RENEWAL AND COMPLETION PROBLEMS IN GEOGRAPHICAL DATABASES IN TURKEY AND A PROPOSAL MODEL

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1- INTRODUCTION

Today, it is known that information is needed to conduct even the slightest research in any given subject. It is imperative that the information meet the needs and be up-to-date and accessible. The properties of the information obtained emerge as an important factor in the success of the services to be offered.

There are quite a number of institutional formations in Turkey in order to meet the various institutional needs. Usually, each institution gathers, assesses and stores the data that it needs to offer its services by itself. This effort on the part of each unit to obtain by itself the data it needs brings along various problems with it. The sharing of the data with other units and the integration of the data become difficult and sometimes even impossible.

This study explores the institutional activities that deal with geographical databases and the institutional activities that are connected with them.

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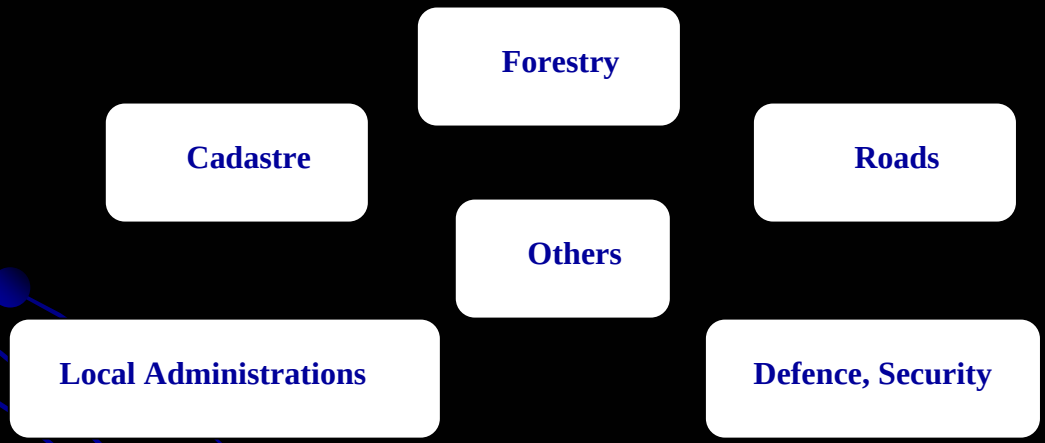
2- THE CURRENT SITUATION OF THE GEOGRAPHICAL DATABASES IN TURKEY

There are various different institutional bodies in Turkey founded in accordance with the nature of the public service to be given. Each institution itself gathers, processes and endeavours to update the data it needs to fulfil the tasks that it was founded to deal with. The leading institutions that engage in geographical database activities are given in Figure



Some of the institutions that conduct activities on a geographical database in Turkey

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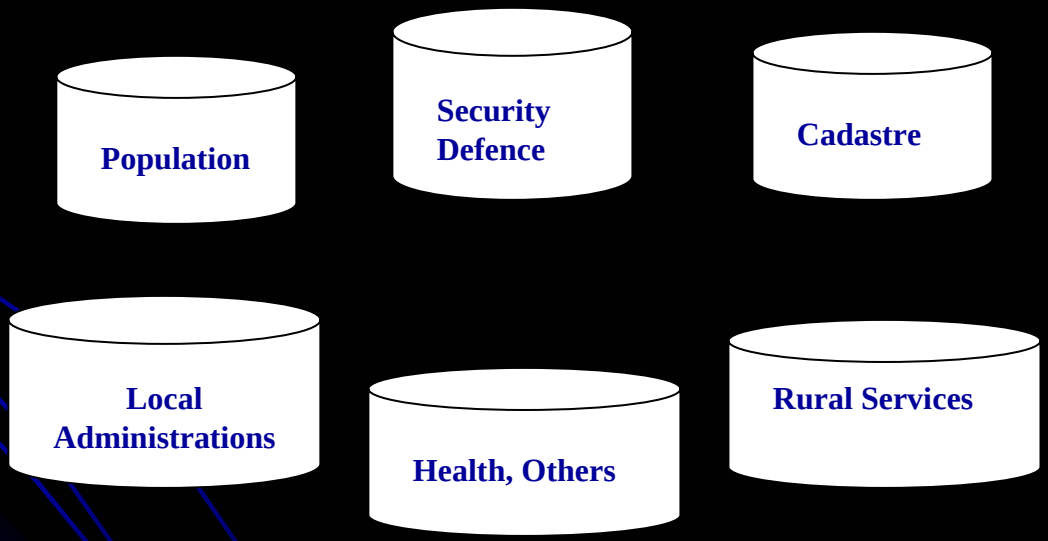
Each institution given in Figure 1 was founded to serve a special purpose. Since a databank has not yet been established in Turkey, each institution has preferred to gather, update and integrate the information that it needs by itself.

