

ATHENS
WORKSHOP



Workshop Joint FIG Commissions 3 and 8
Athens – 13th and 14th December 2022



How Surveyors Can Contribute to Project Management Systems for the Resilient City Public Projects, Case of Istanbul

Cemal Özgür Kivılcım, Ph.D.

Chief Engineer, Istanbul Metropolitan Municipality,
Institutional Project Management Directorate
Chair, FIG Com 3 WG 6 Geospatial Next

Content

- A. Terminology
- B. Example Works from Istanbul Municipality
- C. Perspectives on the role of surveyors (Geomatics Engineering)
- D. Outlook

Terminology

How Surveyors Can Contribute to Project Management Systems for the Resilient City Public Projects, Case of Istanbul

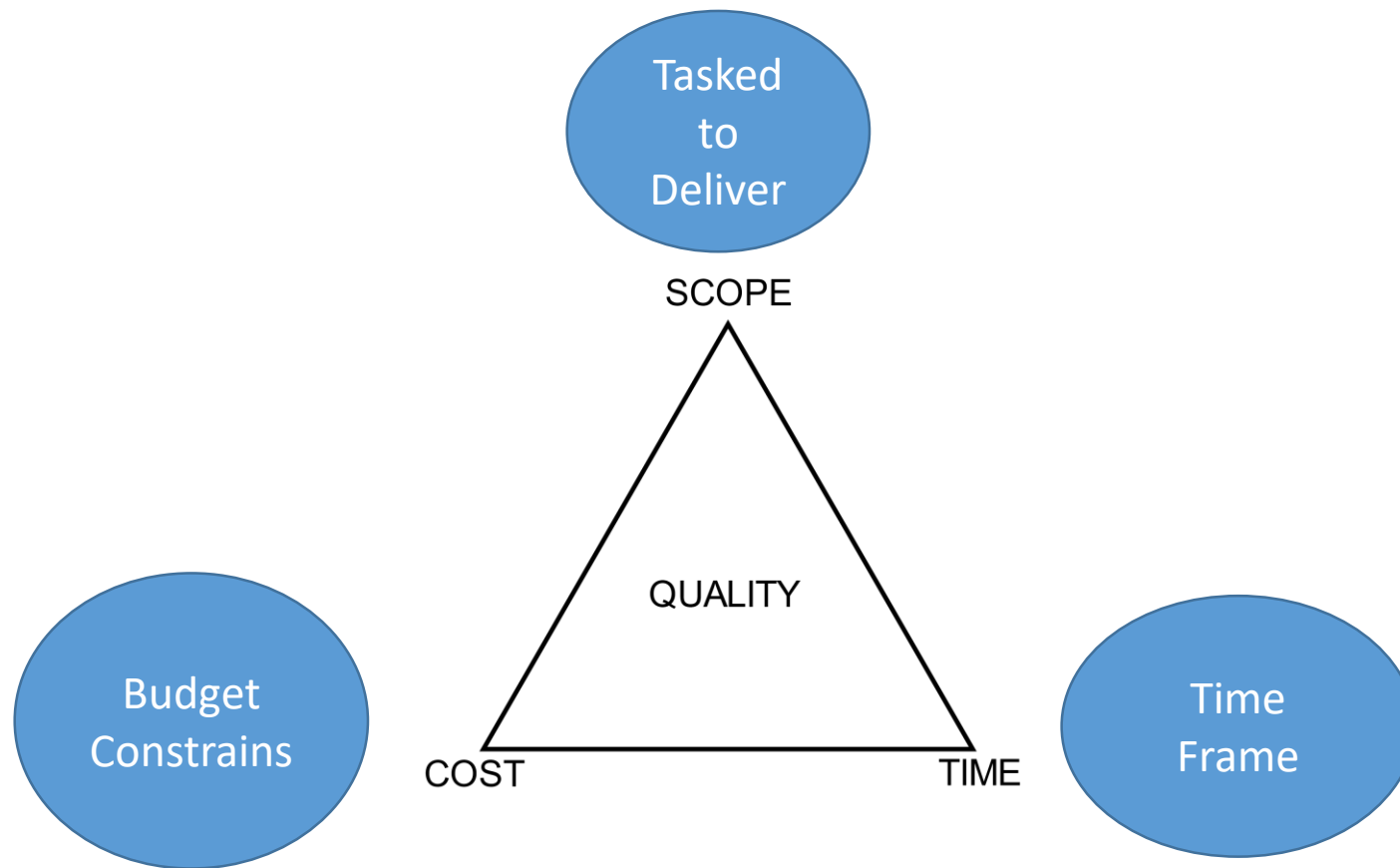


Project Management Systems



- Entire system of processes and principles for completing a project. It can be considered as a ecosystem for one or a group of projects with procedures, workflows, teams, tools and so on.
- From IT perspective teams use project management for technological solutions and platforms to plan, organize and manage complex projects.
- Project management can be performed using general software applications such as spreadsheets and email applications, or specific project management applications.

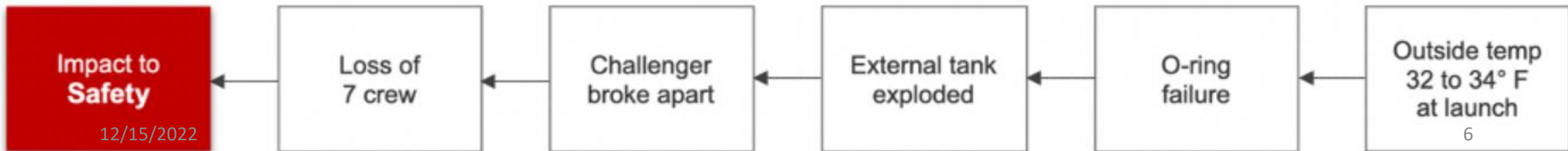
Meet the Project Management Triangle



An Example of Bad Practices of Project Management



- Challenger Shuttle Disaster T+73'
- The immediate cause of the Challenger disaster was the **failure of two rubber O-rings to seal a joint between the two lower segments of the right-hand solid rocket booster.**
- This failure was due to severe cold, and it opened a path for hot exhaust gas to escape from inside the booster during the shuttle's ascent.



An Example of Bad Practices of Project Management

- It was determined that a bolt in the system that keeps the gas closed during the test phases is deformed at low temperatures.
- Although this situation was noted by NASA Engineers, it was not taken into account in NASA management due to the lack of coordination between the vacancies in the risk classification management system and the authorities that manage the storm calendar within the organization.
- Delayed flights were brought up by the media and pressure was put on NASA employees.
- And the risk identified by the contractor firm officials was evaluated as low.

An Example of Bad Practices of Project Management

- In the most recent feasibility report in 1972, extensive financial expenditure tables were predicted to be only one 20th of the actual load for every half kilogram of cargo to be brought on board.
- Wanting to protect their permits in the space race, NASA changes its designs due to financial and political pressures:
- Solid fuel propellants, which are difficult to control, are used instead of the controllable liquid fuel tank.
- Shuttle dimensions are reduced.
- Air-burning engines and the emergency evacuation system was removed.
- Thus, while the load (cost) is reduced, the stability of the system is not preserved.

An Example of Bad Practices of Project Management

- NASA enters the tender process for the rocket system and shuttle manufacturing, and the companies that submit the cheapest bid become the contractors.
- So much so that the firm that will produce the solid fuel tank bids 100 million USD lower than the closest competitor.



Expectations from Typical PM Systems

- Creating estimates for activities
- Creating, updating, and reporting schedules
- Tracking costs and budgets
- Allocating resources
- Recording and managing risks
- Controlling project changes
- Sharing project information and updates
- The project management systems has a tendency to store a digital twin!



Fundamental Benefits of Project Management Systems

- **Improved clarity:** Clear processes and centralized communication mean less confusion about project goals and how you'll get there.
- **Increased accountability:** Similarly, a project management system gives team members better visibility into how they fit within the overall project, which increases their sense of ownership over their assigned tasks.
- **Better collaboration:** When people understand what they're working toward and what they're responsible for, they can work together with less friction and frustration.
- **Repeated success:** A system is a framework that can be used over and over again, which means it doesn't just help one project succeed — it helps all projects succeed.
- Projects on time and in budget.

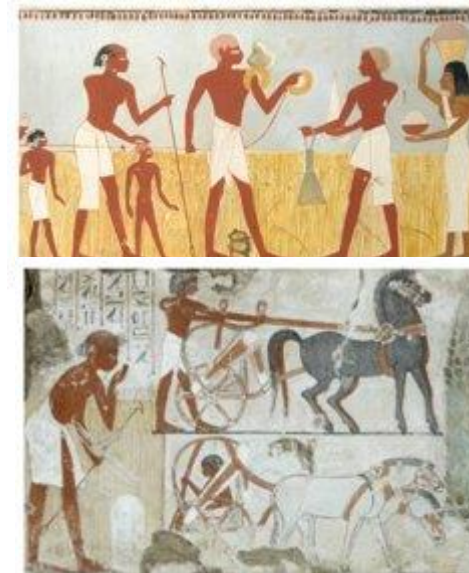
Surveyors always (must) consider project planning for their initial works



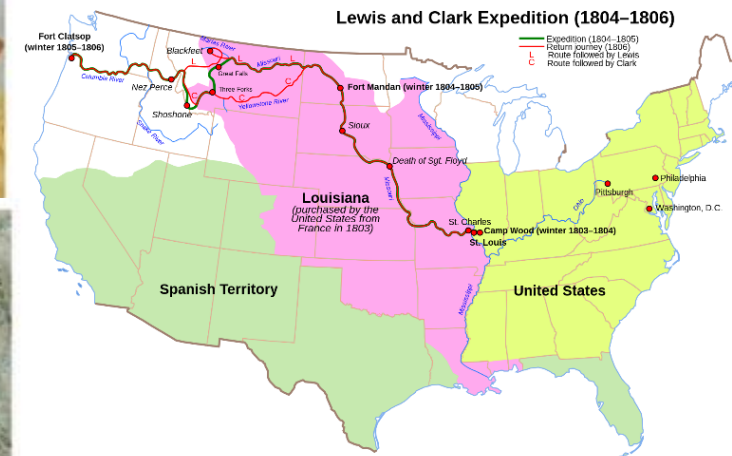
10th millennium B.C.,
Göbeklitepe



3,700-year-old cadastral
survey, Babylon
Image: Dr. Daniel Mansfield

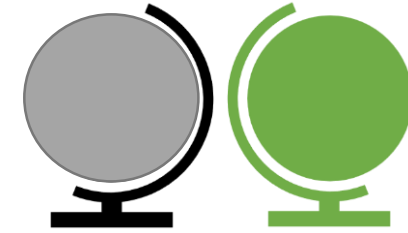


Surveying in Ancient
Egypt c. 1375 BC



Lewis and Clark
Expedition (1804-1806)

Resilient Cities



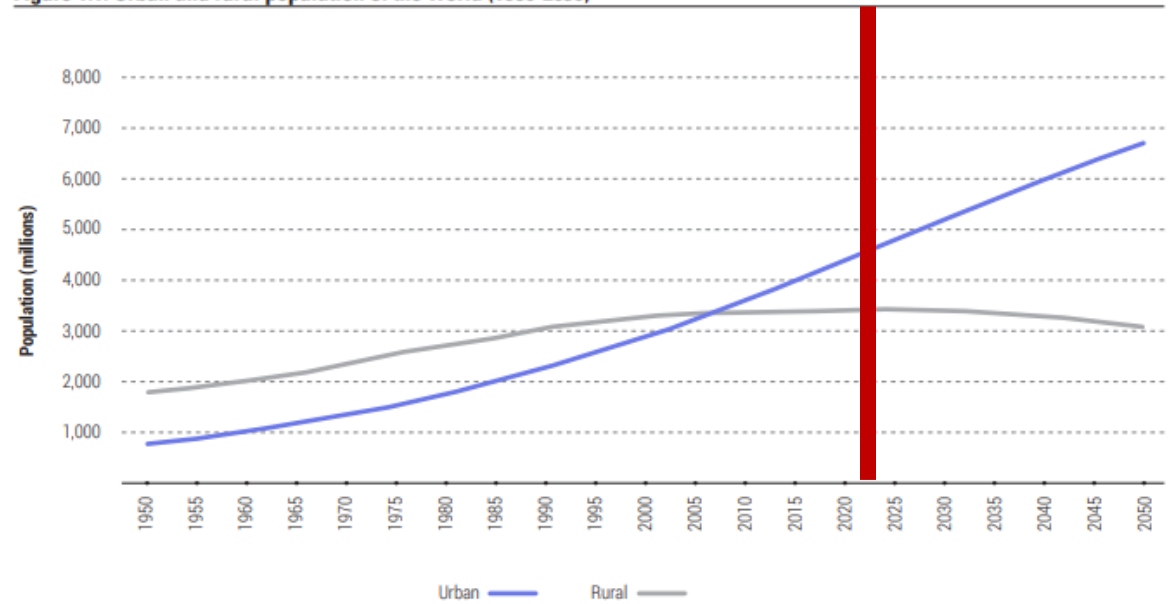
56% of the world's population – 4.4 billion inhabitants – live in cities.

