

# Smart Cities in Turkey



## Basic Data on the Economy (2014)

**GDP** - per capita (PPP): \$10,390

**Major urban areas:** Istanbul 14.38 million; ANKARA (capital) 5.15 million; Izmir 4.11 million; Bursa 2.79 million; Antalya 2.22; Adana 2.17 million; Konya 2.11; Gaziantep 1.89 million; Sanliurfa 1.85 million

**Population:** 77,695,904

**Industries:** Automobiles, energy, construction and building materials, electronics, steel, food processing, mining (coal, gold, chromate, copper, boron), chemicals and petrochemicals, textiles, tourism, and healthcare.

## Smart City Background

Smart City projects in Turkey are fewer in number than those in European countries and in the US. Barriers are mainly lack of funding and qualified human resources. The lack of GIS infrastructure is another challenge, only 3% of municipalities have completed their GIS investments or implemented GIS systems.

However the Ministry of Development with the help of all the other relevant ministries, has prepared the Information Society Strategy and Action Plan for 2015-2018. The English version will be published here: <http://www.bilgitoplumustratejisi.org/en>. According to this study, many cities have already introduced smart applications, particularly in transport and urban services. Accessing services through electronic channels and e-government is the most popular application within municipalities. However smart applications in the fields of energy and water management are on their way with SCADA and GIS applications in particular by electric utilities and water and sewage administrations in major cities. Smart metering is yet in very early stages.

### Initiatives for...

In order to facilitate smart cities in Turkey, the Ministry of Development has designed a hybrid top-down/bottom-up approach within the Information Society Strategy which can be explained as follows:

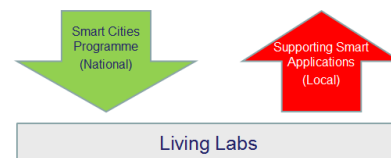
**-Top-Down:** A national level smart cities program aiming to develop a national smart cities strategy framing the smart applications to be implemented in cities, targets and financing instruments would be used to implement these applications. So national level financing would be provided for the local authorities in order to motivate local authorities to implement smart city application within their cities.

**-Bottom-Up:** In order to benefit from the creativity potential of the private sector and universities, local development agencies of the different regions in Turkey, which are operating under the Ministry of Development, would finance smart city projects for private sectors and universities. These projects would use public sector information in order to provide solutions for societal challenges in particular in the fields of health, transport, housing, energy, disaster and water management. Local applications are aimed to be developed within the concept of open data.

**-The Living Lab concept** would be introduced in smart cities in order to involve public participation in innovation.

#### Smart Cities in the Information Society Strategy

In order to implement this approach, a hybrid top-down/bottom-up approach is adopted in the Information Society Strategy.



Turkish Enerjisa Wind Power Plants

### Smart Energy

- Turkey will spend over \$5 billion over the next 5 years for the implementation of smart grids, smart metering and intelligent street lighting.
- Out of 21 electric distribution utilities in Turkey, 13 are in the various stages of implementing smart grid systems while others are studying different technologies.
- Turkish Government is enforcing usage of LED street lighting which will be implemented during the next 5 years.
- Limited number of utilities are using smart meters, which is expected to boom in a couple of years' time.

## Initiatives for...

### Smart Mobility

Intelligent Transportation Systems (ITS) are being installed in many cities of Turkey. However except the major cities, such as Istanbul, Izmir, and Ankara, the majority are only in initial phases. The Ministry of Transportation has stated in their Action Plan 2013-2023, all cities will implement smart traffic light systems working according to the traffic density, green wave system where cars after encountering one red light will pass through green lights if they maintain a specific speed, digital traffic signs, solar powered bus stops with digital arrival time boards.

Currently, all smart transportation projects are planned and realized by local municipalities, some using their own resources, whereas some use other local or foreign funding resources. Since there's no central ITS institution, it is not possible to get a total amount spent or planned to be spent for all the projects in Turkey. Some implementations are explained below:

**Ankara** has smart bus stops, on-line traffic density map, on-line tracking system for fire department vehicles.

**Izmir** has most advanced ITS system in the country. Full Adaptive Traffic Management System to include: full adaptive intersections, on-line traffic density maps for passengers/drivers, traffic lights specified for disabled people including talking lights, enforcement system to track speed/parking/lights etc. A project, funded by World Bank, is continuing to be installed and e-payment cards to be used in all transportation modes, including ferries, busses, train, and metros.

