



INTELLIGENT TRANSPORT SYSTEMS ON HIGHWAY NETWORK

**MINISTRY OF TRANSPORT MARITIME
AFFAIRS & COMMUNICATIONS**

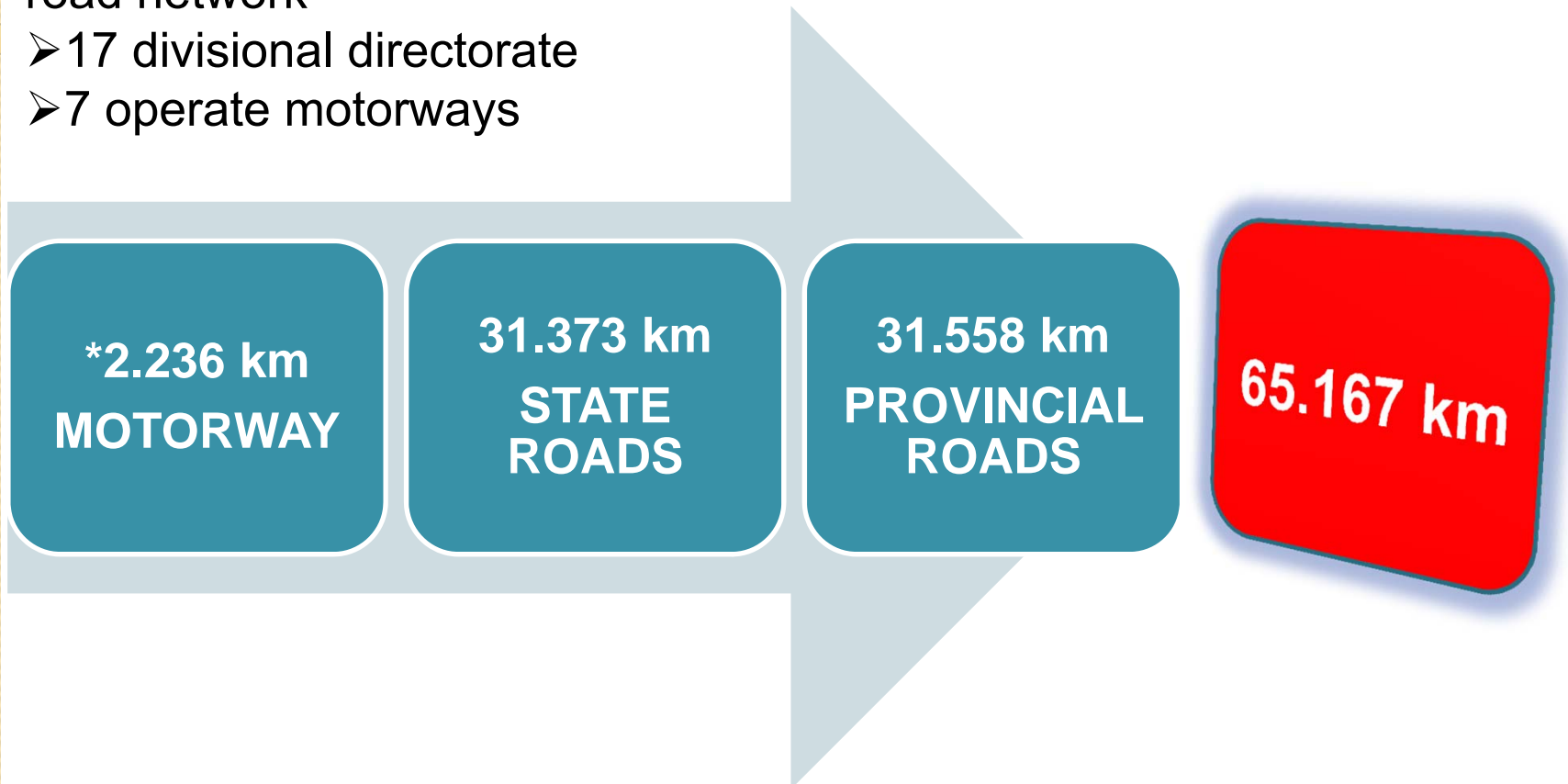
General Directorate of Turkish Highways

TEM-TER Intelligent Transport System Workshop
Ankara
28 March 2012

DG Highways Road Network (01.03.2012)



- Designing, constructing, maintaining and operating 65.167 km of road network
- 17 divisional directorate
- 7 operate motorways



Intelligent Transport Systems



ITS focus on mainly



1) Motorway toll systems



2) Traffic management systems



3) Traveller information systems

Motorway toll systems



Toll authority

- General Directorate of Turkish Highways (GDH)
- First toll facility: 1st Istanbul Strait Bridge in 1973