The WorldBank Group

Urban resilience – “the ability of city dwellers to withstand **economic, social, health, environmental, disaster and climate related risks.**” (UN)

2.5 billion more people will be living in cities by 2050.

Figure 1.1: Urban and rural population of the world (1950-2030)

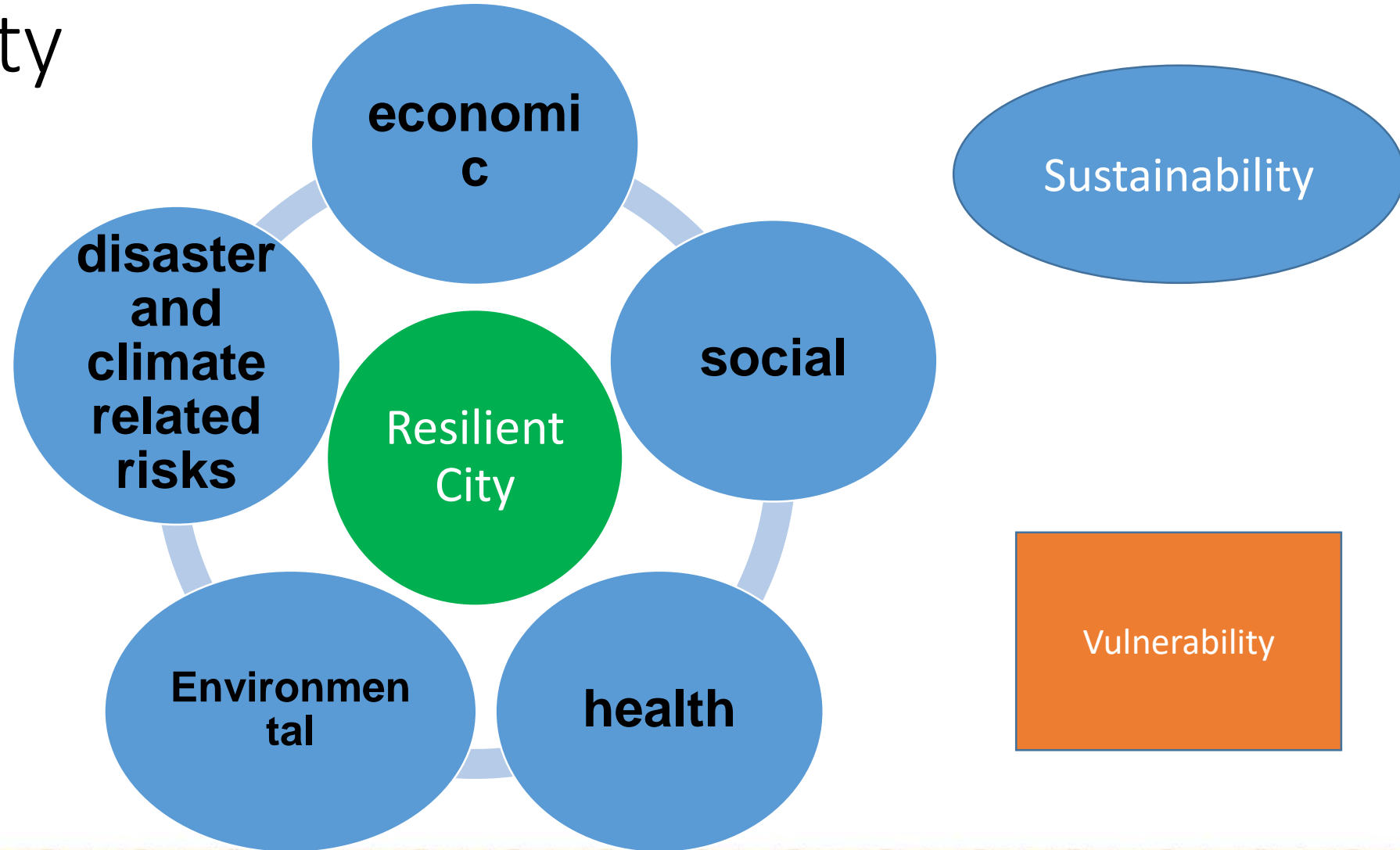


Source: UNDESA, 2019b.

A Resilient City

Key Themes

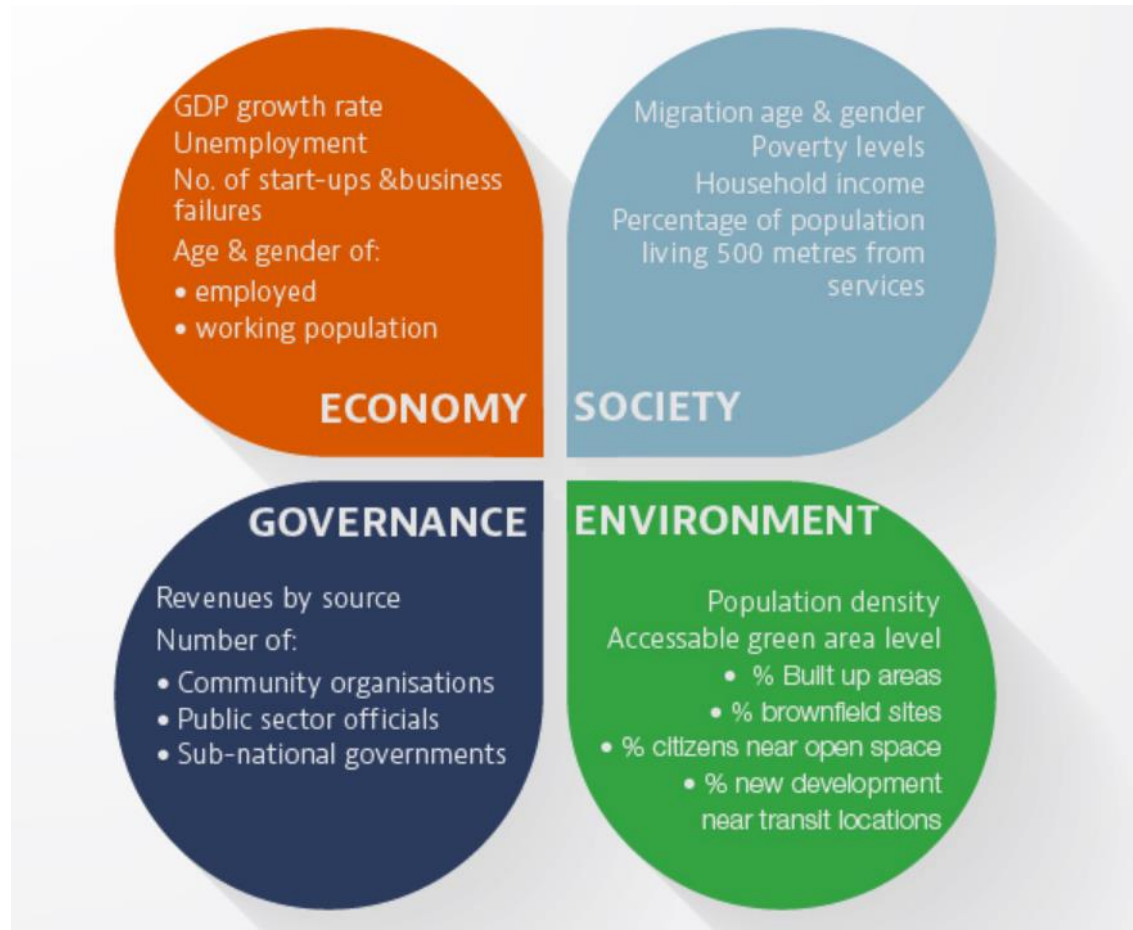
- Urban Poverty & Inequality
- Urban Economies
- Climate Change & Cities
- Urban Planning
- Urban Health
- Urban Governance
- Innovation & Technology



Initiatives for Measuring City Resilience

Sustainability

Vulnerability



Case studies (OECD)

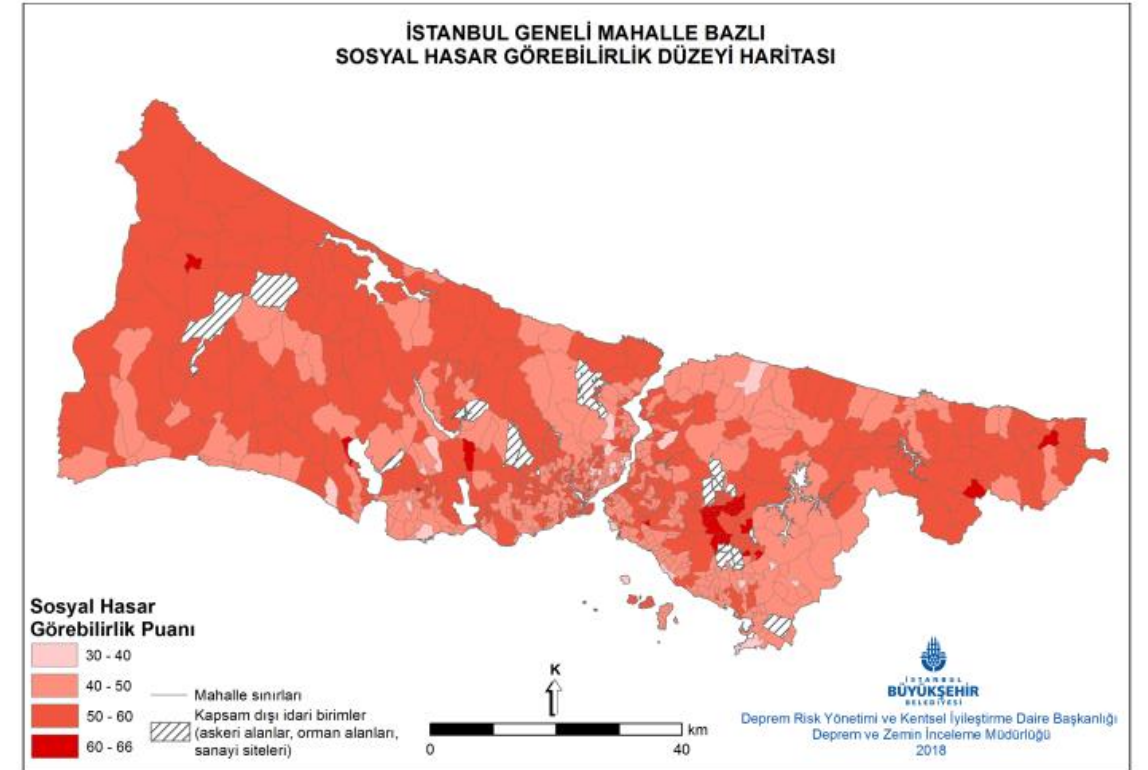
- [Antalya \(Turkey\)](#)
- [Belo Horizonte \(Brazil\)](#)
- [Bursa \(Turkey\)](#)
- [Cardiff \(UK\)](#)
- [Kobe \(Japan\)](#)
- [Kyoto \(Japan\)](#)
- [Lisbon \(Portugal\)](#)
- [Oslo \(Norway\)](#)
- [Ottawa \(Canada\)](#)
- [Tampere \(Finland\)](#)

Source: OECD

An Example: Survey Study For Analysis Of Social Vulnerability Against Disasters In Istanbul -2018

SOCIAL VULNERABILITY: Both the appearance of the negative effects of disasters, as well as the capacity to resist and cope with these effects, shaped by the pre-disaster conditions of a person or the environment.

The total survey number of people living in 41,093 households is 139,688.