Data groups have been established for special purposes within each institution in Turkey. The methods pursued in collecting, storing, updating and integrating the data in each data group that meets only for an institutional purpose exhibit differences.

Figure shows leading data groups in Turkey.



Some Institutional Data Groups in Turkey

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Each data group given in Figure has its own data standards, method of collection, archiving and updating system. The situation being so, difficulties and even impossibilities are experienced in data sharing and hence data import. Efforts aimed at a common data standard for Turkey are also made with difficulty.

Integration and updating activities in these databases specially formed by institutions are implemented with difficulty. Since integration and updating are required for some databases by the joint efforts of various institutions, the diversity of the problems further increases. 1/25 000 and smaller scale geographic map bases that are used for security and public works can be given as an example of this situation.

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3- EFFORTS OF INTEGRATING AND UPDATING GEOGRAPHICAL DATABASES

In Turkey, topographic maps covering the whole of the country have been completed for purposes of Regional Planning, Public Works, Natural Disasters, and Defence etc. Efforts are underway to digitalise these maps, which were completed using traditional methods.

Topographic maps prepared at various different times lose their currency in time, because many public institutions perform various public works such as roads, irrigation, bridges, land regulation etc. in accordance with their foundation goals and therefore the landscape is under constant change. These changes in landscape are made at different times by different institutions.

Institutions keep records of these activities that they make on landscape according to their own standards and use them accordingly. Current archiving and data keeping efforts are mostly sufficient for their purposes since their works are often limited to a local area.

Although the existence of a different recording system for each work does not pose a problem since there is no need for a total display of data, serious difficulties are experienced in special cases like natural disasters.

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Great efforts are spent to incorporate into the general geographical databases the changes made on land by various institutions at different times and great difficulties are experienced in this regard. The authority to integrate and update data belongs to the institution that produces the basic topographic database and is responsible for it.

After the institution prepares the topographic database and puts it to service, it contacts the provincial units for integrating and updating and demand data to be used for the latest updating. Data information exchange is performed with the method given Figure.

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Flow diagram for data exchange operations

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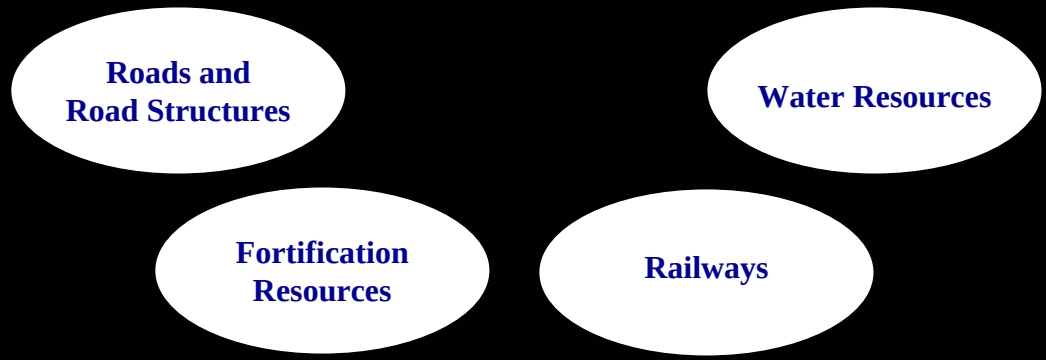
The data compiled from the executive public institutions can be grouped under 4 headings.



The data compiled from the executive public institutions

For example **Roads and Road Structures**

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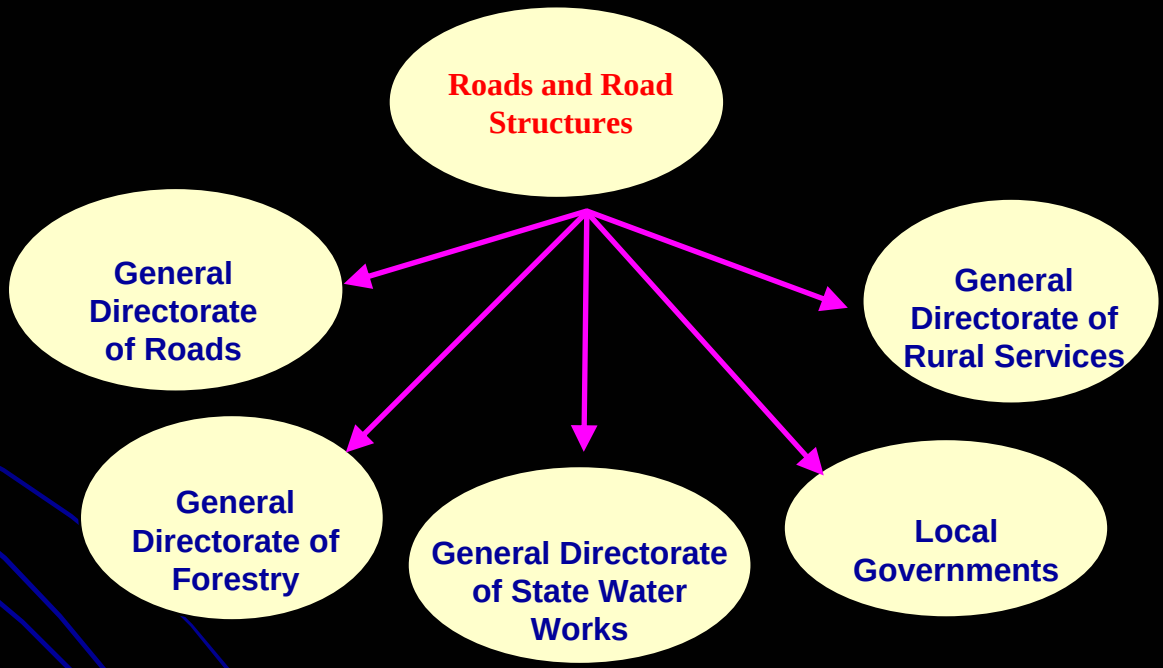
Data about roads and road structures are requested from the institutions given in Figure and data integration and exchange operations are performed.



