economic growth. The public funding is not able to afford highway investments adequately.
- ✓ Expenditure on new development and rehabilitation of roads is likely to be a major component of national budgeting.
- ✓ Due to high cost of construction and budget constraints financing new motorway projects by national budget is difficult.
- ✓ Financing mechanism on the basis of PPP is one of the most effective alternative to realize large scale highway projects without causing public burden.
- ✓ The Build Transfer Operate model brings together the investment dynamism and project experience of the private sector and the support of international finance institutions.



3-Target PPP Motorway Projects-Vision 2023

- ✓ General Directorate of Highways sees Public-Private Partnership (PPP) as the key element to implement large-scale motorway projects.
- ✓ The objective of PPP structure is to obtain necessary funds to implement these projects to meet the passenger and freight transport demand and the competitiveness of the economy.
- ✓ Although Build-Operate-Transfer (BOT) model has been applied in energy , airport construction and operation sectors in Turkey for two decades, PPP in general is a new financial model for motorways



3-Target PPP Motorway Projects-Vision 2023

- ✓ According to the OECD, Turkey is expected to be the fastest growing economy of the OECD members during 2011-2017, with an annual average growth rate of 6.7 percent.
- ✓ Turkey aims to be the world's 10th largest economy by 2023, on the 100th anniversary of the foundation of the Republic.
- ✓ The official target is to increase exports to \$170bn in 2015 and \$ 500 bn by 2023
- ✓ GDP in 2023 is expected to exceed 2 Trillion US \$ with 2010 prices
- ✓ Turkish Highways considers the realization of the some motorway projects by PPP financing by the end of 2023 to meet the road transport demand of the overall economy. The total length of the planned 11 motorway projects (+1 tunnel project) is approximately 5250km.

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3-Target PPP Motorway Projects-Vision 2023

- General Directorate of Turkish Highways has 11 motorway projects (+1 tunnel project) in its agenda which will be financed by BOT.

	TARGET BOT MOTORWAY PROJECTS 2023	Length (km)
1	Gebze-Orhangazi-İzmir Motorway	421
2	North Marmara Motorway	414
3	Ankara-Niğde Motorway	342
4	Ankara-Samsun Motorway I-Ankara-Kırıkkale-Delice Section	112
	Ankara-Samsun Motorway II-Delice-Samsun Section	320
5	Aydın-Denizli-Burdur Motorway Aydın-Denizli Section	175
	Aydın-Denizli-Burdur Motorway Denizli-Burdur Section	155
6	Kınalı-Tekirdağ-Çanakkale-Balıkesir Motorway	370
7	Sabuncubeli Tunnel	4
8	Ankara-İzmir Motorway	535
9	Afyonkarahisar-Antalya-Alanya Motorway	490
10	Sivrihisar-Bursa Motorway	202
11	Şanlıurfa-Habur Motorway (Including Diyarbakır Connecting)	445
12	Gerede-Merzifon-Gürbulak Motorway I- Gerede-Merzifon Section	357
	Gerede-Merzifon-Gürbulak Motorway II- Merzifon-Gürbulak Section	908
TOTAL		5250