Clearance house

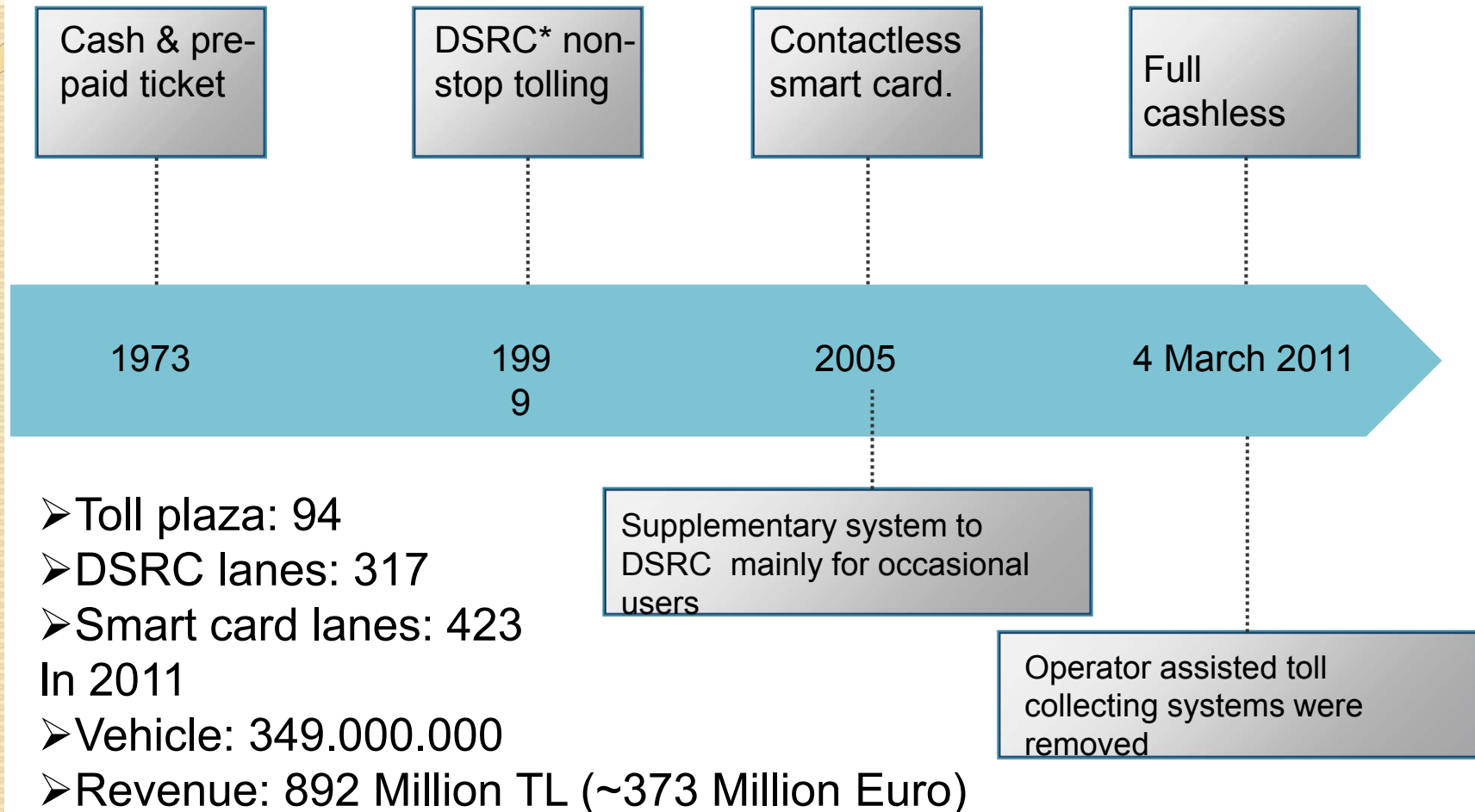
- Banks (Protocol is signed between GDH&Banks laying down the rights&obligations)



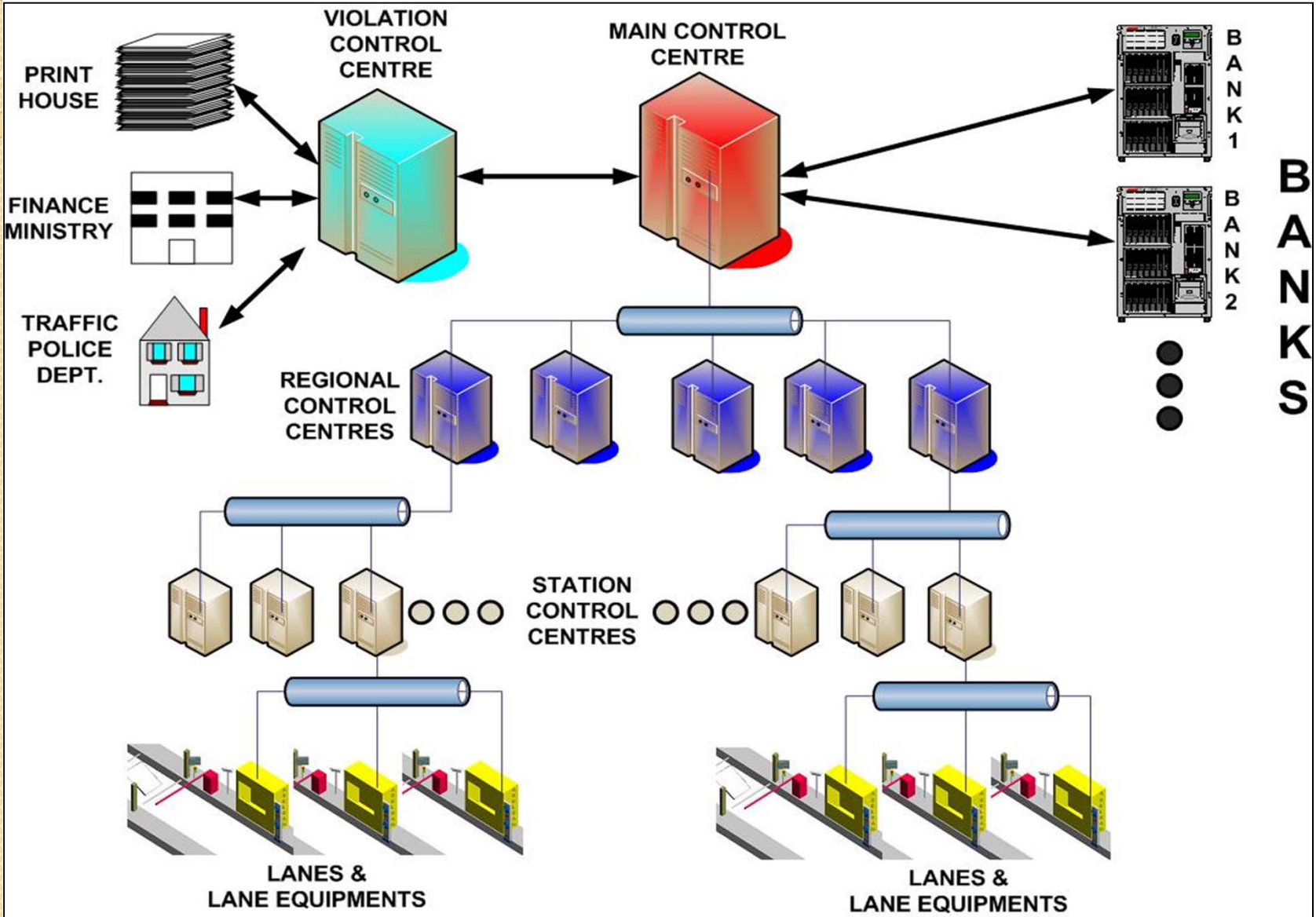
Operation system

- Open type systems (1st & 2nd Istanbul Strait Bridges)
- Closed type systems (5 closed toll motorways)

