



Republic of Turkey
Ministry of Transport Maritime Affairs
and Communications



GENERAL DIRECTORATE
of HIGHWAYS

ROAD MAINTENANCE WORKSHOP



20 OCTOBER 2016

PRAGUE / CZECH REPUBLIC



OUTLINE

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1

GENERAL OVERVIEW of HIGHWAY NETWORK





ROAD NETWORK IN TURKEY

Type: Village and Forest roads
Responsibility: Special
Provincial Administration

Type: Urban roads
Responsibility: Municipal
Authorities



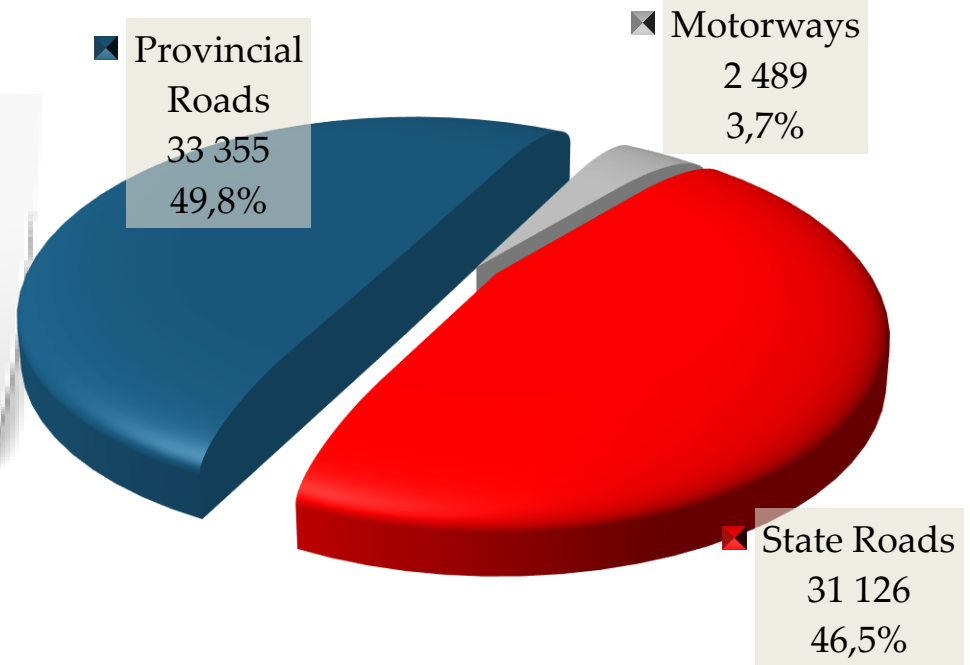
Type: Motorways, State & Provincial roads
Responsibility: General Directorate of Turkish Highways

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

NATIONAL HIGHWAY NETWORK

Highway Network (Km)

- Total road network is 66.970 km.
- 37% of total road network (24.813 km) is dual carriageway



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



NATIONAL HIGHWAY NETWORK (66.970 km)