•Total Cost of Projects~ 47 Billion \$

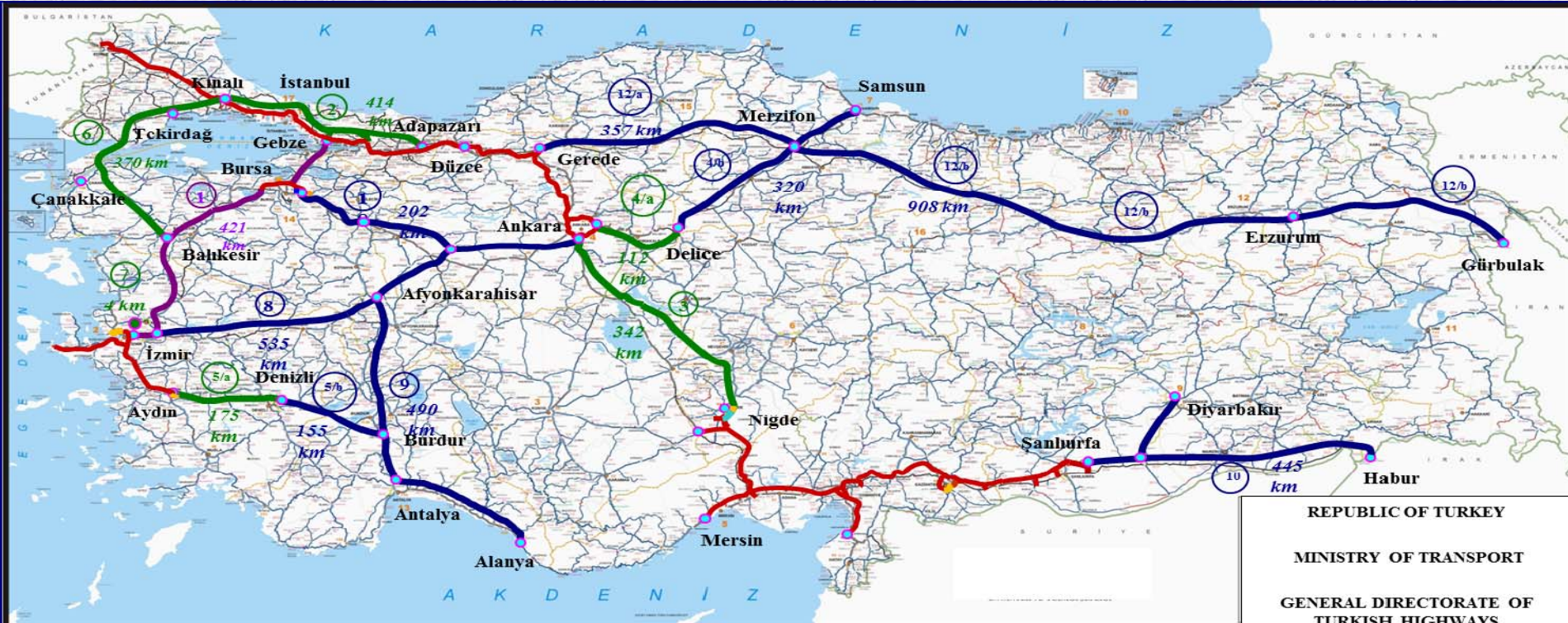
•Total Motorway Network 2023 ~7500 km

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3-Target PPP Motorway Projects-Vision 2023

Target BOT Motorway Project -2023



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█ In operation Motorways (Jan 2011)	2080 km	█ Under construction Motorways (Jan 2011)	82 km	█ BOT 1st Group Motorways	1417 km
█ In operation Motorways in 2011	28 km	█ Tendered BOT Motorways	421 km	█ BOT 2nd Group Motorways	3699 km

█ 1- Gebze-Orhangazi-Izmir motorway	421 (Tendered)	█ 7- Sabuncubeli Tunnel	4 (will be tendered June 2011)
█ 2- North Marmara motorway (incl.3. Durdge)	414 (will be tendered August 2011)	█ 8- Ankara-Izmir motorway	538
█ 3- Ankara-Nigde motorway	342	█ 9- Afyonkarahisar-Antalya-Alanya motorway	490
█ 4/a- Ankara-Kirikkale-Delice motorway	112	█ 10- 5b rihline-Buru motorway	202
█ 4/b- Delice-Samsun motorway	320	█ 11- Sanliurfa-Habur motorway (incl.Diyarbakir connection)	448
█ 5/a- Aydın-Denizli motorway	178	█ 12/a- Gerede-Merzifon motorway	387
█ 5/b- Denizli-Burdur motorway	188	█ 12/b- Merzifon-Garbulak motorway	908
█ 6- Kinali-Tekirdag-Çanakkale-Balıkesir motorway	370		

2023 TARGET BOT PROJECTS: 5250 km



4- Decision Making Procedure of PPP in TURKEY

Economic Feasibility

- For any public projects that to be included in Investment Program of the Government, State Planning Organization (SPO) requires its economic feasibility to be positive.

Financial Feasibility

- If it is planned to be implemented in BOT or any other PPP structure, then SPO requires its feasibility study including financial point of view

Authorization

- After approval stage of SPO, the project goes to Higher Planning Council (HPC), which consists of prime minister and other related ministers.
- If it is approved in the Council, then related institution is authorized to implement the project.

Risk Sharing

- Developed legal/fiscal/economic framework are needed.
- Details that have a crucial effects on projects like organization model and risk sharing model are prepared by the authorized institution and approved by HPC.