Data sources for roads

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Information about roads requested from public institutions given in Figure is recorded in the attributes tables given below with the number of attribute data stated next to them.

	Attributes Table	Data Area
1	Road	17
2	Bridge/Overpass/Viaduct	26
3	Tunnel/Underpass	12
4	Sharp Bend	8
5	Critical Point	7
6	Narrowing/Expanding	7
7	High Inclination Road	6
8	Road Maintenance Facility	15
9	Shallow Passage	10
10	Waterway Passage by Ferry	10

Road attributes data table

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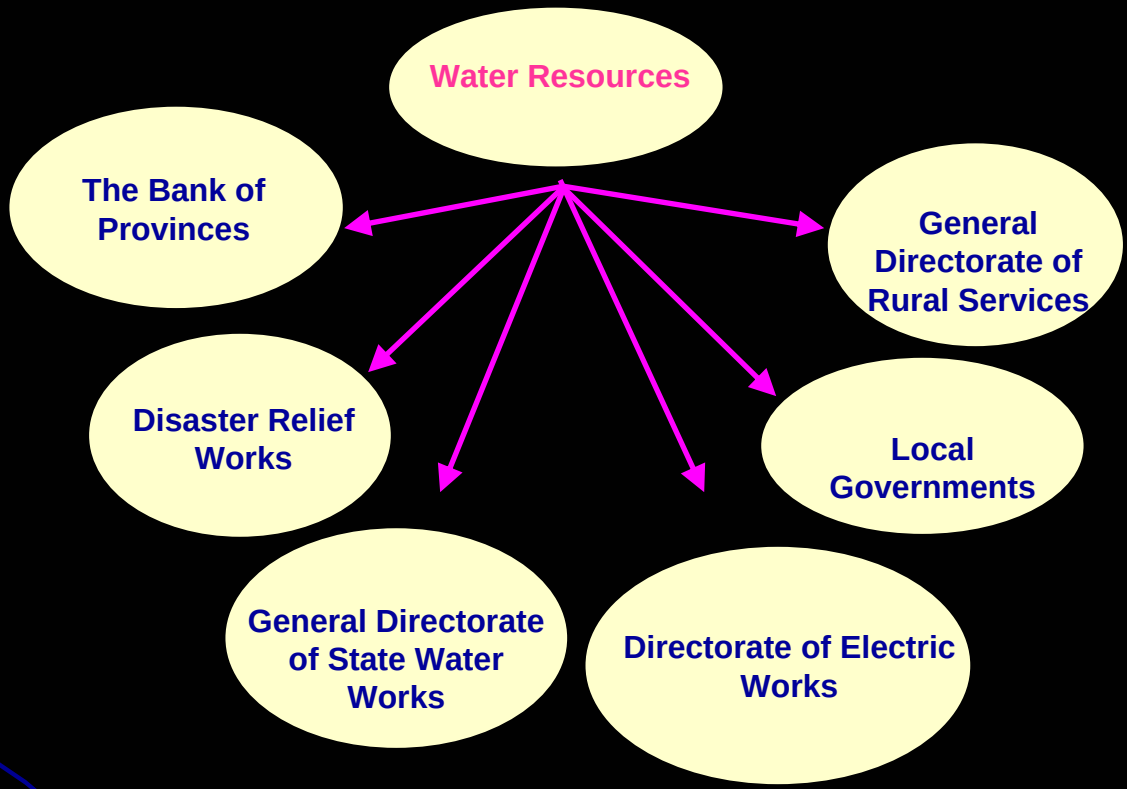
Similarly, 16 pieces of attribute information are gathered from six different institutions given in Figure.



Sources of Data about Water Resources

6 pieces of attribute information are compiled and recorded from about 10 different institutions of Fortification Resources, and,
Attribute data about railways are requested from the State Railways and 14 attribute tables are formed.

