
URBAN INFORMATION SYSTEMS
Prof. Dr. Tahsin YOMRALIOĞLU
İTÜ
GEOMATİK

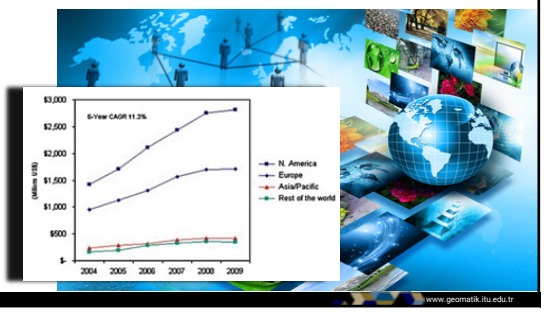
202


KENT BİLGİ SİSTEMİ
URBAN INFORMATION SYSTEM APPLICATIONS...?
What kind of applications can urban information systems be used in? What are UIS/GIS applications in urban management and sectors? What is the place and role of UIS as a decision-support tool in urban functions...?
İTÜ

203

What is the Importance of GIS Data? Why GIS Industries..?

Geographic Information Systems (GIS) has a variety of industrial applications and has significantly improved GIS data, especially how it can be used and what can be achieved as a result. Geographic Information Systems are powerful decision-making tools for any business or industry as they allow analysis of environmental, demographic and topographical data. Data intelligence compiled from GIS applications helps companies, various industries, and consumers make informed decisions.



✓The global GIS commercial market is projected to reach $15 billion by 2020 from $8 billion in 2014...

204

What is the Importance of GIS Data? Why GIS Industries..?

The GIS Industry covers a broad range of areas of opportunity.

These will increase with time, continued advancements in technology, greater awareness of its advantages as a powerful decision support tool, and more availability of spatially enabled data and software.

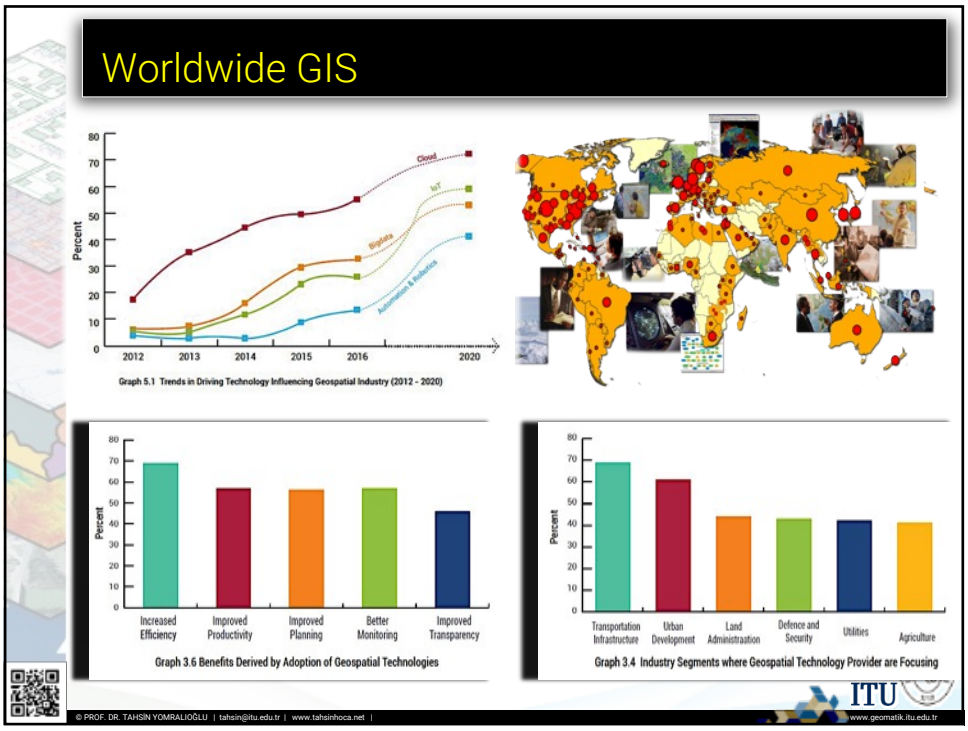
*Stakeholders of the **Geospatial Industry** Ecosystem*