Project Entity

- Gebze-Izmir Motorway Project is the first BOT project of Turkey in road transportation sector on this scale.



5-Financial Feasibility of PPP Motorway Projects

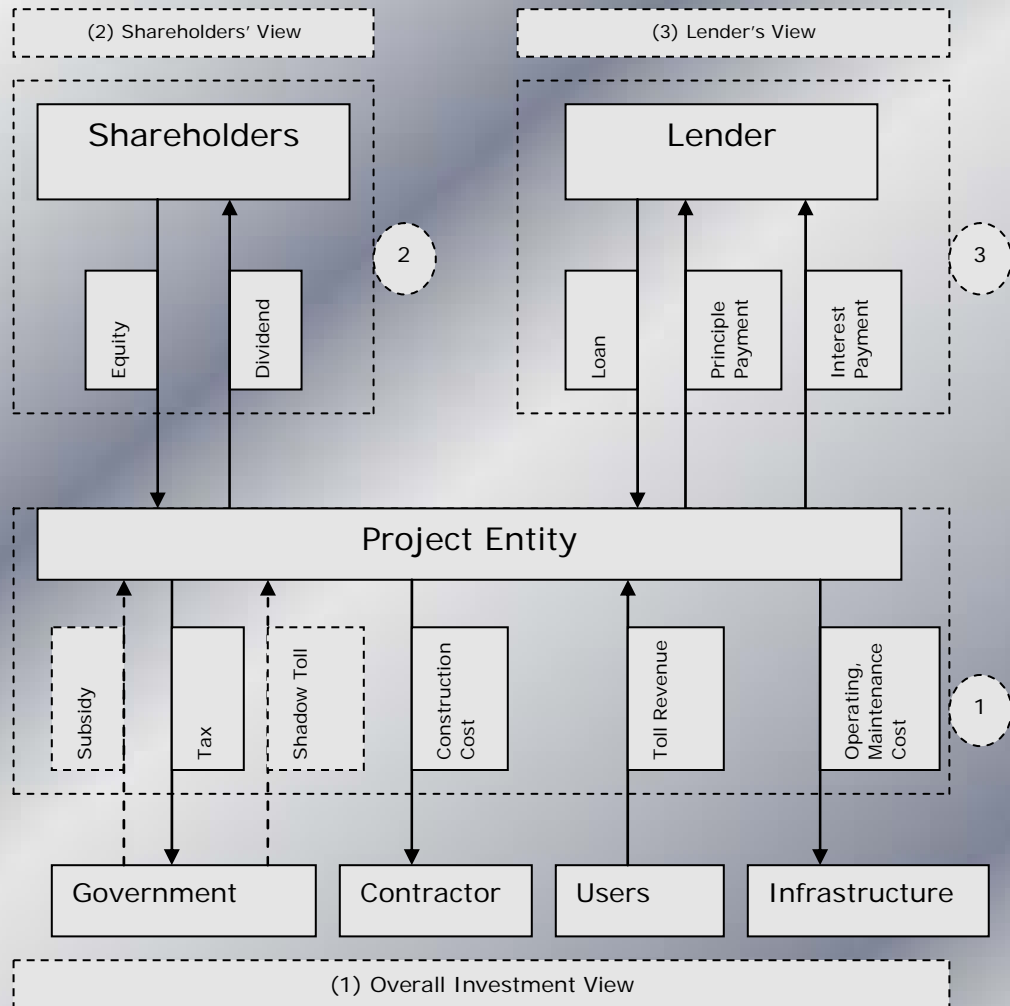
In financial analysis , project incomes are compared with the project expenditures incurred from the costs :

- Construction cost of motorway and bridge
- Maintenance and repairment cost of motorway and bridge
- Operation cost of motorway and bridge
- Taxes
- Reimbursement of credit principal and interest

After the comparison, project estimation is conducted on the base of one of or several assessment parameters as

- Internal Rate of Return
- Net Present Value
- Benefit/Cost Ratio.

