



Republic of Turkey
Ministry of Transport Maritime Affairs
and Communications



GENERAL DIRECTORATE
of HIGHWAYS



TEM / IHEEP MEETING ON ROAD FINANCING

30 May - 02 June 2016

İSTANBUL



OUTLINE

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1

GENERAL OVERVIEW of HIGHWAY NETWORK



STRATEGIC LOCATION OF TURKEY



The lands of Turkey are located at a point where the three continents; Asia, Africa and Europe are closest to each other. Turkey has 13000 km of international road network. Within 4 hours flying time, about 1.5 billion people from 56 countries can reach Turkey.

ROAD NETWORK IN TURKEY



Type: Village and Forest roads
Responsibility: Special
Provincial Administration

Type: Urban roads
Responsibility: Municipal
Authorities

Type: Motorways, State & Provincial roads
Responsibility: General Directorate of Turkish Highways

The road network excluding urban roads is about 385.000 km in length

GENERAL DIRECTORATE OF TURKISH HIGHWAYS

- GDH is responsible for planning, design, construction, maintenance, repair and operation of roads, bridges and structures within the network of motorways, state and provincial roads and keep all the network safely in operation in all weather conditions.
- GDH was established on March 1, 1950
- GDH is an affiliated institution of the Ministry of Transport, Maritime Affairs and Communications.

ORGANIZATION CHART

COUNSELLING AND SUPERVISION UNITS

INSPECTION BOARD	LEGAL ADVISORY OFFICE
DEPARTMENT OF STRATEGY DEVELOPMENT	INTERNAL AUDIT UNIT

DIRECTOR GENERAL



MAIN SERVICE UNITS

DEPT. OF SURVEY, DESIGN AND ENVIRONMENT	DEPT. OF MOTORWAY OPERATIONS
DEPT. OF RESEARCH AND DEVELOPMENT	DEPT. OF EQUIPMENT AND SUPPLY
DEPT. OF ROAD CONSTRUCTION	DEPT. OF STRUCTURES
DEPT. OF FACILITIES AND MAINTENANCE	DEPT. OF REAL ESTATE
DEPT. OF TRAFFIC SAFETY	DEPT. OF PROG. AND MONITORING

DEPUTY DIRECTOR GENERAL

4



PRIVATE SECRETERAT UNIT



PRESS & PUBLIC RELATIONS UNIT

SUPPLEMENTARY SERVICE UNITS

DEPT. OF SUPPORT SERVICE	DEPT. OF HUMAN RESOURCES
DEPT. OF INFORMATION TECHNOLOGIES	

54 DIVISIONS

REGIONAL DIVISIONS OF GDH

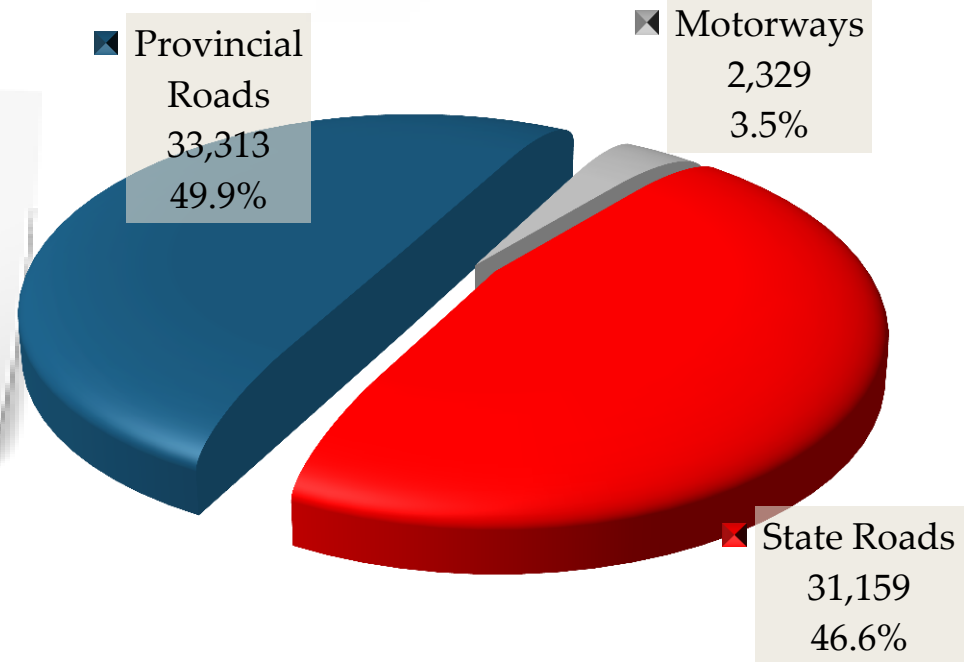


- 18 Regional Divisions
- 118 Subdivisions
- 281 Maintenance Houses
- 25 Motorway Maintenance and Operation Offices
- 2 Equipment and Supply Directories

NATIONAL HIGHWAY NETWORK

Highway Network (Km)

- Total road network is 66.801 km.
- 36,5% of total road network (24.369 km) is dual carriageway



- Total Replacement Value: **67 Billion \$**
- Road Density: **50 km / 100 km²** (Excl. Urban Roads)
- Motorway Density: **2.86/ 1000 km²**

ROAD STRUCTURES – TUNNELS , BRIDGES & VIADUCTS

- Number of Tunnels : 83
- Length of Tunnels: 50 km

2003



- Number of Tunnels : 272
- Length of Tunnels: 271 km

2016



- Number of Tunnels : 85
- Length of Tunnels: 266 km

Under Construction



- Number of Bridges&Viaducts : 5.967
- Length of Bridges&Viaducts: 311 km

2003



- Number of Bridges&Viaducts : 7.898
- Length of Bridges&Viaducts 469 km

2016



- Number of Bridges&Viaducts : 431
- Length of Bridges&Viaducts 65 km

Under Construction

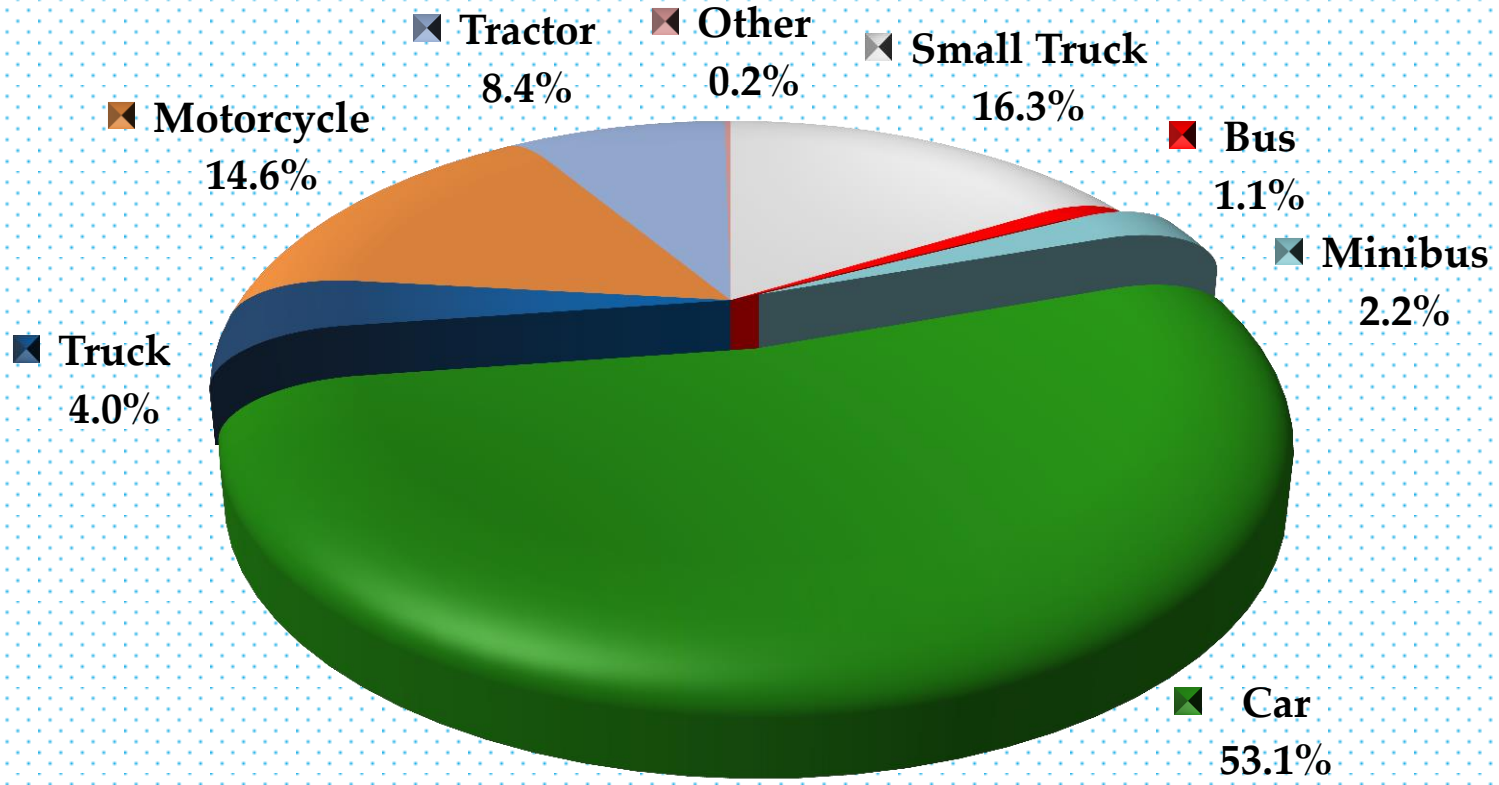


NATIONAL HIGHWAY NETWORK (66.801 km)

➤ Turkish Road Network under General Directorate of Turkish Highways' responsibility.



