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**IMPROVEMENT OF CURRENT CADASTRAL
SYSTEM AND RECENT DEVELOPMENTS
IN TURKEY**

TURKEY AT A GLANCE

A POPULATION OF 82 (+4) MLN
50% UNDER AGE 30
81 PROVINCES



4,56 PERCENT OF GDP IS CONSTRUCTION
SECTOR AND 9,8 PERCENT OF GDP IS REAL
ESTATE ACTIVITIES IN 2014.

LOKOMOTIVE SECTOR OF TURKISH ECONOMY

TURKEY RANKED 2ND AFTER CHINA IN INTERNATIONAL
CONTRACTING BUSINESS. “42 TURKISH CONTRACTORS” RANKED
AMONG WORLD’S TOP 250

SOURCE: ENR (ENGINEERING NEWS RECORD 2017)

NEW INFRASTRUCTURE INVESTMENTS

- ISTANBUL 3rd AIRPORT,
- CANAL ISTANBUL
- ISTANBUL FINANCE CENTRE
- URBAN REGENERATION PROJECTS
- BRIDGES, TUNNELS, AIRPORTS, HIGH SPEED TRAINS, NATURAL GAS PIPELINES, LOGISTICS CENTRES, CITY HOSPITALS ETC.

Legal Framework

ORGANIZATION

- Land registry & cadastre are managed and carried out **by one organization**, centralized management
- **no notary system**

CADASTRE

- **Legal cadastre**
- Legal basis, private sector involvement, licensed cadastre engineers/bureaus, successful cost recovery system/revolving fund, people can access cadastral location of a parcel via internet (cbs.tkgm.gov.tr), only related people with parcel (owner or attorney) can deeply research cadastre registers in local cadastre offices.

LAND REGISTRATION

- The official land register, which **is under the guarantee, supervision and responsibility of the State** and on which the legal status of the real properties is recorded, **not only ownership right but also all real rights other than ownership** bear legal consequences through registration to land register, foreign owners have equal property ownership rights
- Legal support, legal basis, successful cost recovery system/revolving fund, deep involvement in economy.

HISTORY

1871

MINISTRY OF ROYAL REGISTRY ORGANISATION

1847

ESTABLISHMENT OF PRIVATE PROPERTY AND LAND REGISTRY



1913

LAW ON DEFINING AND MANAGING OF ASSETS AND REAL PROPERTIES (1st CADASTRE LAW)