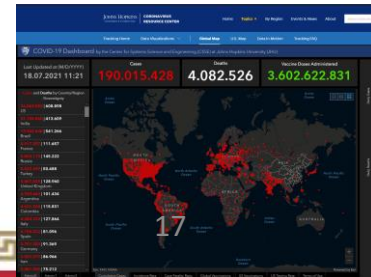
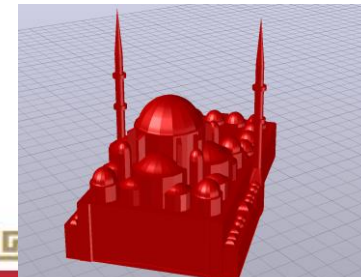
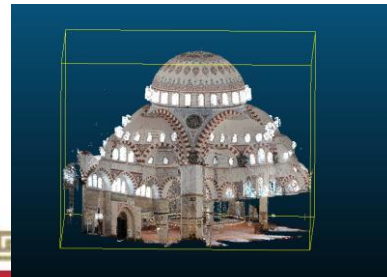
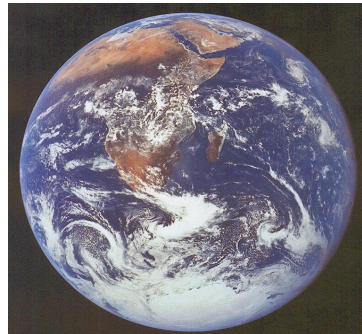
EARTHQUAKE RISK MANAGEMENT AND URBAN
IMPROVEMENT DEPARTMENT EARTHQUAKE
AND GROUND INVESTIGATION DIRECTORATE

Surveyors and Geo-information

Surveyors are geospatial information producers.

We use various techniques, collaborate with other disciplines and tailor solutions to the needs for better decision making and management.

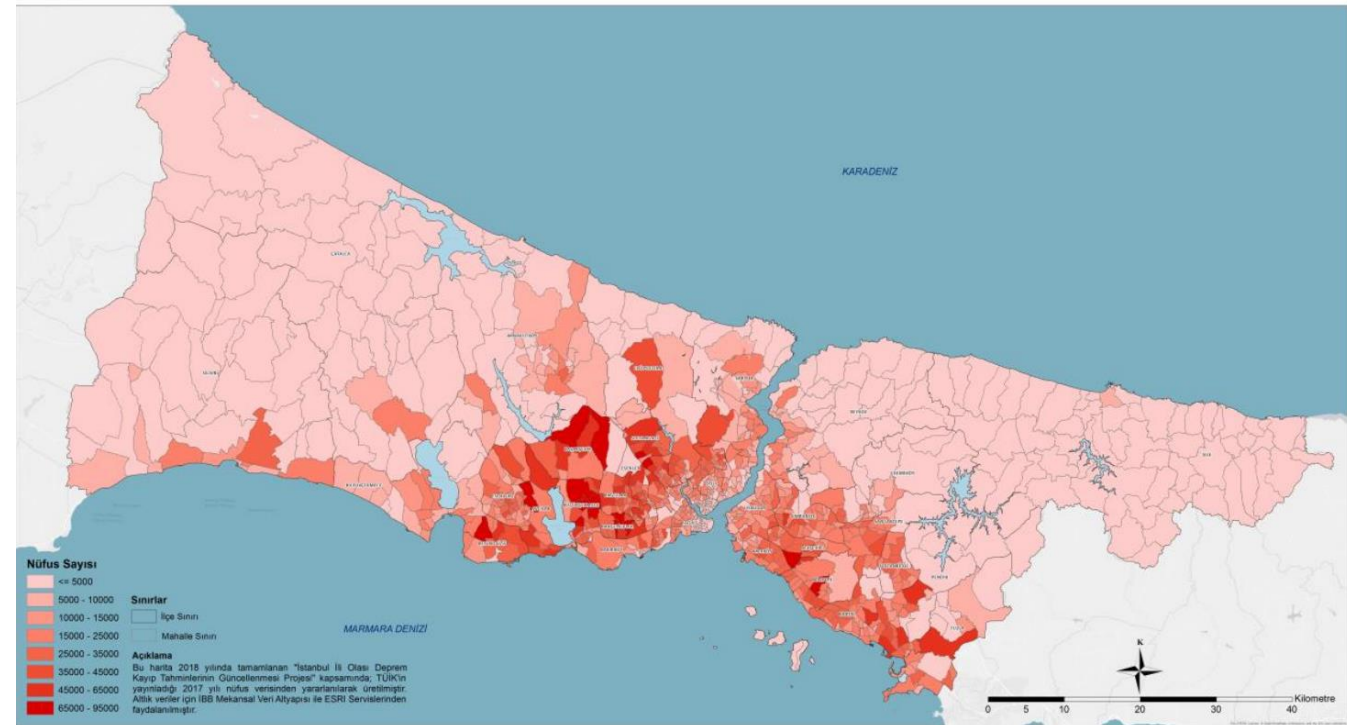
Where does surveyors stand and how we can surveyors make more/better contributions for a better future?



Greetings from İstanbul



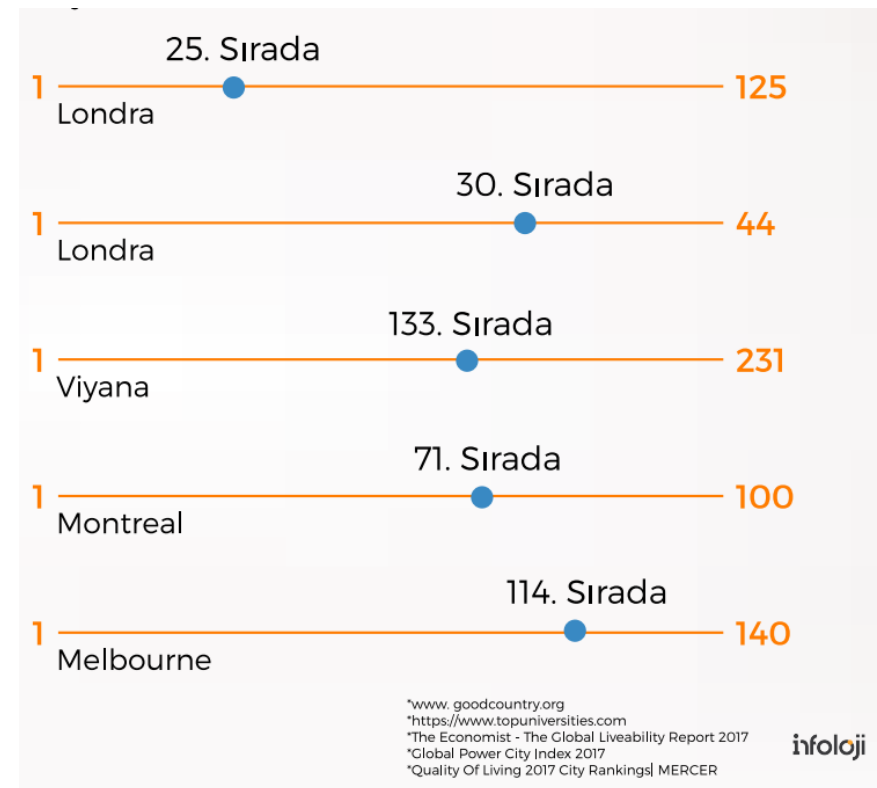
Terra/MODIS acquired June 10, 2001



Istanbul is 16M+ inhabitants
Inhabited for the past 8500 years

Istanbul's Index Scoreboard - 2017

- Global City Index
- Global Power Index
- Life Quality List
- Best Student Friendly Cities List
- Global Livability Index



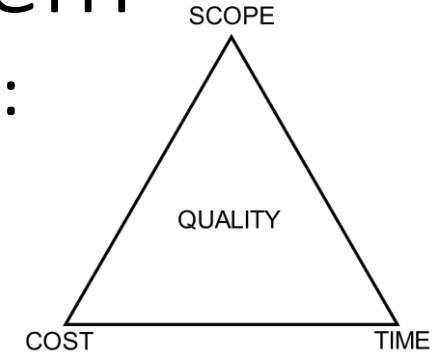
How Different Geospatial Components of Project Management Ecosystem Work for Public Projects Case of Istanbul

- Institutional Project Management for Public Projects
- Geospatial Services for Public Usage
- Geospatial Data/Information for Public Projects
- Feasibility Assessment using Web-GIS
- Smart City Operations
- Participatory Actions



Institutional Project Management System

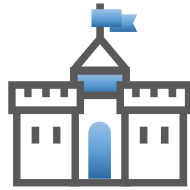
Is established in 2017 with the following aim and mission:



- To analyze the expectations and needs of inhabitants,
- to use the resources of Istanbul Metropolitan Municipality in the most effective way;
- to ensure that the right projects are implemented at the right time, quality and cost.



Ulaşım



Kültür Yapıları



Kent Estetiği



Hizmet Yapıları



Çevre Projeleri



Deniz ve Kıyı Yapıları

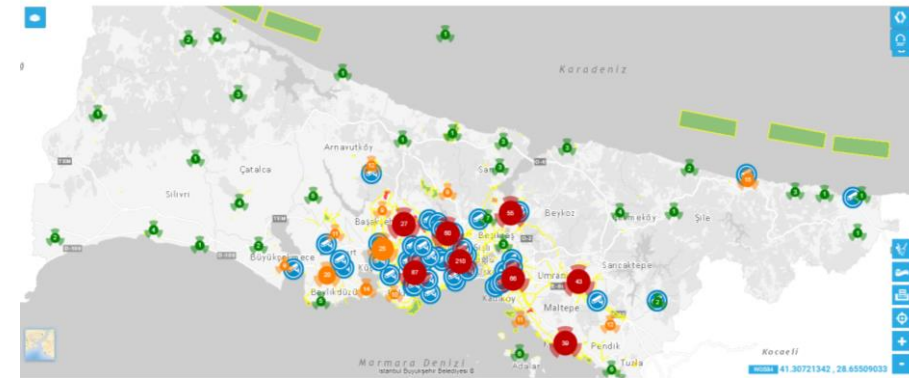
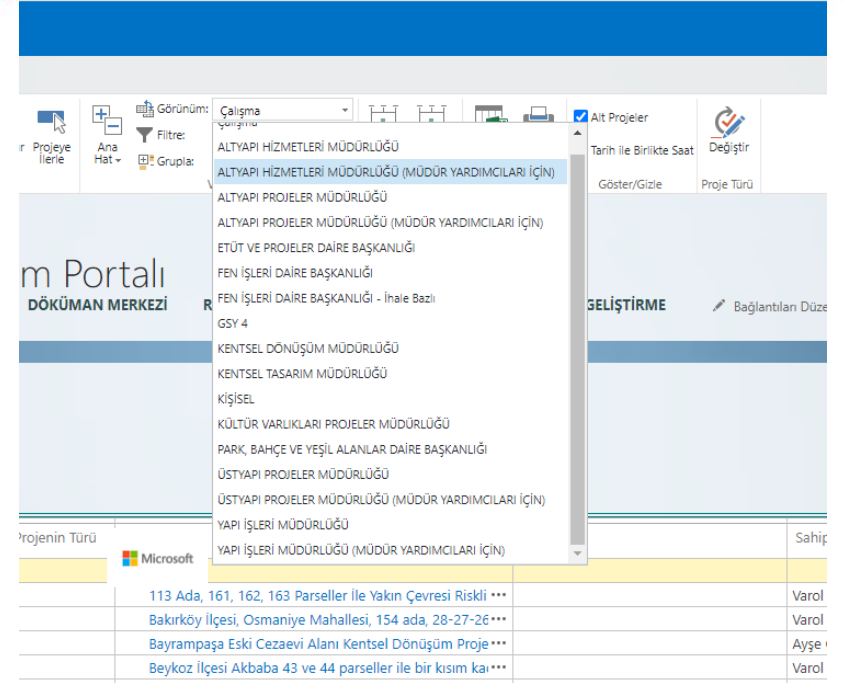