Toll system



*DSRC: Dedicated Short Range Communication



OGS (DSRC), KGS (Smart Card)

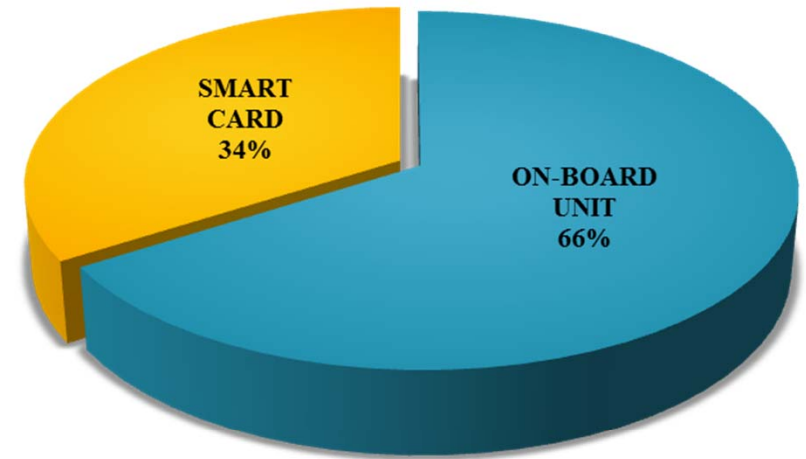


- 5 banks for OGS
- 7 banks for KGS
- OGS: 2.1million subscribers
- KGS: 11.2 million subscribers
- “OGS” is the acronym of DSRC non-stop tolling system
- “KGS” is the acronym of contactless smart card svstem

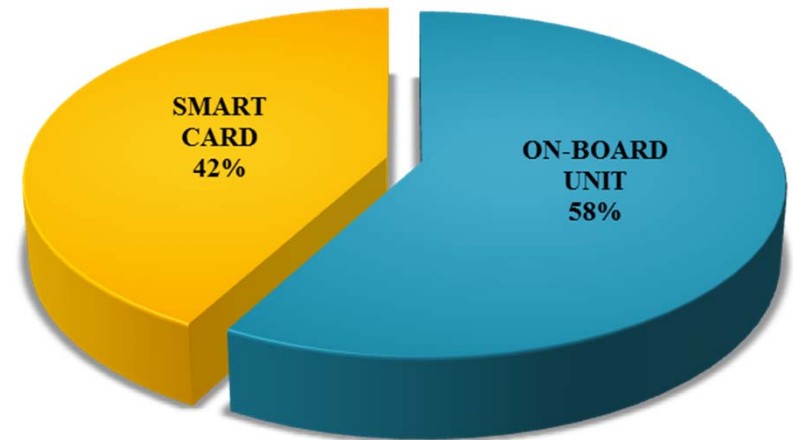
OGS (DSRC), KGS (Smart Card)



