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## **GIS FOR SCHOOL LIBRARIES EMERGENCY PLANNING**

Geographic Information Systems (GIS) are a means of providing great contributions to users in decision making processes based on location. It presents the information to the users serves and provides data collecting, storing, processing, managing, analyzing, querying. GIS ensures that a lot of data are layered on the architectural plans of school libraries. A data that is not well evaluated due to the data intensity in the analysis studies may prevent both the delay and the accuracy of the desired diagnosis for solution. For this reason, GIS technology is used in places where intensive data usage. GIS, which has been started to be used by different disciplines together with technological developments, enables the storage and processing of all kinds of data to be analyzed. It is a system consisting of necessary hardware and software and users for these processes. It is a tool that enables effective management of data. Complex data is easily analyzed by users in a database by GIS software. It is also concerned with the association of spatial data and non-graphical (verbal) data. GIS is able to compare measurement results successfully according to conventional measurement evaluation methods. There are also a number of projects where GIS has been implemented in interior areas. School libraries can also serve in many areas or more than one floor. The GIS layers must be shown on floor plans as emergency exit doors, location of emergency intervention tools (fire extinguisher, fire hose, hydrant, fire alarm buttons, electric panel, gas valve, first aid kit etc.), nearest emergency service centers (fire brigade, police, ambulance, etc.), evacuation routes leading to emergency assembly area, external, main and service ladders, building non structural materials. As there are many people in schools and school libraries as a number of users, in case of fire, their evacuation must also be fast. GIS will also provide effective planning for rapid evacuation of schools and school libraries. Digital data obtained from service providers such as municipalities, water, natural gas companies can also be used as separated GIS layers. All building elements in the building can be classified in different colors and typologies for each floor (Balcony, wall, threshold, hall, stairs, room, window,

shelves etc.). Emergency lighting kits should be installed in school libraries. Sensors, which are part of the fire alarm system, must also be located in the GIS layers. Furniture and furnishings used in the floors can also be shown on the GIS. Routes to be used by disabled users in emergency situations should be specified in these plans and physical arrangements such as ramps should be implemented. Area names in the school and in the school library should also be included in the GIS layers. The joint meetings should be held with the school library experts working in this field in the world, problems should be discussed, national and international networks should be established.

**Key words:** School Libraries Emergency Planning, GIS, Information Management

### **Introduction**

Geographic Information Systems (GIS) are a means of providing great contributions to users in decision making processes based on location.

It presents the information to the users

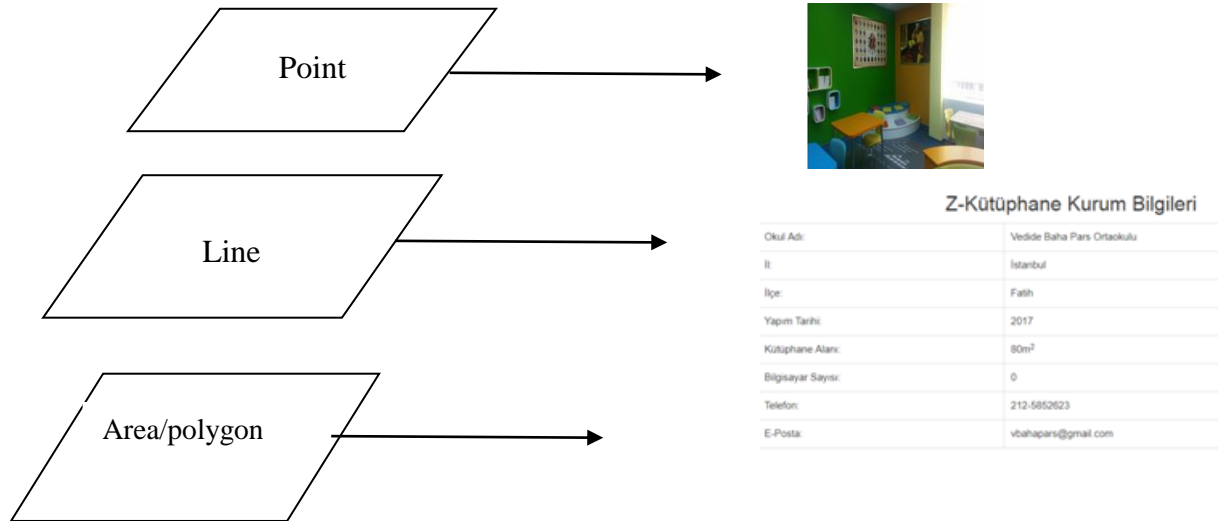
- provides data collecting,
- storing,
- processing,
- managing,
- analyzing,
- querying.