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4- PROBLEMS EXPERIENCED IN DATA COLLECTION

- Few instances of data exchange between institutions in the past in Turkey

- Relatively recent nature of GIS activities for institutions

- Reluctance on the part of the institutions in data sharing

- Although in legal regulations institutions are asked to establish a unit so as to conduct such operations, these units have not been formed in practice. As a consequence of this, the sending of data from the institutions to the centre does not take place. Administration of data integration centre has adopted the method of obtaining data from the central body of each institution.

- However, as most of the data are with the provincial offices of the institutions, it has been impossible to obtain the data requested of the General Directorates.

- A different method has been used to obtain the existing data in the provincial branches of public institutions. In order to obtain information from the provinces, 762 staff members were given the necessary training and thus the data were obtained from the source.

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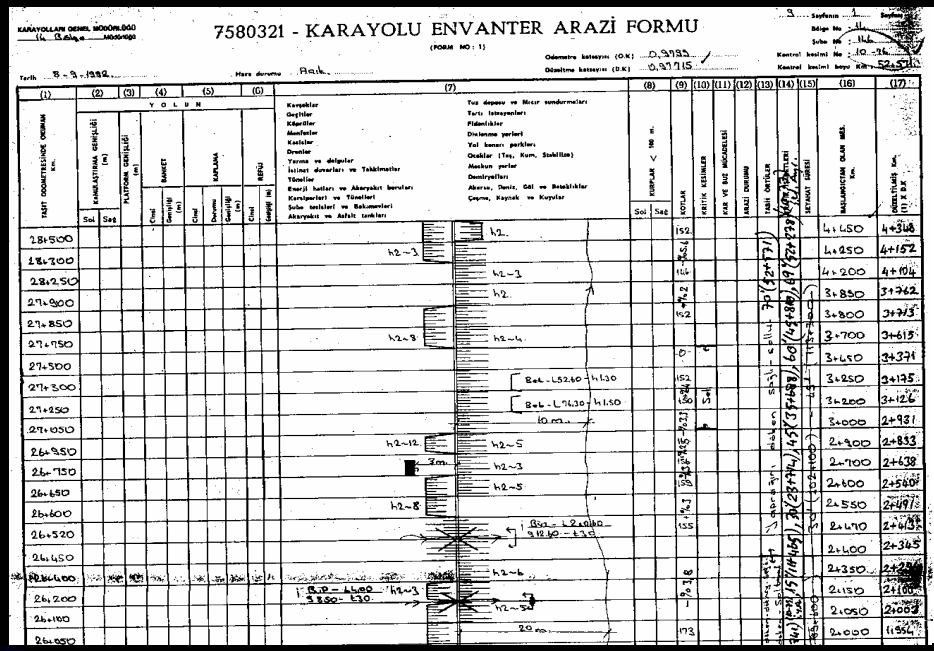
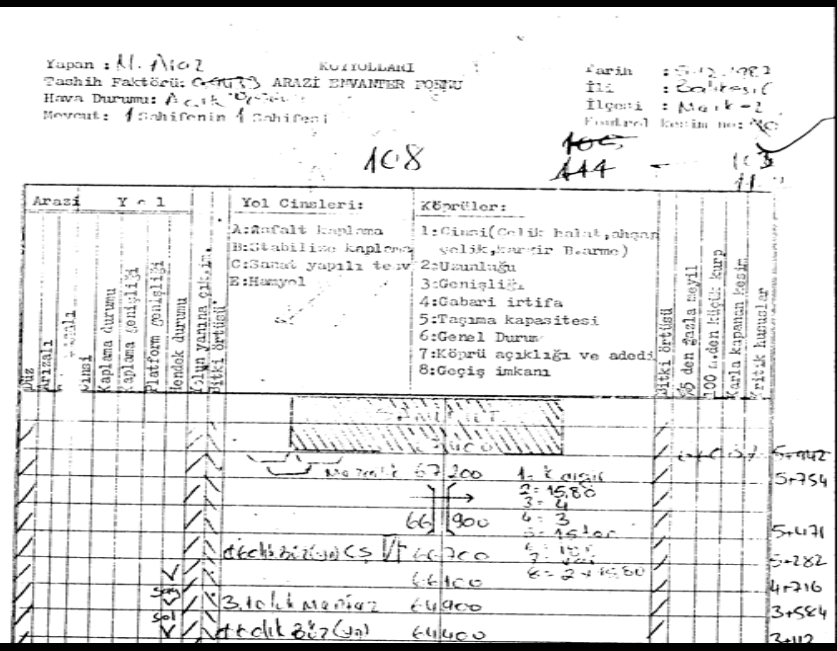
For example

The Turkish Republic Roads Inventory Form





-During the data collection, no technical personnel were found in the provincial branches of some institutions to obtain information

-Some data that were supposed to be included in the institutional documents could only be obtained orally.

- The process of data collection has been completed in 3.5 years.

