

# **Data Production and Management Process as Spatial Strategic Plan Experience: Kadikoy Example**

**Burcu SARI, Nazim AKKOYUN and Tayfun KAYA, Turkey**

**Key words:** Spatial Strategic Plan, Participation, Geographic Information Systems, Large Data

## **SUMMARY**

The main aim is to share experiences related to currently ongoing spatial strategic planning studies including identification of data sources, data collection methods , correlation among data collected and establishing their relationship to the space; evaluation methods for analysis and synthesis together with the problems related.

Second aim is to discuss and analyse the risks and opportunities of Big Data as a new alternative to the inefficiencies of traditional methods of data collection and analysis of present cities.

Finally, the opportunities of Spatial Strategic Plan studies which are not among the responsibilities of district municipalities according to our country's planning hierarchy, will be discussed on the basis of Kadikoy Spatial Strategic Plan as an example that it allows to detect problems of the district, development trends, use of tools for social and economic analysis, in particular, use of potential resources for a sustainable and participatory decision-making process for creating a city vision.

The spatial strategic plan requires a continuous flow of data in order to be sustainable one. Thus, the criticism will be based not only on institutional transformation of spatial planning but also on how it can be used as a strategic tool for driving concrete data, transparency in data collecting and for continuous flow of data out of institutional transformation of it.

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## **1. METHOD**

The urban planning development system in Turkey is based on the bottom top hierarchy of urban plans at different scales co-existingly. The Planning Process according to Spatial Planning Regulations is constituted by making researchs, detecting problems, collecting data and analysing them, gathering and synthesizing informations, evaluating and finally developing planning decisions.

A scientific research technique is the base of this study in order to create a guide to identify the current situation, decision making process and potentials of the city that is changing rapidly. The scope of this study is needed to be defined primarily for the identification of the data source and how to obtain it. It has been investigated that what will be the scope of the study, main topics, subtitles, sources of data and how far to go into details. And the original data request form has been created to be sent to the relevant institutions for collecting data according to internal and external data source classification.

The second step is defined as establishing infrastructure for storing data to be collected, creating database architecture to establish the spatial relationship, updating and establishing backup mechanism.

Database used by the present geographical information system applications were converted to a format that data demanded can be added into and also can work on the various applications.

First of all, analysis and synthesis maps were prepared according to the Spatial Planning Regulations by obtaining data. Meanwhile, new technological improvements also led to increase and diversification of data sources. New analysis and synthesis maps are prepared by benefitting from opportunities created by "Big Data" where traditional analysis and synthesis tools are insufficient for certain topics. The planning decision making stage became the next stage depending on the report created according to Analysis and Synthesis studies. For the internal stakeholders, a workshop has been organized in to obtain a participatory decision making model. Structural decisions regarding the organization of the planning process were taken at the workshop, and accordingly, three key projects called MAK (Smart Spatial Kadikoy), EKIP(Integration, Participation, Collaboration, Planning) and Project Performance, which will ensure the sustainability of the planning process have been created.

MAK (Smart Spatial Kadikoy) includes collecting data on a scientific basis; EKIP (Integration, Participation, Collaboration, Planning) defines participatory planining process

and Project Performance is on the monitoring of the performance of the project implementation.

## **2. DEFINING THE SCOPE OF THE STUDY**

The decisions on spatial environment which directly affect daily life, can lead to interventions on environment that cost economically high. Local Authorities , because of the complex nature of cities today, are in need of a participatory organizational structure that is supported by accurate ,actual data and based on the information. In this case, the spatial decision making process requires a transparent and participatory approach. In line with this requirement, at the Kadıköy Municipality a task towards the preparation of the Spatial Strategic Plan have been identified depending on the Institutional Strategic Plan that has been made by a participatory model.

Preparation of Spatial Strategic Plan consist of the following steps: Identification of the process, the creation of data infrastructure, collection of data with traditional data collection tools, the use of innovative data collection and analysis methods, determination of trends and the current situation of the district; the creation of decision-making process ; production of strategic decisions and creation of a sustainable feedback mechanism.

The Strategic Spatial Planning has been introduced by Spatial Planning Regulations, in 2014 year. Although the practical planning takes place for the first time in legislation, Spatial Strategic Planning consists of plans with sectoral and thematic report layouts made at metropolitan and regional scale.

As the sectoral and thematic report layout issues, settlements and urbanization, transportation system, water, risk, infrastructure, urban economy and specializations by regions, development restricted areas, areas to be developed according to certain rules and regulations.

The content of the report covers vision and priorities, principles, objectives, scope, goals and strategies, sectoral and thematic resolutions, planning decisions and actions. Since the Spatial Strategic Plan refers to a metropolitan or for more than it, Spatial Plans Regulations will be inadequate in terms of understanding and developing urban planning objectives at district level.