**Istanbul** has an intelligent signalization system, electronic enforcement system, traffic congestion and emergency management center, talking roads & talking vehicles (connected vehicles), parking automation system with unmanned payment points, e-payment card, smart bus stops, special info points at bus stops for disabled people carrying cards.



*Kocaeli Shared Bicycle System*



*Izmir E-Card System*

**Others:** Shared bicycle systems (Antalya, Izmir, Erzincan, Kocaeli, Yalova) to use a green transportation system.

E-card: used in most cities from highly populated cities like Istanbul to smaller cities like Mardin.

ITS systems utilized partially: Eskisehir (mostly being installed and being utilized), Konya (dynamic intersections at certain ones, information system on traffic density using cameras only without any sensors and with intersection control mechanism that is capable of controlling the traffic light with emergency vehicles being able to change

the light, intelligent public transportation system), Mardin (smart bus stops, smart intersections, tracking systems for busses in planning phase), Kahramanmaraş (mobile park meter system), Gaziantep (smart bus stops, systems to enable smart phones to inform passengers/drivers, systems to enable disabled people to use transportation systems alone), Sakarya (tracking system for busses), Yalova (smart bus stops), Kars (smart bus stops, information system for disabled passengers, both in planning phase), Edirne (enforcement system under planning phase to track and send bills automatically drivers not obeying traffic rules), Manisa (payment system for public transportation using smart phones).

### Smart Infrastructure

- Preventing water losses is a main priority for the Turkish government. SCADA (Supervisory Control and Data Acquisition) systems have been implemented by water authorities of some large and industrialized cities in Turkey to identify water losses and network failures. However, there is a need to expand this system to less developed regions of Turkey as well.
- In some major cities waste to energy systems are being implemented. However, projects on collection and separation of waste through smart systems in various cities are required. These projects will probably be implemented through BOT method.
- Overall, implementation of smart city projects in the environment sector is not as widespread as others like transportation. Some pilot cities have been chosen such as Karaman to initiate smart waste collection.

## Featured Cities

### Istanbul

- Istanbul is part of the CitySDK (Smart City Service Development Kit and its application Pilots) project, which is funded by the European Union's ICT Policy Support Program as part of the Competitiveness and Innovation Framework Program (CIP) and led by Forum Virium Helsinki. CitySDK is a pan-European project that will create a service development kit enabling the creation of applications across partner cities in the domains of smart mobility, smart tourism and smart participation.
- The U.S. Trade & Development Agency (USTDA) has awarded a grant to the Istanbul Metropolitan Municipality (IMM), the administrative body responsible for the general management of Istanbul. The grant provides technical assistance to improve city operations, enhance crisis and disaster management, and provide efficient and reliable public services for the citizens of Istanbul. The project will focus on procuring advanced IT solutions and developing a cloud-based environment capable of aggregating data from existing municipal databases. Once the IMM approves the Request for Proposals (RFP), information on these tenders will be posted on the Federal Business Opportunities (FBO) website: <https://www.fbo.gov/>

With the help of the USTDA grant, Istanbul Metropolitan Municipality (IMM) seeks to improve its operations through procuring enhanced IT solutions and developing a cloud based environment capable of aggregating data from existing municipal databases and information inputs. This Big Data infrastructure would allow the IMM to retrieve data from a variety of domains that would generate comprehensive analytics to support citizens and improve decision making and planning within the municipality. IMM seeks to integrate the data that currently exists in a number of unconnected systems and databases to improve municipal planning.

**Geographic Information System (GIS) Geospatial Analytics:** IMM seeks to better utilize existing and planned GIS technology to reduce costs, improve city services, and support disaster and crisis awareness, management and mitigation.

**Browse, Search and Discovery Portal System:** IMM seeks to further develop an online portal to provide government and citizen access to the comprehensive data stored in the planned cloud based environment.

**Disaster Management:** IMM seeks to implement data collection and analysis tools that would enable first responders to efficiently communicate and respond to crisis situations that may arise in Istanbul.

**Citizen 360:** Due to the increased citizen engagement, IMM seeks to develop improved systems for understanding citizen needs and, in turn, developing additional citizen IT services. A Citizen 360 Initiative will enhance citizen digital interaction with municipal services.