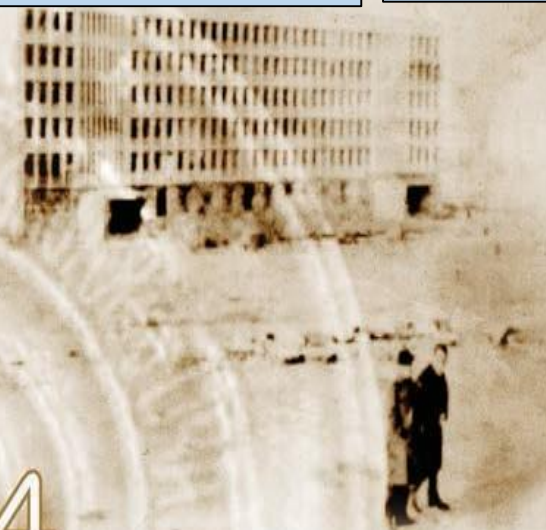


1971

RE-STRUCTURE

2010

RE-ORGANISATION OF GDLRC



1924

GENERAL DIRECTORATE OF LAND REGISTRY AND CADASTRE

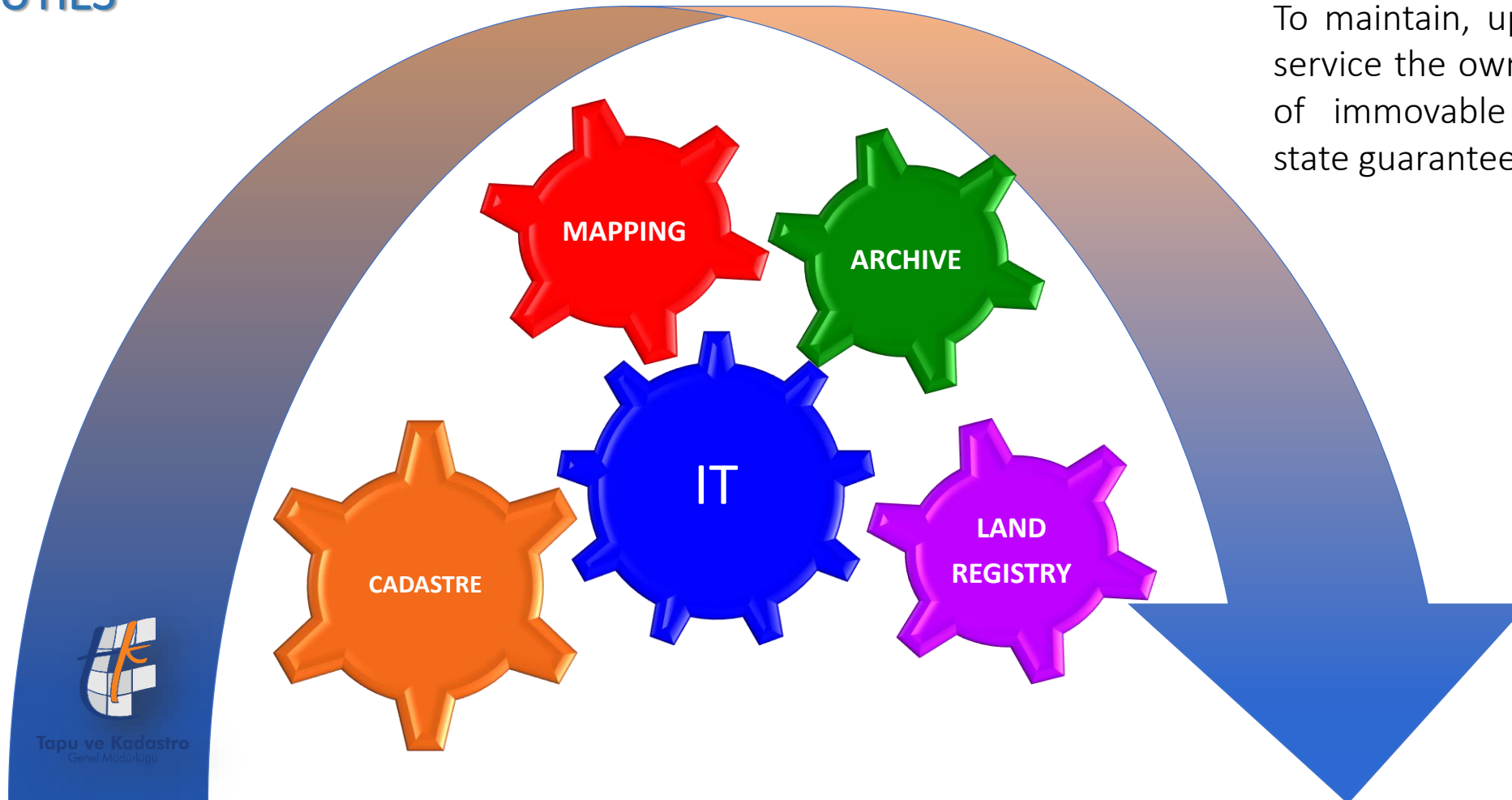
...Target 2023



G D of L R and C

DUTIES

To maintain, update and put into service the ownership information of immovable properties under state guarantee.