5-Financial Feasibility of PPP Motorway Projects

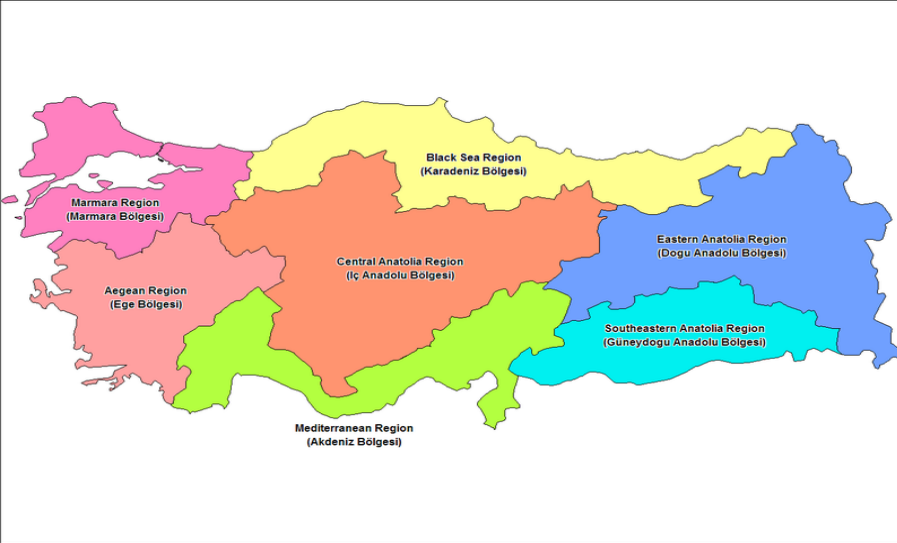


- financial analysis can be assessed according to overall investment, shareholders and lender
- projects are analyzed on the base of overall investment (1) and shareholders (2)

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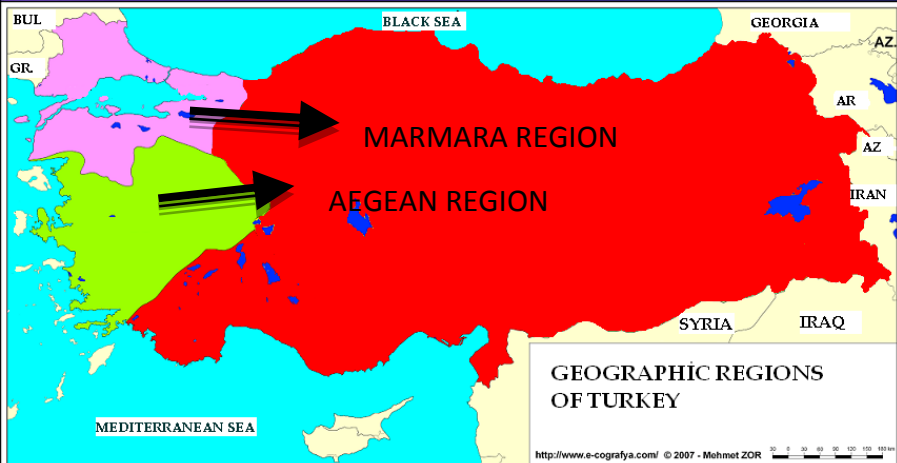
6- Gebze-İzmir Motorway Project



Turkey consist of 7 regions

- Marmara
- Aegean
- Mediterranean
- Black Sea
- Central Anatolia
- Eastern Anatolia
- Southeastern Anatolia

Two most developed regions of Turkey, namely Marmara and Aegean Regions.



Cities of Marmara & Aegean Regions

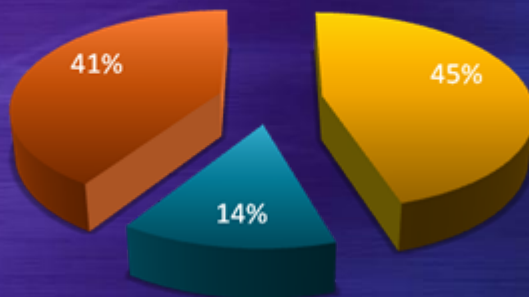




6- Gebze-İzmir Motorway Project

Regional Gross Domestic Products

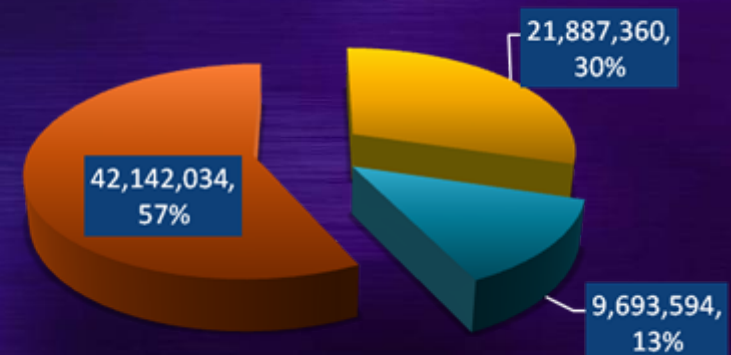
■ MARMARA REGION ■ AEGEAN REGION ■ REST OF TURKEY