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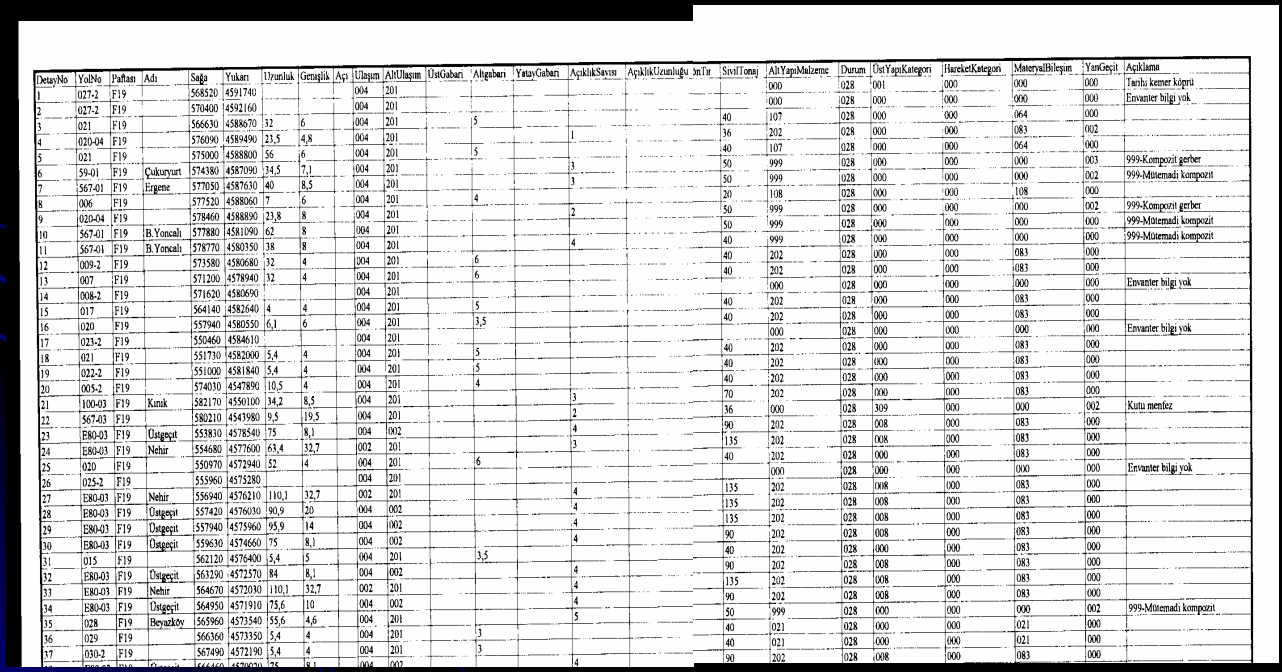
5- PROBLEMS ABOUT THE DATA OBTAINED

Various problems are encountered about the formats, shortcomings, accuracy and currency of the data to be incorporated into the system. The information wished to be incorporated can be grouped under the titles of graphic and non-graphic information. These data are in the form of non-digital, traditional documents and printed forms in many institutions.

While graphic road data are marked in the printed maps of General Directorate of Roads approximately, they are prepared in the form of sketches in the roads of other institutions.