PROGRESS IN TURKISH CADASTRE

PHASE 1 : TRADITIONAL OPERATIONS, UNTIL 2000

PHASE 2 : COMPLETION AND MODERNIZATION, 2000 – 2012

PHASE 3 : DATA AND SERVICES QUALITY IMPROVEMENT,
2013 – PRESENT, STILL IN PROGRESS (2019)

PHASE 1 : TRADITIONAL OPERATIONS, UNTIL 2000

CADASTRE

- The cadastre of 39.422 units was completed by the institutions own cadastre teams – 76%
- Digital geodetic instruments and GPS usage after 1990, ED-50

LAND REGISTRY

- Daily land registry transactions
- Traditional methods
- The transition period to automation with simple software

MAPPING

- Different production methods (polar, orthogonal, analogue photogrammetric, digital)
- Different coordinate systems (ED-50, ITRF, local, no coordinates)

IT

- LRCIS draft Project (1990)
- CAD based cadastre SW
- Land registry automation software

OTTOMAN ARCHIVE

- Digitalization of archives and automation considerations

PHASE 2 : COMPLETION AND MODERNIZATION, 2000 – 2012

CORS - TR

CADASTRE PARCEL INVENTORY WORKS

INITIAL CADASTRE MAINTANENCE ENTIRE COUNTRY

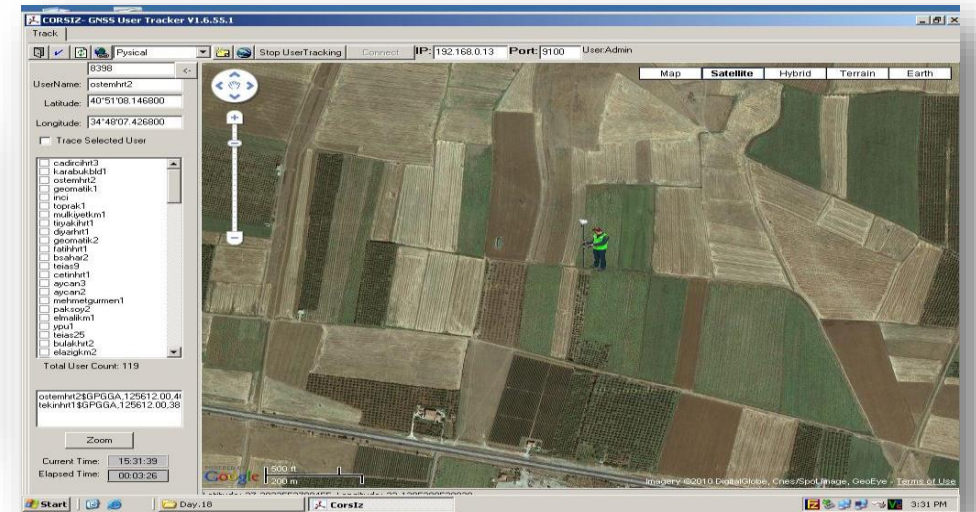
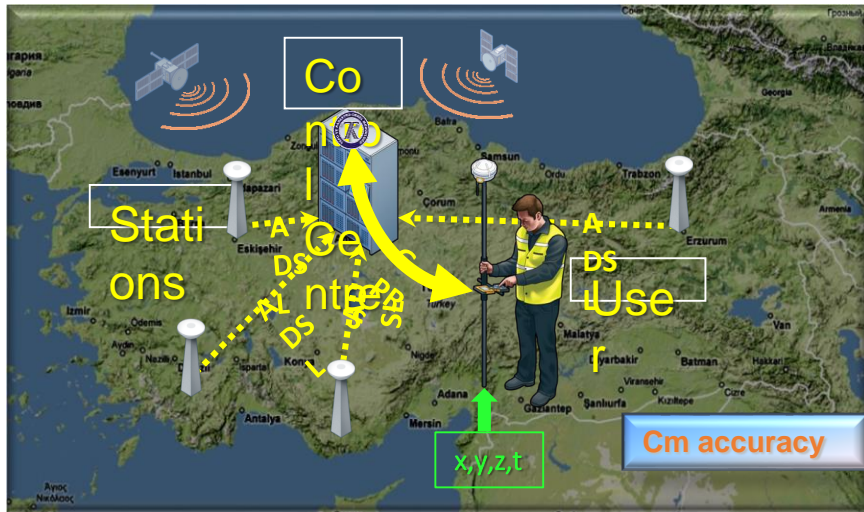
CADASTRE RENOVATION