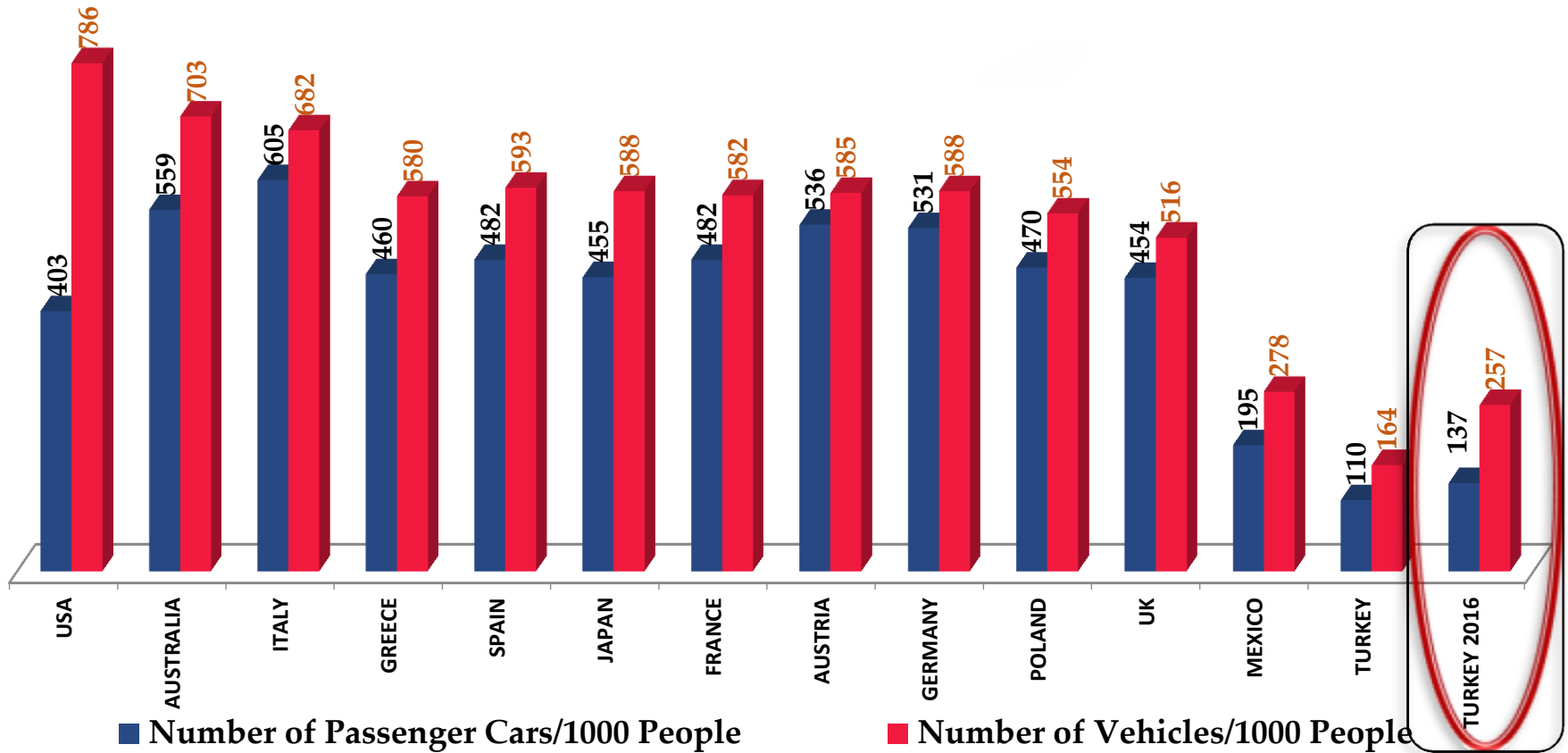
VEHICLE FLEET (MARCH 2016)



By the end of March 2016

- Number of Vehicles: 20.252.146
- Number of Passenger Cars: 10.752.863 (53% of Vehicle Fleet)

VEHICLE & CAR OWNERSHIP

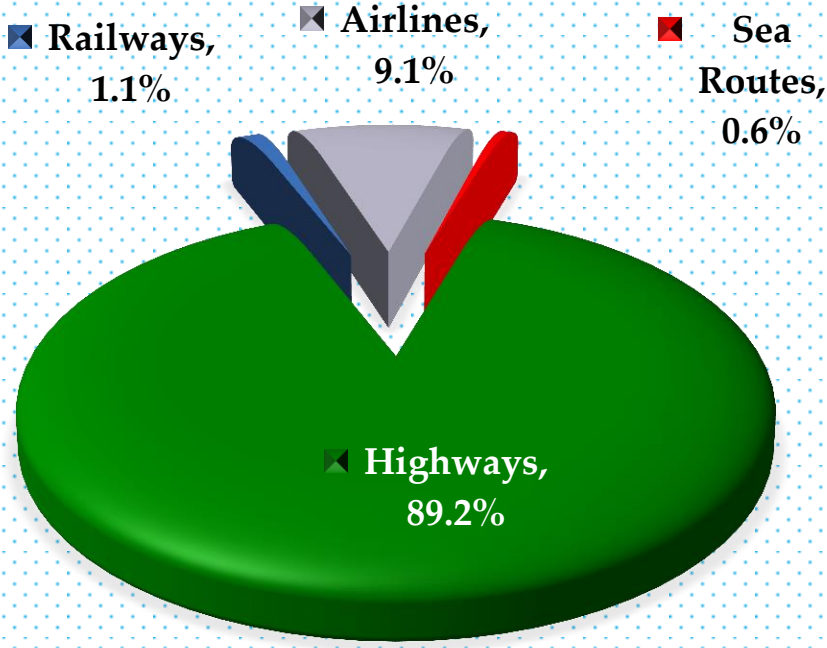


- Car ownership 137 cars per 1000 people is much lower than the EU and other developed countries.
- High potential for an increase in the number of vehicles per capita (compared to developed countries)

*IRF WORLD ROAD STATISTICS 50 TH YEAR ANNIVERSARY VOLUME 1 DATA 2000-2011

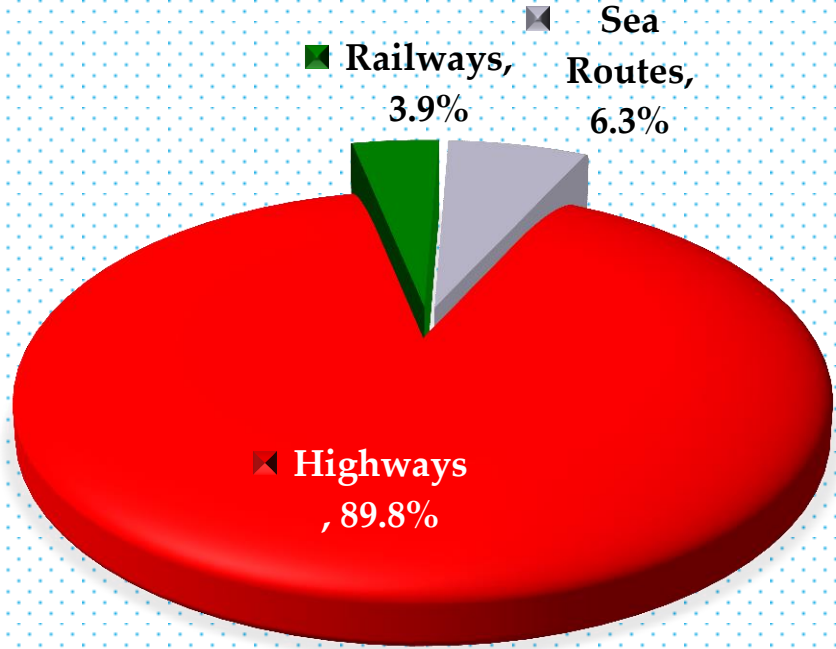
DOMESTIC PASSENGER & FREIGHT TRANSPORT 2015

PASSENGER TRANSPORT



Passenger Transport
Highways: 89,8 %

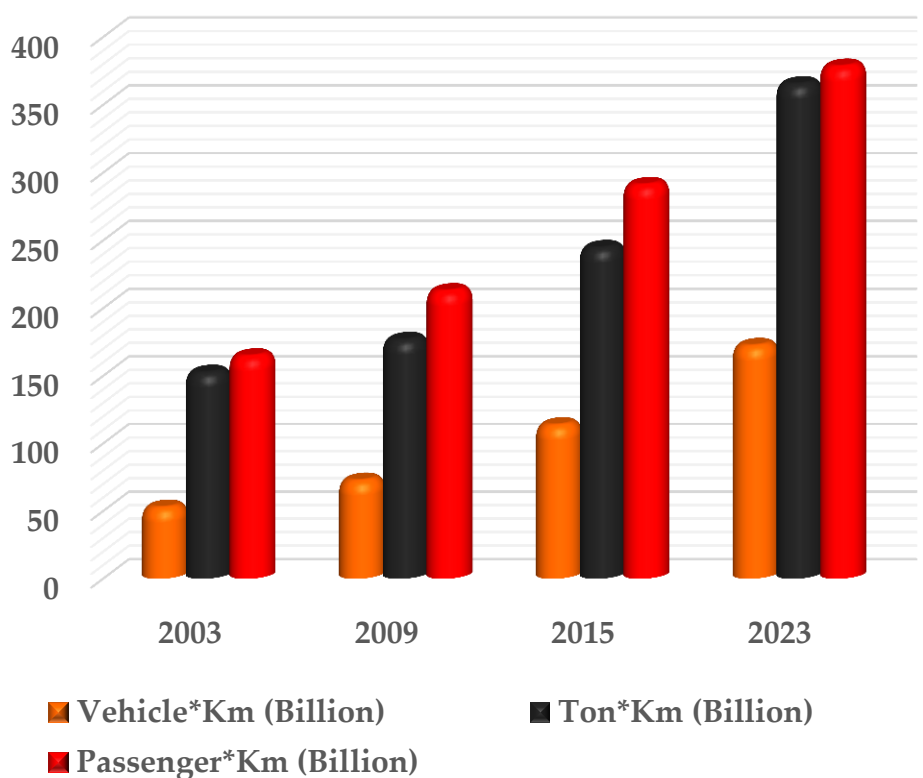
FREIGHT TRANSPORT



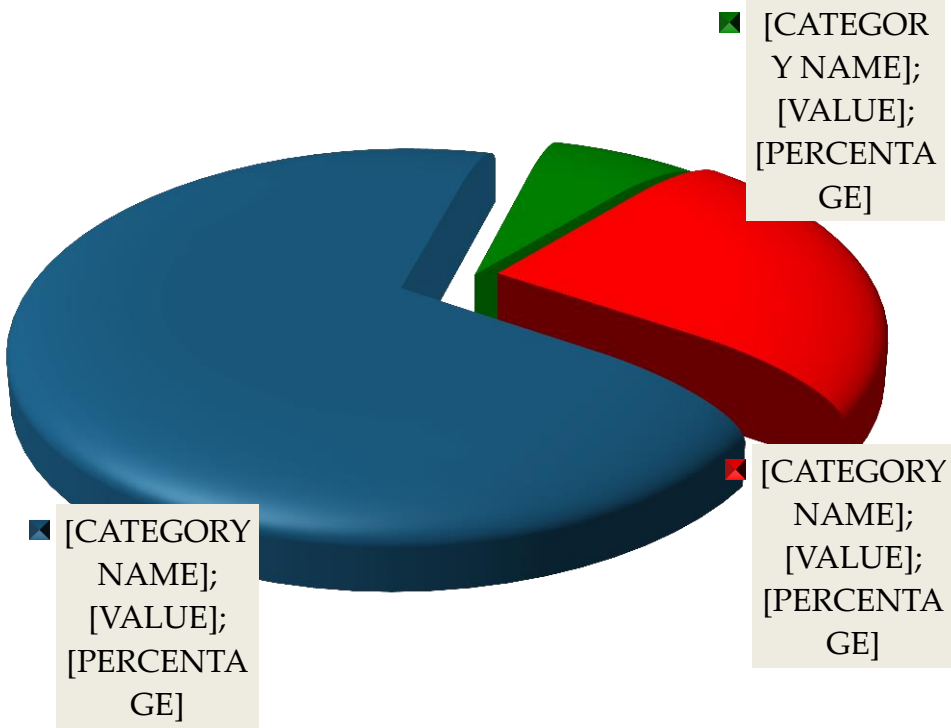
Freight Transport
Highways: 89,5%

PASSENGER AND FREIGHT TRANSPORT IN HIGHWAYS

Passenger & Freight Transport



FREIGHT TRANSPORT 2015 (Billion TonxKm)