Toll transaction percentages by payment type



Revenue by payment type

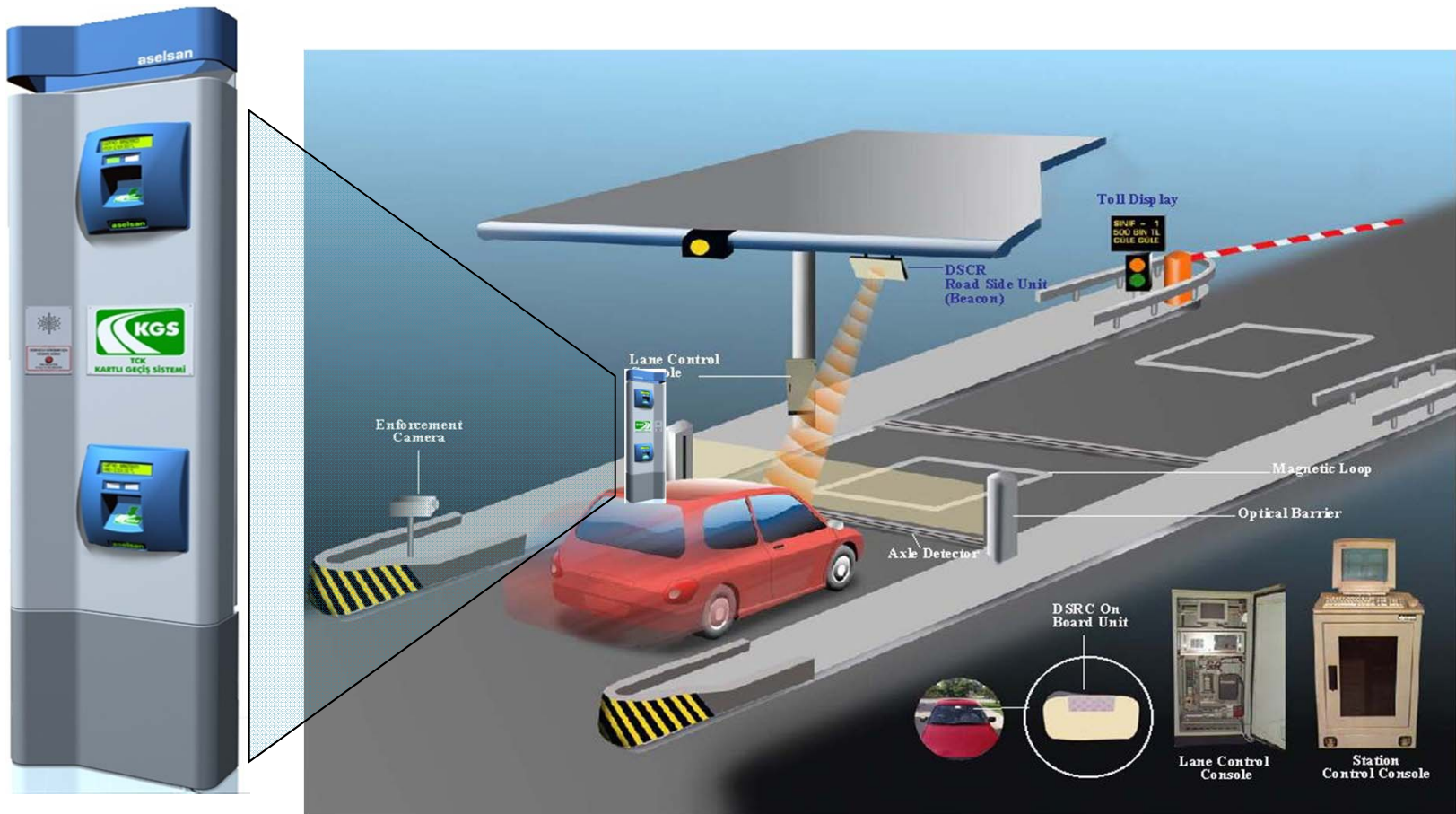




Role of the banks

- Enrolling users
- Supplying on-board units & Smart cards
- Managing bank accounts
- Issuing bank statements (eg: Transactions details and bank account balance)

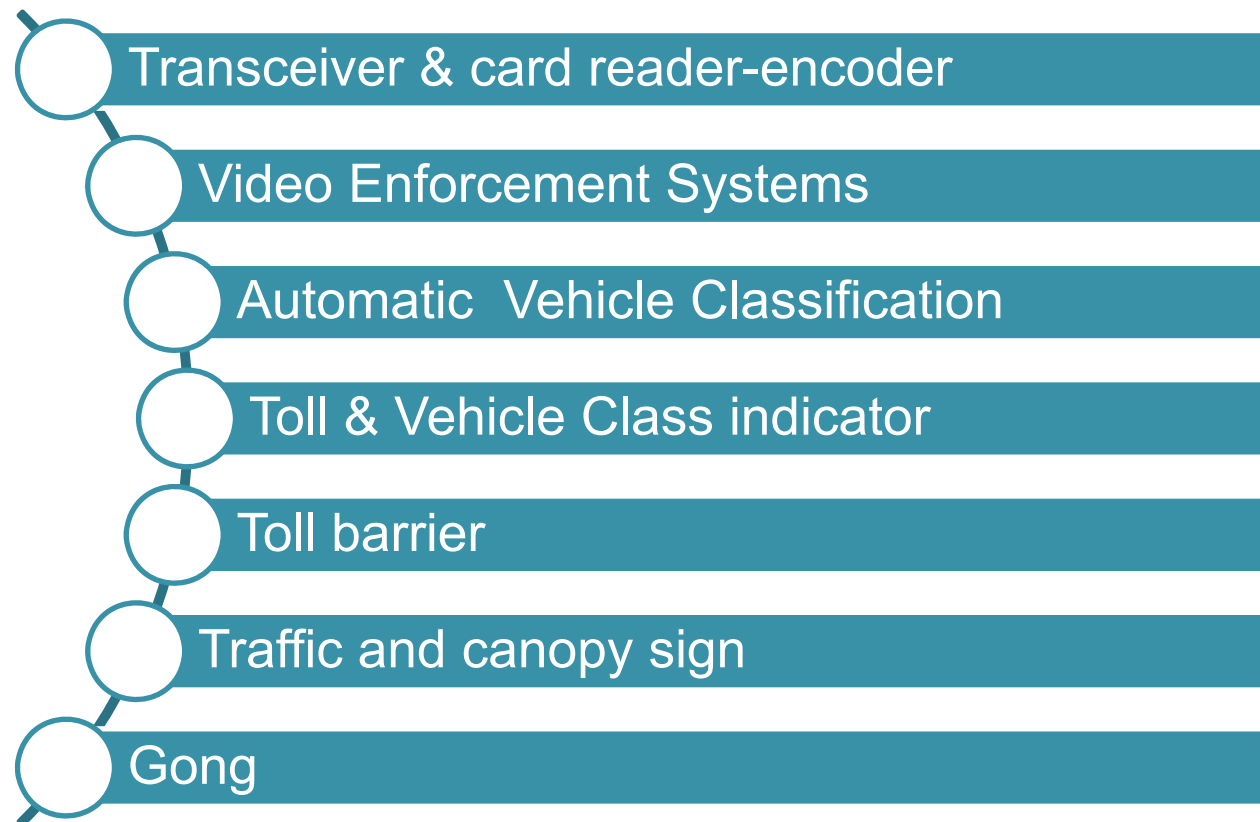
Lane configuration



Lane equipment



Lane controller





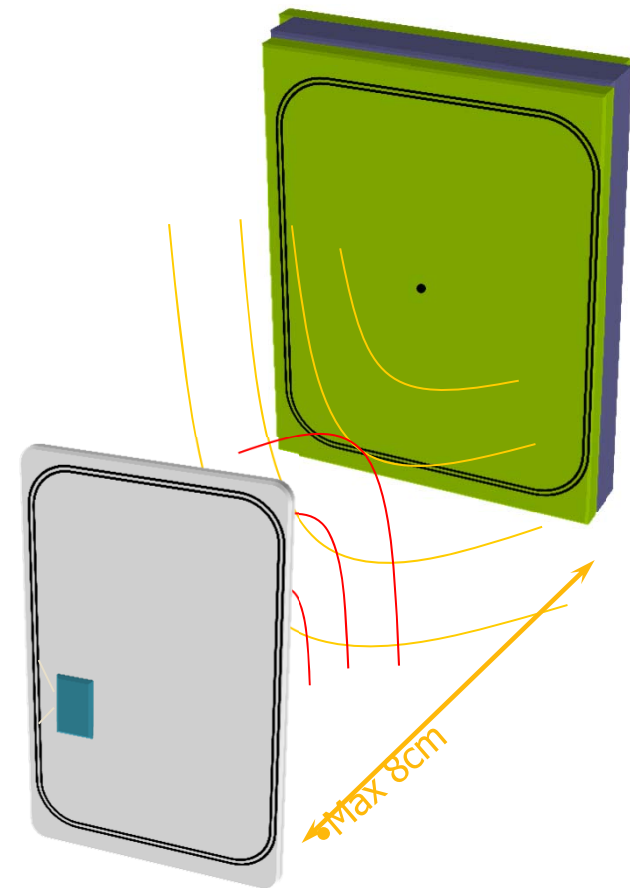
DSRC & On-board unit

- Compliant with CEN TC 278
 - 5.8 Ghz
 - 5 Mhz bandwidth
 - Downlink : 500 kb/s
 - Uplink : 250 kb/s
- 4 different company products