LAND REGISTRY AND CADASTRE INFORMATION SYSTEM

1.NSDI

DIGITAL ARCHIEVE

CORS - TR

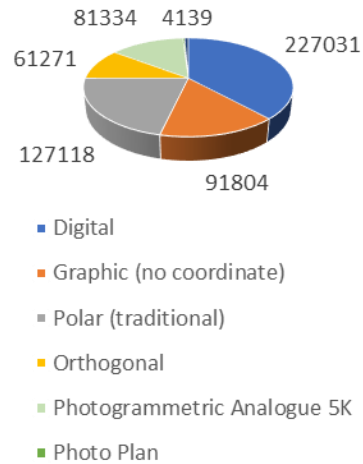


Started to establish in 2006 and fully operational since 2010

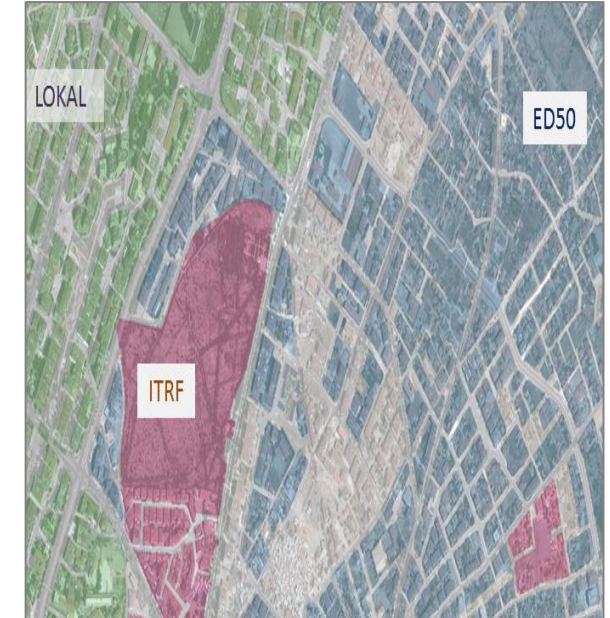
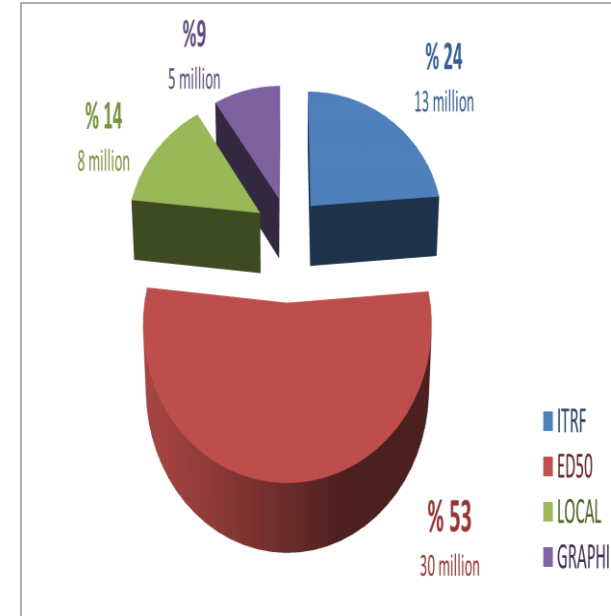
- 147 stations entire country
- Provides **cm-level accuracy** position information in **real time** with RTK GPS network,
- **Datum transformation** between ED50-ITRFxx
- No GCP needed for surveying and cadastral works.
- Saves more than 50 million USD every year in Turkey (reduces 30% in all Surveying&GIS projects)

CADASTRE PARCEL INVENTORY

Number of Cadastre Map Sheets



Surveying Method	No of Map Sheets	Ratio %
Numerical Method	227.031	38.19
Graphical	91.804	15.44
Polar Method	127.118	21.38
Orthogonal	61.271	10.30
5K Analogue Photogrammetric	81.334	13.68
Photoplan	1.782	0.30
Others	4.139	0.70
TOTAL	594.479	100.00