Therefore, the data and data analysis are varied by using new technologies and techniques.

## **3. DATA TRANSFORMATION**

In the description made by the regulation on data and information resources, the titles determined by the Spatial Strategic Planning Scale indicate the data produced by the relevant institutions and organizations. On the other hand, today, data sources have diversified and expanded their boundaries. Within the scope of the Spatial Strategic Planning process, data collection process which consist of 4 steps is planned. First step is the editing of existing datas which produced in municipality's own constitution. Second step is collection of data with

traditional data collection methods. Third step is take advantage of innovative data collection methods and the last step is sythesis (production of new datas from existing datas) stage.

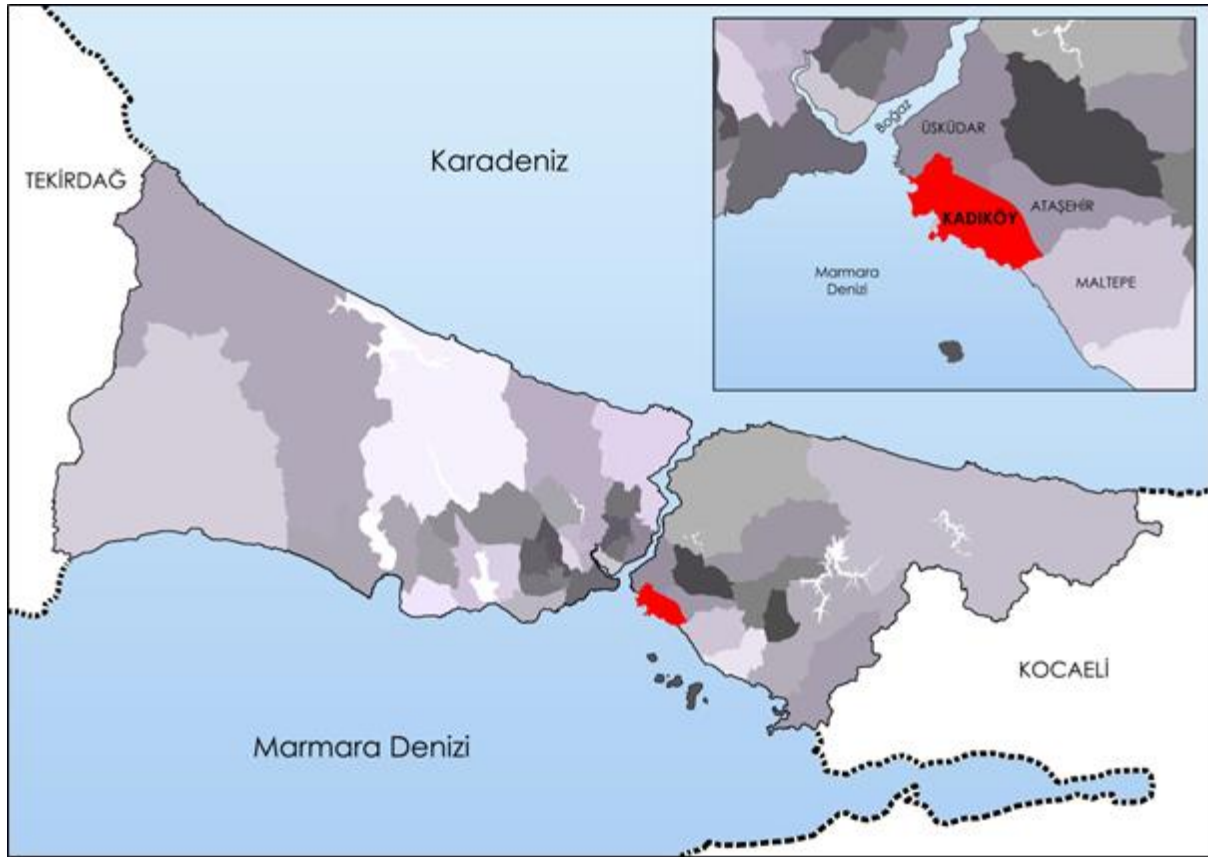
Urban Information System Office which is the coordinator of the work has been primarily carrying out studies to harmonize existing spatial data with national and international standards. Firstly the existing spatial datas are edited in accordance with the standarts for associating the datas which provided from central institutions via services with location. For example, when the project starts, the compatibility of verbal adress data in the National Adress Database and geometrical address data which located in database was found to be about 60%. The compliance rate has been increased to 97% as a result of a yearly effort to remedy this situation, which is also extremely problematic for the municipality in terms of its internal functioning.