Spor

Departments in Institutional Project Management System

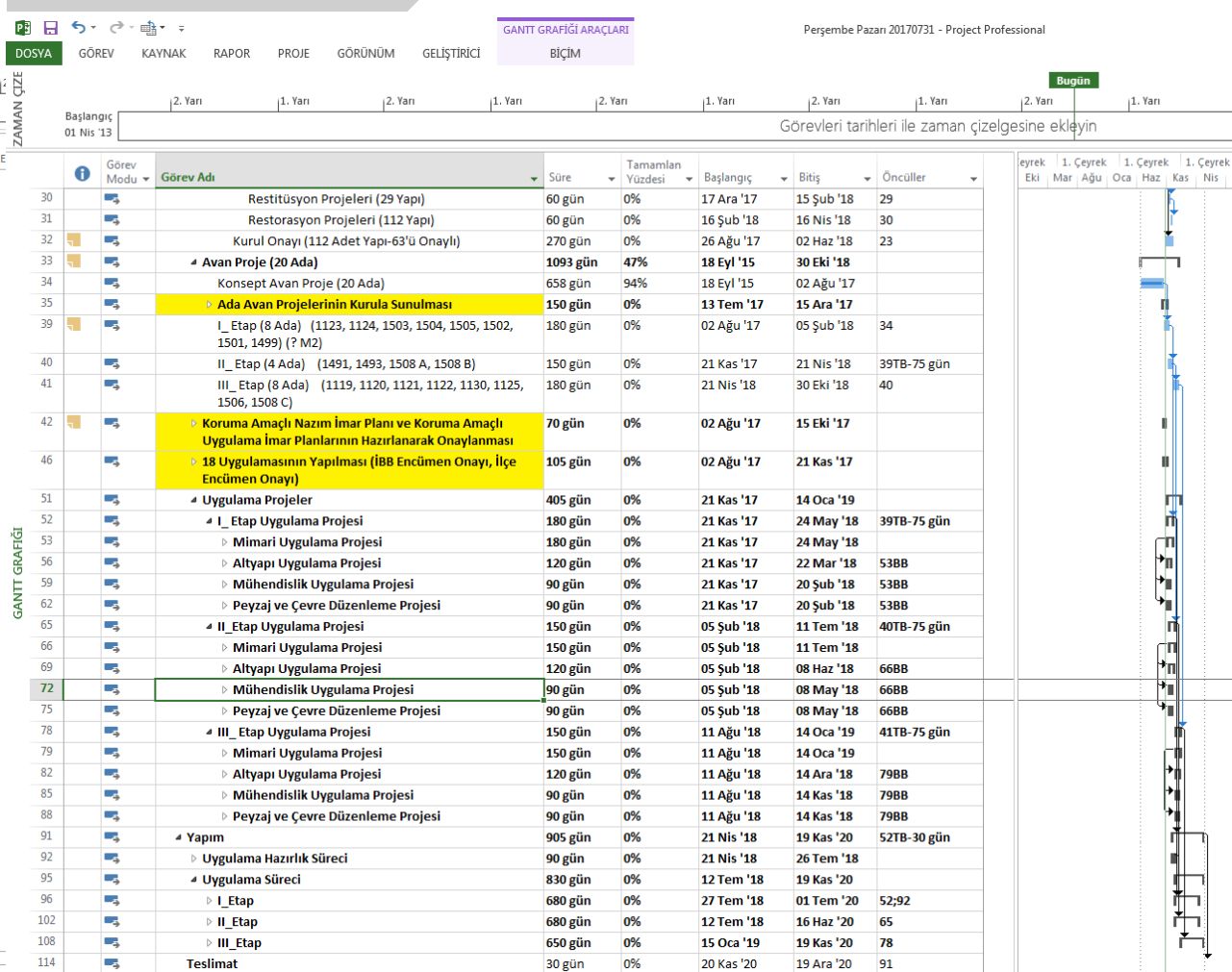
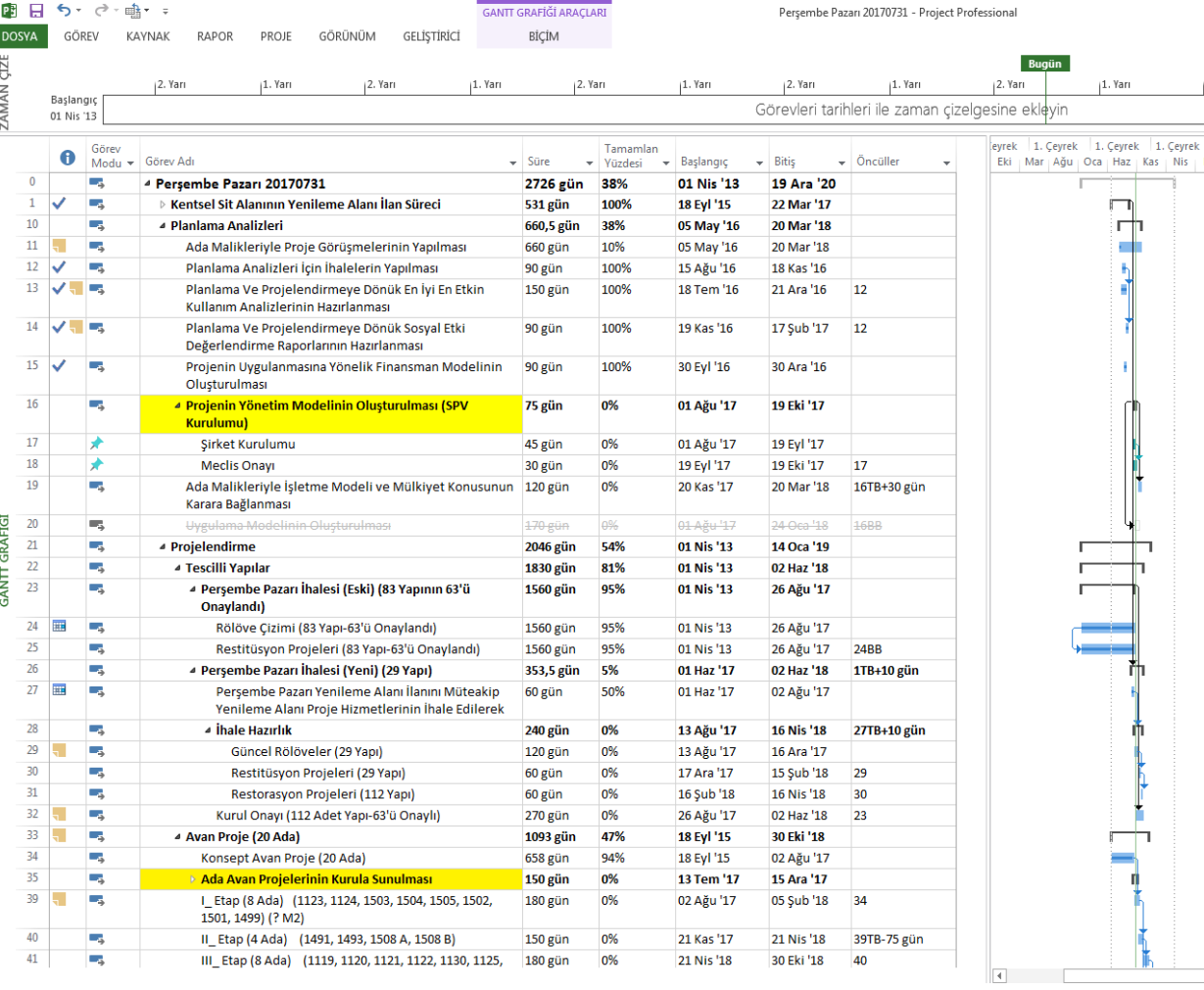
- Department of Construction and Infrastructure
- Department of Cultural Heritage
- Department of Survey and Projects
- Department of Parks, Gardens and Green Areas

• Strategy, Help Center, Communication
3000+ Design Projects and Constructions





An Example of Project Plan (Perşembe Pazarı Urban Renovation Project)

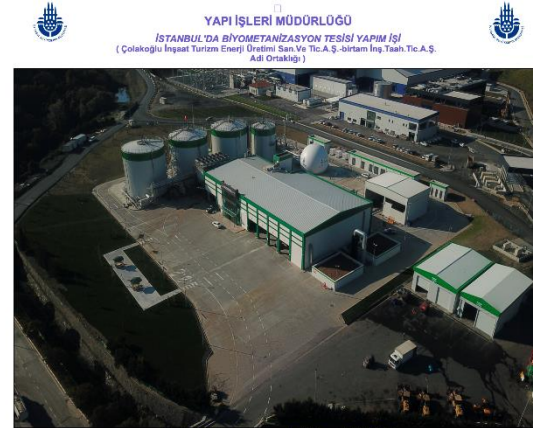


Instant and Periodic Reporting Examples

FEN İŞLERİ DAİRE BAŞKANLIĞI YAPI İŞLERİ MÜDÜRLÜĞÜ			
İSTANBUL'DA BİYOMETANİZASYON TESİSİ YAPIM İŞİ (Çolakoğlu İnşaat Turizm Enerji Üretimi San. Ve Tic. A.Ş.-birim İnş.Tic.A.Ş. Adı Ortaklığı)			
MÜDÜR YARDIMCISI Rubhat AYVAÇ	30 Kasım 2021 Saat: 10:50 (Son Güncelleme Tarihi)	İNŞAAT MÜHENDİSLERİ VE TAŞ	
PROJE KÜNYE BİLGİSİ			
Proje Adı / Proje Kodu	İstanbul Biyometanizasyon Tesisi Yapım İş / 340003180860031601		
Temel Hizmet Alanı	Çevre	Ana/Alt Hizmet Alanı	Alık Ve Anıtma Tesisleri, Kati Alık Tesisleri Ve Alanları
İl	İstanbul	İlçe	Eyüpsultan
Pafta, Ada, Parsel	F21C02D2A-F21C02D2B pafta, 531 parsel		
İnşaat Alanı	10.000 m ²	Peyzaj Alanı	15.000 m ²
PROJE KAPSAM BİLGİSİ			
Fonksiyon Bilgisi	Günlük 90 ton organik atıktan oksijeniz (anaerobik) ortamda fermantasyon yöntemi ile biyogazdan 1,2 MW-saat elektrik enerjisi üretilecek kapasitede projelendirilen tesis için, 16.03.2018 tarihli ve Tn:348278 sayılı Başkantik Otoru ile 130 ton/gün kapasitede organik atığın fermantasyon yöntemi ile biyogazdan 1,4 MW-saat elektrik enerjisi üretilecek şekilde kapasite artışı yapılarak buna göre dizayn yapılmıştır.		
PROJE TAKVİM BİLGİSİ			
Sözleşme Başlama Tarihi	17 Ağustos 2017	Yer Teslim Tarihi	22 Ağustos 2017
Sözleşme Bitim Tarihi	13 Haziran 2019	Süre Uzatımı Bitim Tarihi	1 Nisan 2022
Sözleşme Süresi	865 Gün	Süre Uzatımı Sözleşme Süresi	+ 1023 Gün
Tahmini/Gerçekleşen Bildim Tarihi	1 Nisan 2022	İşin Süresi	1683 Gün
PROJE MALİYET BİLGİSİ			
Yapım Bedeli (Sözleşme)	47.453.000€	Yapım Yaklaşık Maliyeti	30.636.550€
Yapım Bedeli (İş Arzı Dahil)	52.182.886€	İş Arzı Bedeli	4.729.886€
Yapım Hakedeli Bedeli (Kümülatif) - %100'ü	30 Nis/10 Hakedeli 46.707.809€	Yapım Nakdi Gerçekleşme %	% 90
PROJE DURUM BİLGİSİ			
Yapım Aşaması	Devam Ediyor	Yapım Fiziki Gerçekleşme %	% 99
Yapım Son Durum Açıklaması	Genel olarak tesis alt betonarme imalatları %100 tamamlanmıştır. Ana binanın çekirdek imalatları, çatı kapama imalatları, asfalt ve panel cephe ve kompozit cephe kapama imalatları ile cam cephe kapama imalatları %100 oranında tamamlanmıştır. Ana bina ve proses alanı mekanik tesisat imalatları, ölçme duvarı alan imalatları, inşaat işleri, ön işlenim ünitesi imalatları, işleri ünitesi deposu yapısı, ana çürütücü tank ve hidroli tesis ile son çürütücü tank temelleri, idari bina ve kati ürün yapısı gaz beton duvar imalatları, idari bina ve proses alanı dışı alan duvar imalatları, sanitasyon tesisleri montajı, CHP (Kojenrasyon) ünitesi, ana çürütücü tanklar ile fayyer (yakma ünitesi) %100 tamamlanmıştır. Jeneratörler sahaya indirilmiştir ve bağlantı yapılarak devreye alınmıştır. Kuvvet ve kompanzasyon panosu imalatı tamamlanmıştır. Çürütücü tankların izolasyonu ve sahadaki tüm borulama çalışmaları tamamlanmıştır. Tesisin yapım tamamlanmış ve işletmeye başlama çalışmaları devam etmektedir.		
PROJE SORUMLU BİLGİSİ			
Koordinatör Mühendis	İNŞAAT MÜHENDİSLERİ VE TAŞ	Şantiye Sorumlusu	Gürnel AYDIN 0532 280 91 92
DEVAM EDİYOR		1/4	