1 https://www.geospatialworld.net/article/where-is-the-money/

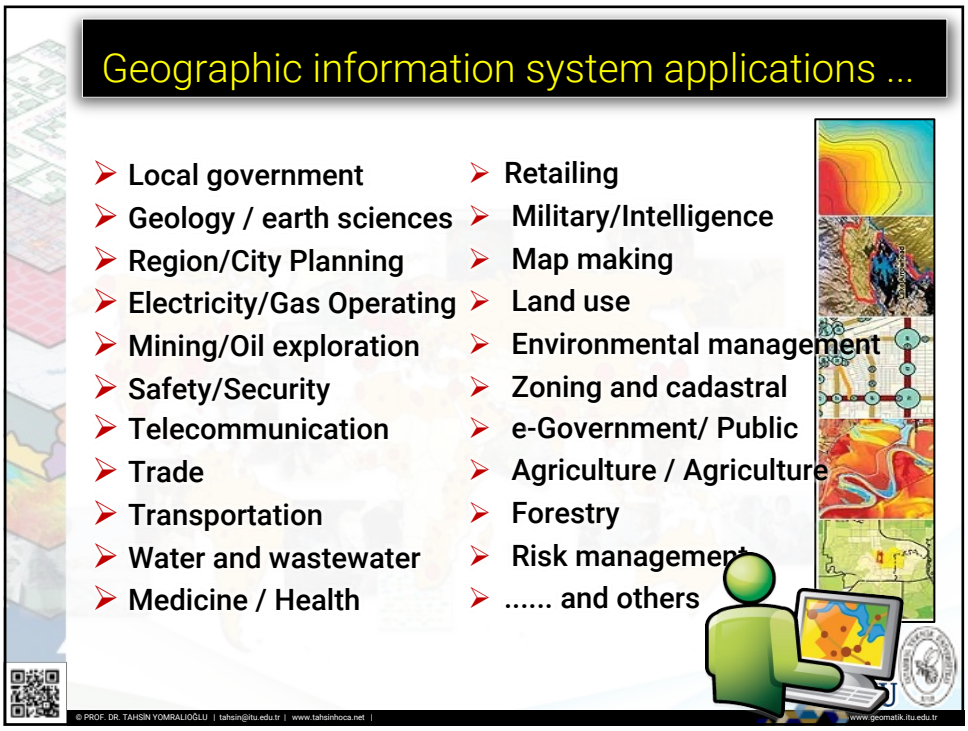
✓The economic sector is more than $500 billion...

İTÜ

205

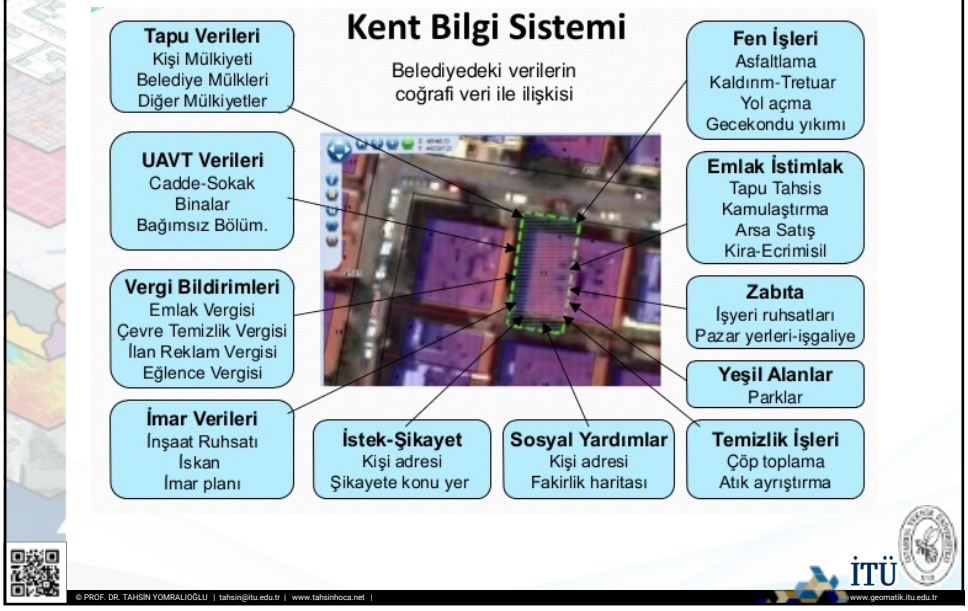

Worldwide GIS
Percent
2012
2013
2014
2015
2016
2020
Graph 5.1 Trends in Driving Technology Influencing Geospatial Industry (2012 - 2020)
Increased Efficiency
Improved Productivity
Improved Planning
Better Monitoring
Improved Transparency
Graph 3.6 Benefits Derived by Adoption of Geospatial Technologies
Transportation Infrastructure
Urban Development
Land Administration
Defence and Security
Utilities
Agriculture
Graph 3.4 Industry Segments where Geospatial Technology Provider are Focusing
ITU