- TKGM conducted a study in 2008 to determine the current number of cadastral maps and the methods used / geodesic infrastructure of measurement in these maps in order to create cadastral map inventory.
- One of the most important issues to be addressed on the automation work which will be carried out **with the cadastre data is to gather the data from different coordinate systems** in an integrated infrastructure and to present it in the way required by cadastre directorates. In the scope of the project all binary coded closed data has been converted into open data structure, ISO standards have been applied to data model, and Cadastre and Land Registry data integration process has been implemented.
- The Cadastre Parcel Inventory application has been developed to serve as a basis for the work to be conducted by TKGM and the existing cadastre data has been entered into the system by cadastre directories.

COMPLETION OF THE INITIAL CADASTRE IN THE ENTIRE COUNTRY

YEARS	FUNDED BY REVOLVING FUND			FUNDED BY WB PROJECT			
	TENDERS	UNITS	PARCELS	TENDERS	UNITS	PARCELS	
2005	96	1.510	1.670.444	57	1.436	1.382.471	29.47
2006	157	2.976	3.355.286	46	1.155	1.213.545	40.40
2007	107	2.398	2.392.031	15	389	313.515	30.41
2008	43	862	760.605				29.34
2009	17	371	333.005				39.02
2010	26	558	614.316				38.75
TOTAL	446	8.675	9.125.687	118	2.980	2.909.531	34.57
				564	11.655	12.035.218	

NUMBER OF PARCELS

12 million parcels instead of 2.5 million parcels*
 A total of 15 million parcels were produced and cadastre was completed.

IMPLEMENTATION

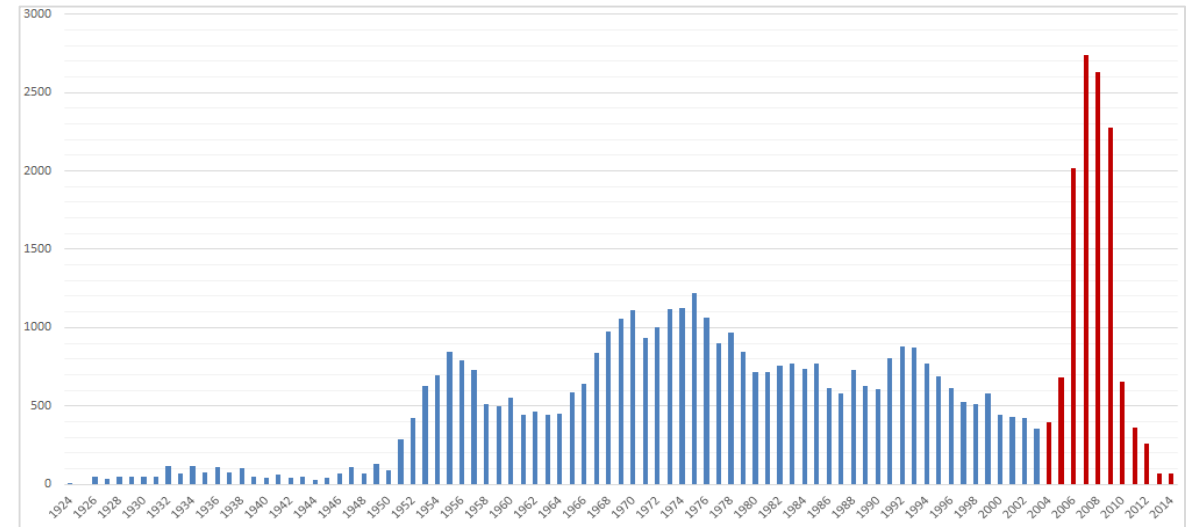
5 years instead of 24 years

PARCEL COST

US\$44,00 decreased to US\$39,76 thanks to private sector participation.