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



ROAD STRUCTURES – TUNNELS , BRIDGES & VIADUCTS

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

2003



- Number of Tunnels : 295
- Length of Tunnels: 306 km

2016



- Number of Tunnels : 93
- Length of Tunnels: 309 km

Under Construction



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

2003



- Number of Bridges&Viaducts : 7.983
- Length of Bridges&Viaducts 505 km

2016



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

Under Construction

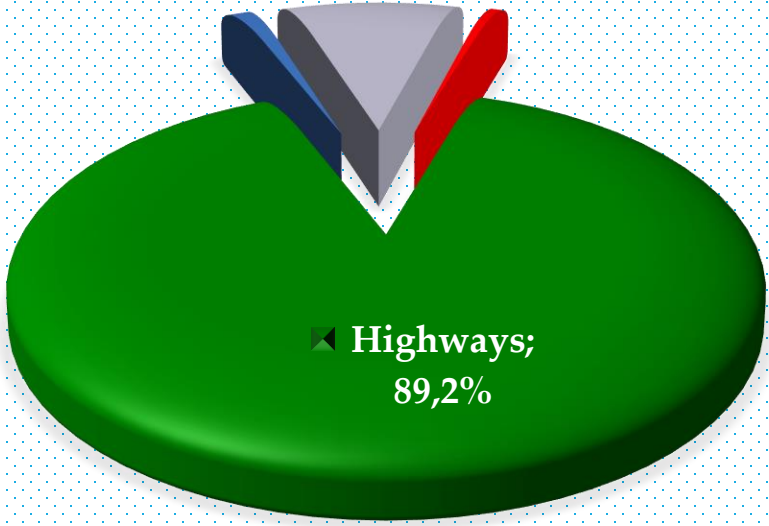




DOMESTIC PASSENGER & FREIGHT TRANSPORT 2015

PASSENGER TRANSPORT

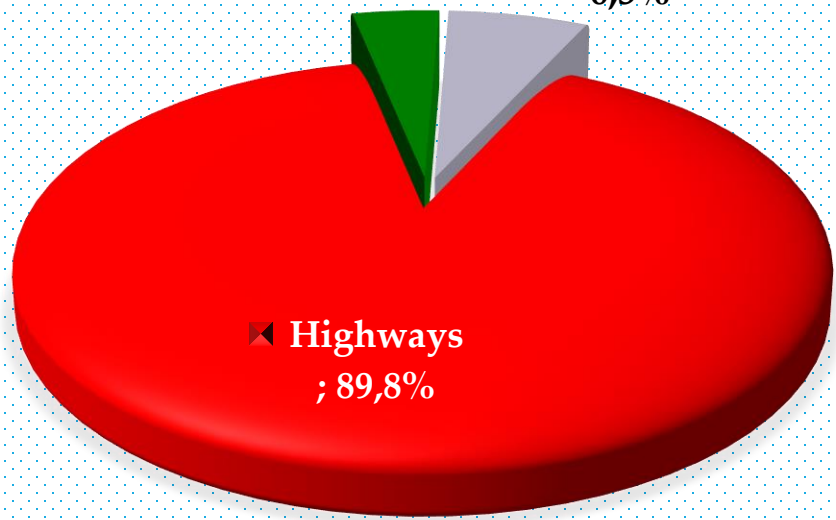
■ Railways; 1,1% ■ Airlines; 9,1% ■ Sea Routes; 0,6%