✓ About 60% of Turkey's total GDP is produced by these two regions.

Population 2011

■ MARMARA REGION ■ AEGEAN REGION ■ REST OF TURKEY



✓ About 43% Turkey's population lives in Marmara and Aegean Regions

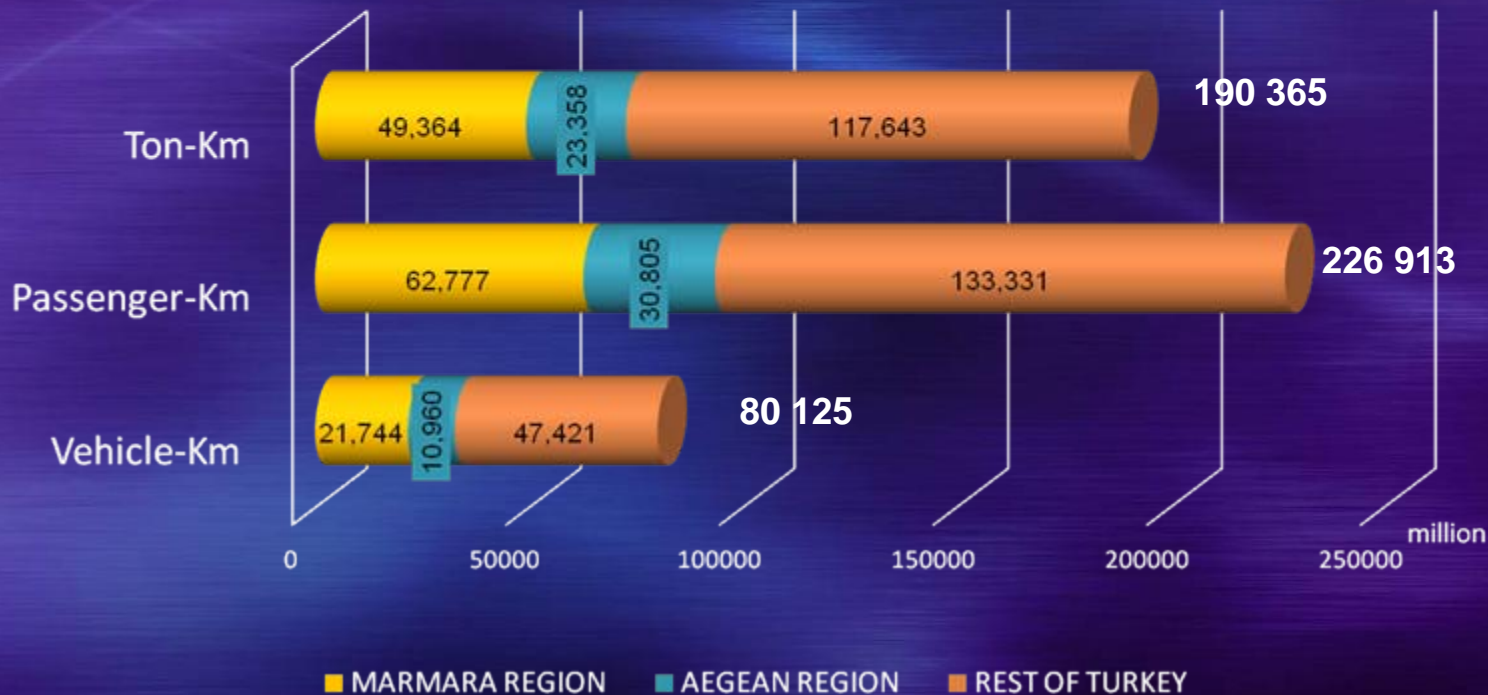