GIS ensures that a lot of data are layered on the architectural plans of school libraries. A data that is not well evaluated due to the data intensity in the analysis studies may prevent both the delay and the accuracy of the desired diagnosis for solution.

For this reason, GIS technology is used in places where intensive data usage. GIS, which has been started to be used by different disciplines together with technological developments, enables the storage and processing of all kinds of data to be analyzed. It is a system consisting of necessary hardware and software and users for these processes. It is a tool that enables effective management of data. Complex data is easily analyzed by users in a database by GIS software.

The most important feature is GIS enables spatial data and non-graphical (verbal) data relationship. In the world, the number of GIS used at university level is more than 100 fields.

In GIS applications, it is an important feature to allow multiple uses by keeping the data in a single place. Web-based GIS applications allow an unlimited number of users to share data at the same time.

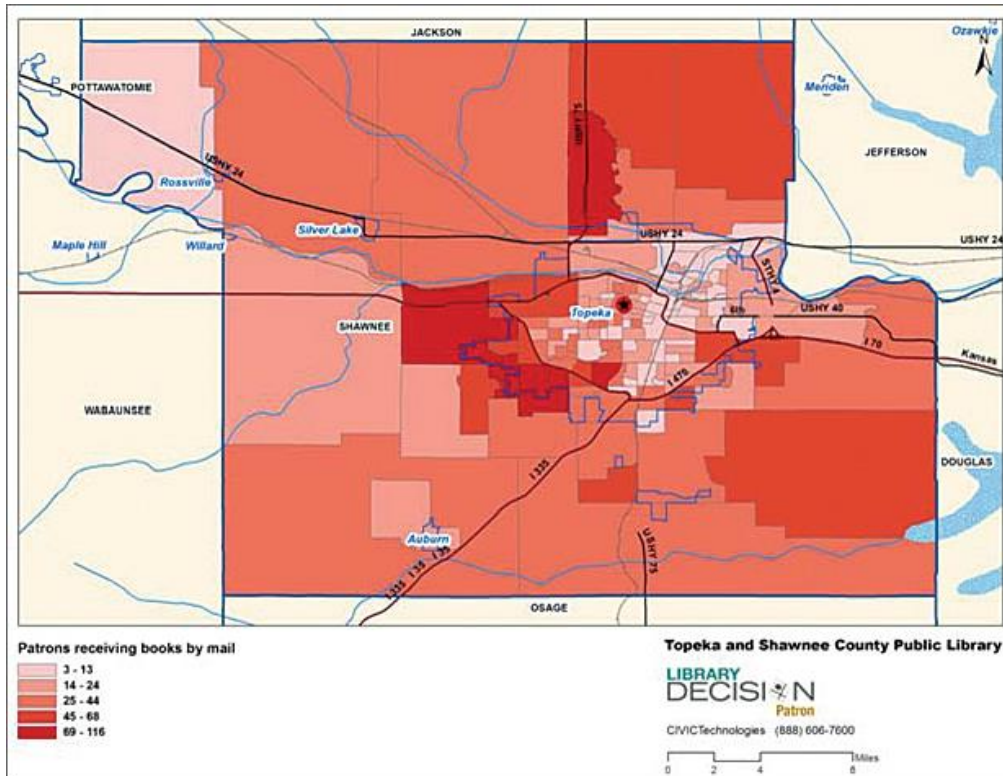


**Fig 1.** Spatial data (left), non-graphical (verbal) data (right)

GIS is able to compare measurement results successfully according to conventional measurement evaluation methods. There are also a number of projects where GIS has been implemented in interior areas. GIS is used to prepare maps for the locations and finding objects in archaeological sites. In the museums, it is used for the preparation of maps showing the settlement areas and the places of the collections.

Libraries, museums and schools use GIS to help students and visitors / users understand the connections between places, people, and events through a geographic approach to learning. GIS can also help these institutions manage their operations and facilities.

Topeka and Shawnee County Public Library (TSCPL) in Kansas (US), conduct an analysis of community and its library patrons. By utilizing GIS data analysis to correlate customer, circulation, materials, and programming attendance statistics with demographic and marketing segmentation data are defined (Baumann, J., 2008).