Passenger Transport
Highways: 89,8 %

FREIGHT TRANSPORT

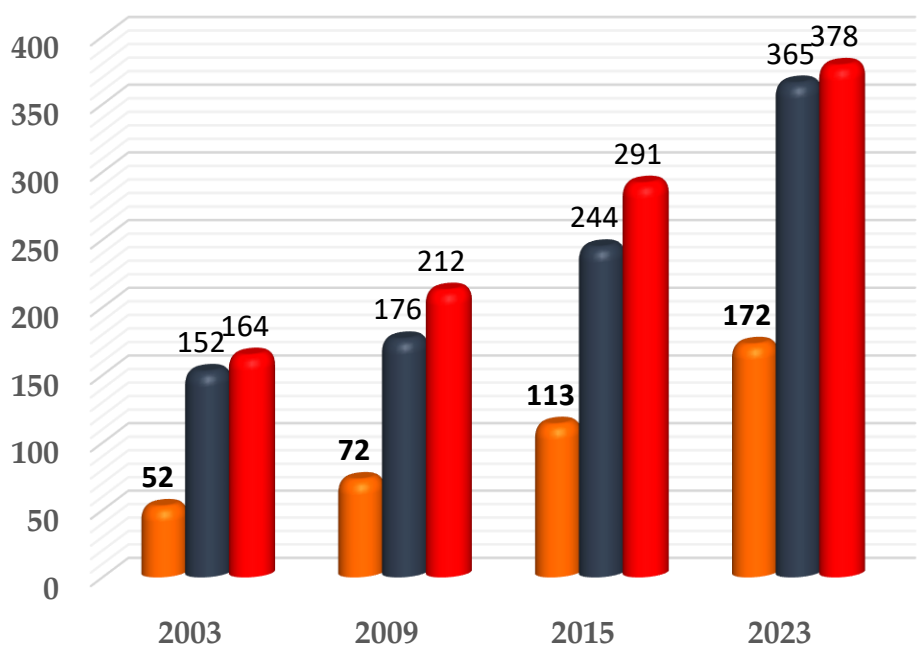
■ Railways; 3,9% ■ Sea Routes; 6,3%



Freight Transport
Highways: 89,5%

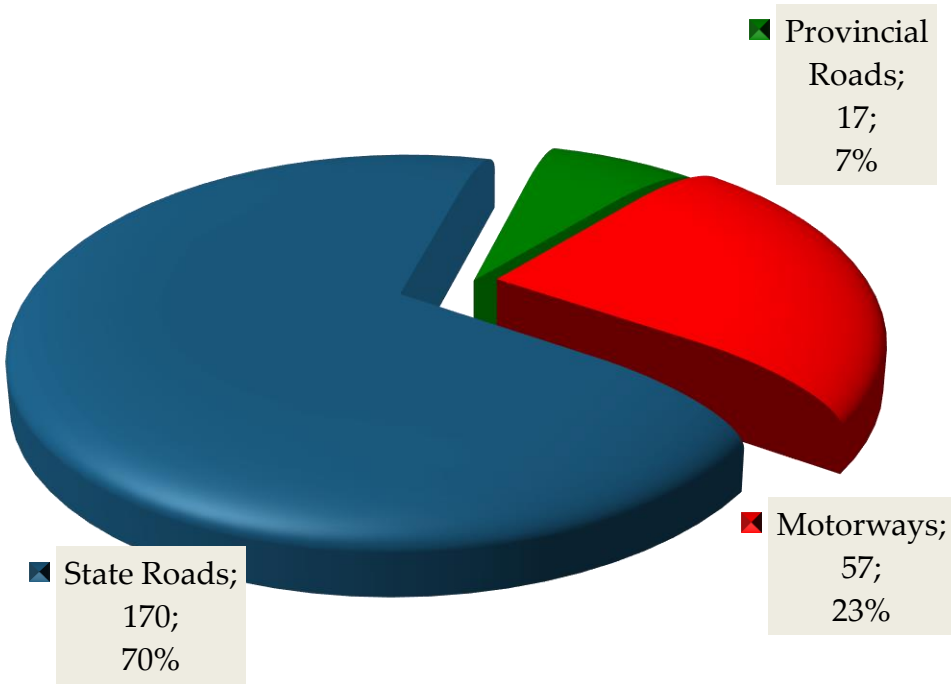
PASSENGER AND FREIGHT TRANSPORT IN HIGHWAYS

Passenger & Freight Transport



■ Vehicle*Km (Billion) ■ Ton*Km (Billion)
■ Passenger*Km (Billion)

FREIGHT TRANSPORT 2015 (Billion TonxKm)



- **117 %** 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.



2

ROAD MAINTENANCE WORKS





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.**



STRATEGIC PLAN OF TURKISH HIGHWAYS 2012-2016

MISSION:

- In a framework of authority entrusted with rule to the institution, to contribute to the social and economic development of the country through planning, designing, constructing, **maintaining** and operating **in every climate conditions** of motorways, state and provincial roads, meeting road users' demand, compromising with other transportation systems in a way of **providing safe, comfortable**, environmentally sensitive roads, meeting contemporary needs.



STRATEGIC PLAN OF TURKISH HIGHWAYS 2012-2016

VISION: To be an institution

- **providing safe and comfortable transport service,**
- using advanced technologies,
- preparing road projects sensitive to environment and human in a base of reality,
- having a strong budget,
- having smiling personnel and modern management



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

REGIONAL DIVISIONS OF GDH



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



ROAD MAINTENANCE WORKS

ROUTINE MAINTENANCE

Removing surface deformation on asphalt roads, corrugation and rutting on surface of stabilized road, repairing structures, such as, bridge, culvert, structures, also struggling against flow and erosion, clearing drainage systems, ditch and culverts as well as vegetation, etc.

SNOW AND ICE REMOVAL

Snow and ice removal has a considerable place in maintenance works. Removing snow and ice on roads during winter and providing a secure and smooth traffic flow are among these works.