When the data can be obtained from the institutions by the demand form, a small part of it provide the certain standards. Therefore, the obtained data was required to go through specific arrangements to standardize the databate architecture in accordance with national and international standards (INSPIRE).

After the standardized data is added to the database, the process of associating the verbal data with the location is performed. Spatial relationship of the data are generally made through SQL queries on the database. Thus, more than one data is associated wit each other and the continuity of the relationship is ensured.

#### **4. ANALYSIS AND SYNTHESIS**

The data obtained from the municipality and from other instittuions are analyzed under the nine topics and these are Location and Surroundings Relations, Historical Process, Natural Building and Environment, Demographical Structure, Socio - Economical Structure, Housing, Urban Services, Technical Infrastructure and Transportation constitutes headers. Location and Surroundings Relations constitutes the location of the district within İstanbul, its neighboring districts and relations with them, and transport connections. This introductory information related to the identification of the district gives a genearal information about the district.

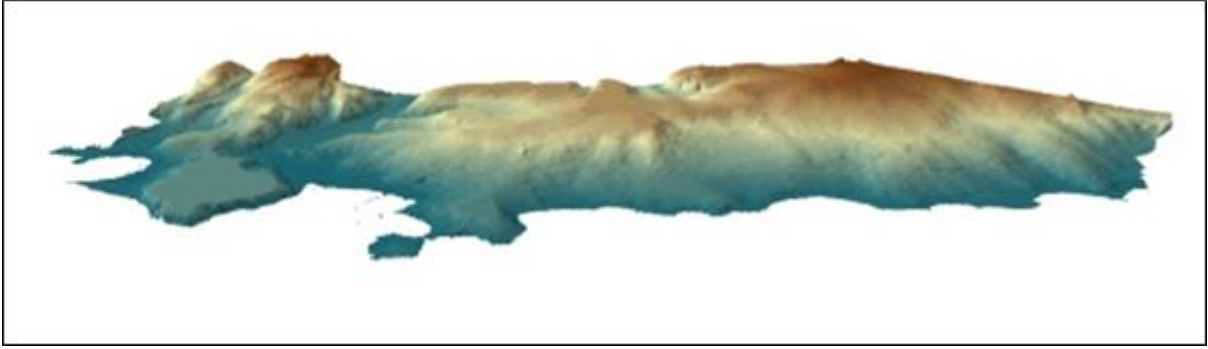


Map 1: Location of the Istanbul's Kadikoy district In the

An historical evaluation has been made in order to understand the present situation of the district. The old plans and their regulations are discussed in the Historical Process section in order to understand spatial transformation and the impact of planning on this transformation.

Natural building and environment, topography, slope, as well as standard analysis such as orientation, air corridors, river beds, natural protected areas, geological districts with the analysis of the areas that need to take precautions were unearthed natural and environmental potential and risks.

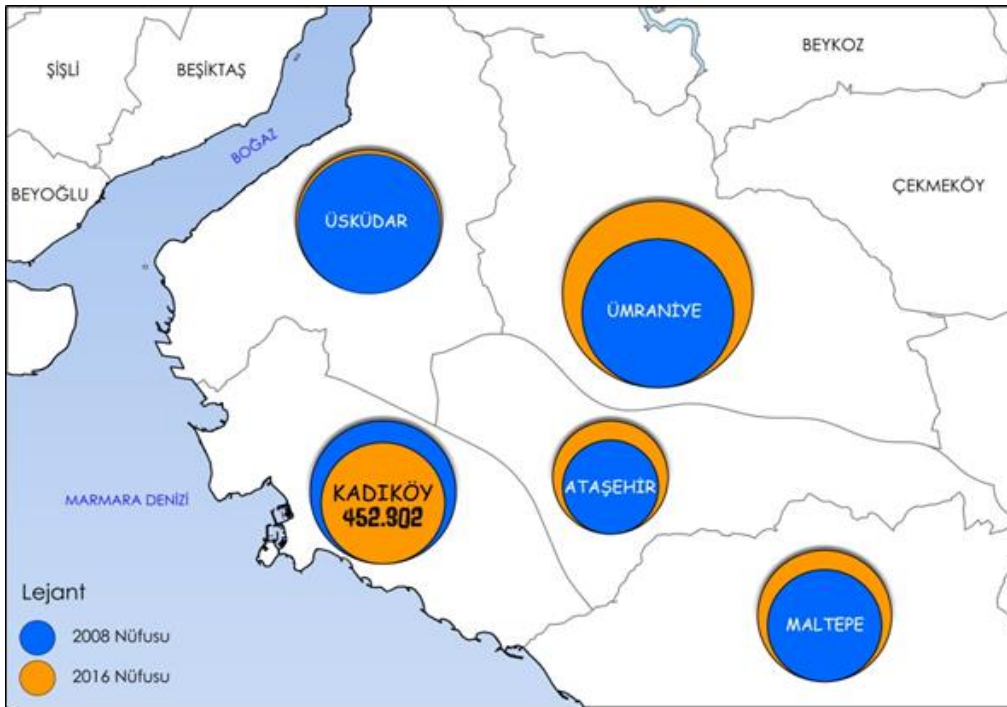
Also, climate indicators, environmental issues, topics such as energy efficiency which are obtained from the General Directorate of Meteorology are discussed in this section. Environmental Protection and Control Directorate Climate Action Plan prepared by the data in this section are also evaluated within the framework of the integration of the Spatial Plan of the Climate Action Plan.