DEVAM EDİYOR 2/4



DEVAM EDİYOR 3/4

T.C. İSTANBUL BÜYÜKŞEHİR BELEDİYESİ		
Diğer		
İSTANBUL BİYOMETANİZASYON TESİSİ YAPIM İŞİ		
30 Kasım 2021		
İLÇE	Eyüpsultan	
PAFTA/ADA/PARSEL	F21C02D2A-F21C02D2B pafta, 531 parsel	
MÜLKİYET		
İMAR DURUMU (1/5000)		
İMAR DURUMU (1/1000)		
PROJE MÜELLİFİ		
PROJE BAŞLANGIÇ TARİHİ		
PROJE BEDELİ	+ KDV	PROJE BİTİŞ TARİHİ
PROJE ALANI	25.000 m ²	YAPIM YAKLAŞIK MALİYETİ
		İNŞAAT ALANI
		10.000 m ²
FONKSİYON BİLGİSİ	Günlük 90 ton organik atıktan oksijeniz (anaerobik) ortamda fermantasyon yöntemi ile biyogazdan 1,2 MW-saat elektrik enerjisi üretilecek kapasitede projelendirilen tesis için, 16.03.2018 tarihli ve Tn:348278 sayılı Başkantik Otoru ile 130 ton/gün kapasitede organik atığın fermantasyon yöntemi ile biyogazdan 1,4 MW-saat elektrik enerjisi üretilecek şekilde kapasite artışı yapılarak buna göre dizayn yapılmıştır.	
İŞİN SON DURUMU		
MÜDÜR YARDIMCISI	KOORDİNATÖR	
	İstanbul Biyometanizasyon Tesisi Yapım İş 23.11.2018	

Collaborating Projects on WebGIS

Yatırım Portalı v4

Yapım Projelendirme Planlama

FİLTRE PARSEL SORGU

Ana Yapımlar

- > ANA IS ADI
- > ILCE - MAHALLE
- > HIZMET ALANI - DONATI
- 24 HAZİRAN SONRASI DONEM
- > SON DURUM
- AKTİF ŞANTİYELER
- FEN ISLARI DAIRE BASKANLIĞI
- > MUDURLUK - EKIP
- ANA IS GIZLE

Alt Yapımlar

- > ALT IS ADI
- > ILCE - MAHALLE

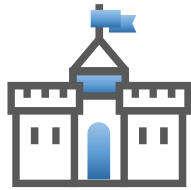
Adres Ara

SAYIM	YAPIM BEDELİ	YAPIM HAKEDİS BEDELİ	YAPIM FIZIKI %
1,612	21,570,966,595	11,315,855,065	42.27

Project Workflow Stages



Ulaşım



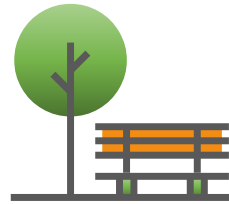
Kültür Yapıları



Kent Estetiği



Hizmet Yapıları



Çevre Projeleri



Deniz ve Kıyı Yapıları

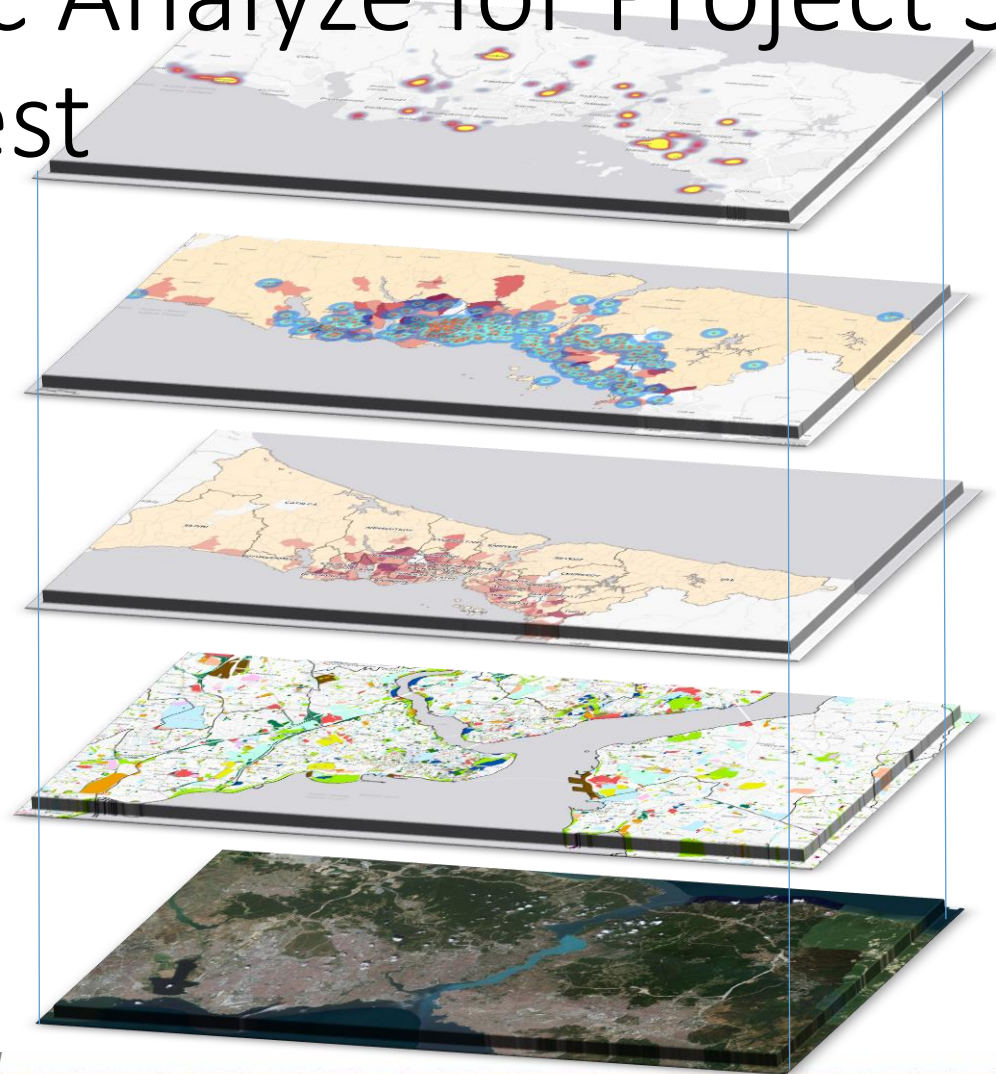


Spor



Geospatial and Demographic Analyze for Project Site Request

- Answer: Who needs any investment most in where.
 - Accessibility Analyze
 - Demographic Analyze
- Existing, Proposed and Planned Sites
- Geographical and Administrative Data



Project Feasibility Considerations

LOCATION

- Where should the facility be?
- What is Plan and Property Eligibility?
- What is Accessibility Level?
- What is the Distribution of the Existing Reinforcement Areas, Their Relationship with Each Other and the City?

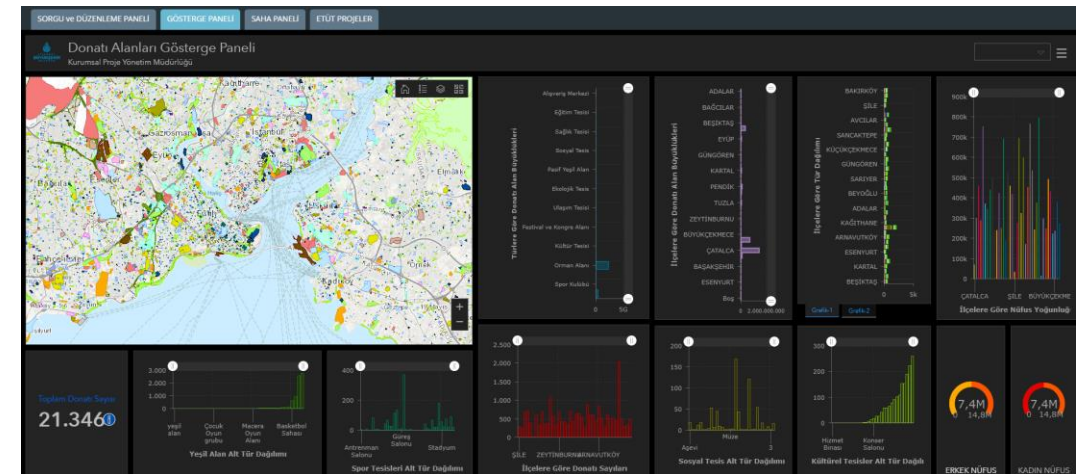
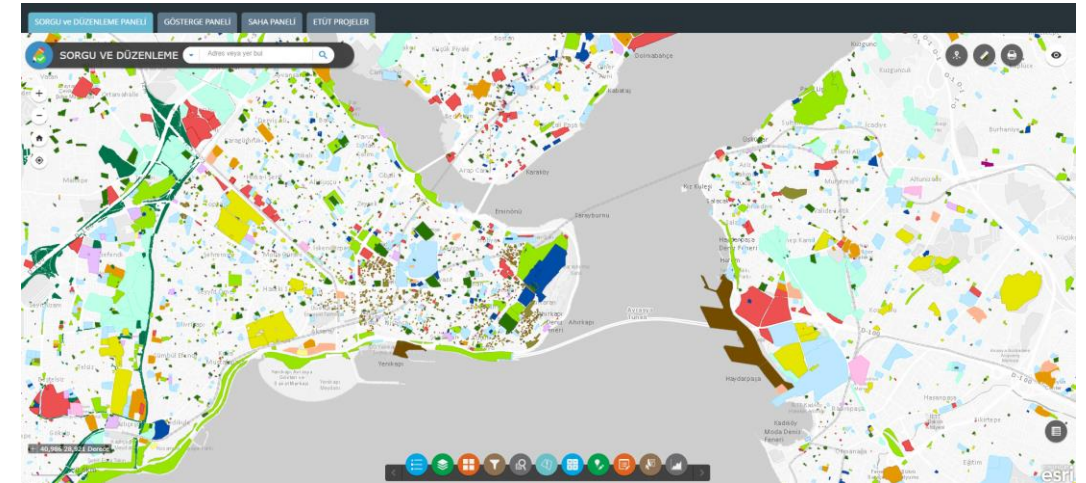
EFFECTIVE USE

- What is the Need Level of District Demands?
- Which Functions Should Be Included in the Facility?
- What is its Compliance with Demographic Structure?
- Area's attractiveness