EMERGENCY REPAIR

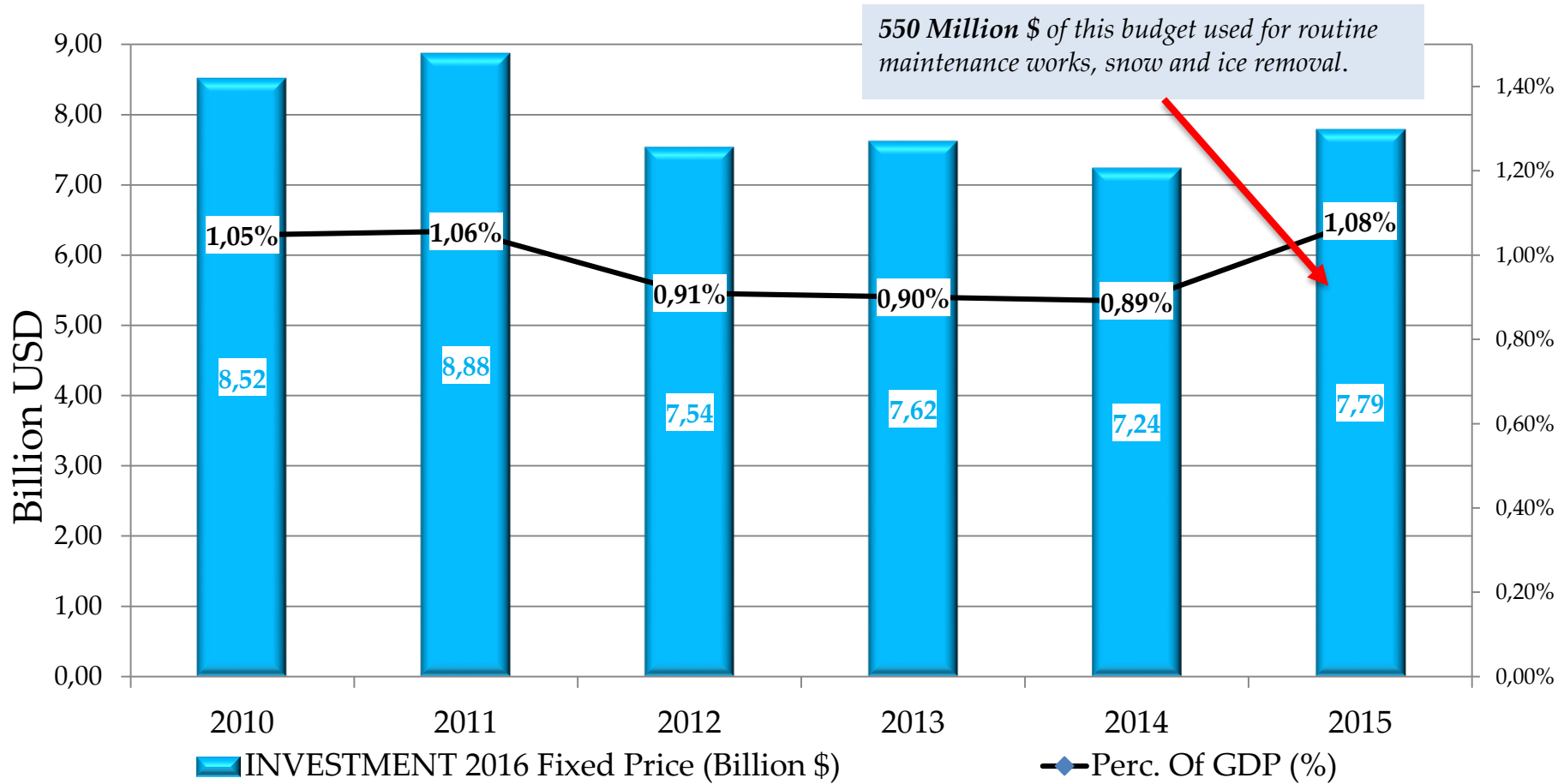
Maintenance in case of emergency and disasters

PERIODIC MAINTENANCE

To preserve the structural integrity of the road, or to enable the road to carry increased axle loadings.



PERCENTAGE OF GDP USED FOR HIGHWAY INFRASTRUCTURE INVESTMENT





ROUTINE MAINTENANCE WORKS IN 2015

Maintenance Works carried out by	402 (118 Subdivision, 284 Maintenance Houses)
Maintenance Crew	8.144
Machinery & Equipment	6.640
Aggregates used for asphalt patching	1.032.827 m ³
Bitumen used for asphalt patching	83.918 Tonnes
Number of Planted Seedling	2.216.771
Number of GRP (Glass Reinforced Plastic) plates	900.000