Map 2: Kadıköy District of topographic structure of

The district's population and its demographic structure should be dealt with in a sensitive manner by the local governments within the framework of their responsibilities in Turkey..

Population data related to Kadıköy can be analyzed in point level by making relation with building and door geometry. Ministry of Interior General Directorate of Population and Citizenship Affairs downloaded with the web services provided by KPS population data associated with the address numbers data out of the door, so that could be reduced to an extremely precise level of data spatiality.

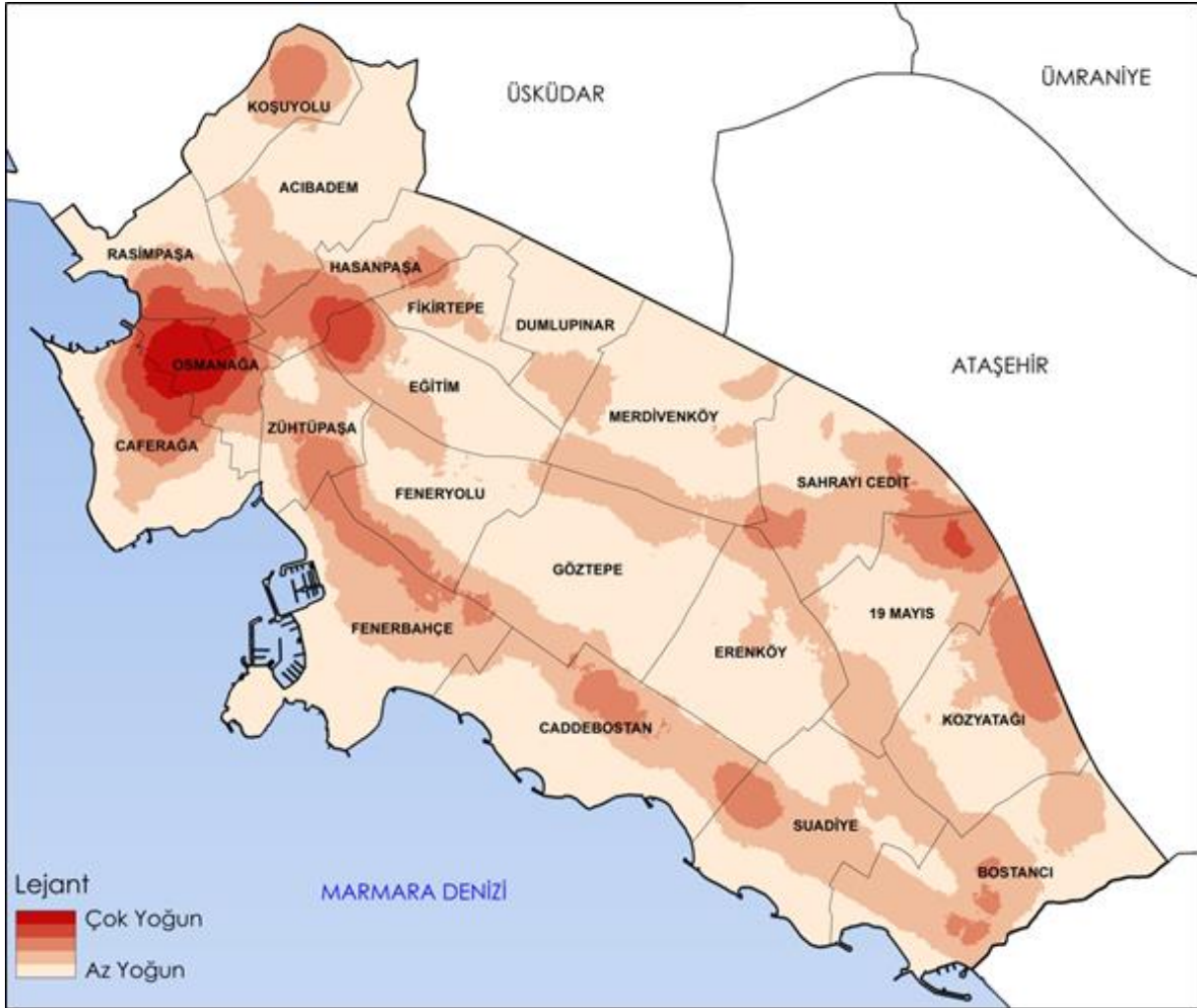


Map 3: Comparison of Kadikoy district and the neighboring district of Population (2008-2016)