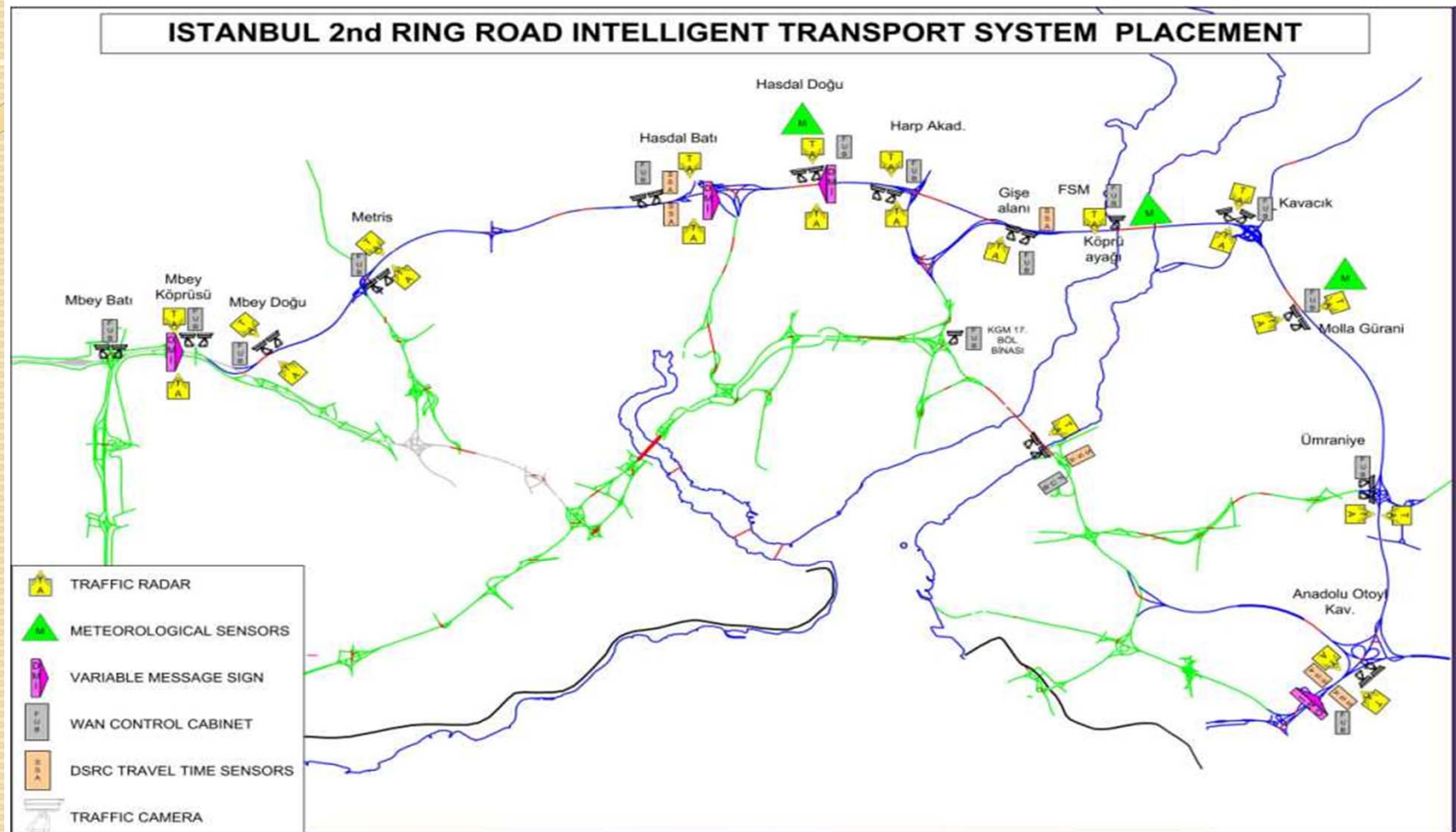


Contactless smart card

- MiFare ISO 14443-A Standard
 - Communication at 13.56 MHz
- Two type cards
 - Electronic purse type
 - Bank account/credit card backed type