**Fig 2.** GIS analysis on patrons were using the library's services (Topeka and Shawnee County Public Library) [www.esri.com](http://www.esri.com)

### **Aim and Scope**

In the school libraries, students are able to manage technology tools to access information and to communicate what they have learned. Information literate students are flexible, able to adapt to change, and able to function both individually and in groups (IFLA, 2015, p.7). These library areas are open to many users at the same time. In case of a possible emergency, injuries and loss of life and collection losses are inevitable. For this reason, both the users and the personnel should know the area in terms of emergency.

The scope of the study consists of all users and staff who use these libraries. The aim of the study is to provide the all users and staff in the libraries to know these places very well and to take precautions in advance with the GIS Project.

### **Istanbul “Enriched Library” GIS Project Proposal (IEL GIS)**

The z-libraries, which contains basic books for students and information technology classes together located at the entrance level of the schools provide services to the students till 20.00

or 21.00 hours in the evening. School libraries can also serve in many areas or more than one floor.

Features of Enriched-Libraries are defined: Equal opportunity in access to information, Audio and electronic books, Modern and aesthetic design, Pedagogical adaptation, Portable shelves, Wood and fabric covered walls, Environment that stimulates reading pleasure; Enriched -Library Components are defined: Renovation and Infrastructure, Furniture, Computer, Printer, Book.

According to Turkey Republic National Education Ministry statistics, School Library Number in Turkey is 18 916, Enriched -Library Number is 1308 (Fig, 3). Istanbul has 39 districts. Number of Enriched -Libraries in Istanbul: 59 (Fig, 4).



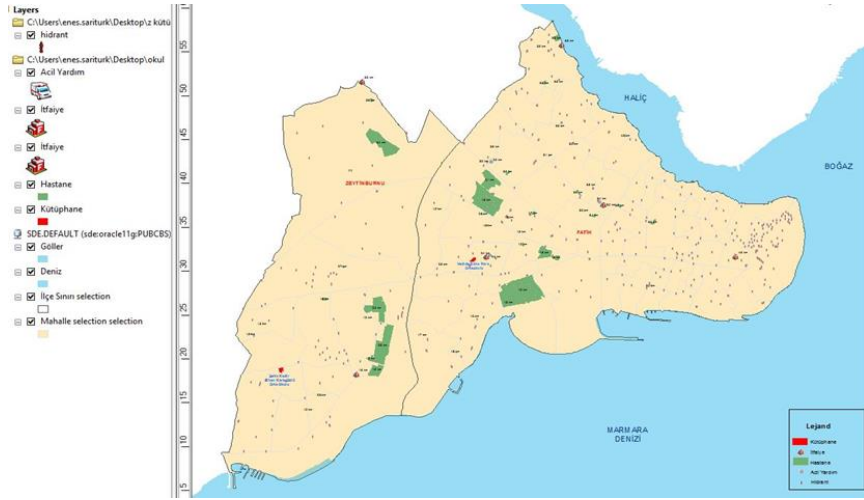
**Fig 3.** Number of Enriched -Library in Turkey

The schools where the study is conducted are given below:

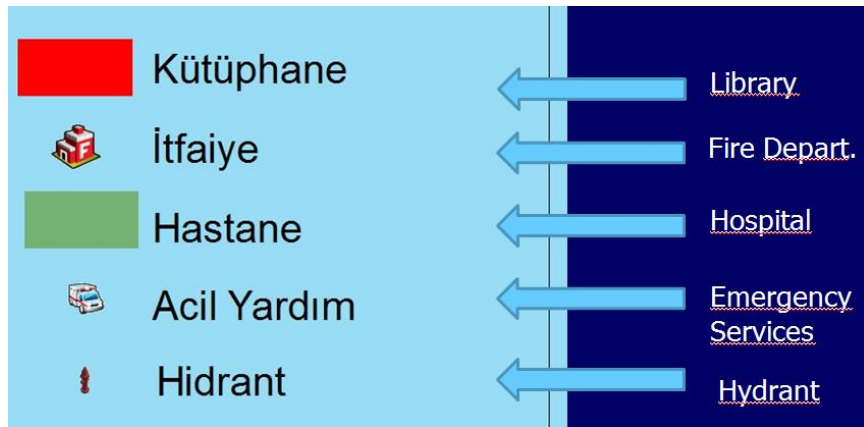
- Fatih Vedide Pars Secondary School (Date of Opening: 2017, Library Area: 80 m<sup>2</sup>)
- Zeytinburnu Şehit Kadir Cihan Karagozlu Secondary School (Date of Opening: 2017, Library Area: 75m<sup>2</sup>)

They have Enriched -Libraries in their school buildings.