Socio - Economical Structure is one of the titles that includes minimal accessible data on the economic structure of the district scale. By providing a registered place of business of the Istanbul Chamber of Commerce, neighborhood, street and door number established on the

spatial relationships, such that the economic activities in the district, according to the spatial analysis were put forward by industry and type of activity.

Street fair value of the data within the institution for the economic structure has been associated with street geometry. Thus the change in the district of the county's real estate value has been demonstrated in the streets of scale.

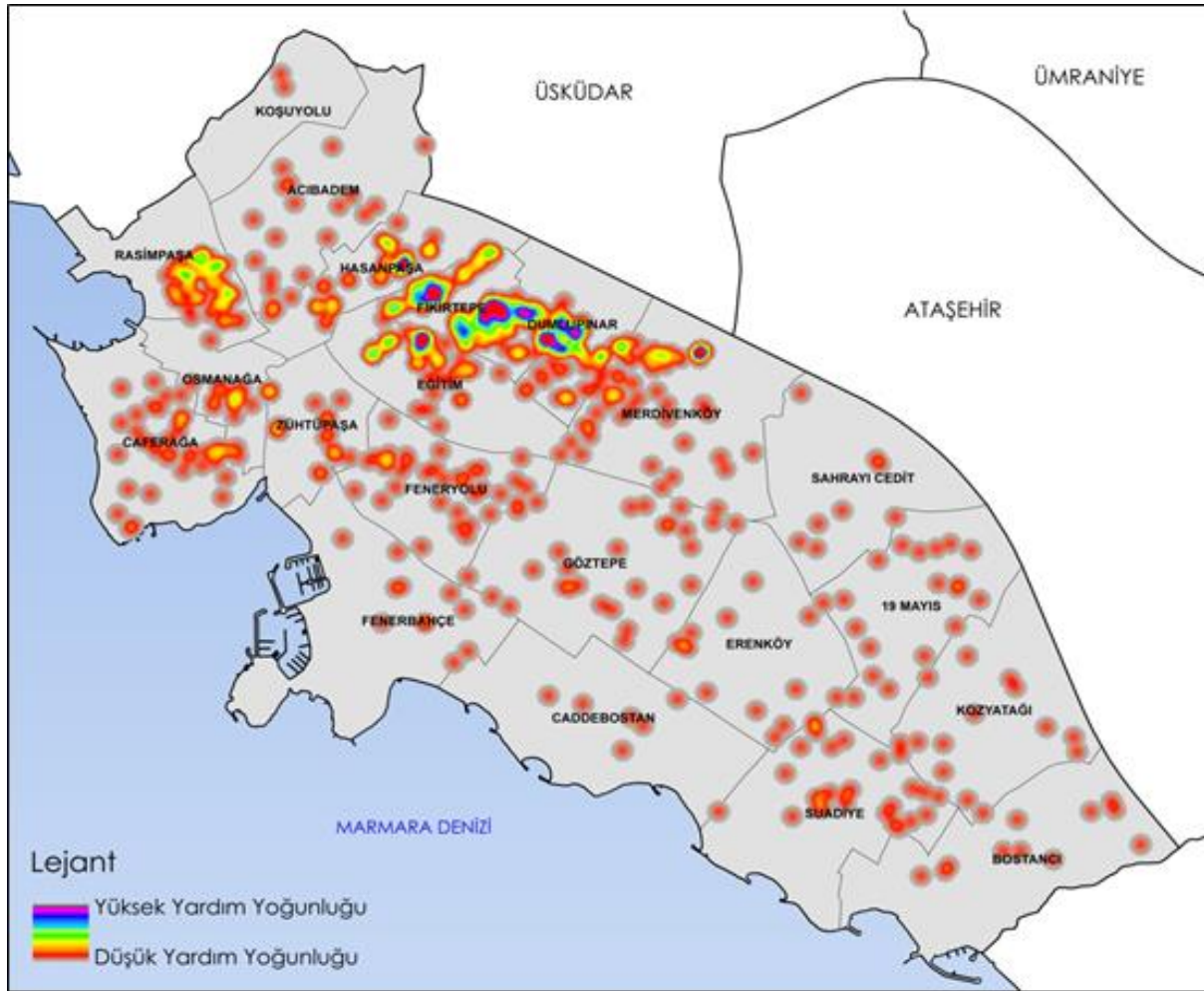


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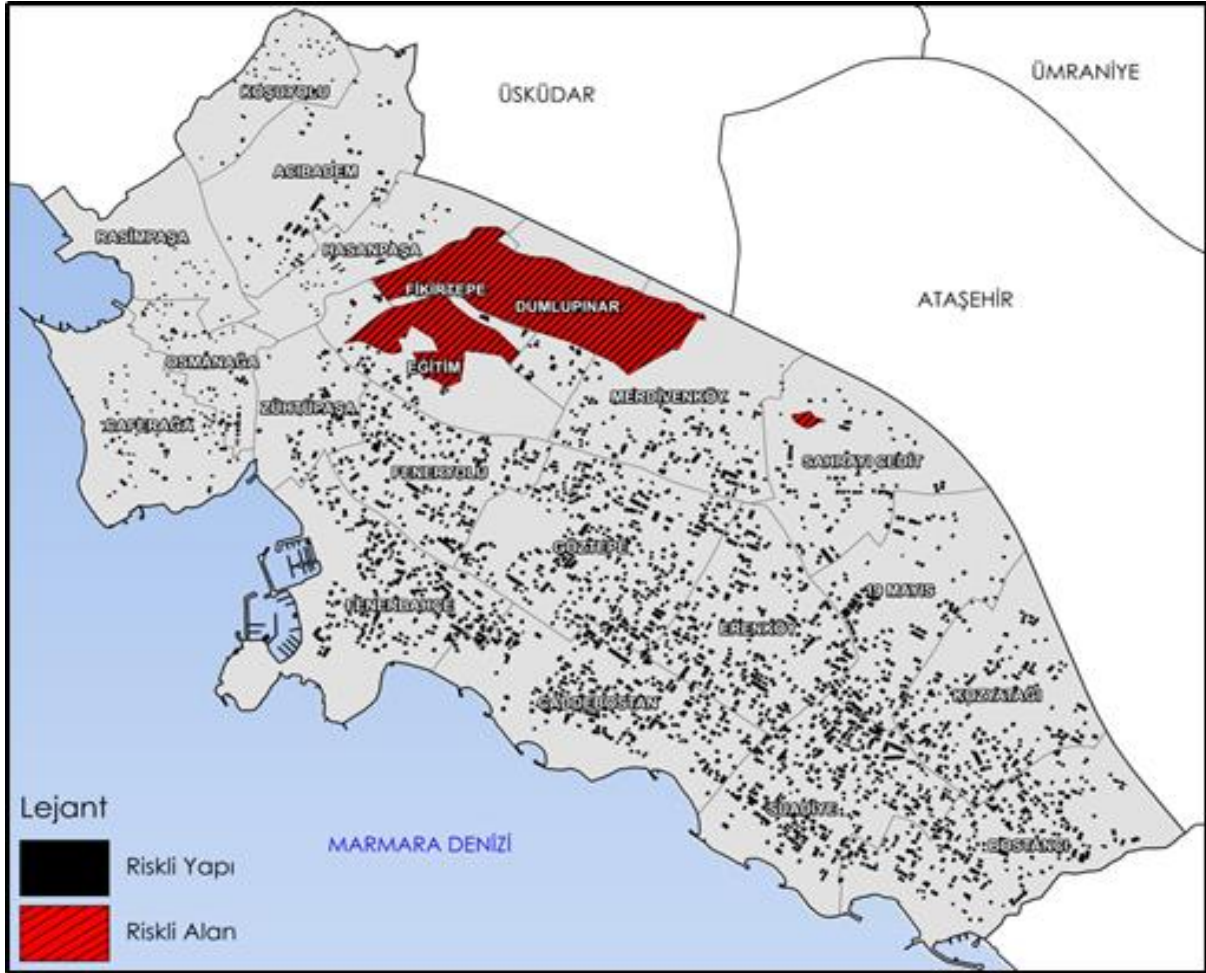


Map 5: Performed in Kadikoy district of Spatial Density Welfare

Collecting data on social structure at district level one of the more problematic data. Defined in relation to the organization by obtaining specific data on associations with civil society organizations are classified according to their field of activity. Kadikoy district is the district experiencing the most urban transformation applications depending on Transformation of Disaster Areas Law No. 6306 enacted in 2012.

New opportunities and challenges along the spatial period of rapid transformation has been brought in. The process can be run better by following the necessary precautions by accessing to current and accurate data. In this context, all in relation with the risk database structures and building parcel geometry it is reduced to the space.