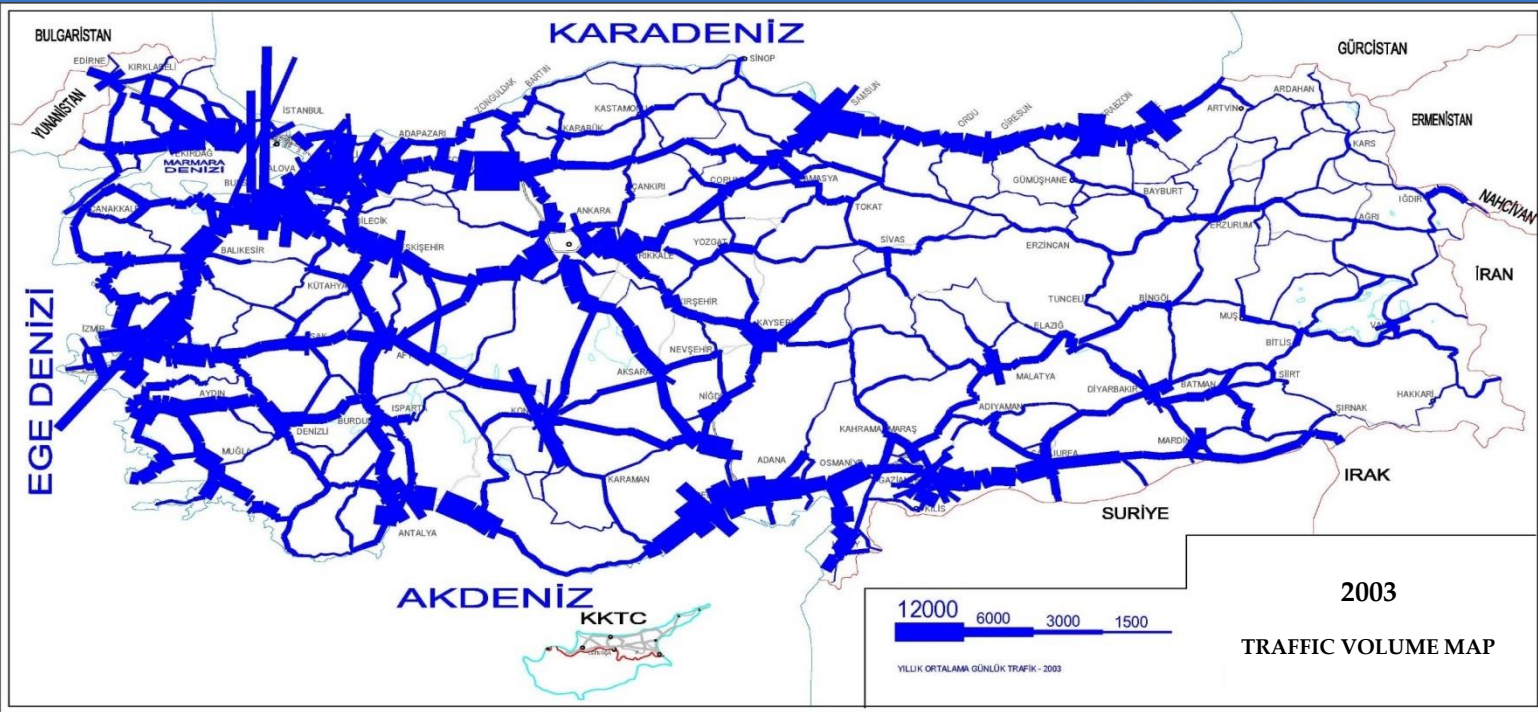


- **116 %** increase in vehicle-km, **61 %** increase in ton-km, **77 %** increase in passenger-km in the period of 2003 & 2015
- Despite only accounting for **3,4%** of the road network as a whole, our motorway network is carrying **23%** of all freight.

TRAFFIC VOLUME
Million Km (2003)

52.349

Total Vehicle-Km

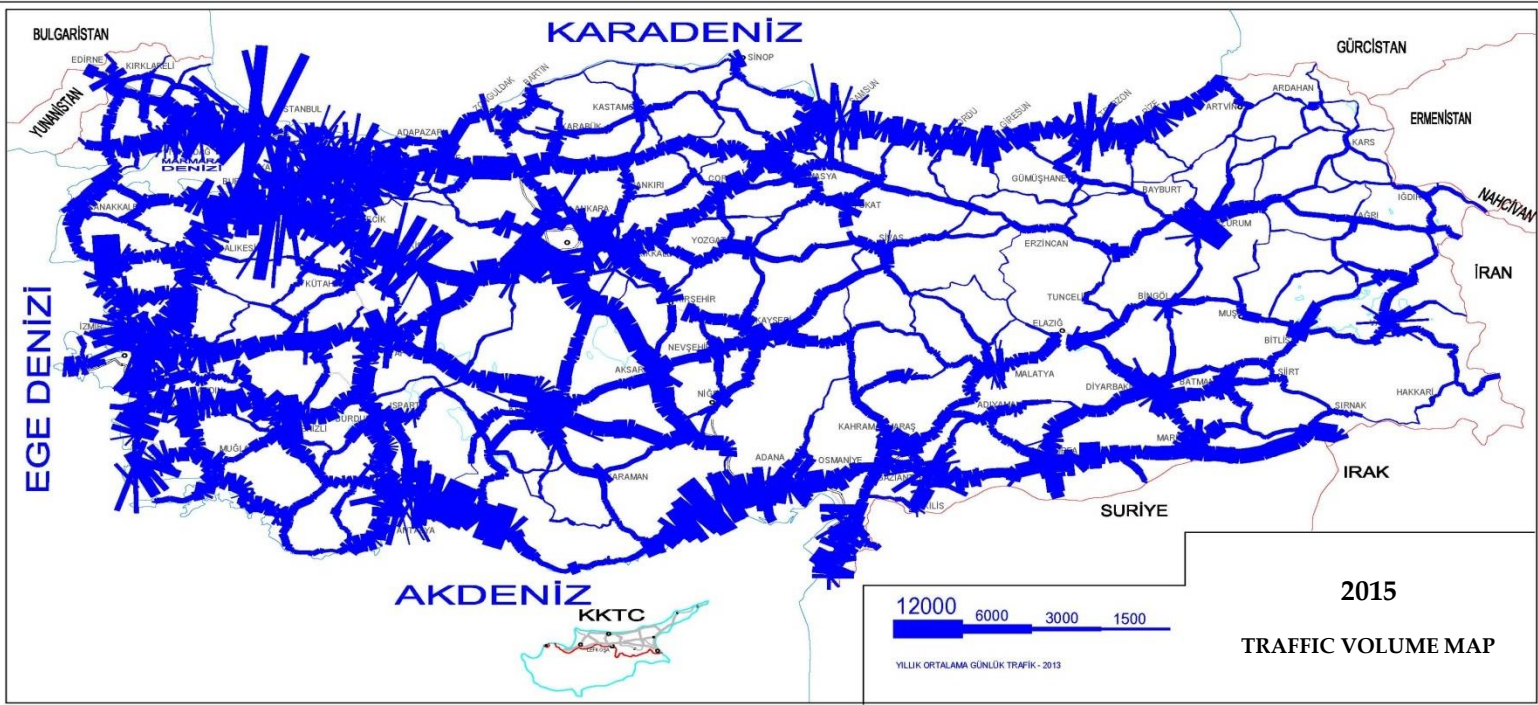


TRAFFIC VOLUME
Million Km (2015)

113.274

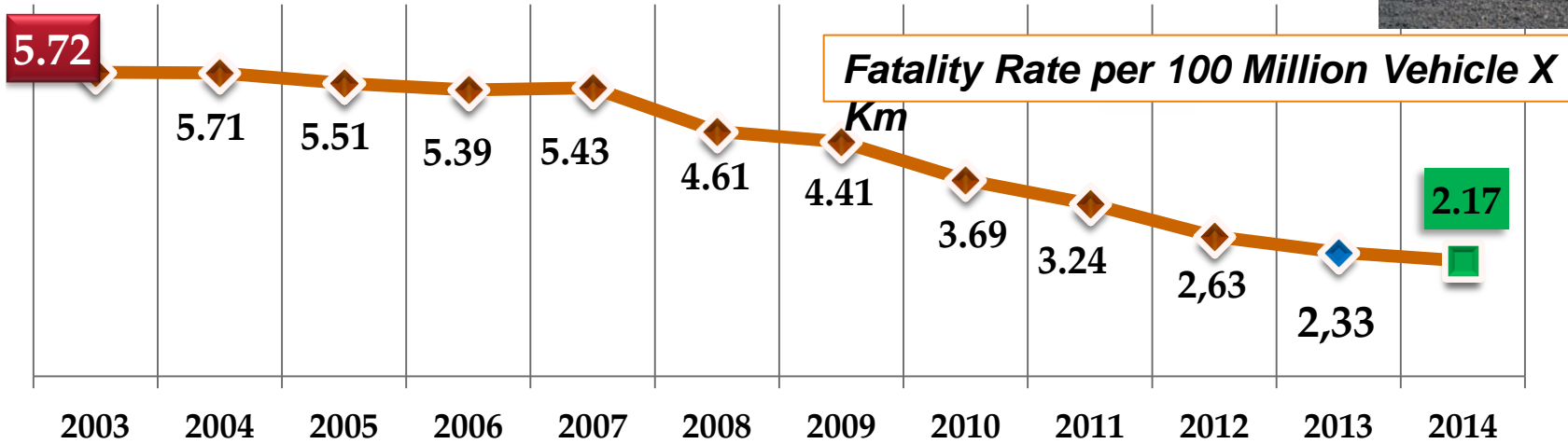
Total Vehicle-Km

116 % increase in
vehicle-km





ROAD SAFETY



YEAR	VehiclexKm (Million)	Fatality (100 Million VehiclexKm)
2003	52.349	5.72
2004	57.767	5.71
2005	61.129	5.51
2006	64.577	5.39
2007	69.609	5.43
2008	69.771	4.61
2009	72.432	4.41
2010	80.124	3.69
2011	85.495	3.24
2012	94.225	2.63
2013	99.431	2.33
2014	102.988	2,17

Between 2003 & 2014, we achieved **62%** reduction in fatality rate per 100 Million VehiclexKm.