DetayNo	YolNo	Paftası	Adı	Sağa	Yukarı	Uzunluk	Genişlik	Açı	Ulaşım	AltUlaşım	ÜstGabarı	Altgabarı	YatayGabarı	AçıklıkSayısı	AçıklıkUzunluğu	ÖnTır	SıvıTonaj	AltYapıMalzeme	Durum	ÜstYapıKategori	HareketKategori	MateryalBileşim	YanGeçit	Açıklama
1	027-2	F19		568520	4591740				004	201								000	028	001	000	000	000	Tarihi kemer köprü
2	027-2	F19		570400	4592160				004	201								000	028	000	000	000	000	Envanter bilgi yok
3	021	F19		566630	4588670	32	6		004	201		5					40	107	028	000	000	064	000	
4	020-04	F19		576090	4589490	23,5	4,8		004	201			1				36	202	028	000	000	083	002	
5	021	F19		575000	4588800	56	6		004	201		5					40	107	028	000	000	064	000	
6	59-01	F19	Çukuryurt	574380	4587090	34,5	7,1		004	201			3				50	999	028	000	000	000	003	999-Kompozit gerber
7	567-01	F19	Ergene	577050	4587630	40	8,5		004	201			3				50	999	028	000	000	000	002	999-Mütemadi kompozit
8	006	F19		577520	4588060	7	6		004	201		4					20	108	028	000	000	108	000	
9	020-04	F19		578460	4588890	23,8	8		004	201			2				50	999	028	000	000	000	002	999-Kompozit gerber
10	567-01	F19	B.Yoncalı	577880	4581090	62	8		004	201							50	999	028	000	000	000	000	999-Mütemadi kompozit
11	567-01	F19	B.Yoncalı	578770	4580350	38	8		004	201			4				40	999	028	000	000	000	000	999-Mütemadi kompozit
12	009-2	F19		573580	4580680	32	4		004	201		6					40	202	028	000	000	083	000	
13	007	F19		571200	4578940	32	4		004	201		6					40	202	028	000	000	083	000	
14	008-2	F19		571620	4580690				004	201								000	028	000	000	000	000	Envanter bilgi yok
15	017	F19		564140	4582640	4	4		004	201		5					40	202	028	000	000	083	000	
16	020	F19		557940	4580550	6,1	6		004	201		3,5					40	202	028	000	000	083	000	
17	023-2	F19		550460	4584610				004	201								000	028	000	000	000	000	Envanter bilgi yok
18	021	F19		551730	4582000	5,4	4		004	201		5					40	202	028	000	000	083	000	
19	022-2	F19		551000	4581840	5,4	4		004	201		5					40	202	028	000	000	083	000	
20	005-2	F19		574030	4547890	10,5	4		004	201		4					40	202	028	000	000	083	000	
21	100-03	F19	Kınık	582170	4550100	34,2	8,5		004	201			3				70	202	028	000	000	083	000	
22	567-03	F19		580210	4543980	9,5	19,5		004	201			2				36	000	028	309	000	000	002	Kutu menfez
23	E80-03	F19	Üstgeçit	553830	4578540	75	8,1		004	002			4				90	202	028	008	000	083	000	
24	E80-03	F19	Nehir	554680	4577600	63,4	32,7		002	201			3				135	202	028	008	000	083	000	
25	020	F19		550970	4572940	52	4		004	201		6					40	202	028	000	000	083	000	
26	025-2	F19		553960	4575280				004	201								000	028	000	000	000	000	Envanter bilgi yok
27	E80-03	F19	Nehir	556940	4576210	110,1	32,7		002	201			4				135	202	028	008	000	083	000	
28	E80-03	F19	Üstgeçit	557420	4576030	90,9	20		004	002			4				135	202	028	008	000	083	000	
29	E80-03	F19	Üstgeçit	557940	4575960	95,9	14		004	002			4				135	202	028	008	000	083	000	
30	E80-03	F19	Üstgeçit	559630	4574660	75	8,1		004	002			4				90	202	028	008	000	083	000	
31	015	F19		562120	4576400	5,4	5		004	201		3,5					40	202	028	000	000	083	000	
32	E80-03	F19	Üstgeçit	563290	4572570	84	8,1		004	002			4				90	202	028	008	000	083	000	
33	E80-03	F19	Nehir	564670	4572030	110,1	32,7		002	201			4				135	202	028	008	000	083	000	
34	E80-03	F19	Üstgeçit	564950	4571910	75,6	10		004	002			4				90	202	028	008	000	083	000	
35	028	F19	Beyazköy	565960	4573540	55,6	4,6		004	201			5				50	999	028	000	000	000	002	999-Mütemadi kompozit
36	029	F19		566360	4573350	5,4	4		004	201		3					40	021	028	000	000	021	000	
37	030-2	F19		567490	4572190	5,4	4		004	201		3					40	021	028	000	000	021	000	
																	90	202	028	008	000	083	000	

Field Analysis Information Table for Bridge Attributes

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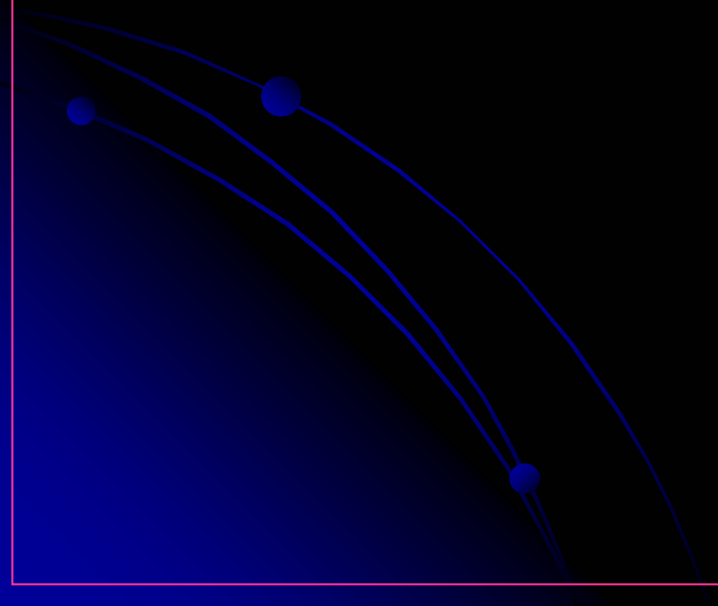
Most of the data in the institutions are preserved in traditional environments in the form That they were first collected without being updated. In some provincial branches of institutions, information is encountered on roads and water that belongs to 15 or 20 years before.