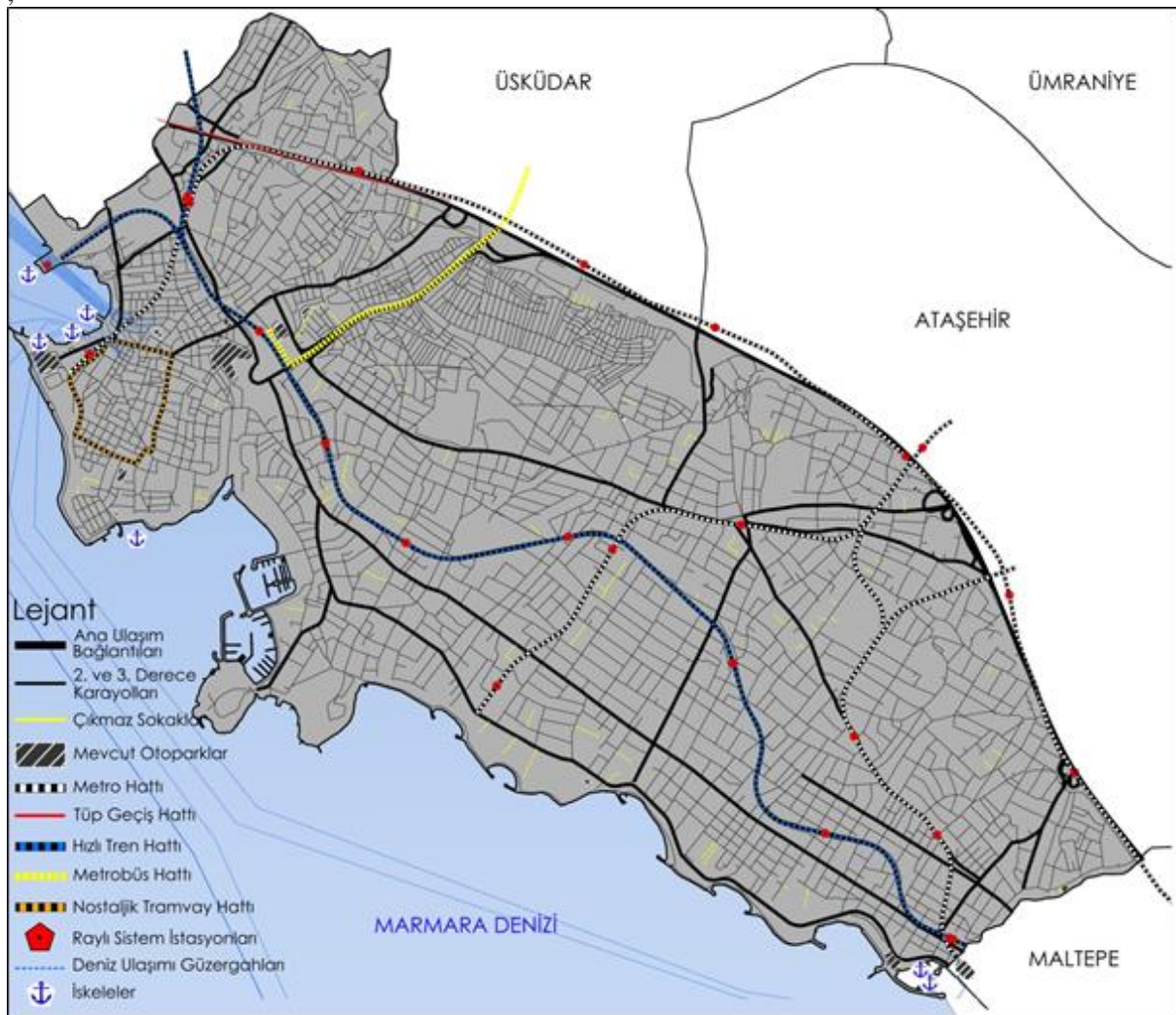
Map 6: Kadikoy district Structures Involved in Risk and High Risk Areas

Also, data on rental real estate and its sales and payback period of the investment were analyzed according to e- information declared by real estate sector. Data for urban services which are one of the main investment areas of local governments, were obtained from the Kadıköy Municipality and other public institutions.

Data collected on Health, Education and Culture and the Arts in Kadikoy Municipality area, public institutions, Istanbul Metropolitan Municipality and its private sectors were established on the spatial relationship database.

In terms of technical infrastructure facilities Kadikoy district with its central location exhibit an improved structure. Electricity, drinking water, waste water, rain water, and natural gas infrastructure has been transferred to the database by obtaining data from relevant institutions. Neighborhood geometry could be associated with amounts of consumption can be obtained while at the neighborhood level.