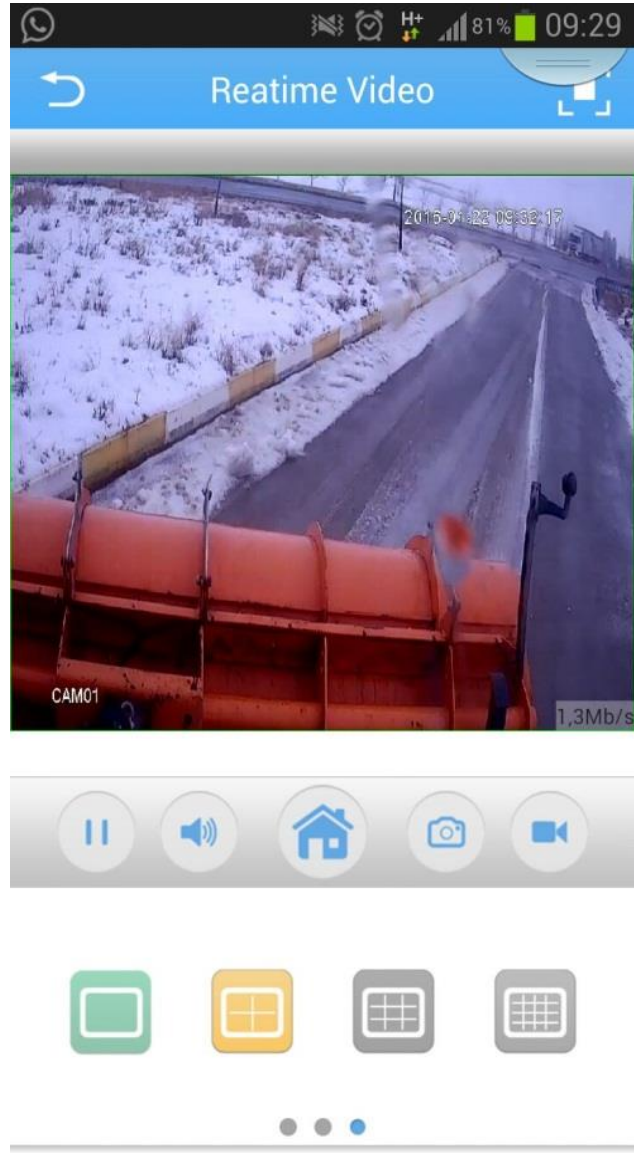
SNOW & ICE REMOVAL WORKS IN 2015-2016 WINTER



Network In Operation	52 388 Km
Network In Operation (If Possible)	8 123 Km
Maintenance Works carried out by	384 (118 Subdivision, 266 Maintenance Houses)
Maintenance Crew	7 857
Machinery & Equipment	6.697
Aggregates used	208 000 m ³
Salt Used	115 000 Tonnes
Length of snow fence	353 Km