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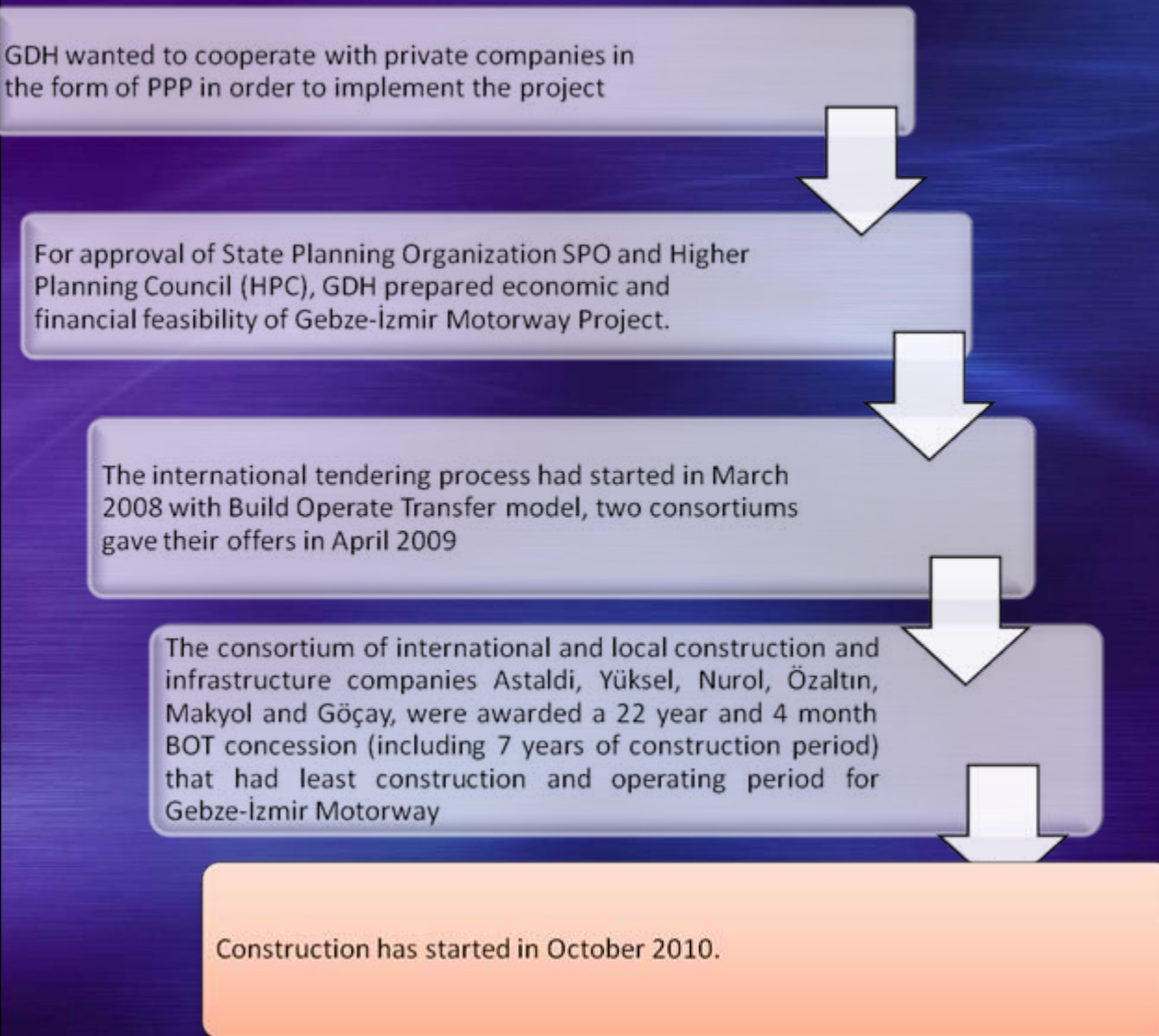
6- Gebze-İzmir Motorway Project

- ✓ % 38 of freight transport in Turkey takes place in these two regions.
- ✓ % 41 of passenger transport in Turkey takes place in these two regions.