- IBM and Vodafone are cooperating with IMM Transportation Corp to make a smart transportation project. IBM utilized its data processing and analysis solutions, Vodafone used its mobile communication technologies and Transportation Corp utilized its analytical and transportation knowledge.
- IBM launched Turkish Smart Cities Technology Center, which provides technological solutions to the problems generated by urban life.
- Smart Mobility applications are very widely used in Istanbul.

Pedestrian Electronic Detection System project by Isbak, Istanbul Municipality's transportation telecommunication and security technology company, aims to prevent the delay rates at the crossroads and abolish the emission of harmful gases. It is a smart signalization and electronic supervision system. In the `Talking Roads & Talking Vehicles` project, which is an EU project performed by the Turkish private companies Koc Sistem and Otokar, the system is able to send particular warnings 400 meters beforehand to the vehicle that approaches a crossroad.

Belbim, the Istanbul Municipality Informatics company integrated NFC technology with the Istanbul Card. Belbim's parking automation system and unmanned payment kiosk for ISPARK, Istanbul Municipality's parking management company, is in the test phase. ISPARK utilizes the Istanbul Card in marinas for the boat parking fee collection. The company is also realizing a smart bicycle renting system.

IETT, Istanbul Municipality's bus and tram company, realized smart bus/tram stops in 750 different points accompanied with the MobiETT application which enables passengers to access the information of the smart stops. A special card is developed for the visually impaired citizens. If they swipe their cards at the smart stops, they can get information vocally.



## Featured Cities Continued

### Izmir



- Izmir has a SCADA system which is centrally managing the water distribution system.
- With WizmirNET project, İzmir Municipality provides internet in the open areas.
- İzmir Municipality has activated the Trunked Radio System, which even works in the times of disaster and emergency.
- Izmir has a very advanced transportation system which is mentioned in the smart mobility section and the city have plans to do more investments in this sector.

### Important associations, organizations

#### 1. Smart City Institute

<http://www.ckillishirenstitusu.com/>

<http://www.novusens.com/>

Novusens, the private innovation and entrepreneurship institution established a Smart City Institute. They have started the “Smart Cities Readiness Assessment of Turkey Project” and is also organizing various events. Novusens is working with several government agencies and NGOs, therefore it is developing a great resource of information. Novusens can be a potential partner for US companies.

#### 2. Turkish Green Building Institute

[http://www.cedbik.org/default\\_eng.asp](http://www.cedbik.org/default_eng.asp)

Turkish Green Building Association organizes educational programs, develops pilot projects with government and universities and conducts lobbying activities to increase public awareness about the necessity of green building while also encouraging the building industry to develop along principles of sustainability.

#### 3. Turkish Informatics Foundation

<http://www.tbv.org.tr/en/>

The main purpose of the Foundation is to contribute build of infrastructure for Turkey's transformation into an information society, and to conduct economic and social studies by carrying out scientific researches and development activities, to generate project and make effort to have these projects implemented.

### Important trade shows and events

#### 1. The 4<sup>th</sup> International Istanbul Smart Grid and Cities Congress

<http://www.icsgistanbul.com/en/>

Istanbul, April 20-21, 2016

Largest smart grid event in Turkey. In 2015, over 150 exhibitors from 39 countries including the U.S. exhibitors participated at the event. It attracted over 5000 visitors including conference attendees. It was supported by major associations in the electricity, gas and water sector and all of the utilities in these sectors participated at the conference sessions. The event is supported by the Turkish Ministry of Energy and Natural Resources and Turkish Ministry of Science, Industry and Technology. This year, the event also includes smart cities topic and will probably be one of the hot subjects.

#### 2. Kent Expo Urbanism and City Demands Fair

<http://kentexpo.izfas.com.tr/en/anasayfa/>

İzmir, October 2016

Gathers the latest urbanization technologies, applications and the best solutions for expectations. Kent Expo provides a platform for municipalities to attain the latest technologies as well as the firms to present themselves primarily to the municipalities and all other applicants.

#### 3. Antalya City Expo

<http://www.anfascityexpo.com/>

Antalya, March 16-18, 2016

In 2015, City Expo was visited by approximately 13,450 sector professionals, including 1,500 visitors consist of Mayors, Governors, Presidents, Vice Presidents and Department Heads of government institutions, department heads and directors of the purchasing departments.



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