SNOW & ICE REMOVAL WORKS



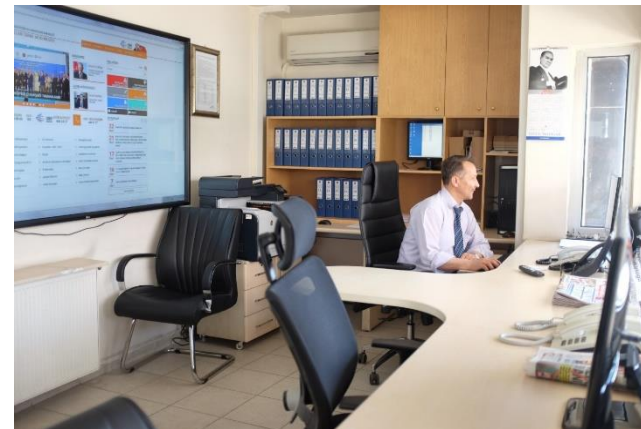
MAINTENANCE IN CASE OF EMERGENCY AND DISASTERS



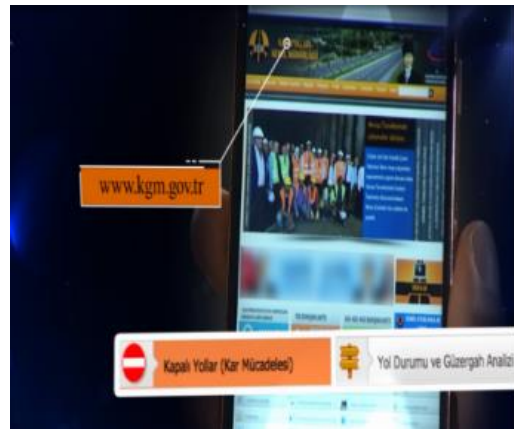


HIGHWAY INFORMATION & PUBLIC RELATIONS

7/24 HIGHWAY INFO LINE



Public Service Announcements



Educational Publications



KGM
SERVICE
LINE
ALO 159

HIGHWAY
INFORMATION
LINE
0-312-415 88 00



Online Surveys





3

ASSET MANAGEMENT SYSTEM & IT





GIS BASED ROAD MAINTENANCE MANAGEMENT SYSTEM

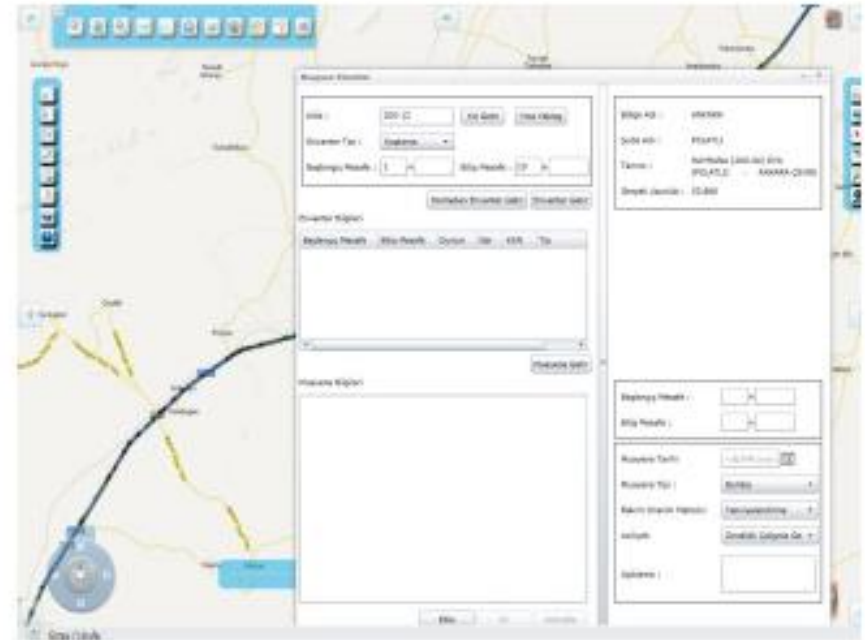
<http://yol.kgm.gov.tr/kbys/uygulama.aspx>

The screenshot displays a GIS-based road maintenance management system interface. The main area shows a map of Turkey with various road segments highlighted. On the left side, there is a vertical toolbar with several icons. On the right side, there is another vertical toolbar with icons and corresponding labels: Inspection Management, Inventory Query, Layer Query, Maintenance Management, Report, Authorization, Info, and Help. A red arrow points from the left toolbar to the right toolbar.

GIS BASED ROAD MAINTENANCE MANAGEMENT SYSTEM

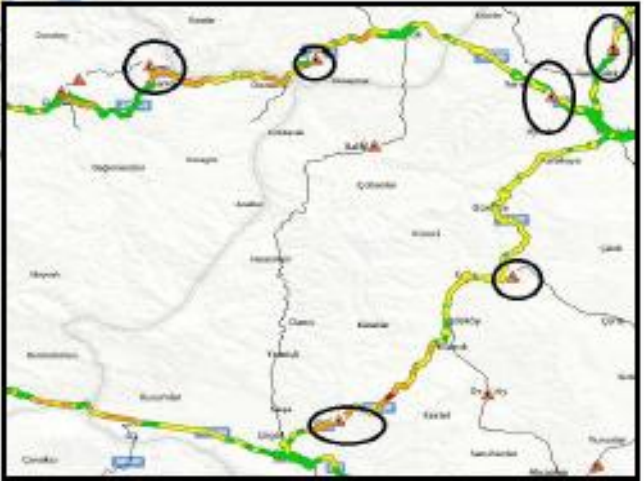
Updating & querying & reporting

- Road Inventories,
- Road Structures,
- Maintenance History
- Maintenance Management Program from web.





ROUTE ANALYSES & ROAD MAINTENANCE



INSTANT TRAFFIC FLOW DATA COMBINED WITH ROAD MAINTENANCE & REHABILITATION DATA

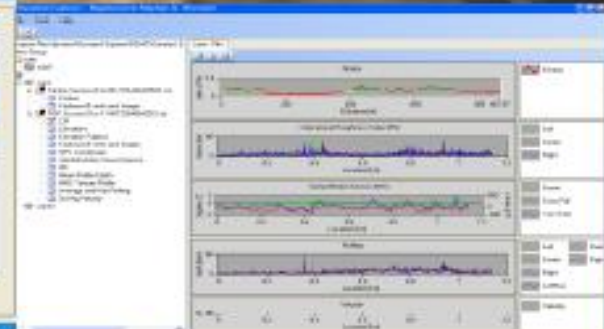
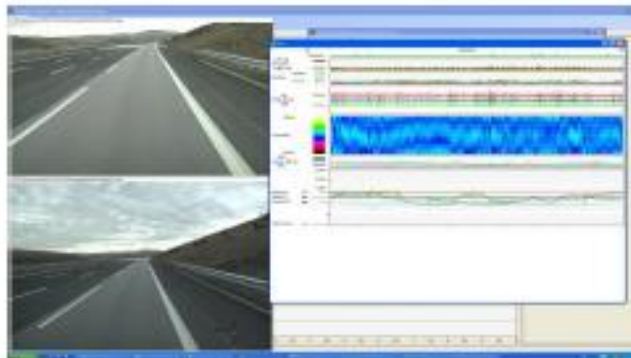