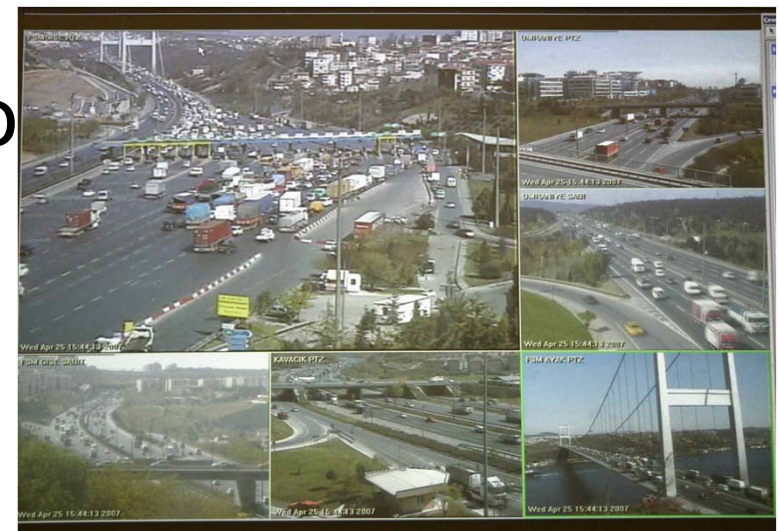
Integrated toll & traffic management



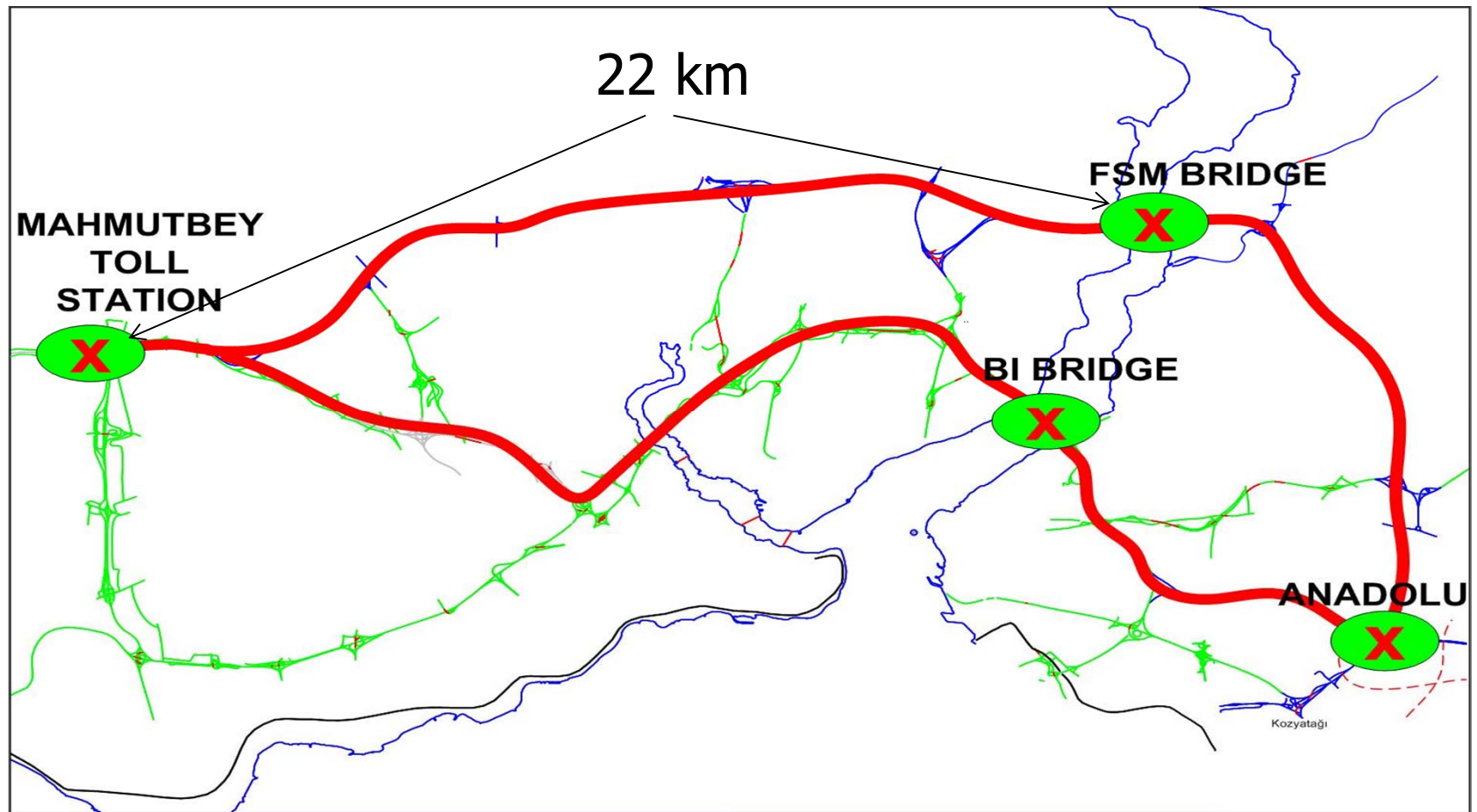
Integrated toll & traffic management



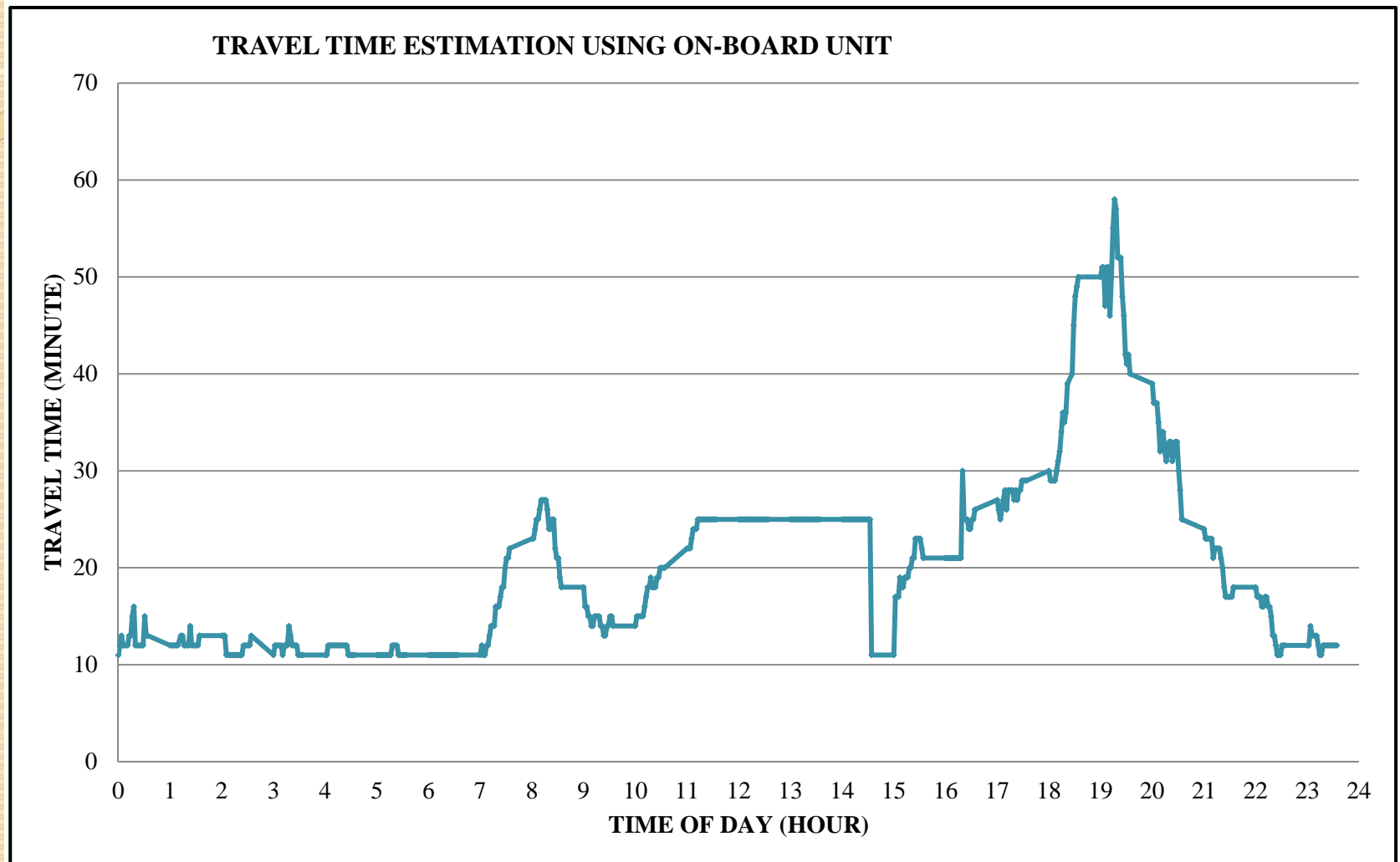
- On-board units
- Data from
 - Toll lanes
 - Overhead gantries
- Travel time calculation