COST RECOVERY

The 47,6% of the investment and operation costs of the cadastral projects paid back within 10 years

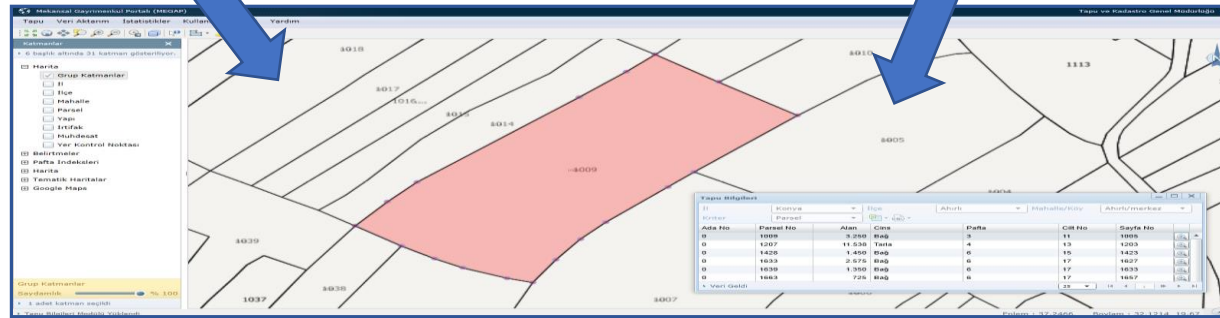
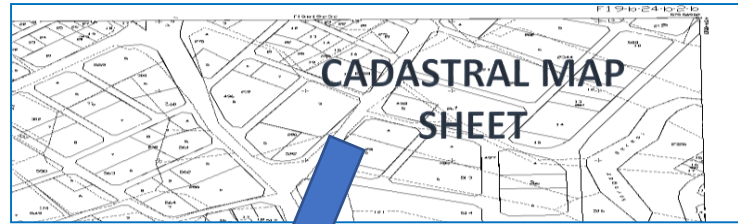
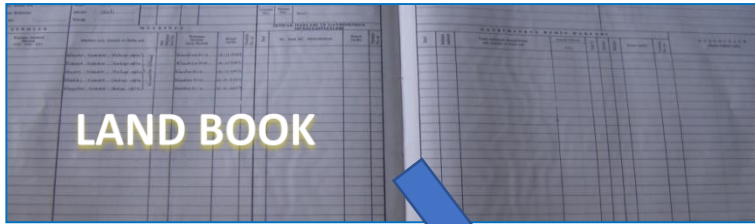


CADASTRE RENOVATION

TYPE of PROJECT	NUMBER OF TENDERS	UNIT	NUMBER OF PARCELS
CADASTRE RENOVATION - WB BUDGET	309	6.934	7.143.230
CADASTRE RENOVATION TKGM REVOLVING FUND	129	2.056	2.107.500
DIGITIZATION WB – TKMP	38	1.010	1.163.210
TOTAL	476	10.000	10.413.940