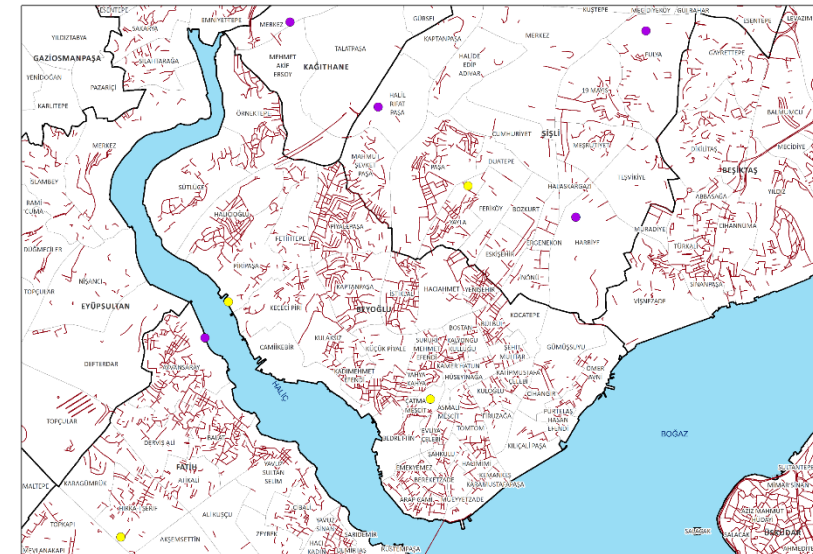
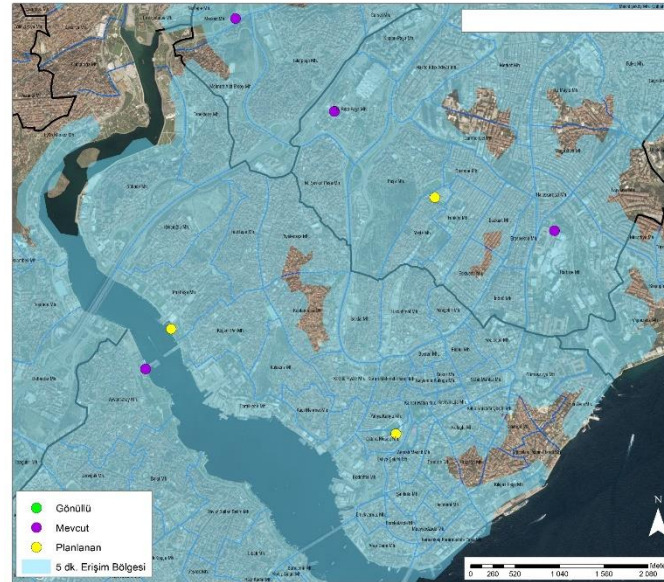
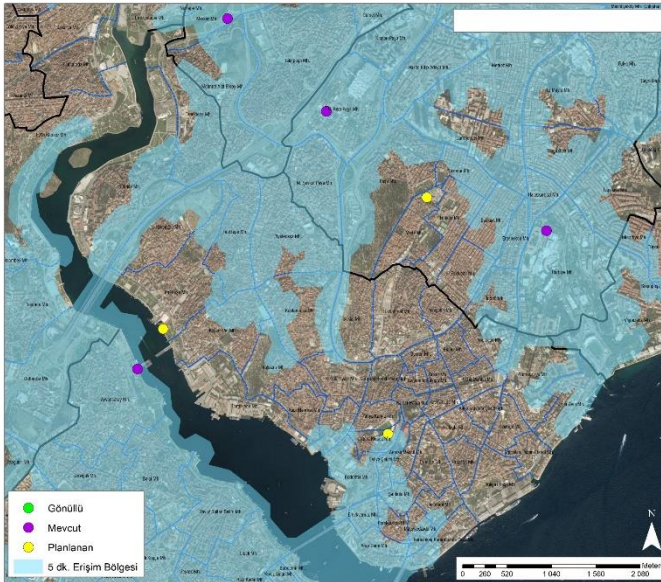
THE CURRENT SITUATION

- How Much of the Existing Facilities Meet the Needs
- Is per Capita Below Standards?
- Do the Facilities Serve on a Neighborhood, District, or Urban Scale?

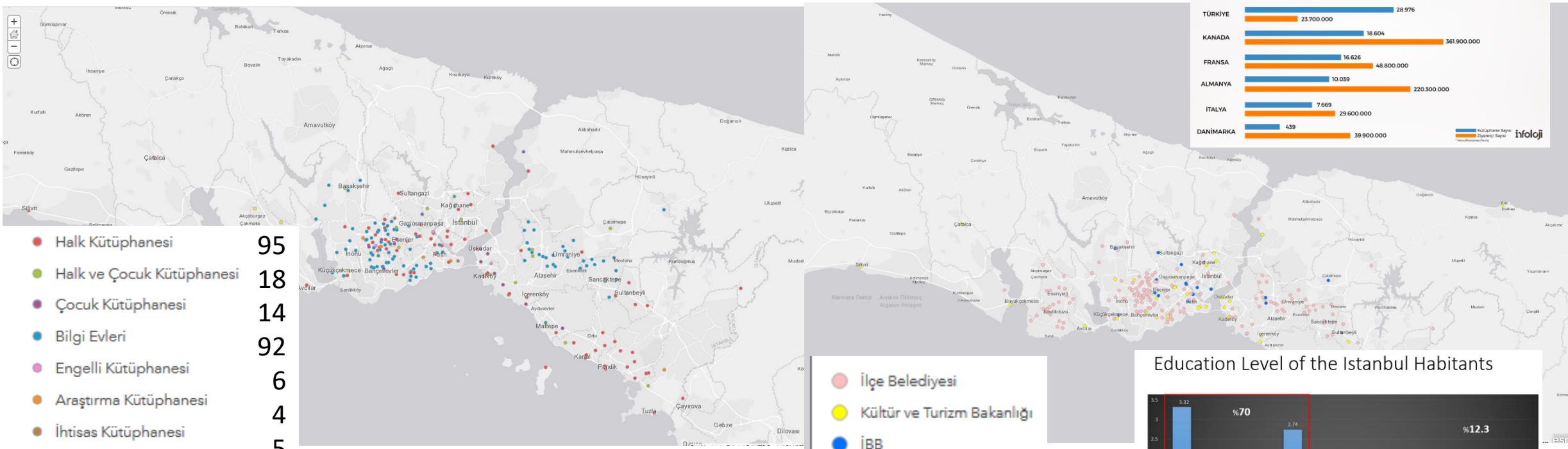
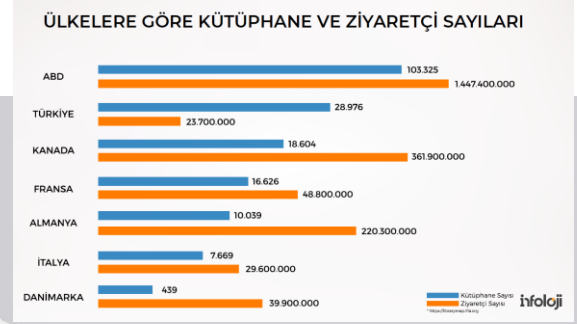
**26000+ Open and Closed – Public and Private Owned
Urban Structures and Areas**



New Fire Brigade site selection for a 5 min. coverage based on network analyse

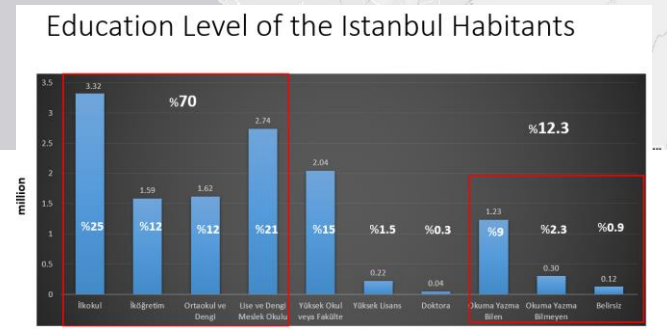


Geographic Distribution and Management of Public Libraries In İstanbul -2019

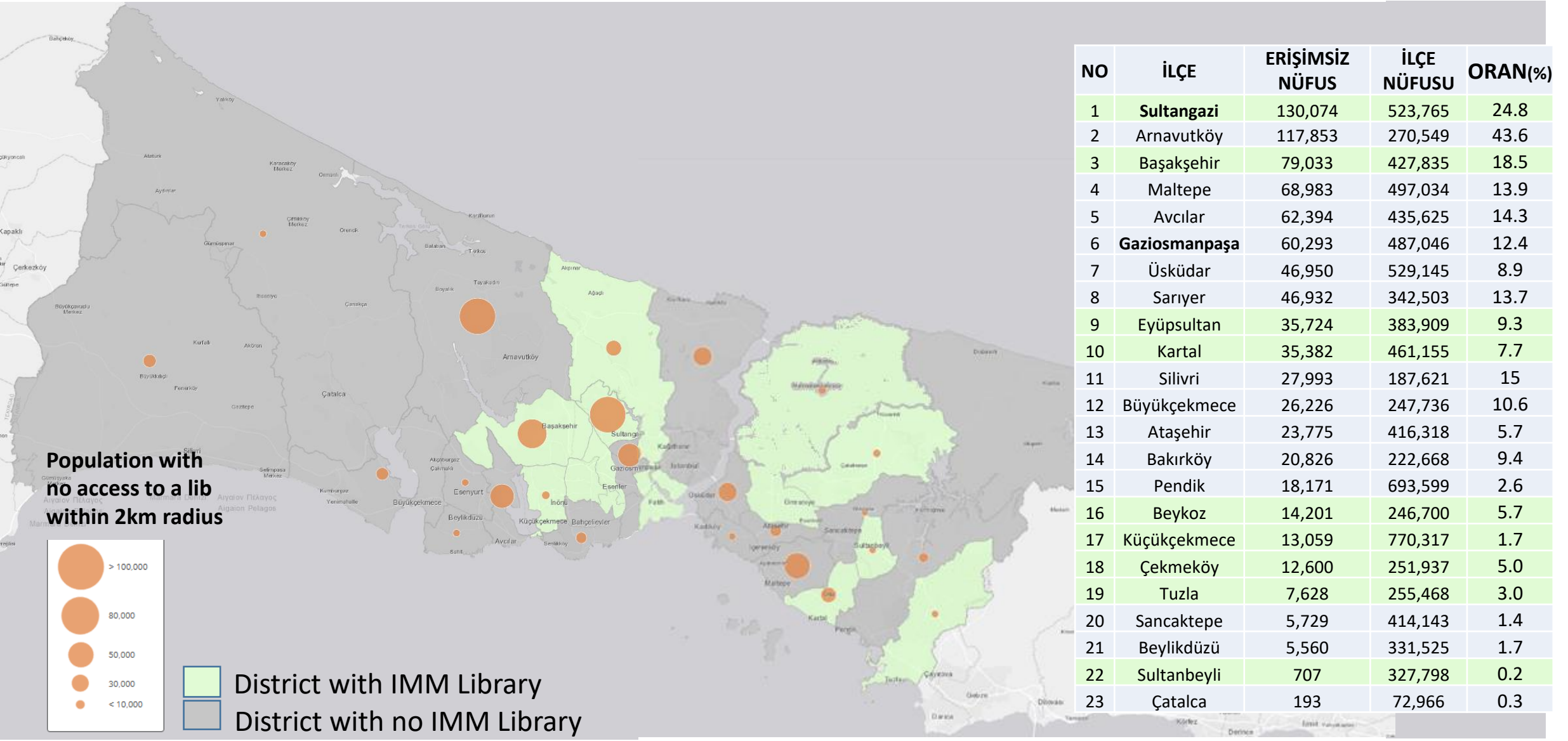


- Halk Kütüphanesi 95
 - Halk ve Çocuk Kütüphanesi 18
 - Çocuk Kütüphanesi 14
 - Bilgi Evleri 92
 - Engelli Kütüphanesi 6
 - Araştırma Kütüphanesi 4
 - İhtisas Kütüphanesi 5
 - Cep Kütüphanesi 3
 - Okuma Salonu 2
 - Gençlik Merkezi 2
- Toplam 243**

- İlçe Belediyesi
 - Kültür ve Turizm Bakanlığı
 - İBB
- Toplam 243**



POPULATION DISTRIBUTION WITHOUT MUNICIPAL PUBLIC LIBRARY ACCESS -2019

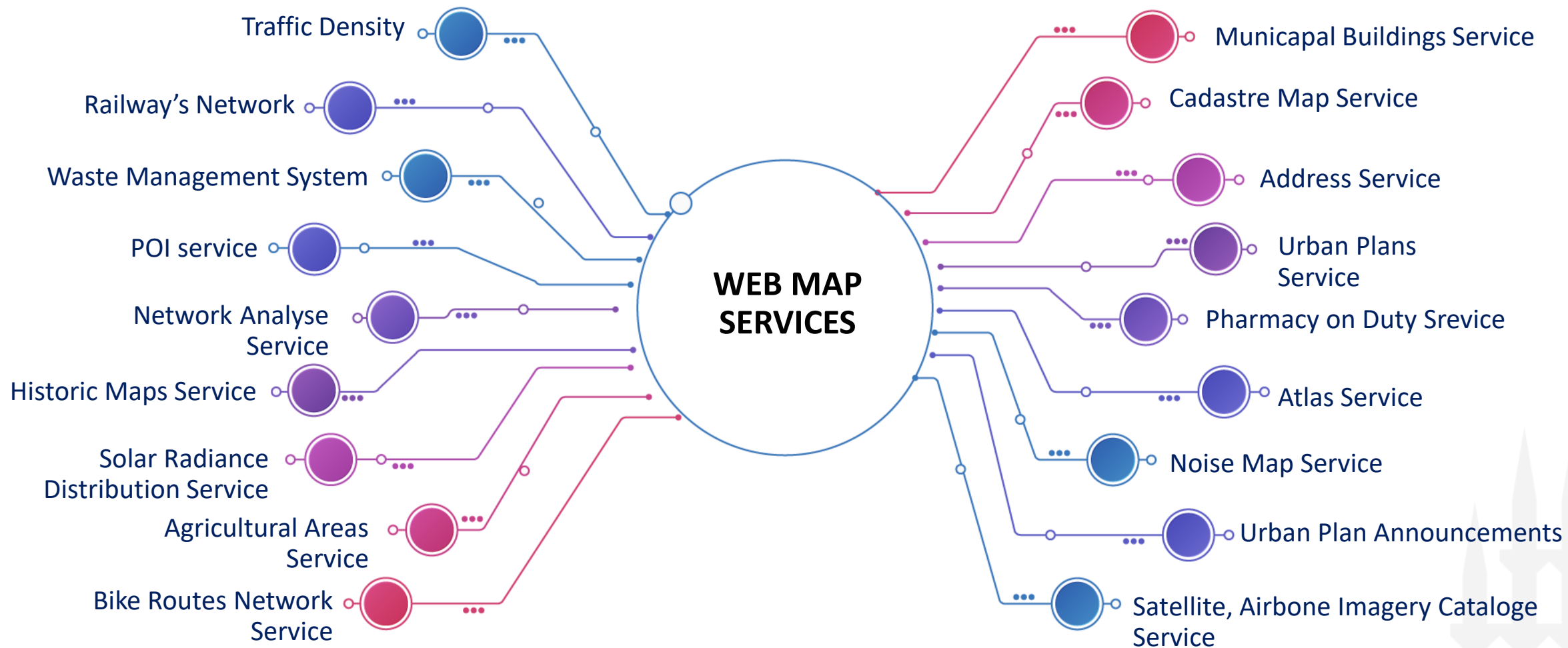



12/15/2022


Erişim hesaplamasında kütüphane barındıran tesislerden kuş uçuşu erişim mesafesi 2km olarak dikkate alınmıştır.