Information about the same data exists with different information attributes in different Public institutions. As there exist fundamental problems such as a lack of standardisation, shortcomings, currency and accuracy due to the abovementioned reasons, attaining the set goals becomes very difficult.



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5- NATIONAL AND INTERNATINAL GIS ACTIVITIES ACROSS THE WORLD

In technologically advanced countries, activities about Geographical Information Systems are conducted by a "board of experts" appointed by law. These boards guide and Coordinate GIS activities and prepare the technical and administrative regulations (laws, directives, and statutes) for these activities.

Examples of this are:

American Federal Geographic Data Committee (FGDC)
American Geospatial One-Stop Project (GOS)
European Union Geographical Information Database (INSPIRE)

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7- CONCLUSION AND SUGGESTIONS

Initially, the procedure for Field Analysis System in Turkey was so planned that data would be sent to the centre by the institutions and the coming data would be presented to the users after being turned into the required format.

As a consequence of the problems encountered, the project's section related to the data acquisition turned into data collection. This situation led to an additional cost arising from data collection activities. Various problems arose in attaining the desired results in integrating and updating data.

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For ideal GIS activities in Turkey, a board appointed by law and funded properly should be established and under its guidance, the following steps should be taken:

1- The country's geographical data infrastructure and standards should be prepared

2- Geographical data should be collected with joint efforts of public and private institutions

3- A geographical information system network that resembles a database should be set up

4- Geographical data exchange between institutions that offer public services should be conducted according to standards to be determined.

5- Institutions areas of responsibility are determined for data produced by different institutions

By this way, maps of scale 1/25.000, which are our country's basic topographic maps, will be prepared faster and in a more up-to-date manner.

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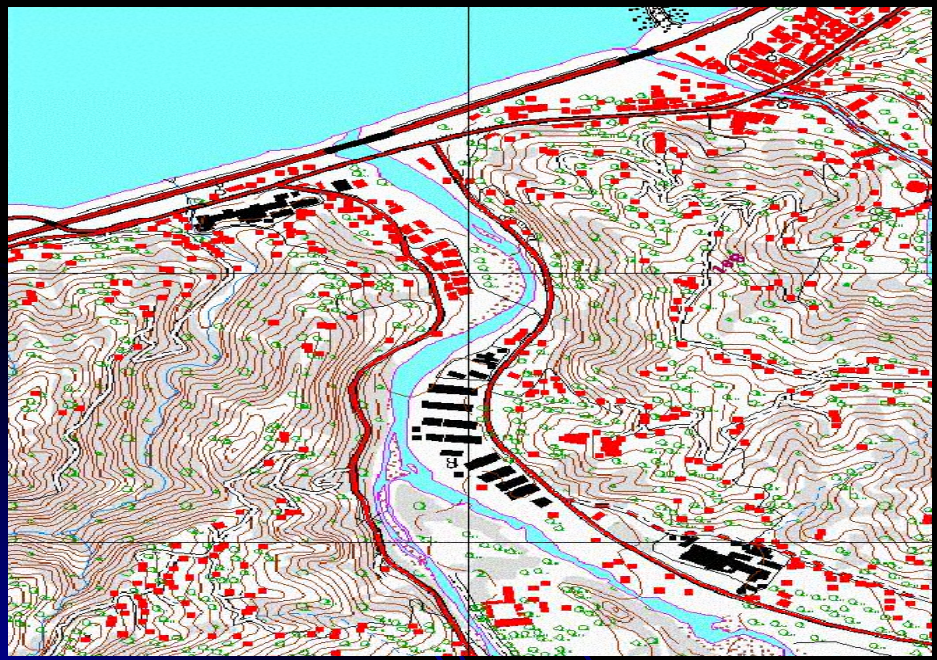
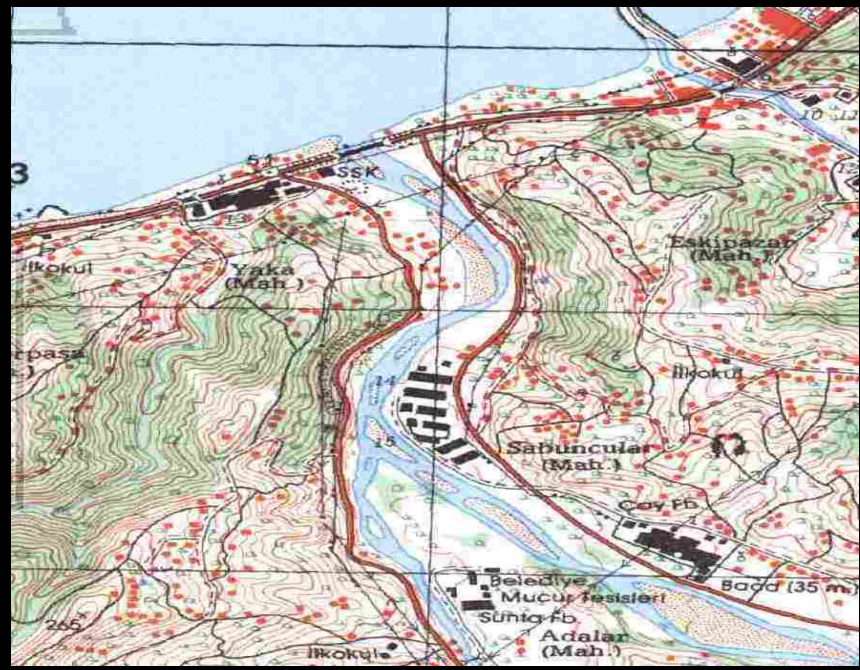
Despite all the difficulties experienced, it can be said that, as a result of dedicated efforts, information that is needed in Turkey has been put into digital systems to a great extent, inquired and processed using Geographical Information Systems technology and final products have been presented to the users, thereby setting the system going.