Distribution of Passenger and Freight Transport 2010



6- Gebze-İzmir Motorway Project



6- Gebze-İzmir Motorway Project



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6- Gebze-İzmir Motorway Project



TÜRKİYE TEM YOL AĞI (01.01.2010) **TURKEY TEM NETWORK**

UZUNLUK : 6972 KM. **LENGTH : 6972 KM.**

KARAYOLLARI GENEL MÜDÜRLÜĞÜ
STRATEJİ GELİŞTİRME DAİRE BAŞKANLIĞI
STRATEJİK PLANLAMA ŞUBESİ MÜDÜRLÜĞÜ

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DEPARTMENT OF STRATEGY DEVELOPMENT
DIVISION OF STRATEGIC PLANNING

6- Gebze-İzmir Motorway Project

- ✓ The motorway crosses İzmit Bay thorough a 3000m-long suspension bridge.
- ✓ Travel time for car users who use peripheral state road is 70 min, 60 minutes with ferry passage and only 6 min with suspension bridge.
- ✓ World 2nd suspension bridge with longest main span (1700 m) after Akashi Kaikyo Bridge which has central span 1991m





5- Gebze-İzmir Motorway Project

Results of economic and financial feasibility studies of Gebze-İzmir Motorway Project are given below:

1. Length of the road between Gebze-İzmir will be shorten by 140 km (approximately 90km İzmit Bay). Travel time will decrease 8-10 hours to 3,5-4 hours.
2. Economic IRR of the project will be about 14%

Technical Specifications of Gebze-İzmir Motorway		
Length	377 km motorway	44 km connecting road
Suspension Bridge	1700 m mid-span	3000 m total length
Viaduct	Total 30	18212 m total length
Tunnel	Total 4	7395 m total length
Bridge	Total 209	
Toll Collecting Service	Total 18	
Maintenance Management Center	Total 5	
Service Area	Total 7	
Parking Area	Total 7	