Sultangazi and Gaziosmanpaşa Districts Example of Neighborhoods With no Library Access

DISTRICT	SUBURBAN AREA	POP. WITH NO ACCESS TO LIB	SUBURBAN POP.	RATIO(%)
SULTANGAZI	İSMETPAŞA	41,913	60,461	69.3
	ZÜBEYDE HANIM	34,426	34,426	100
	CEBECİ	5,535	65,045	8.5
	GAZİ	14,119	36132	39.1
	YUNUS EMRE	2,295	49388	4.7
	75. YIL	31,819	33,409	95.2
GAZİOSMANPAŞA	MEVLANA	0	24443	
	KARADENİZ	15,920	75895	21.0
	YENİ MAHALLE	56	37907	0.2
	BARBAROS HAYRETTİN PAŞA	16,944	51701	32.8
	KARAYOLLARI	27,373	43375	63.1



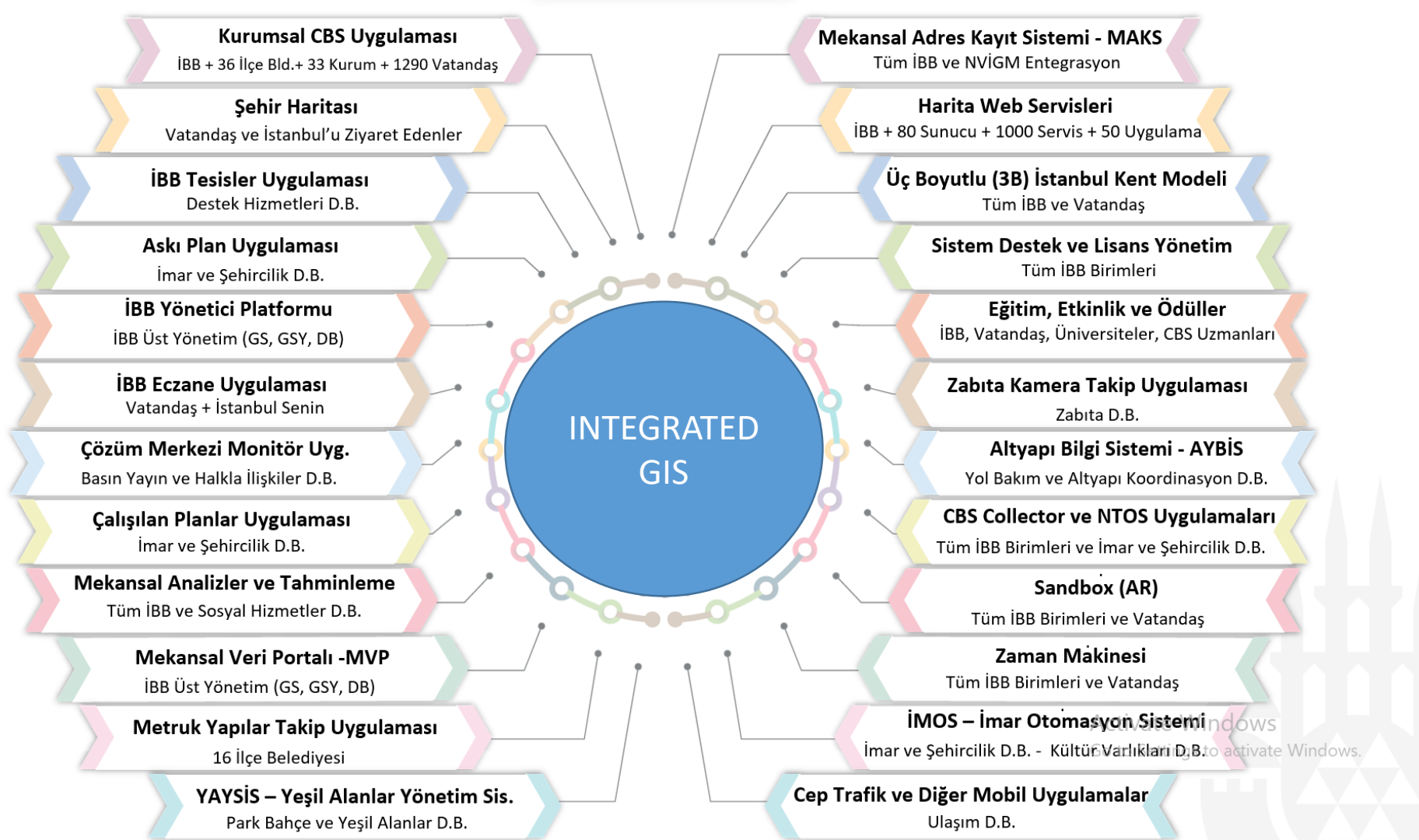
 **80+**
GisServer

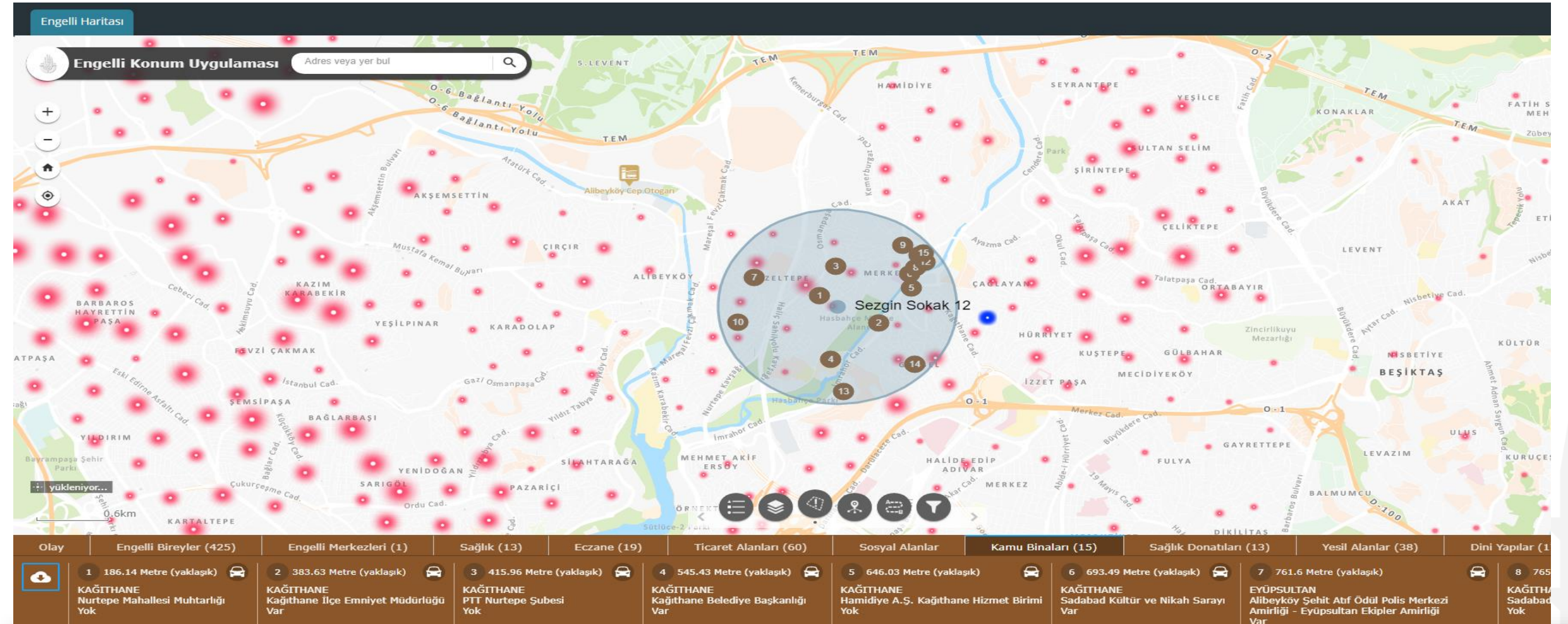
 **1000+**
Map Servers

 **50+**
Applications



Different Components of Applications for Project Management Ecosystem for Public Projects





Web maps developed for Disabled individuals Making their life easier and removing barriers

Başlama Tarihi : 2020

Durum : Sürekli Güncelleme

Yapım : İç Kaynak

Nüfus-Cinsiyet

Nüfus-Cinsiyet Sınıflaması

Yaş Grupları

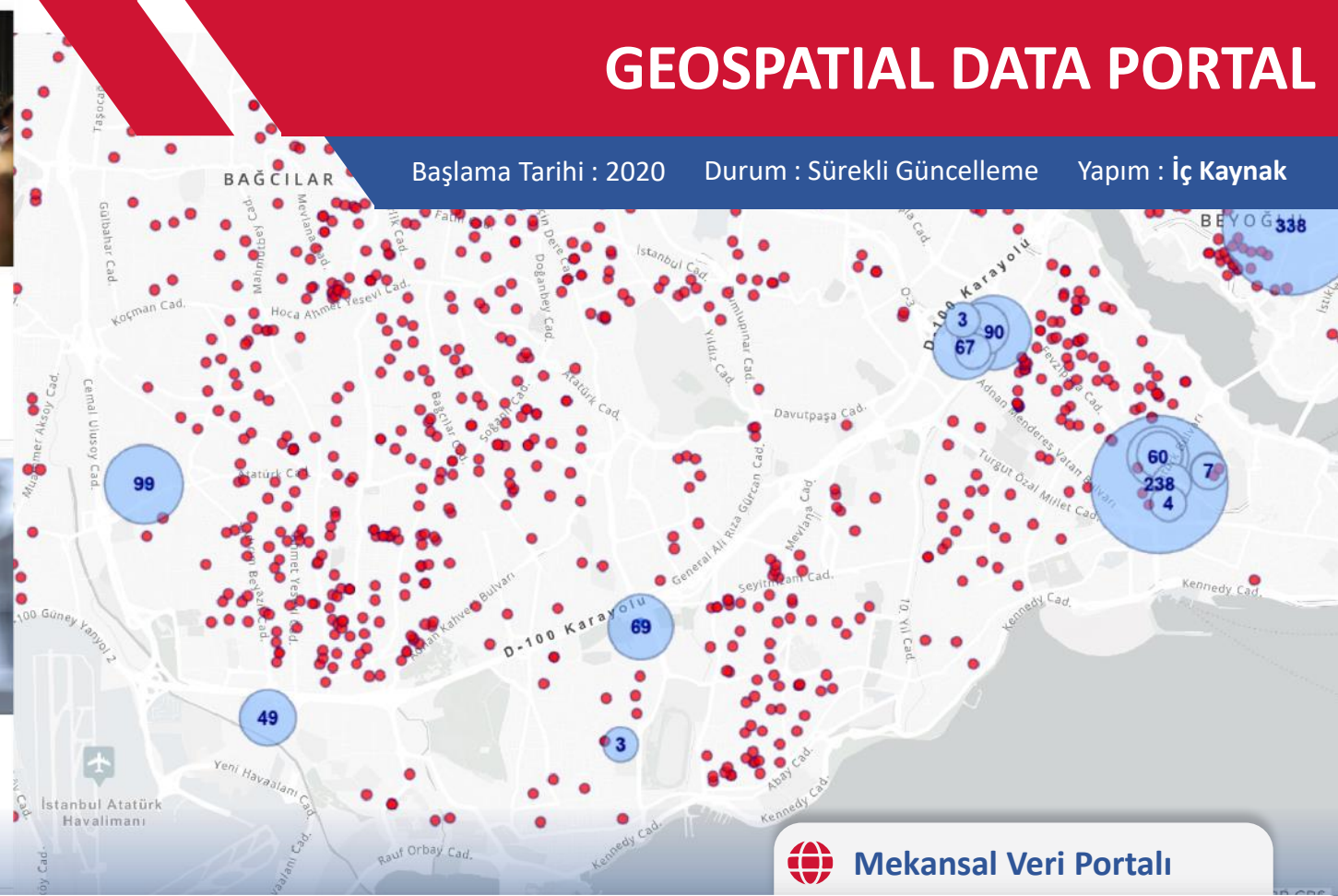
Yaş grupları, ortalama yaş, 65+ yaş grubu