Travel time estimation



Travel time estimation



ITS facilities



- 3 Management centres on motorways (İstanbul, İzmir, Mersin)
- 1600 Signalisation on state and provincial roads
- Over 100 Variable Message Signs (VMS)
- 97 Speed detection & warning systems
- 536 Permanent & Portable Traffic counting & classifying devices

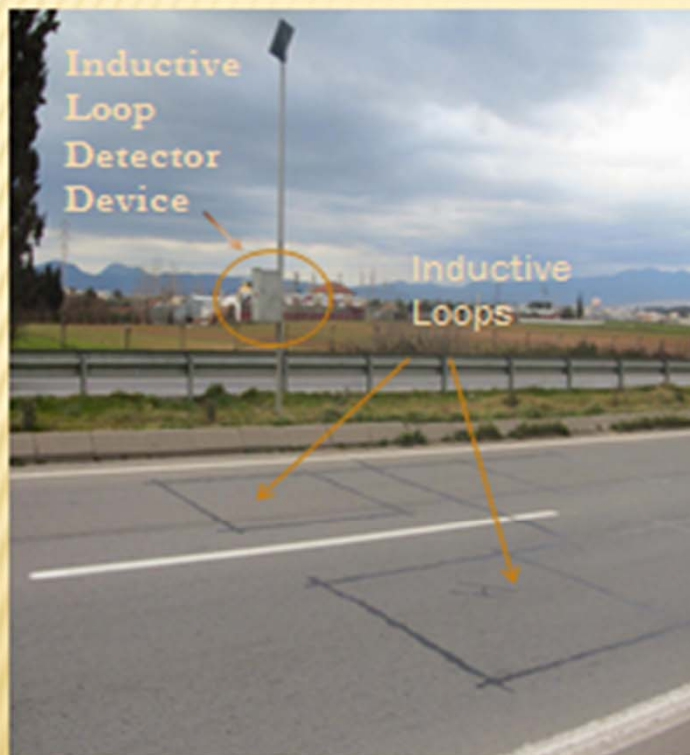
İstanbul, İzmir, Mersin



Traffic Counting & Classifying System



The Site System on Roads of Traffic Counting And Classifying System

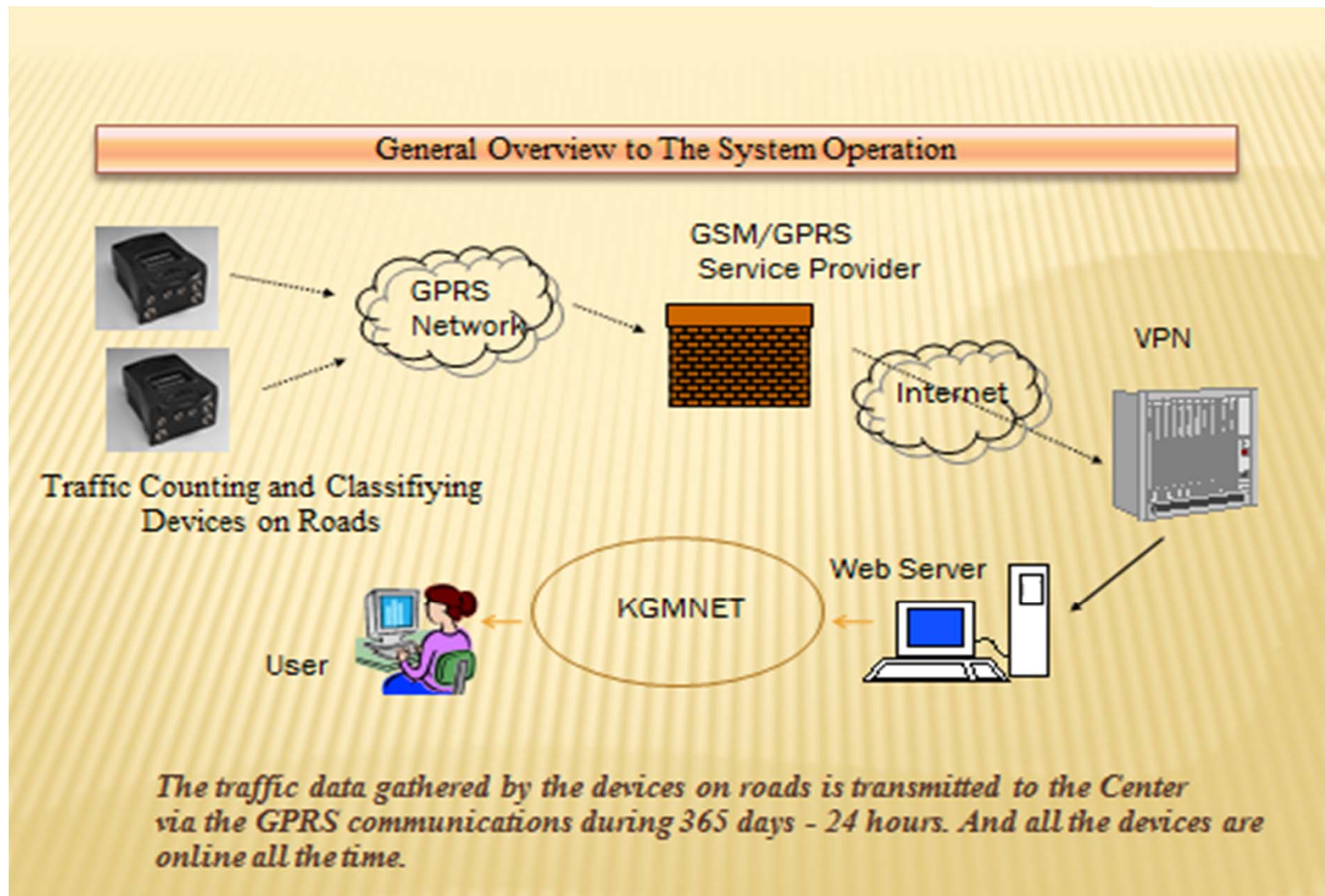


❑ The inductive loop detector is commonly used for permanent traffic counting and classifying applications as well as short term applications. The data supplied by conventional inductive loop detectors are vehicle passage, presence, count, occupancy, speed and classification.

❑ The operation of inductive loop sensors is well understood and their application for providing basic traffic parameters (volume, presence, occupancy, speed, classification, and gap) represents a mature technology. The equipment cost of inductive loop sensors is low when compared to non-intrusive sensor technologies.