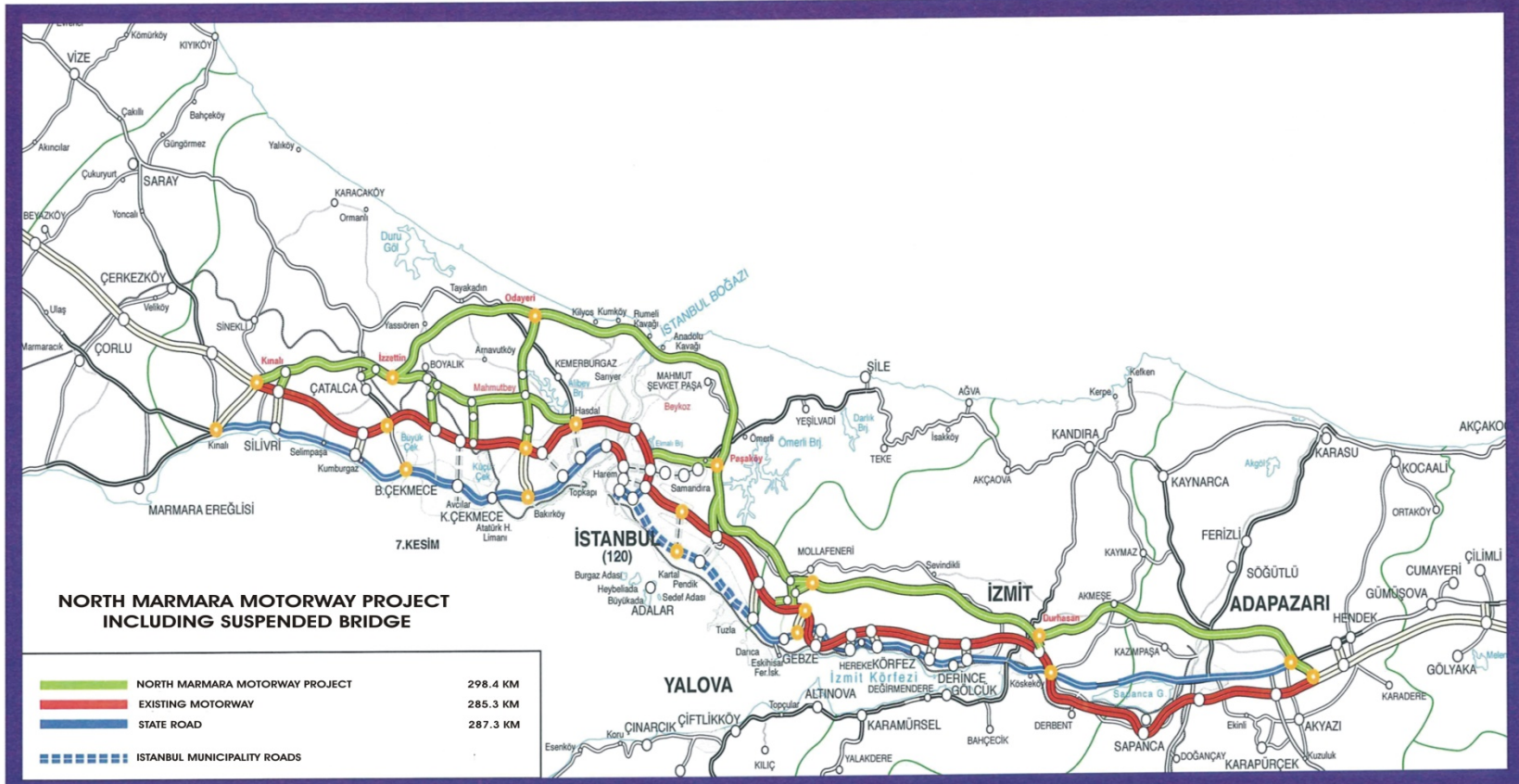
5- *Gebze-İzmir Motorway Project*

3. Financial implementation model is BOT.
4. Consortium that will construct and operate the motorway, will collect tolls from the road users for specific duration to reimburse the project costs.
5. Toll price of passenger car is 0,05\$/km+VAT for highway , 35\$ +VAT for İzmit Bay Bridge
6. Financial IRR of the project will about 8.8% from the Project Entity's point of view.
7. In order to decrease the operation time, traffic guarantees which vary 17000-40000 pcu/daily for different sections are given.
8. As a result, 49 years operation time decreases 22 years 4 months (including 7 years construction time)
9. Estimated cost of Gebze-İzmir Motorway Project is about \$6 Billion. (including taxes and expropriation)

MOTORWAY DEVELOPMENT PROGRAM of TURKEY



7- North Marmara Motorway Project



Technical & Financial Specifications of North Marmara Motorway

Length	299 km motorway (2x3/2x4 lanes)	115 km connecting road (2x2 lanes)
Suspension Bridge	1275 m mid-span	1875 m total length
Costs (incl. TAX & Expropriation)	\$ 6.2 Billion	
STAGE: Will be tendered in August 2011		

MOTORWAY DEVELOPMENT PROGRAM of TURKEY



7- North Marmara Motorway Project



KARAYOLLARI GENEL MÜDÜRLÜĞÜ
STRATEJİ GELİŞTİRME DAİRE BAŞKANLIĞI
STRATEJİK PLANLAMA ŞUBESİ MÜDÜRLÜĞÜ

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7- North Marmara Motorway Project

- North Marmara Motorway Project (Including 3rd suspension bridge on Istanbul Strait) is consist of 299 km motorway, 115 km connecting roads and 1875 m suspension bridge.
- Total length of the project is 414 km and the project includes numerous viaducts tunnels and other infrastructures.
- The estimated approximate cost of the project is \$6.2 Billion including taxes and expropriation.

The aim of the project is:

- To decrease the traffic congestion at 2 suspension bridges on Istanbul Strait with an alternative suspension bridge that will locate on the north of Istanbul close to Black Sea region



7- North Marmara Motorway Project

- Average Annual Daily Traffic volume of existing bridges are approximately 400 000 and the mobility tends to increase in this corridor.
- Marmara region is densely populated and economically developed. As a result, decrease in the road service capacity inherits the economical activities and results in loss of time, work force and money.
- The additional traffic that was constrained by road capacity will also increase local, national and international traffic.
- Financial implementation model is BOT.
- Economical and Financial Analyses of this project were finished by GDH on August 2010 and the project will be tendered in August 2011.



8-Conclusions:

- Marmara and Aegean Regions are two most important regions of Turkey.
- According to feasibility studies, Gebze-İzmir & North Marmara Motorway Projects will have socio-economic benefits on these regions.
- These 2 projects constitute the major part of Vision 2023
- These 2 projects are also part of TEM Network & E-Roads
- The Build Transfer Operate model brings together the investment dynamism and project experience of the private sector and the support of international finance institutions.
- GDH sees PPP as a key to finance the motorway projects.