65+ Yaş

65+ yaş, 65+ yaş yalnız yaşayan dağılımı

Sağlık Hizmetleri

Covid-19 testi yapan hastaneler, eczaneler, acil yardım istasyonları



 Mekansal Veri Portalı

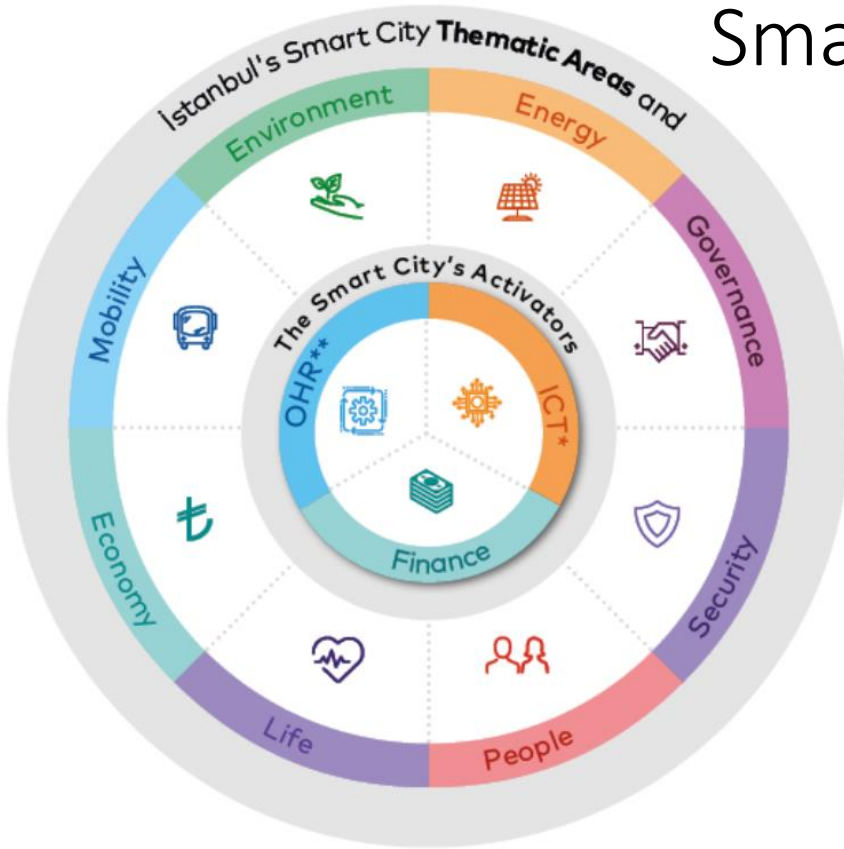
Demographic Analyze

Social Help Analyze

Citizen Mobility Analyze

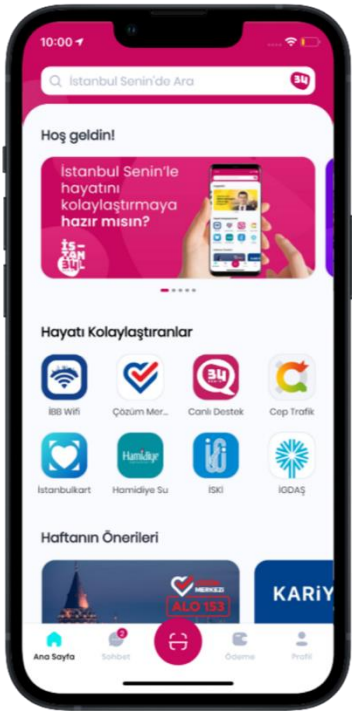
Social Economic Analyze

Different Components of Project Management Ecosystem for Public Projects Smart City Directorate



IOT, Big Data is crucial

Behavioral Analytics



Istanbul Senin SuperApp

MiniApp,
IETT,
IGDAS,
Alo 153,
ISKI,
CepTrafik,
Ödeme sistemi

*Instant Response
Ability from big data*

Dynamic Dashboard for Decision makers

Dynamic Mobility Maps

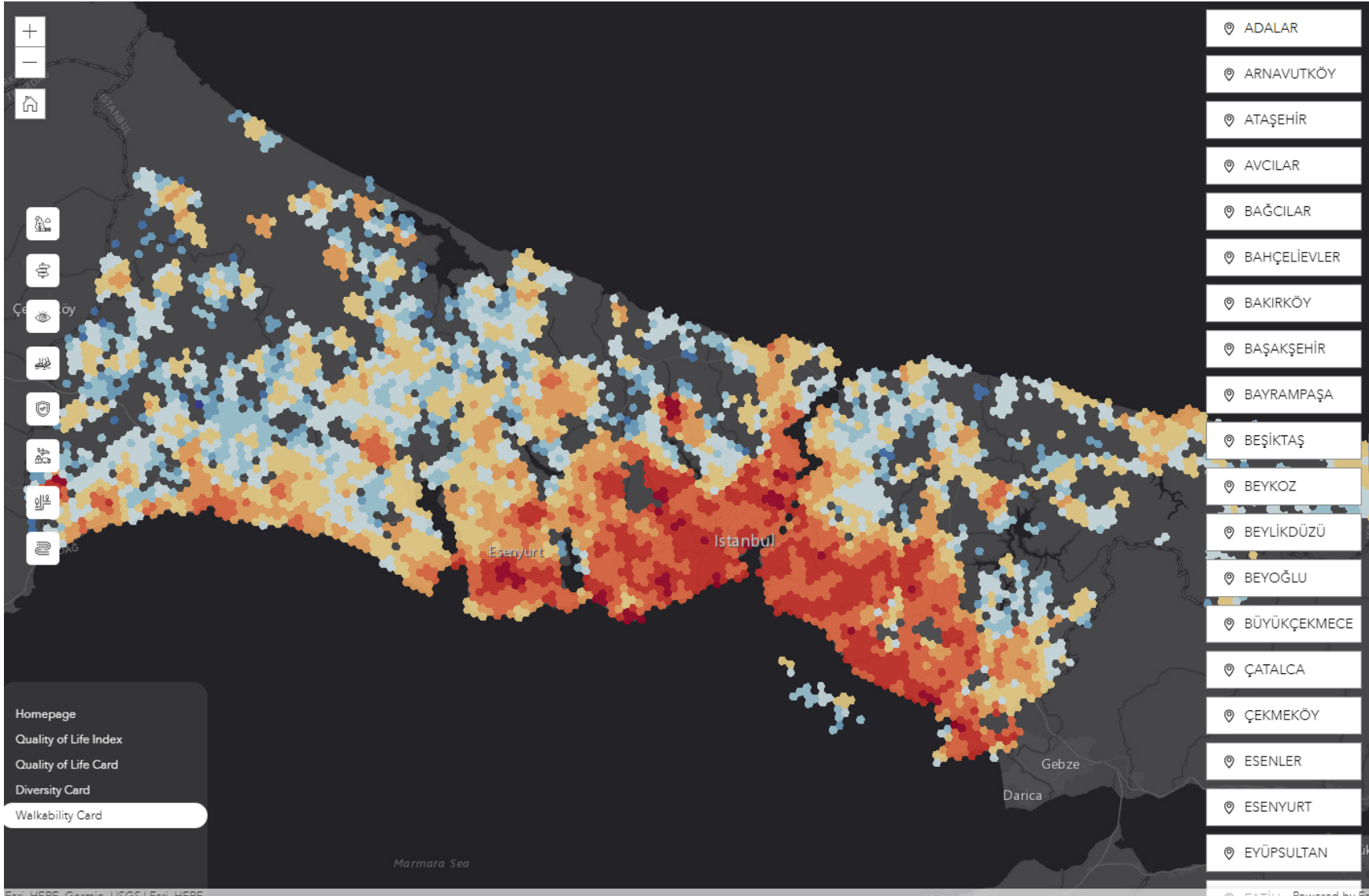
Web Maps / Spatial Rest – SOAP Service



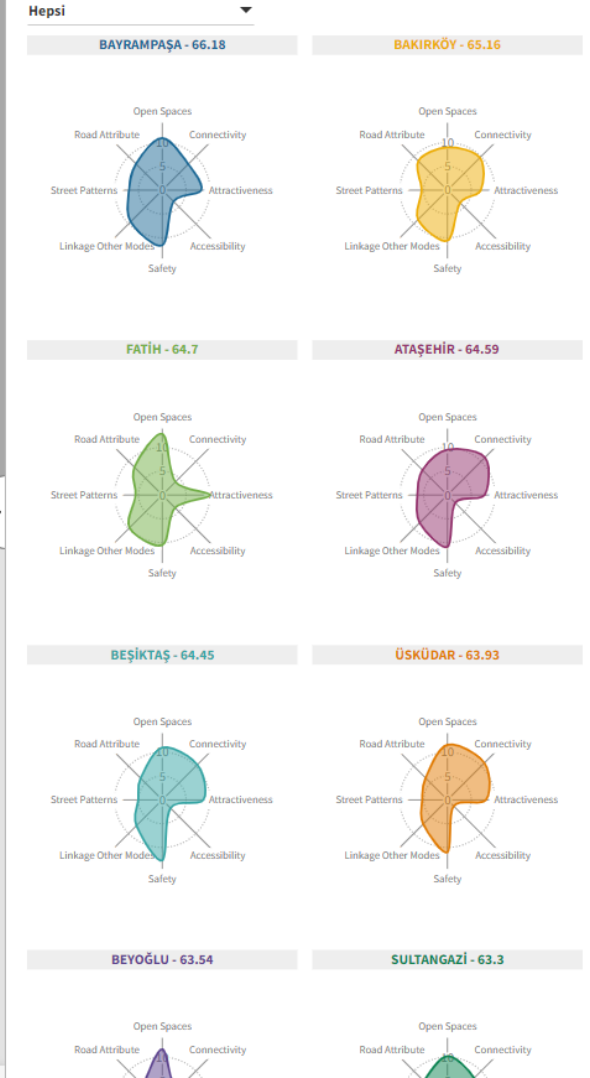
KVKK- GDPR anonymous data

34 MINUTE ISTANBUL

Türkçe



Walkability Card



data.ibb.gov.tr - Open Data Portal



IMM

OPEN DATA PORTAL

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Economy



Disaster Management



Energy



Living



Governance



People



Environment



Information and
Communication
Technologies



Security



Mobility

Ongoing Works

- More usage data driven analytics blended using big data
- 3D City Models are available but not widely used yet.
- BIM implementation is still discussed.
- Digital Twins are just on the horizon.



Outlook for Surveyors

- Surveyors has a deep knowledge of the environment and human activity.
- Surveyors not only extract the worlds dimensions but also they analyze using different spatial and non-spatial data to extract information for leading decisions.
- Can play a roles in day to day to long term decision with solid information backed by geospatial data working multidisciplinary.
- Geodata Scientists and Geo-orchestration terms for today's surveyors.
- Institution's Culture and ability to adapt technologies of doing things has been the most resistance in initializing the project management systems.

Outlook



- FIG needs to address guidelines and best practice approaches for producing meaningful solutions for resilient cities.
- Commission 3 needs to address methods and roles for surveyors for further resiliency of cities.

Thank you for your attention!
cemal.kivilcim@ibb.gov.tr