TARGET 2023



Reduce Fatality Rate below 1 for 100 Million Vehicle x Km



2

ROAD FINANCING IN TURKEY



HIGHWAY FINANCING RESOURCES

National Budget

- financing approximately 95 % of road investment budget
 - Road used related taxes and excise taxes on vehicle purchasing taxes directly go to the consolidated budget. Ministry of Finance collects all taxes and allocates those

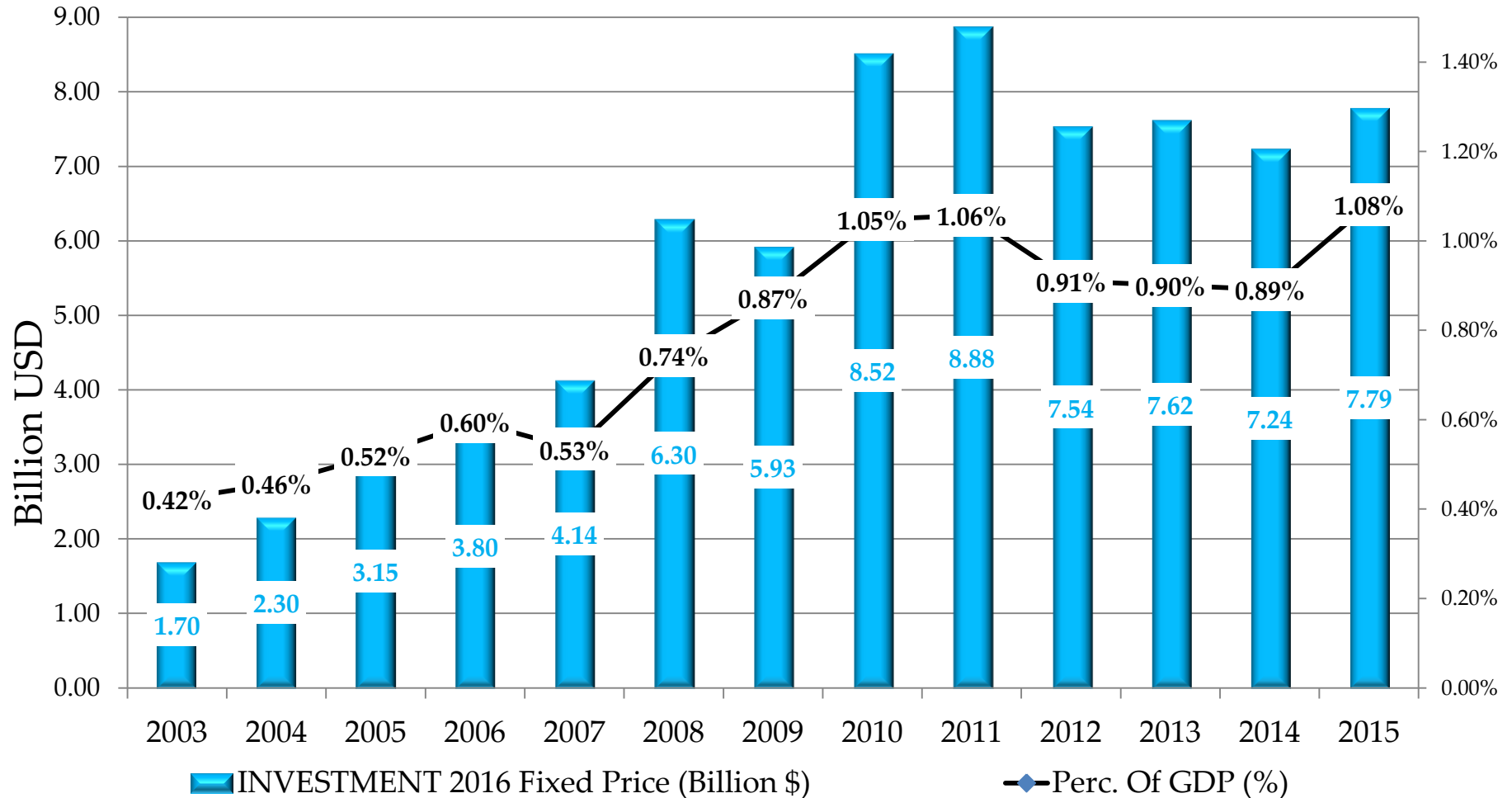
Toll Motorway Revenues

- 400 Million USD, covering %5 of total road investment budget
 - Istanbul-Ankara toll rate is about 6 USD for 380 km (0,015 USD/km, 1,5 US Cents/km)
 - Two intercontinental suspended bridges over Istanbul Strait 1.5 US \$ for two way

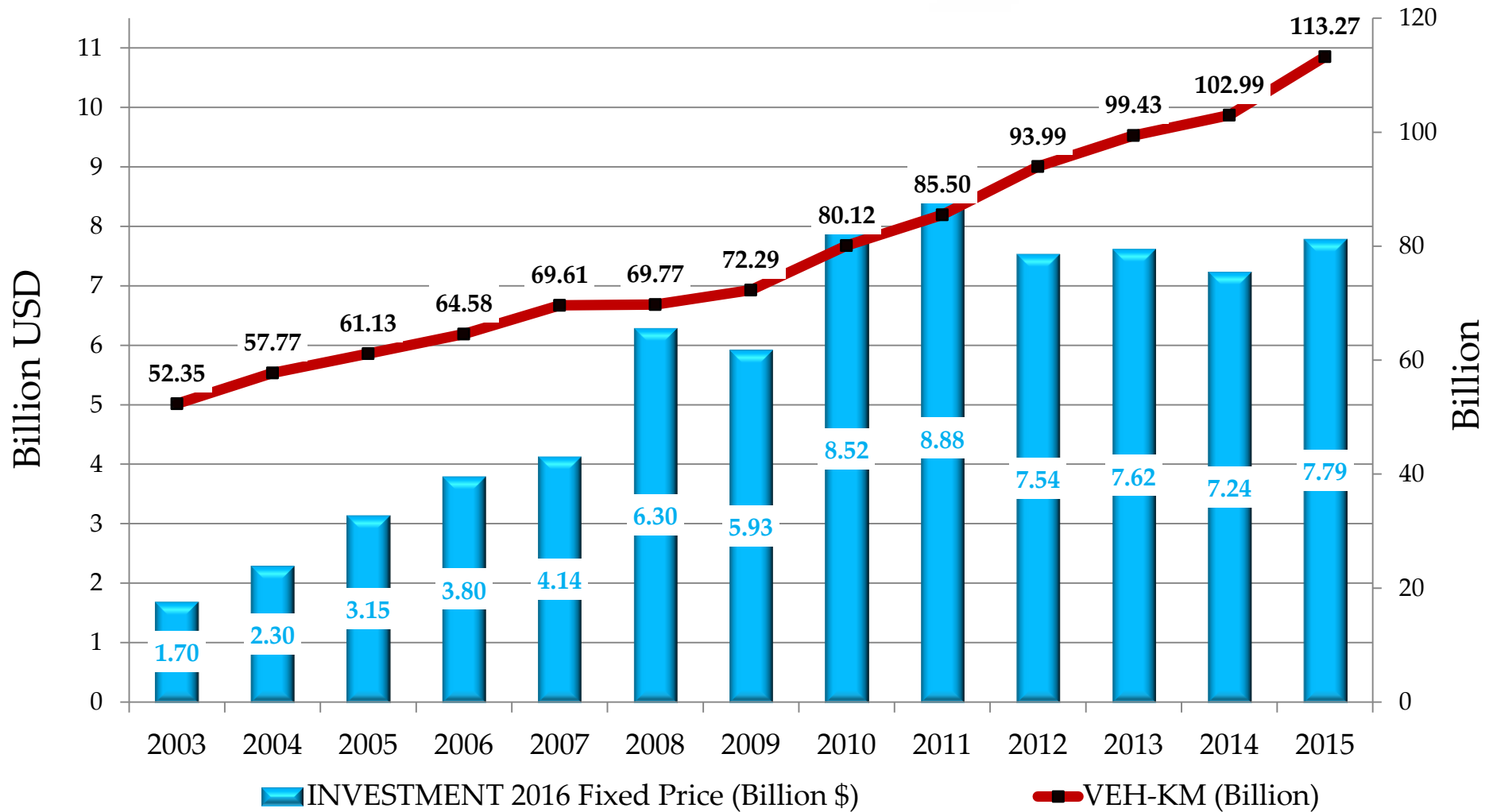
PPP concessions for the construction of BOT motorways

- İstanbul-İzmir Motorway (Inc. İzmit Bay Crossing)
- Northern Marmara Motorway, Odayeri-Paşaköy Section (Inc. Yavuz Sultan Selim Cable Stayed Suspension Bridge) Project