PAVEMENT MANAGEMENT SYSTEM

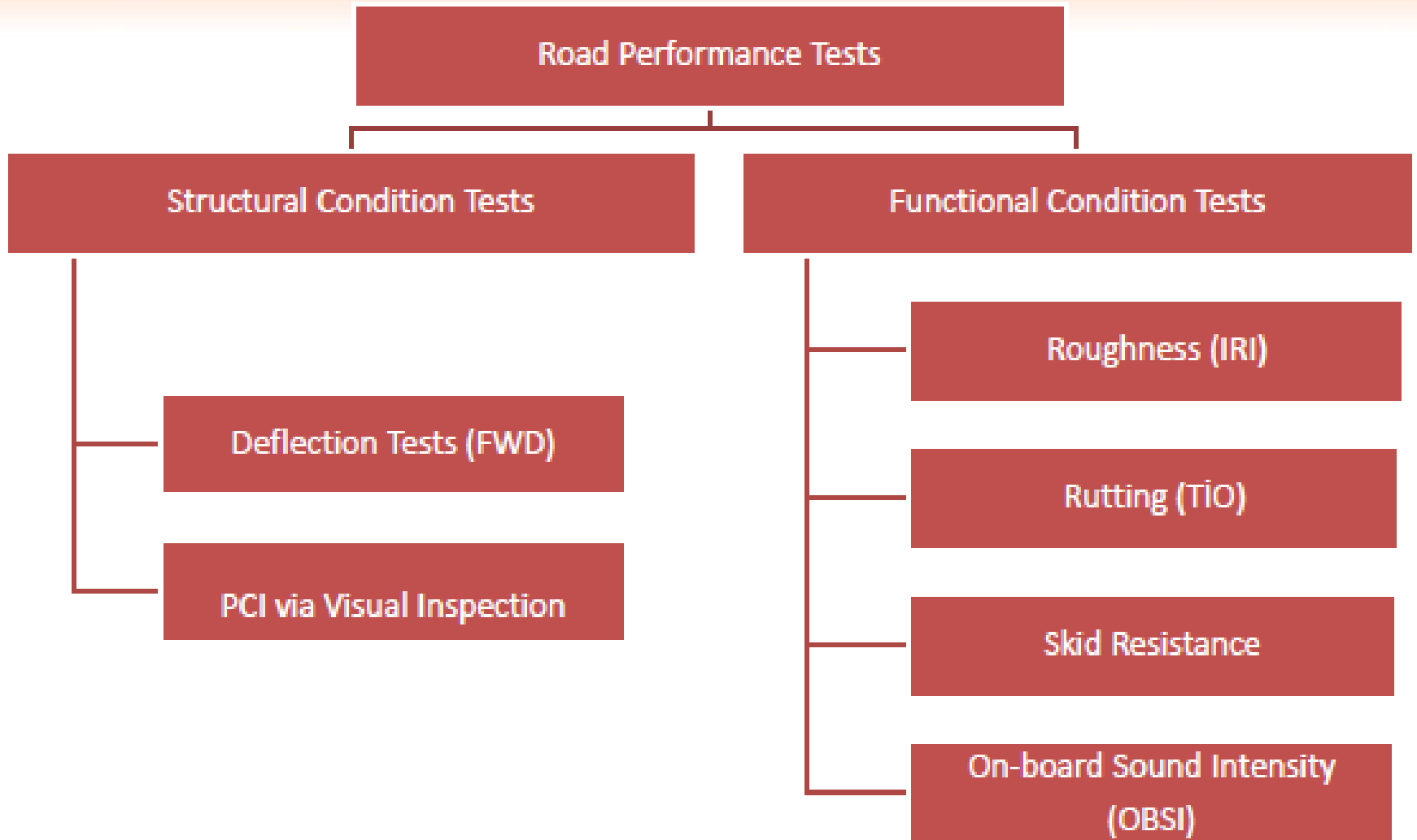
- ROAD INVENTORY
- PAVEMENT INVENTORY
- PAVEMENT PERFORMANCE
- TRAFFIC COUNTS
- CLIMATE
- COST