By the year 2012, we have 200 inductive loop detector devices . We use them for permanent surveys to get traffic data from roads.

Traffic Counting & Classifying System



ITS deployment



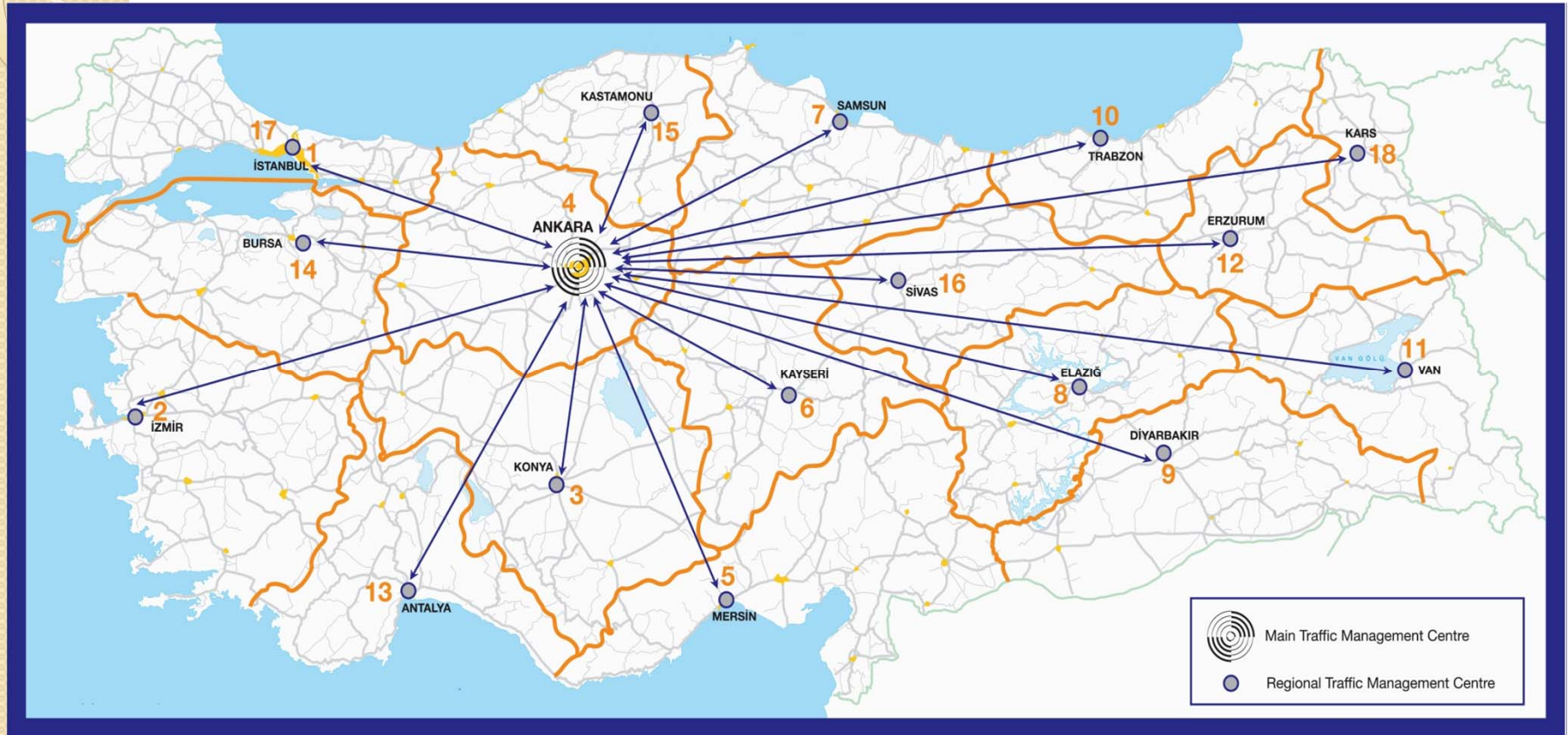
- Extending ITS to state & provincial roads
- Reorganisation in 2010-2011
 - New administrative units at headquarter and regional divisions regarding ITS
- Dual Carriageways at first
- ITS will focus on
 - Traffic management systems
 - Traveller information systems

Future perspective



- 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

Future perspective-integrated ITS



Applications for tunnels 1



- Enclosed facilities
- Special conditions
- Increasing of safety
- 61 tunnel longer than 500 m. in operation



Applications for tunnels 11



- Power
- Illumination
- Communication
- Fire detection
- Extinguishing
- Air quality control & ventilation



Applications for tunnels 111



- Traffic control
- Incident detection
- CCTV
- Public announcement
- Radio broadcasting
- Telecontrol
- Control centre





- Thank you for your attention