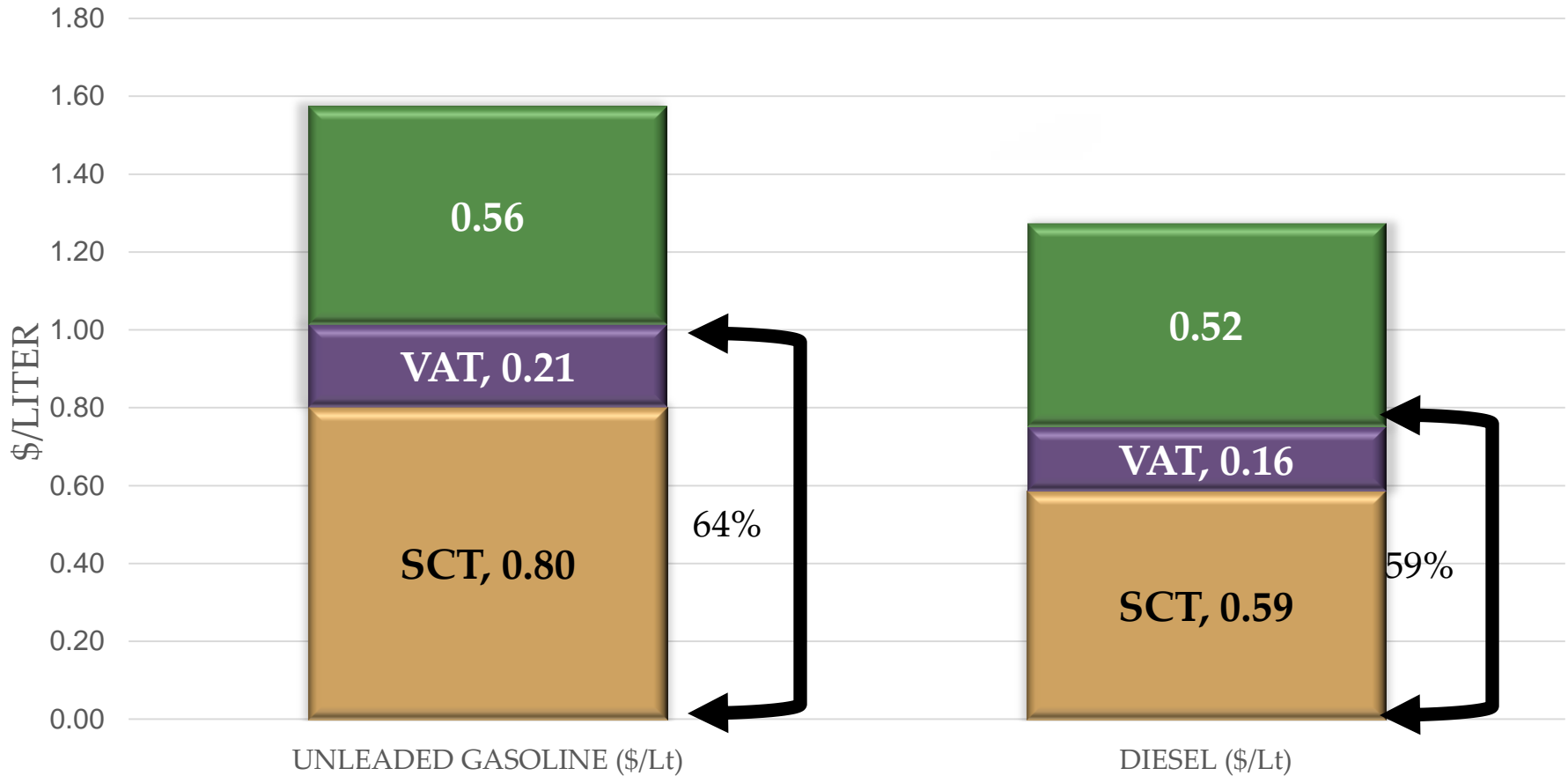
PERCENTAGE OF GDP USED FOR HIGHWAY INFRASTRUCTURE INVESTMENT



HIGHWAY INFRASTRUCTURE INVESTMENT VS. VEHICLE-KM

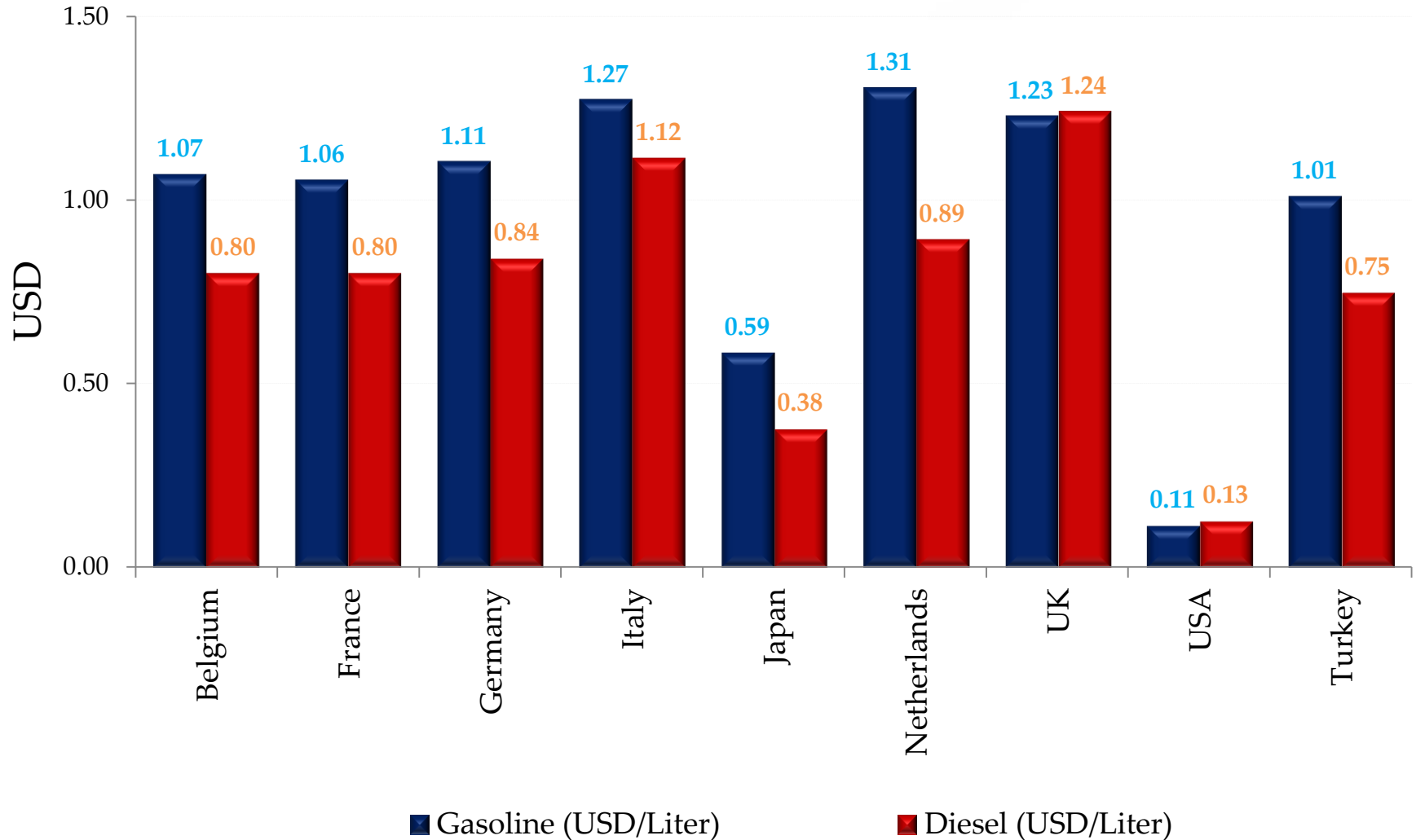


FUEL PRICE AND TAXES IN TURKEY 2016



- 64 % of Gasoline price and 59 % of diesel price is tax. Tax rates of diesel is lower.
- Vehicle purchase taxes and annual motor vehicle taxes are determined according to engine size, age and type of vehicle.
- The revenues from the road related taxes, taxes on gasoline and diesel, vehicle purchase taxes, annual motor vehicle taxes are not tied to highway construction and maintenance.

FUEL TAXES IN SELECTED COUNTRIES



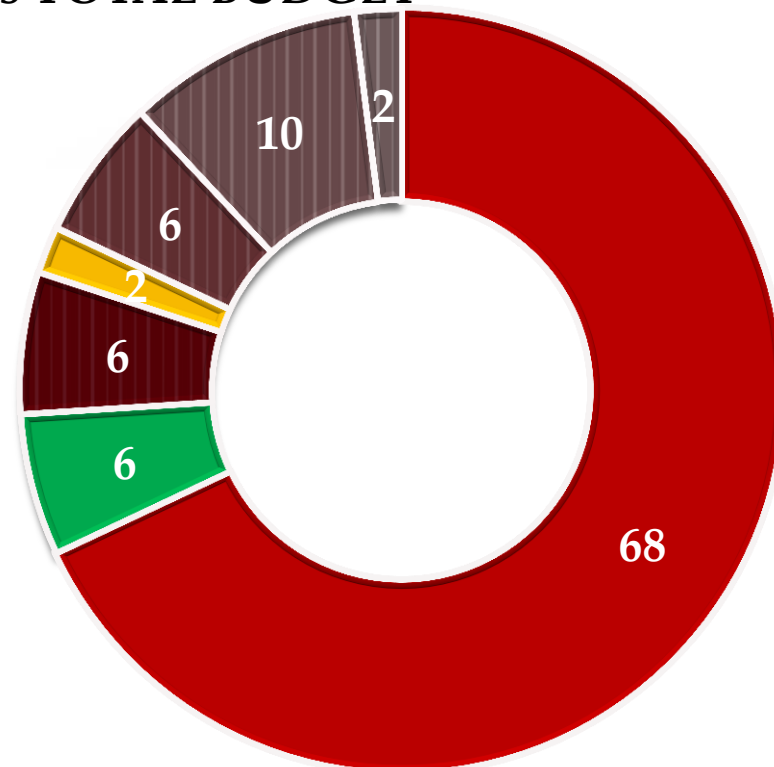
THE BREAKDOWN OF GDH's TOTAL BUDGET

In 2015, Total budget of Turkish Highway amounted to **8.5 Billion US \$**.

Out of total budget,

- 68 % on state and provincial road construction & upgrading
- 6 % on motorway rehabilitation and operation,
- 6 % on routine maintenance,
- 2 % on routine road safety works,
- 6 % on personnel expenditure,
- 10 % on expropriation
- the remaining 2 % on other current expenditures.

The share of road transport investments in the Gross Domestic Product (GDP) is about 1%.



- State & Provincial Road Cons. & Upgrading
- Motorway Rehab. & Oper.
- Routine Maintenance
- Personnel Expenditure
- Expropriation
- Road Safety Works
- Other Current Expenditures



3

HIGHWAY INVESTMENTS



NATIONAL ROAD PROGRAM

ACCORDING TO OUR NATIONAL ROAD PROGRAM :

The road infrastructure investments are planned to ensure;

1

Staying competitive by reducing travel times and transport costs

2

Providing uninterrupted and safe road transportation

3

The improvement of mobility and road user comfort

4

Facilitating the distribution of economic prosperity to all regions of the country

UPGRADING SINGLE CARRIAGEWAYS INTO DUAL CARRIAGEWAYS

Action

General Directorate of Highways started the implementation of a highway upgrading program in 2003 involving the upgrading of existing single carriageway into dual carriageway.

Missions & Goals

The primary objectives of dual carriageway road construction:

- to reduce traffic accident fatalities and serious injuries due to head-on collision,
- to improve the level of service affected by inadequate capacity.

Current Situation

The length of dual carriageway roads opened to traffic has reached to 18.268 km including motorways since 2003.

EAST-WEST CORRIDORS (8.126 KM)



Corridor	LENGTH (KM)	In Operation	Under Construction	Will be Tendered
D010	1.152	867	27	258
D100	1.852	1.851	1	0
D200	1.235	1.222	2	11
D300	1.926	1.897	3	26
D400	1.961	1.385	56	519
TOTAL	8.126	7.222 (% 89)	89(%1)	815 (%10)

NORTH-SOUTH CORRIDORS (12.146 KM)



	DUAL CARRIAGEWAY	SINGLE CARRIAGEWAY	TOTAL
In Operation	9.086	640	9.726 (80%)
Under Construction	973	218	1.191 (9,8%)
Will be Tendered	722	507	1.229 (10,2%)
TOTAL LENGTH	10.781 (88,7%)	1.365 (11,3%)	12.146