Transport stands out as the main problem of both Kadıköy and Istanbul. Kadikoy district is also one of the centers where there is an intense traffic and parking problems. On the other hand, public transport facilities are advanced compared to other parts of the city. Data for transportations are classified under the topics called highways, seaways, railways, cycling and walking, and all were transferred to the database.



Map 7: Urban Transformation System

## 5. MECHANISM OF PLANNING

Spatial Strategic Plan as a living planning process, it consists of three basic elements. These projects are Smart Spatial Kadikoy, EKIP and Project Performance. These three projects have emerged with the participation of relevant managers and employees on Spatial Strategic Plan

Workshop. There were three sub-group, spatial decision making directorates, directorates producing spatial projects and directorates affected by spatial decisions. By identifying the problems mentioned groups have sorted out the solutions to these problems and voting results of all participants has increased the recommended five projects forward. These five projects were combined then under three headings.

Smart Spatial Kadıköy involves transforming data into meaningful analysis by relating it to space. EKIP is considered as a mechanism of participation in which the spatial decision in the direction of the data obtained from the MAC can be taken jointly by the relevant stakeholders. Performance of the project is in line with kriti are determined by monitoring the performance of actual applications and the data obtained for assessing a project.

Spatial Smart Kadıköy is designed to provide a solution to the problem of quick and easy access to the up-to-date and accurate data within the organization, to establish a scientific basis for the Spatial Strategic Plan / spatial decisions and to pre-determine the probable effects of decisions made by central organizations on the city. Accordingly, it involves the establishment of a database where everyone can easily access the data and also a platform where one can display and query this data in a meaningful way. Within the Project, it is aimed to publish the collected data as annual reports involving significant and comparative analyses before it is transformed into a platform. Thereby, it is expected that the collection, standardization and interpretation methods of the data will reach a stable status.

The EKIP project is planned as a commission by which the related parties can participate in the evaluation and decision-making processes through the scientific platform produced by the Spatial Smart Kadıköy. The Commission Secretariat will be coordinated by the Directorates of Urban Design and Survey Project. Spatial decision making departments are the permanent members of the commission. Participation of the other directorates, different public organizations, professional associations, NGOs and citizens will be enabled by invitation of the commission secretariat according to their relevancy. Commission agenda will be distributed to the participants in advance, and the data on the agenda will be acquired in report format from Spatial Smart Kadıköy. Commission decisions will be communicated to the relevant directorates, organizations and persons and will be made available to the public through a platform.

By means of Project Performance, the data to be collected on the efficiency, environmental impact and citizen satisfaction of the project/implementations based on the decisions will be evaluated according to the pre-determined criteria. This data and evaluations will be directed to the Spatial Smart Kadıköy and once again reintegrated to the Planning Process.

## **6. CONCLUSION**

Spatial Strategic Planning process as being the first in Turkey at district scale is expected to strengthen the relationship between data and planning. Hence, it is considered that demand for the data will be kept alive and compliance with standards and analysis methods will be

increased and diversified, while a stable data structure will be reached over time. Moreover, data sharing culture will eventually be improved through regular data demands at regular intervals.

The transformation of the Spatial Strategic Plan into a living process through data flows as well as updates and evaluations in light of this data is foreseen another important outcome. Ensuring quick access to accurate and up-to-date data will improve the legitimacy and efficiency of the spatial decisions and investments.

Spatial Strategic Planning tool will contribute to the elimination of the internal communication problems and to the improvement of the joint decision-making culture since it can work on the collective decision making process. The process is aimed to be transformed into the one ensuring continuous participation rather than providing limited participation mechanisms.

Replacing the existing planning tools which are inadequate in understanding and directing the current complex structure of the cities and which also have long-term restrictions, Spatial Strategic Plan is expected to be institutionalized as the new planning tool and to become best practice for other areas of the district.

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INSPIRE Directive, <https://inspire.ec.europa.eu>

## BIOGRAPHICAL NOTES

**Burcu Sari Basman** graduated from Urban and Regional Planning Program in Yildiz Technical University in 2012. After graduation, she worked as a urban planner in the private sector for 5 years. She is currently a graduate student at the same university in the Urban Design and Environment Organization Master Degree Program and working as a urban planner at Directorate of Plan and Project in Kadikoy Municipality since June, 2017.

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**Tayfun Kaya** graduated from the Department of Geomatic Engineering in Ondokuz Mayıs University in 2014. He completed his graduation project entitled "Examination of the fires in

Samsun in GIS and Generating Fire Risk Mapping". Previously, he worked as a Real Estate Appraisal Expert and Real Estate Appraisal Assistant Expert for one year. He has been working as a Geomatic Engineer in Office of Urban Information System Office Directorate of Plan and Project in Kadıköy Municipality, where he started to work in 2016.

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