OUTLINE

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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
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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)**

<table>
<thead>
<tr>
<th>Motorway</th>
<th>2225 km</th>
<th>% 3.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Road</td>
<td>31.384 km</td>
<td>% 48.3</td>
</tr>
<tr>
<td>Provincial Roads</td>
<td>31.453 km</td>
<td>% 48.3</td>
</tr>
<tr>
<td>STATE &amp; PROVINCIAL ROADS</td>
<td>MOTORWAYS</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
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<td></td>
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<tr>
<td>5718 bridges with a length of 247 Km</td>
<td>• 1584 bridges and viaducts with a length of 159.8 km</td>
<td></td>
</tr>
<tr>
<td>160 single &amp; double tube tunnels</td>
<td>• 2x3 lane 29 double tube tunnel with a length of 22.8 Km</td>
<td></td>
</tr>
<tr>
<td>Total length of tunnels 89.3 Km</td>
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</tbody>
</table>
1. Turkish Road Network

Turkish Road Network under the jurisdiction of General Directorate of Turkish Highways
• 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.
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 personnel 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.
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.
General Directorate of Turkish Highways has 11 motorway projects (+1 tunnel project) in its agenda which will be financed by BOT.

<table>
<thead>
<tr>
<th>TARGET BOT MOTORWAY PROJECTS 2023</th>
<th>Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Gebze-Orhangazi-İzmir Motorway</td>
<td>421</td>
</tr>
<tr>
<td>2 North Marmara Motorway</td>
<td>414</td>
</tr>
<tr>
<td>3 Ankara-Niğde Motorway</td>
<td>342</td>
</tr>
<tr>
<td>4 Ankara-Samsun Motorway I-Ankara-Kırıkkale-Delice Section</td>
<td>112</td>
</tr>
<tr>
<td>5 Ankara-Samsun Motorway II-Delice-Samsun Section</td>
<td>320</td>
</tr>
<tr>
<td>6 Aydın-Denizli-Burdur Motorway Aydın-Denizli Section</td>
<td>175</td>
</tr>
<tr>
<td>7 Aydın-Denizli-Burdur Motorway Denizli-Burdur Section</td>
<td>155</td>
</tr>
<tr>
<td>8 Kınalı-Tekirdağ-Çanakkale-Balıkesir Motorway</td>
<td>370</td>
</tr>
<tr>
<td>9 Sabuncubeli Tunnel</td>
<td>4</td>
</tr>
<tr>
<td>10 Ankara-İzmir Motorway</td>
<td>535</td>
</tr>
<tr>
<td>11 Afyonkarahisar-Antalya-Alanya Motorway</td>
<td>490</td>
</tr>
<tr>
<td>12 Sivrihisar-Bursa Motorway</td>
<td>202</td>
</tr>
<tr>
<td>13 Şanlıurfa-Habur Motorway (Including Diyarbakır Connecting)</td>
<td>445</td>
</tr>
<tr>
<td>14 Gerede-Merzifon-Gürbülak Motorway I- Gerede-Merzifon Section</td>
<td>357</td>
</tr>
<tr>
<td>15 Gerede-Merzifon-Gürbülak Motorway II- Merzifon-Gürbülak Section</td>
<td>908</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>5250</strong></td>
</tr>
</tbody>
</table>

*Total Cost of Projects~ 47 Billion $
*Total Motorway Network 2023 ~7500 km
MOTORWAY DEVELOPMENT PROGRAM of TURKEY

3-Target PPP Motorway Projects - Vision 2023

Target BOT Motorway Project - 2023

2023 TARGET BOT PROJECTS: $250 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-İzmir Motorway Project is the first BOT project of Turkey in road transportation sector on this scale.
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)

Financial Analysis from different point of views
Two most developed regions of Turkey, namely Marmara and Aegean Regions.

Turkey consists of 7 regions:
- Marmara
- Aegean
- Mediterranean
- Black Sea
- Central Anatolia
- Eastern Anatolia
- Southeastern Anatolia

Cities of Marmara & Aegean Regions
About 60% of Turkey’s total GDP is produced by these two regions.

About 43% of Turkey’s population lives in Marmara and Aegean Regions.
MOTORWAY DEVELOPMENT PROGRAM of TURKEY

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

- Ton-Km: 49,364 (MARMARA), 117,643 (REST OF TURKEY), 23,358 (AEGEAN)
- Passenger-Km: 62,777 (MARMARA), 133,331 (REST OF TURKEY), 30,805 (AEGEAN)
- Vehicle-Km: 21,744 (MARMARA), 80,125 (REST OF TURKEY), 47,421 (AEGEAN)
6- Gebze-İzmir Motorway Project

GDH wanted to cooperate with private companies in the form of PPP in order to implement the project.

For approval of State Planning Organization SPO and Higher Planning Council (HPC), GDH prepared economic and financial feasibility of Gebze-Izmir Motorway Project.

The international tendering process had started in March 2008 with Build Operate Transfer model, two consortiums gave their offers in April 2009.

The consortium of international and local construction and infrastructure companies Astaldi, Yüksel, Nurol, Özaltın, Makyol and Göçay, were awarded a 22 year and 4 month BOT concession (including 7 years of construction period) that had least construction and operating period for Gebze-Izmir Motorway.

Construction has started in October 2010.
6- Gebze-İzmir Motorway Project
6- Gebze-İzmir Motorway Project
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%

<table>
<thead>
<tr>
<th>Technical Specifications of Gebze-İzmir Motorway</th>
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</thead>
<tbody>
<tr>
<td>Length</td>
</tr>
<tr>
<td>Suspension Bridge</td>
</tr>
<tr>
<td>Viaduct</td>
</tr>
<tr>
<td>Tunnel</td>
</tr>
<tr>
<td>Bridge</td>
</tr>
<tr>
<td>Toll Collecting Service</td>
</tr>
<tr>
<td>Maintenance Management Center</td>
</tr>
<tr>
<td>Service Area</td>
</tr>
<tr>
<td>Parking Area</td>
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</tbody>
</table>
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)
Technical & Financial Specifications of North Marmara Motorway

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>299 km motorway (2x3/2x4 lanes)</td>
</tr>
<tr>
<td></td>
<td>115 km connecting road (2x2 lanes)</td>
</tr>
<tr>
<td>Suspension Bridge</td>
<td>1275 m mid-span</td>
</tr>
<tr>
<td>Costs (incl. TAX &amp; Expropriation)</td>
<td>$ 6.2 Billion</td>
</tr>
<tr>
<td>STAGE:</td>
<td>Will be tendered in August 2011</td>
</tr>
</tbody>
</table>
7- North Marmara Motorway Project
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.
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.