**MULTILANE DIVIDED
HIGHWAY NETWORK
(2003)**

HIGHWAY NETWORK: 63.143



1.714 Km
MOTORWAY

4.387 Km
MULTILANE DIVIDED
STATE&PROVINCIAL
ROADS

6.101 Km
TOTAL

**MULTILANE DIVIDED
HIGHWAY NETWORK
(May 2016)**

HIGHWAY NETWORK : 66.801

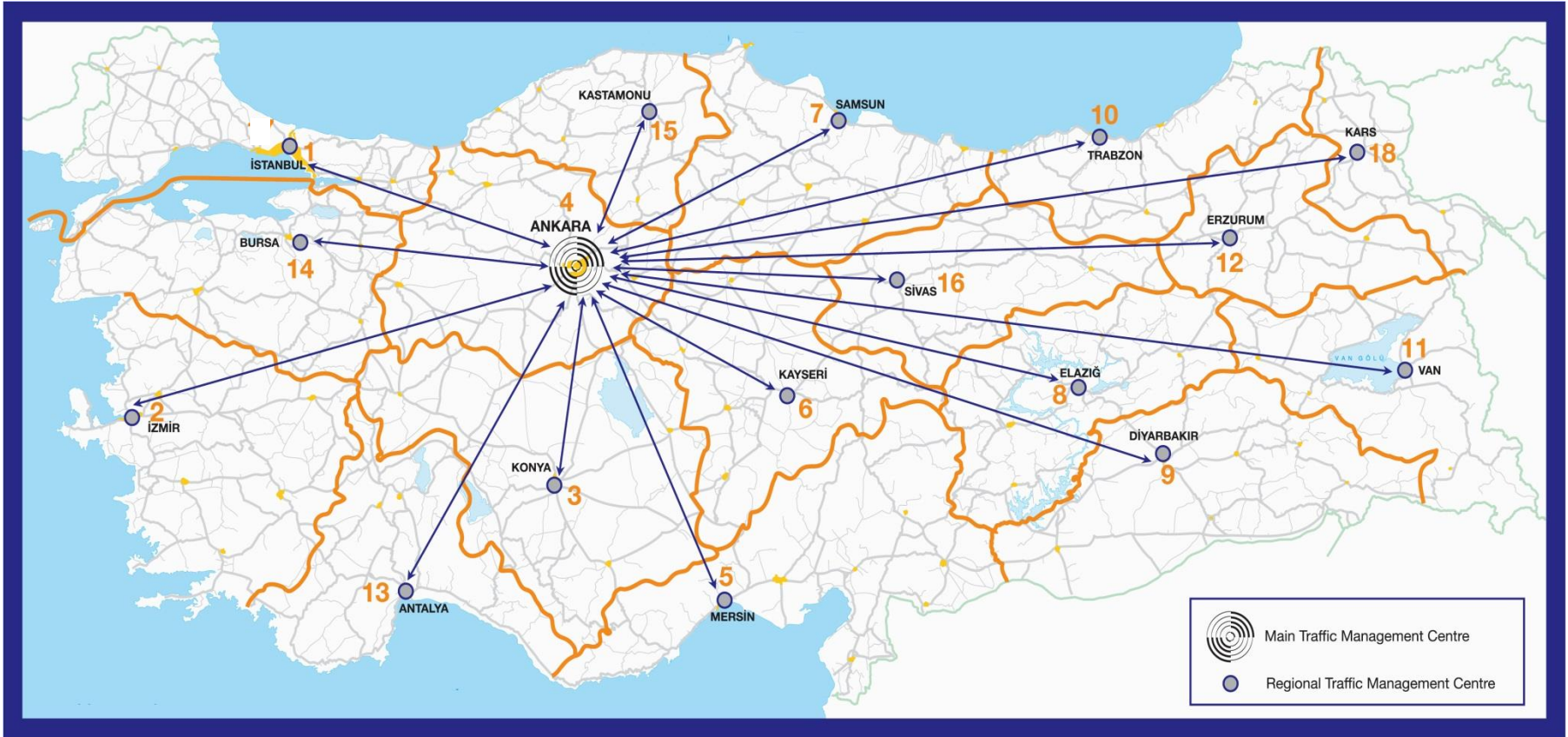


2.329 Km
MOTORWAY

22.040 Km
MULTILANE DIVIDED
STATE&PROVINCIAL
ROADS

24.369 Km
TOTAL

INTELLIGENT TRANSPORTATION SYSTEMS-ITS



- Nationwide integrated system
- Main Traffic Management Centre in Ankara
- 17 Regional Traffic Management Centres
- Fibre optic cable 7500 km for inter-centre communication
- Widespread implementation of traffic management & traveller information systems on state & provincial roads
- Completion of the project up to 2023



4

MOTORWAYS & PPP MOTORWAY PROJECTS



EXISTING MOTORWAY NETWORK



Our organization has launched a challenging and ambitious motorway construction program. With regard to this expedited motorway construction program, up to now, a motorway network with a length of 2.329 km has been opened to traffic. Up to date, the total expenditure for motorway projects has been reached to approximately 25 Billion USD.

MOTORWAYS IN OPERATION

2.329 Km

TOLL COLLECTION

OGS (DSRC-ACTIVE)

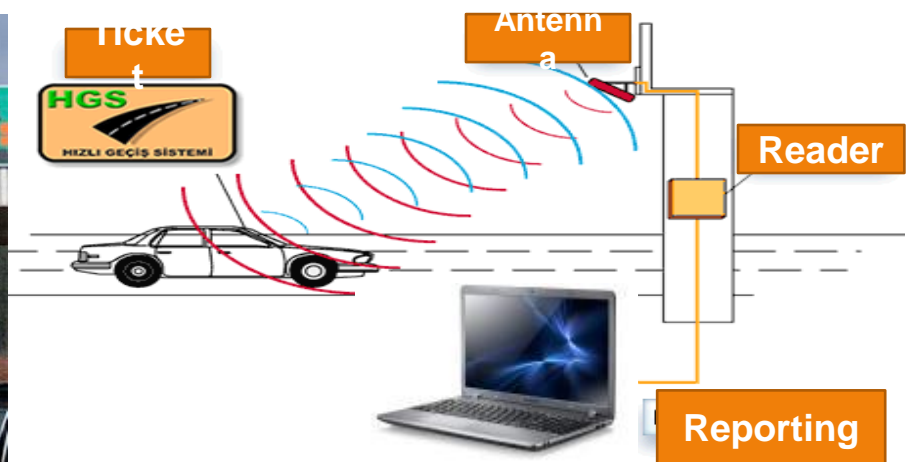
- 1.941.210 Subscribers
- 32,98% of Payment

HGS (RFID-PASSIVE)

- 8.923.450 Subscribers
- 67,02% of Payment

TOTAL

- 10.864.460 Subscribers
- 400 Million Dollar collected
- 400 Million Vehicles Passed



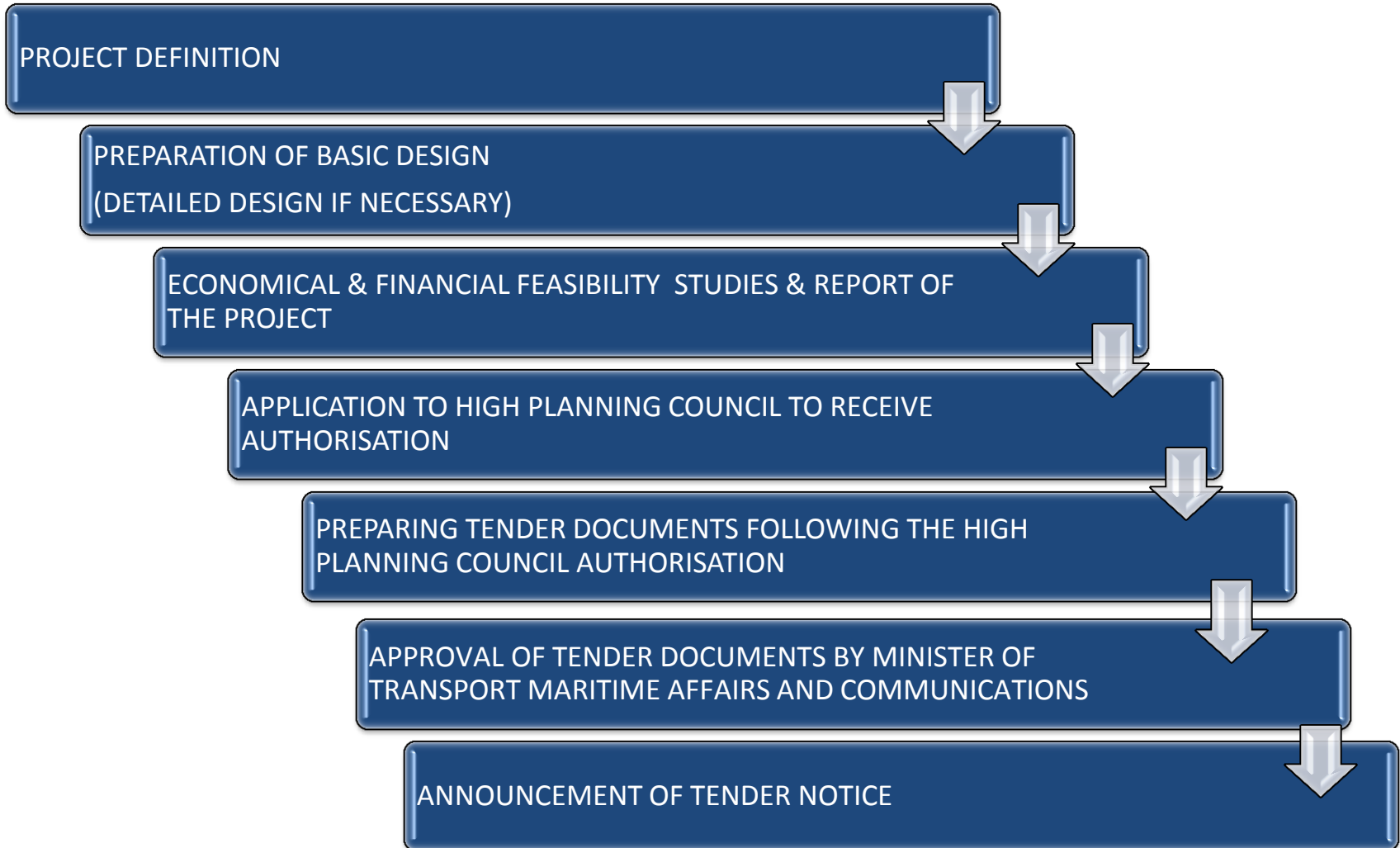
TURKEY'S PPP POLICY

GENERAL FEATURES OF BOT MOTORWAY CONTRACTS:

- Design specifications and standard are determined by GDH.
(Project start-end points, corridor, technical requirements for special structures like suspension bridges)
- Traffic Guaranty will be provided to secure the pay back of the debt and equity if the generated revenue is not enough
- Expropriation costs are partly or wholly covered by Administration
- In case of the termination of Agreement, used loans will be paid by the Treasury
- The Tolls are updated every year based on the guidelines of United Nations Statistics Office
- Financing of project will be covered by the contractor as equity (at least 20%) and loan (80% at most)



PPP PROJECT PROCESS BEFORE TENDERING



PPP PROJECT PROCESS AFTER TENDERING

REQUESTERS START AS A PARTY AFTER ANNOUNCEMENT OF TENDER NOTICE

REQUESTER WHICH PROPOSED THE BEST BID IS CHOSEN BY TENDER COMMITTEE AND APPROVED BY MINISTER

AFTER THIS STAGE THIS REQUESTER CALLED AS CONTRACTOR

SIGNING OF CONTRACT

ADMINISTRATION CONTROLS THE PROJECT IN BOTH CONSTRUCTION AND OPERATION PERIOD

FINANCING OF PROJECT WILL BE COVERED BY THE CONTRACTOR AS EQUITY (AT LEAST 20%) AND LOAN (80% AT MOST)

IN CASE OF CANCELLATION, USED LOANS WILL BE PAID BY TREASURY OR ADMINISTRATION

PPP MOTORWAY PROJECTS UNDER CONSTRUCTION



ISTANBUL-İZMİR MOTORWAY (INCLUDING İZMİT BAY CROSSING AND CONNECTING ROADS)

- Investment Cost is 6.3 Billion US \$
- 433 Km Length
- 7 Year Construction Period
- 15 Years 4 Months Motorway Operation Period
- 22 Years 4 months Contract Period



NORTH MARMARA MOTORWAY, ODAYERİ PAŞAKÖY SECTION (INCLUDING YAVUZ SULTAN SELİM CABLE STAYED SUSPENSION BRIDGE) PROJECT

- Investment Cost is 2.5 Billion US \$
- 117 Km Length
- 2 Years 6 Months Construction Period
- 7 Years 8 Months 20 Days Operation Period
- 10 Years 2 Months 20 Days Contract Period

North Marmara Motorway
L : 117 km. (Under Construction)

ISTANBUL-İZMİR MOTORWAY

Istanbul-İzmir
Motorway

Çanakkale - Balıkesir
Motorway (Project)