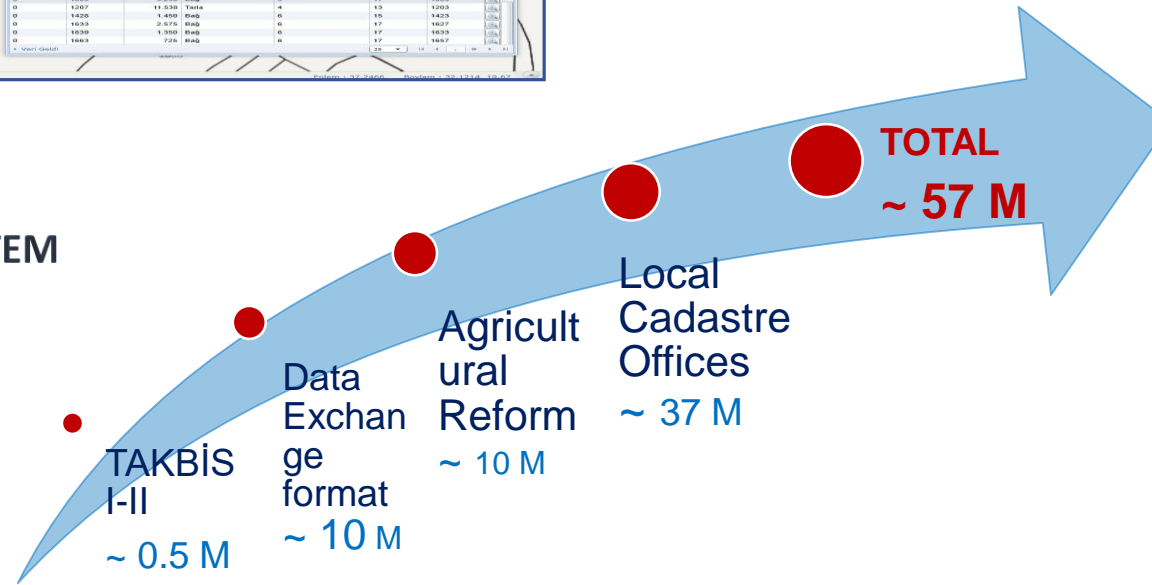
- The most challenging aspect is that cadastral maps (graphical or line maps) continue to be in a **paper format, vary in accuracy and consistency**, and are **not linked to the national network**.
- Furthermore, in many localities' **maps are out of date and do not correspond with the ground parcel location and areas**, differing sometimes by up to ten meters.
- The important issue **to be underlined here** is that TKGM, on the one hand, performs cadastre in areas without having cadastre by new technologies and on the other hand renews the problematic / graphic / out of date old cadastral parcels.
- Private sector involvement

LAND REGISTRY AND CADASTRE INFORMATION SYSTEM



The land registry automation has been in use since 2004.

INTEGRATED INFORMATION SYSTEM



TAKBIS

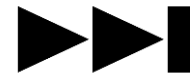
LAND REGISTRY AND CADASTRE INFORMATION SYSTEM (TAKBIS)

“LRC-IS” IS ONE OF THE FUNDAMENTAL E-GOVERNMENT PROJECT OF TURKEY. LRC-IS IS COVERING *ALMOST 650 DIFFERENT TYPE* OF OFFICIAL LAND REGISTRY TRANSACTIONS.

IT IS FULLY OPERATIONAL SINCE 2004.