Section Before Integration



Section After Integration



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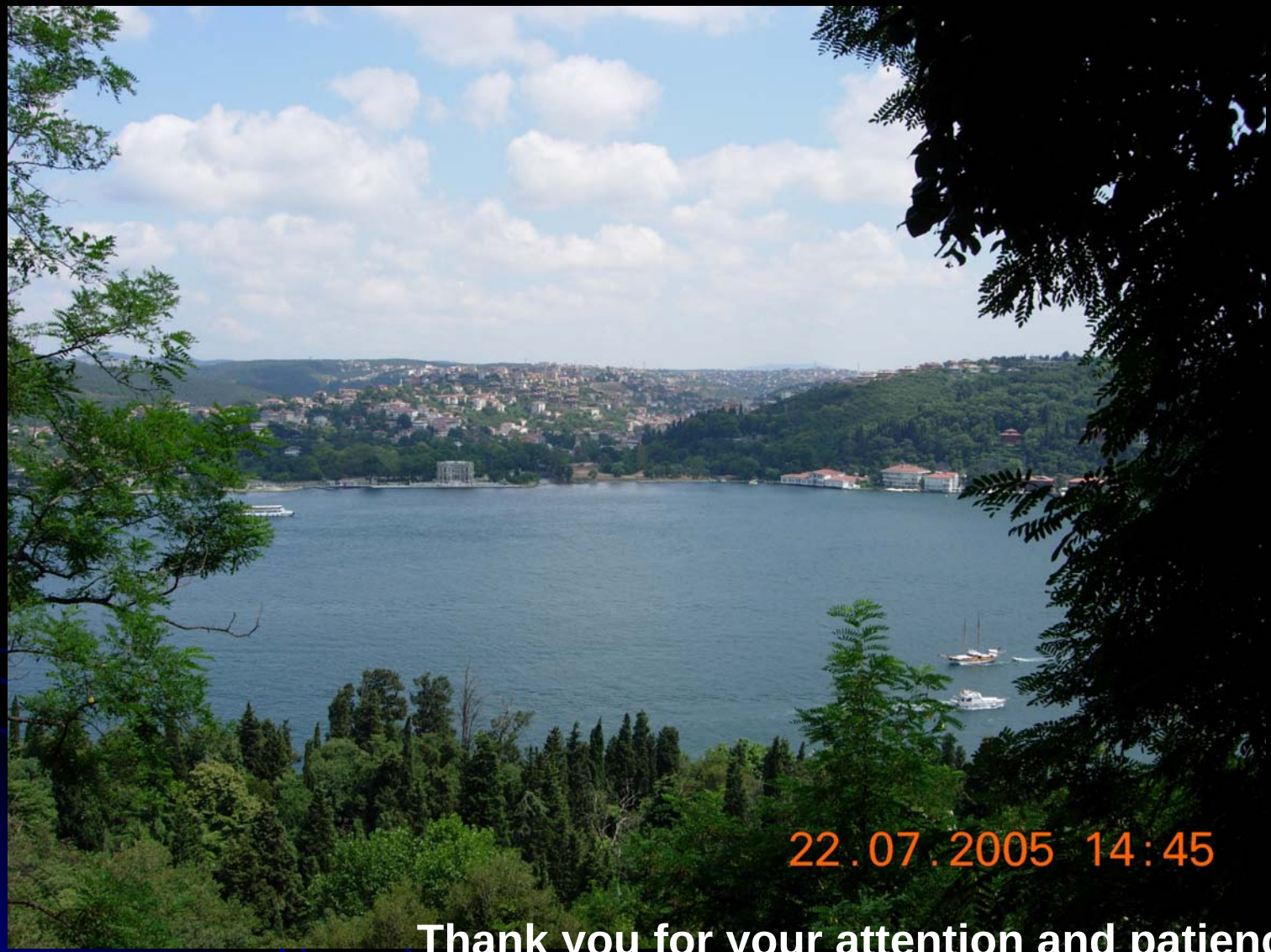

Thank you for your attention and patience.

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