Existing Bursa Ring
Road

Existing State Road



İSTANBUL-İZMİR MOTORWAY (INCLUDING İZMİT BAY CROSSING AND CONNECTING ROADS)



TOTAL LENGTH : 433 km
(384 km motorway, 49 km connecting roads, 2.682 m suspension bridge)



NUMBER OF VIADUCTS : 40
LENGTH OF VIADUCTS : 22.3 Km



NUMBER OF TUNNELS : 3
LENGTH OF TUNNELS : 6.45 Km



NUMBER OF BRIDGES : 364
LENGTH OF BRIDGES : 20.8 Km

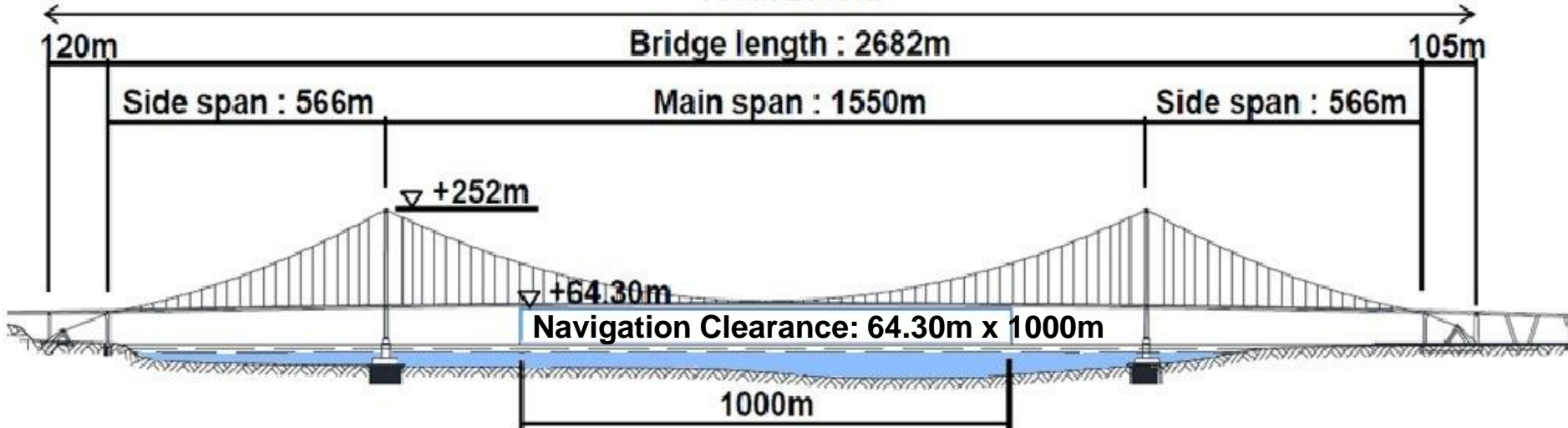


NUMBERS OF INTERCHANGES : 25

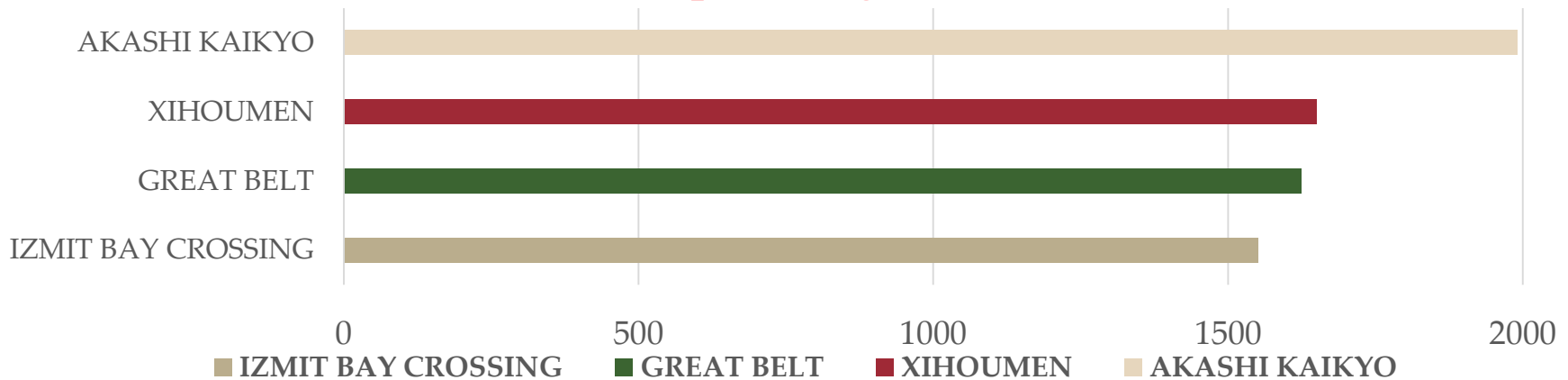
GENERAL VIEW OF İZMİT BAY SUSPENSION BRIDGE

İzmit Bay Crossing comprise of ; North Approach Viaduct, Suspension Bridge

Total: 2907m

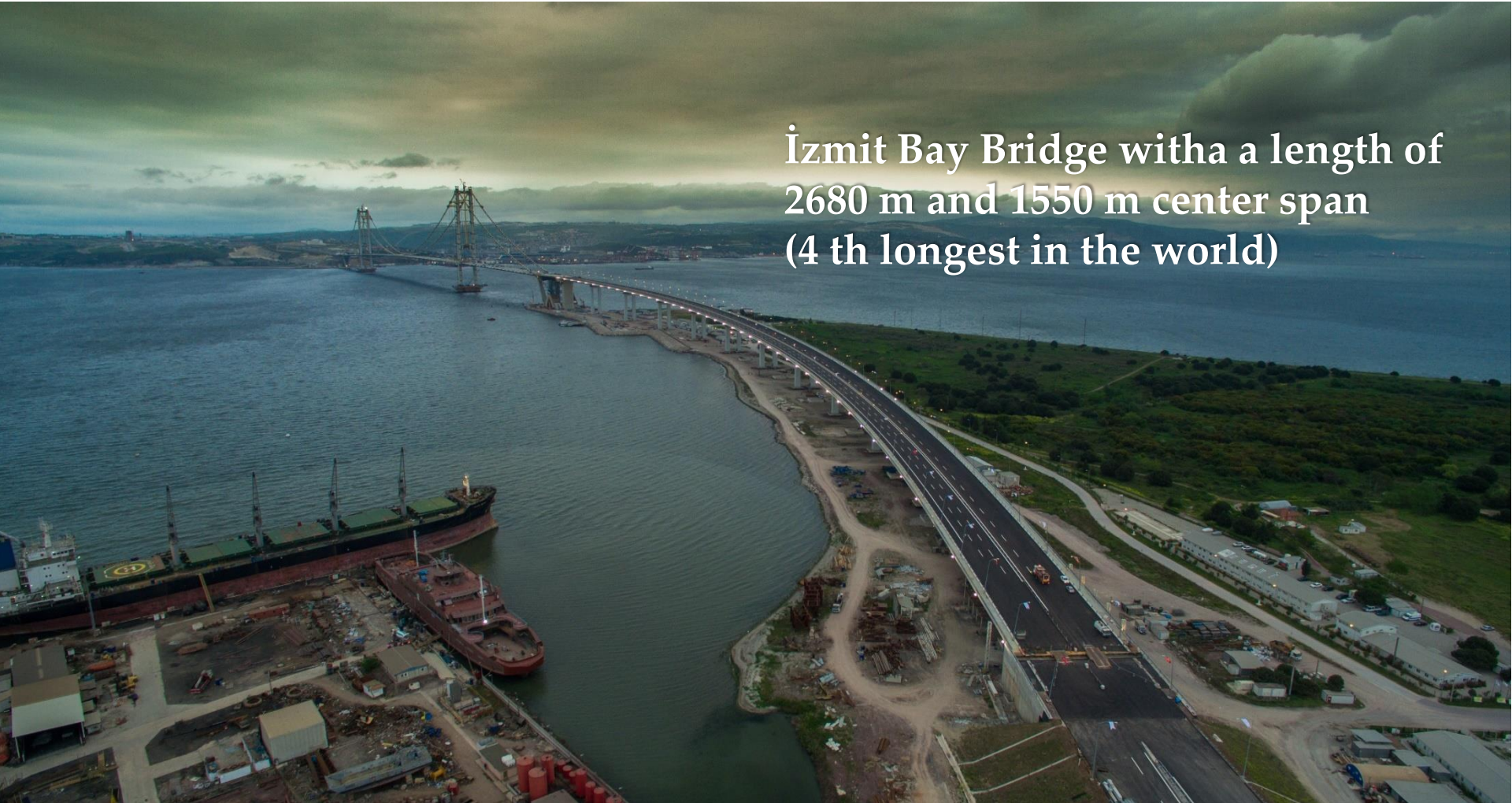


Midspan Length (m)



İSTANBUL-İZMİR MOTORWAY

İzmit Bay Bridge with a length of 2680 m and 1550 m center span (4 th longest in the world)



- Altınova-Gemlik Section with 40 km length and 6,5 km of İzmir-Kemalpaşa section have been opened to traffic.
- 12 km length Gebze-Altınova Section which includes İzmit Bay Crossing Bridge will be opened to traffic in June.

İSTANBUL-İZMİR MOTORWAY



At the end of 2016,

- 25 km length Gemlik-Bursa and 20 km length İzmir-Kemalpaşa will be in operation.
- Motorway section İstanbul-Bursa will have been completed.
- 103,5 km of 433 km motorway will be in operation.

NORTH MARMARA MOTORWAY (including 3rd suspension bridge, Yavuz Sultan Selim Bridge)



NORTH MARMARA MOTORWAY (including cable stayed suspension bridge, Yavuz Sultan Selim Bridge)



TOTAL LENGTH : 117 Km
Cable Stayed Suspension Bridge with a length of 1875 meter



NUMBER OF VIADUCTS : 35
LENGTH OF VIADUCTS : 13.5 km



NUMBER OF TUNNELS : 2+2(Railways)
LENGTH OF TUNNELS : 2389+536 m



NUMBER OF BRIDGES : 97
LENGTH OF BRIDGES : 7,6 Km



NUMBERS OF INTERCHANGES : 20

YAVUZ SULTAN SELİM BRIDGE

Cable Stayed Suspension Bridge



Yavuz Sultan Selim Bridge

- 1408 m main span (The Bridge will be the longest suspension bridge in the world which has a rail system on it, 2x4 lanes of motorway and 2 lanes of railway on the same deck.
- Northern part of the bridge is BlackSea, southern part of the bridge is Marmara Sea.