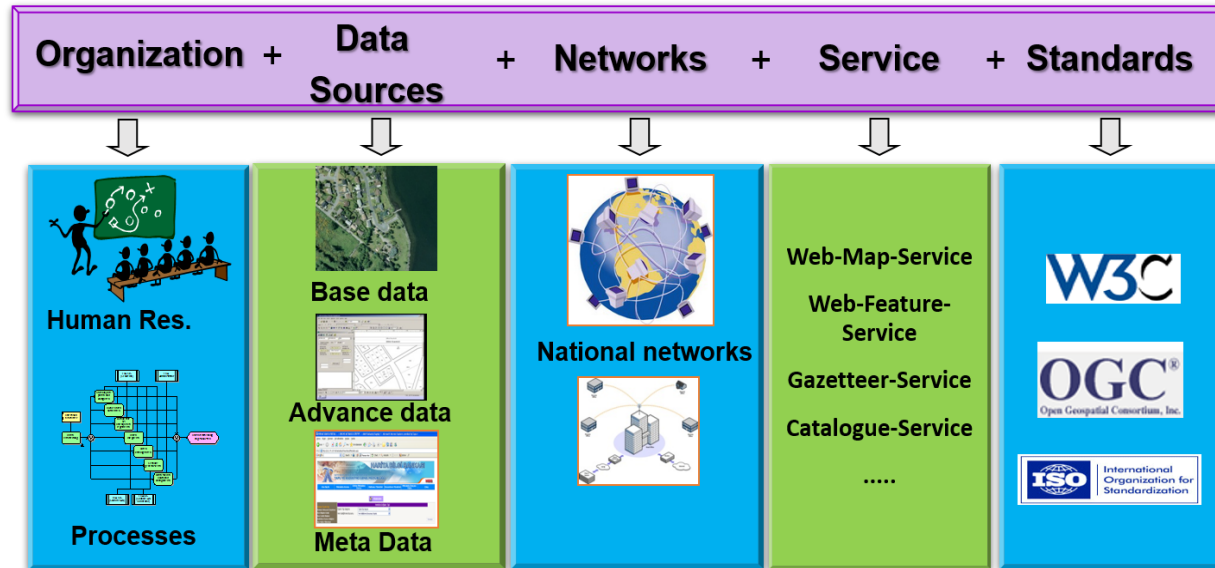


ADRESS INFORMATION SYSTEM IS INTEGRATED WITH THE CENTRAL CIVIL REGISTRATION SYSTEM (UNIQUE TR IDENTIFICATION NUMBER)



VALUATION BASED REAL ESTATE INFORMATION SYSTEM IS INTEGRATED WITH TAKBIS

NSDI



COMPONENTS

Institutional framework	Technical standards
Fundamental Geo-data sets	Web-Services (WMS-WFS-WCS)

Preparations for the creation of NSDI were carried out by the institution and in 2011 an administration was established under the name of General Directorate of Geographic Information Systems.

<https://cbs.csb.gov.tr>

DIGITAL ARCHIVE (OTTOMAN)



Through the project, a large part of the documents within the Department of Land Registry Archives was microfilmed, transferred to digital media and thus ensuring more efficient storage and use of archival documents.

- 8.227 volumes of minute books have been microfilmed using 1.726 rolls of microfilm.
- 25.564.912 units of title deed records in ottoman script were transcribed and transferred to digital environment land boks from Ottoman Empire time).
- Archive automation software and infrastructure have been established.

PHASE 3 : DATA AND SERVICES QUALITY IMPROVEMENT, 2013 – PRESENT, STILL IN PROGRESS (2019)

INSTITUTIONAL

- In the countries where Turks live intensively, transactions can be made within the embassy.
- Information Technologies Department
- Land Valuation Department
- TKGM international

IT

- Spatial Property System (MEGSIS)
- Cadastral parcel inquiry applications
- Data Sharing
- LRCIS (TAKBİS) improvement project
- 3D cadastre

CADASTRE

- Cadastre Renovation (and digitization)
- Private sector involvement
- Licenced bureaus
- Forest cadastre
- The cadastre of the areas that have lost the nature of being a forest, occupied by the citizens and opened to agriculture and settlement.

LAND REGISTRY

- Electronic mortgage and its release
- Electronic levy of attachment and its release
- Electronic collection (Land registry fees and revolving fund service fees can be collected thorough all bank branches, ATMs, video transaction centers and Cadastre website.
- Web Land Registry (Citizens can apply for transactions through the internet without going to the land registry Office)
- QR coded certificate

CONCLUSIONS

- 1) SUCCESSFUL PROJECTS HAVE BEEN REALIZED IN THE COMPLETION OF KADASTRON AND INFORMATION TECHNOLOGIES.
- 2) IS EVERYTHING PERFECT?
ANSWER IS NO!!
COMPLETED WORKS IS JUST AN UPPER SIDE OF ICEBERG.
THERE IS MORE THINGS TO DO ∞

THANK YOU...

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As of January 2019, in Turkey;

- **81 Cadastre Offices** and 1.010 Land Registry Offices, annually 9 million transactions
- Cadastral parcels: **57.700.530**; all is digital and computer medium
- Engineers working in Cadastre Offices: **733**
- Total number of staff working in Cadastre Offices: **5.542**
- Surveying bureau and companies: **3.000**
- Companies running more than 20 employees: app **200**
- Licensed Surveying and Cadastre Engineers and Bureaus: **225**
- Universities with Surveying Department : **23** (21 of them are state, 2 of them are private universities. 9 out of 21 state universities has dual education program)