**Fig 5. IEL-GIS Layers in ArcGIS**



**Fig 6. IEL-GIS Legend**



**Fig 7. IEL-GIS School Locations in Fatih and Zeytinburnu districts**

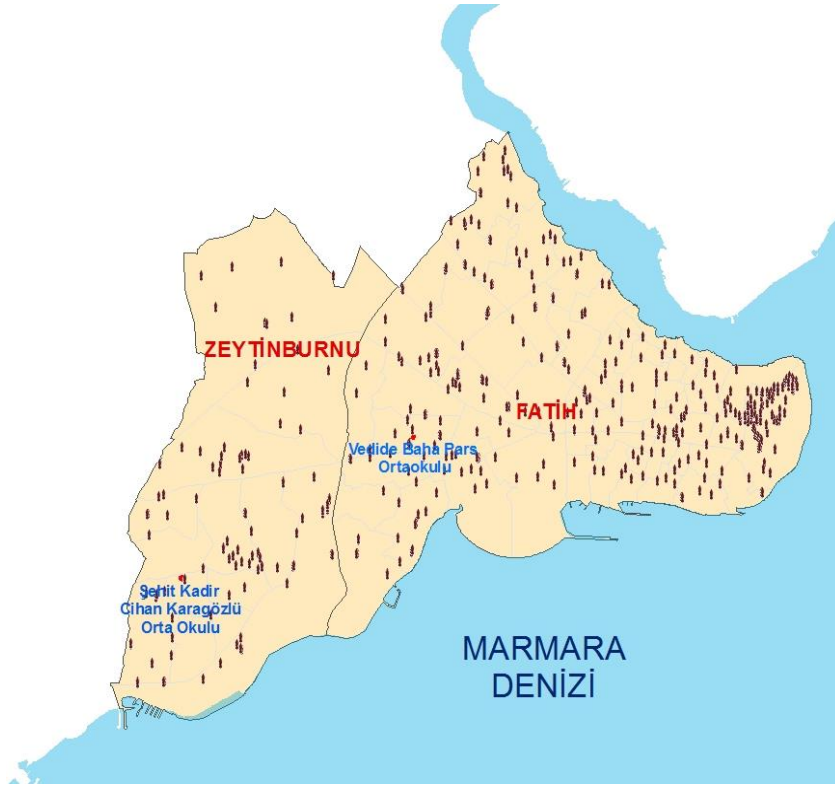


**Fig 8.** IEL-GIS hospital distances to the schools



**Fig 9.** IEL-GIS fire service distances to the schools





**Fig 10.** IEL-GIS hydrant locations

## **Results and discussion**

As there are many people in schools and school libraries as a number of users, in case of fire, their evacuation must also be fast. GIS will also provide effective planning for rapid evacuation of schools and school libraries. In the study, digital data obtained from service providers such as municipalities. and also data used by National Education Directorate of Istanbul GIS database.

All building elements in the building can be classified in different colors and typologies for each floor (Balcony, wall, threshold, hall, stairs, room, window, shelves etc.). However, emergency lighting kits should be installed in school libraries. Sensors, which are part of the fire alarm system, must also be located in the GIS layers. Furniture and furnishings used in the floors can also be shown on the GIS. Emergency escape routes to be used by disabled users in emergency situations should be specified in these plans and physical arrangements such as ramps should be implemented.

The study was carried out in the schools in Zeytinburnu and Fatih districts. It would be appropriate to use this pilot study in all z-libraries. all details in floor plans can be shown in GIS databases. Fatih Vedide Baha Pars Secondary School Layout Plan shows emergency exit doors, furniture and desks.



**Fig 11.** Fatih Vedide Baha Pars Secondary School Layout Plan

## Conclusion

GIS risk maps should be obtained and contribute school libraries emergency planning. The usage of GIS in all school libraries should be widespread. The necessary infrastructure should be provided to transfer the GIS data of the libraries within the Ministry of National Education schools to the digital environment. Therefore, schools should be equipped with the necessary software and equipment.

Employees (teachers, library staff etc.) of the institution should be informed about GIS technologies, and training should be given on the use of software and hardware. A database must be created to ensure that all employees have access to this information. The use of the system should be extended to the whole country.

The joint meetings should be held with the school library experts working in this field in the world, problems should be discussed, national and international networks should be established.

### **Acknowledgement**

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<http://www.esri.com/news/arcuser/0110/tapestry.html>

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### **Turkey Ministry of Education Enriched Library Web Site:**

<http://z-kutuphane.meb.gov.tr:8076/zharita.html>