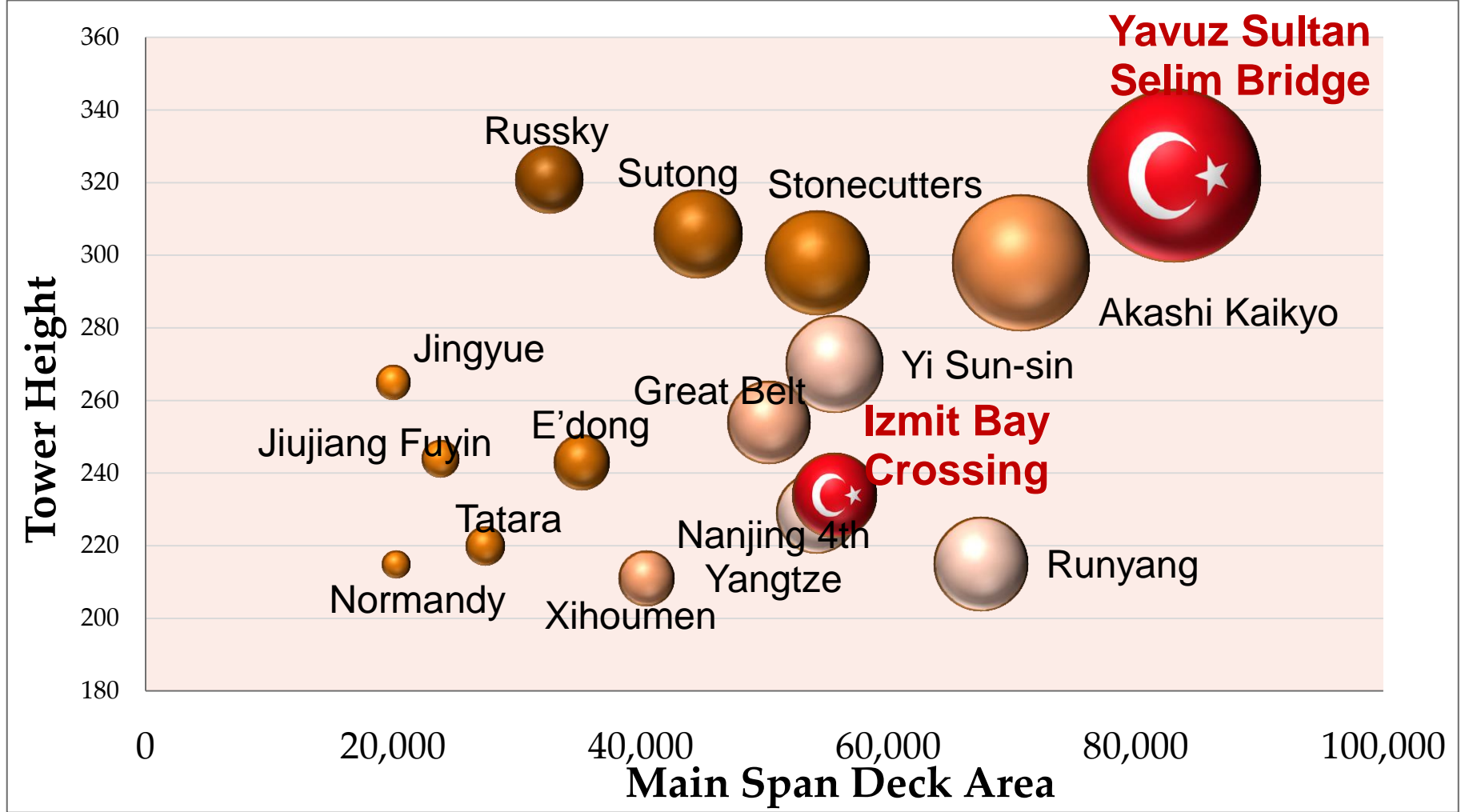
YAVUZ SULTAN SELİM BRIDGE



Yavuz Sultan Selim Bridge

- The width of the deck will be 59 meters, the largest in the world.
- Also it will have the highest tower in the world with a height of 320 meters.

WORLDWIDE RANKING OF IMPORTANT BRIDGES



NORTH MARMARA MOTORWAY PPP PROJECT (European & Asian Parts - Tender Phase)



**KINALI-ODAYERİ (LINK HIGHWAYS
INC.) SECTION
88 KM (European Side)**

**KURTKÖY-AKYAZI (LINK HIGHWAYS
INC.) SECTION
169 KM (Asian Side)**



BOT PROJECTS UNDER CONSTRUCTION 550 Km

- 1-Gebze-Orhangazi-İzmir Motorway (44 km of 433 km is in operation) 433 Km
- 2-North Marmara Motorway (Yavuz Sultan Selim Cable Stayed Suspension Bridge) Odayeri-Paşaköy Section 117 Km

BOT PROJECTS IN TENDERING PROCESS 257 Km

- 3-a North Marmara Motorway Kınalı-Odayeri Section 88 Km
- 3-b North Marmara Motorway Kurtköy-Akyazı Section 169 Km

MOTORWAYS IN OPERATION
2.329 Km

TARGET BOT PROJECTS (1.Group)



TARGET BOT PROJECTS (1. GROUP)

1.321 Km

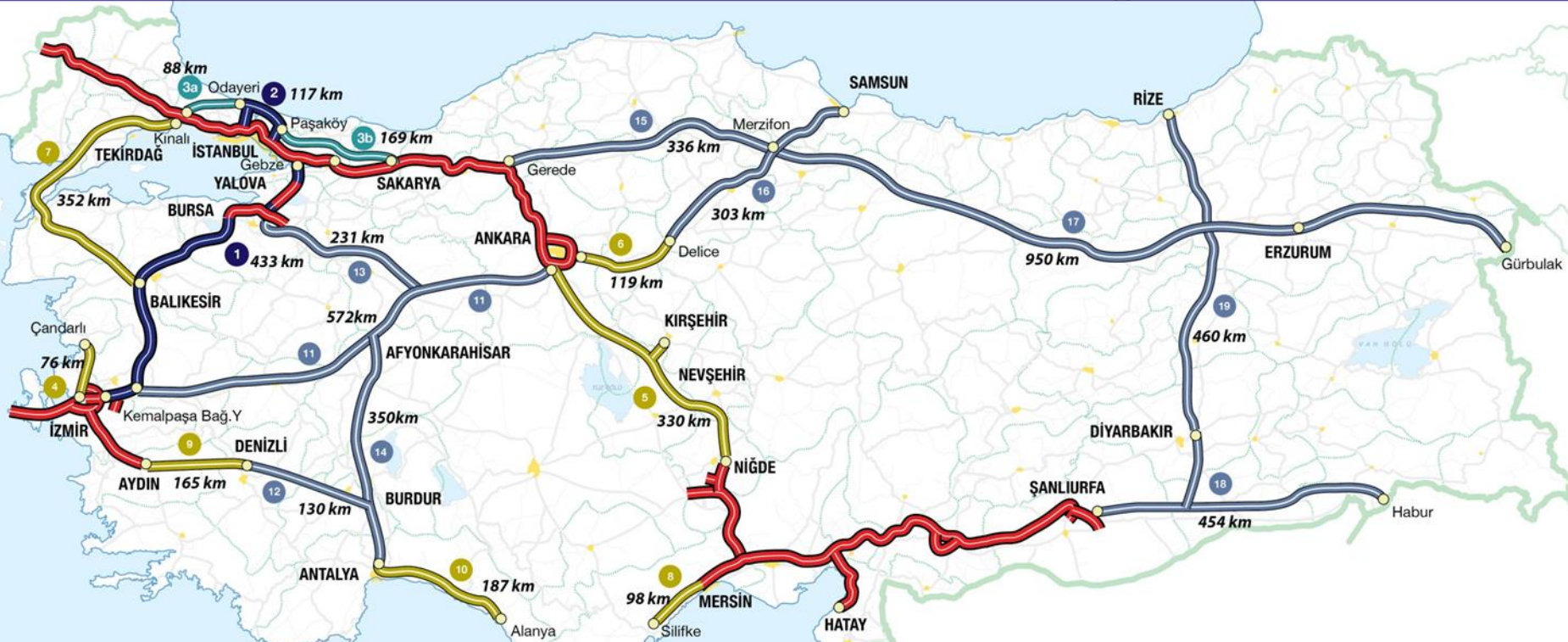
4- ÇİĞLİ-ALİAĞA-ÇANDARLI MOTORWAY	76 Km
5- ANKARA-NİĞDE MOTORWAY (INCL. KIRŞEHİR CONNECTION)	330 Km
6- ANKARA-KIRIKKALE-DELİCE MOTORWAY	119 Km
7- KINALI-TEKİRDAĞ-ÇANAKKALE-BALIKESİR MOTORWAY (INCL. ÇANAKKALE BRIDGE)	352 Km
8- MERSİN-ERDEMLİ-TAŞUCU MOTORWAY	92 Km
9- AYDIN-DENİZLİ-BURDUR MOTORWAY AYDIN-DENİZLİ SEC.	165 Km
10- AFYON-ANTALYA-ALANYA MOTORWAY ANTALYA-ALANYA SEC.	187 Km

MOTORWAYS IN OPERATION :2.329 Km

**TARGET BOT PROJECTS
(Under Construction) : 550 Km**

**TARGET BOT PROJECTS
(In Tendering Process): 257 Km**

TARGET BOT PROJECTS (2.Group)








TARGET BOT PROJECTS (2. GROUP) 3.786 Km

11-Ankara-İzmir Motorway	572 Km	16-Delice-Samsun Motorway	303 Km
12-Aydın-Denizli-Burdur Motorway (Denizli-Burdur Sec.)	130 Km	17-Gerede-Merzifon-Gürbulak Motorway (Merzifon-Gürbulak Section)	950 Km
13-Sivrihisar-Bursa Motorway	231 Km	18-Şanlıurfa-Diyarbakır-Habur Motorway (Incl. Diyarbakır Connection)	454 Km
14-Afyon-Antalya-Alanya Motorway (Afyon-Antalya Section)	350 Km	19-Rize-Erzurum-Diyarbakır Motorway	460 Km
15-Gerede-Merzifon-Gürbulak Motorway (Gerede-Merzifon Section)	336 Km		

TARGET MOTORWAY NETWORK



	MOTORWAYS IN OPERATION (2.285+44 Km BOT)	2.329 km	
	TARGET 2023 BOT PROJECTS (UNDER CONSTRUCTION)	550 km	
	TARGET 2023 BOT PROJECTS (IN TENDERING PROCESS)	257 km	
	TARGET 2023 BOT PROJECTS (1.GROUP)	1.321 km	5.914 KM
	TARGET 2023 BOT PROJECTS (2.GROUP)	3.786 km	

TOTAL: 8.199 KM



5

CONCLUSIONS



- It is important that road infrastructure investments are made on time to avoid negative effects on economy.
- In addition to the traditional direct budget allocations from general revenues, innovative financing mechanisms should be put into application for sustainable and efficient financing of road infrastructure. In this regard, Users have to pay for the quality of the service offered and collected toll revenues should be earmarked to the road infrastructure.
- Financing mechanism on the basis of PPP is one of the most effective alternative to realize large scale highway projects without causing public burden and reducing duration of the road construction works without waiting for the availability of public funding.

Successful PPP Projects needs;

- Government commitment
- Appropriate risk allocation between concession Authority and concessionaire
- Expropriation done by the Public side.

A nighttime photograph of the Bosphorus Bridge in Istanbul, Turkey. The bridge's towers are illuminated with purple lights, and the suspension cables are strung with small lights. In the foreground, the Ortaköy Mosque is brightly lit with green and white lights, reflecting on the water. The city lights of Istanbul are visible in the background under a dark blue sky.

*THANK YOU FOR
YOUR ATTENTION !*

Mücahit ARMAN
Head of Strategy Development Department
General Directorate of Turkish Highways
Ministry of Transport, Maritime Affairs and Communications