DATABASE

ANALYSES

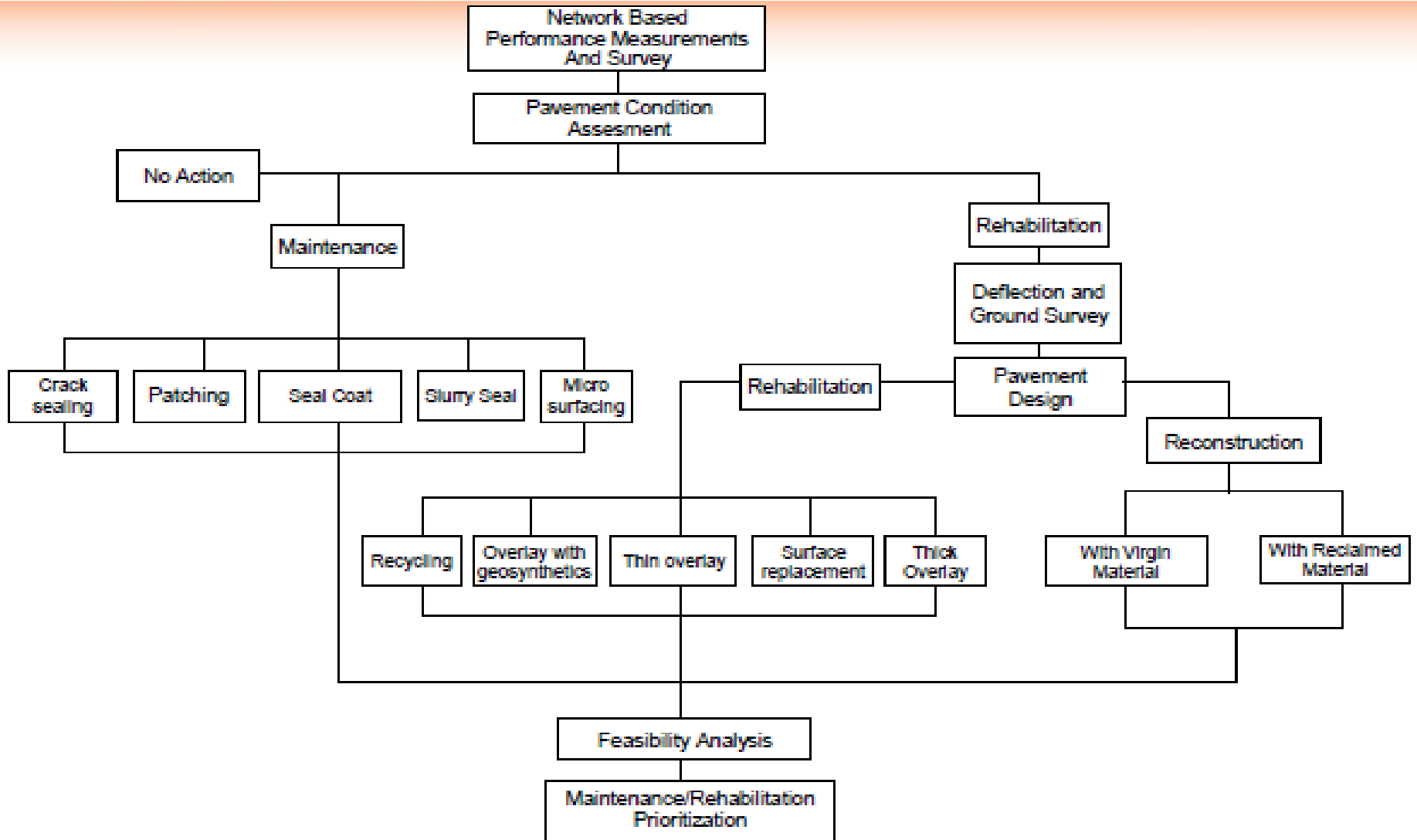


PAVEMENT MANAGEMENT SYSTEM





PAVEMENT MANAGEMENT SYSTEM DECISION TREE FOR ASPHALT CONCRETE ROADS





4

CONCLUSIONS





CONCLUSION

- It is important that road maintenance works are made on time to avoid negative effects on economic life of infrastructure
- Proper road maintenance contributes to reliable transport at reduced cost, as there is a direct link between road condition and vehicle operating costs
- An improperly maintained road can also represent an increased safety hazard to the user, leading to more accidents, with their associated human and property costs
- Establishing Road maintenance/Pavement management systems are crucial in order to use the limited budget more efficiently.

***THANK YOU FOR
YOUR ATTENTION !***

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General Directorate of Turkish Highways
Ministry of Transport, Maritime Affairs and Communications