206


Geographic information system applications ...
Local government
Geology / earth sciences
Region/City Planning
Electricity/Gas Operating
Mining/Oil exploration
Safety/Security
Telecommunication
Trade
Transportation
Water and wastewater
Medicine / Health
Retailing
Military/Intelligence
Map making
Land use
Environmental management
Zoning and cadastral
e-Government/ Public
Agriculture / Agriculture
Forestry
Risk management
..... and others

207

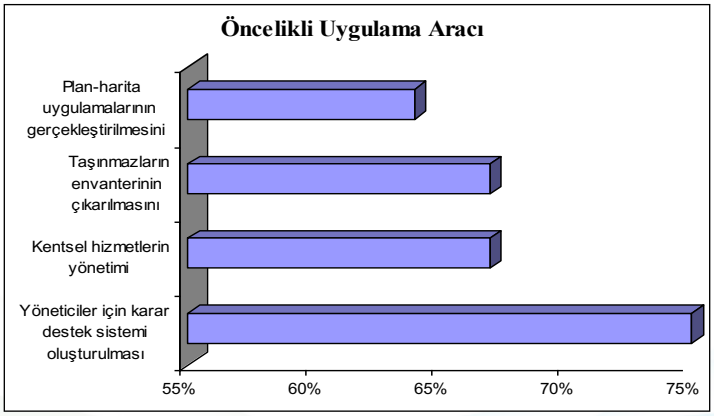
The main benefits of the urban information system?



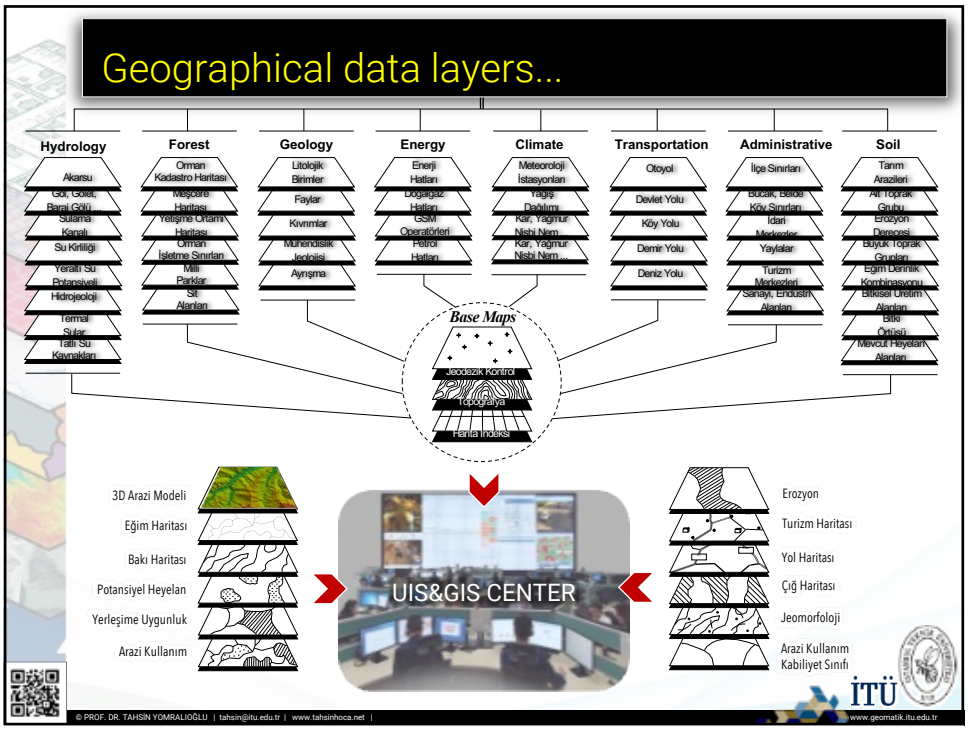
208

UIS Applications...

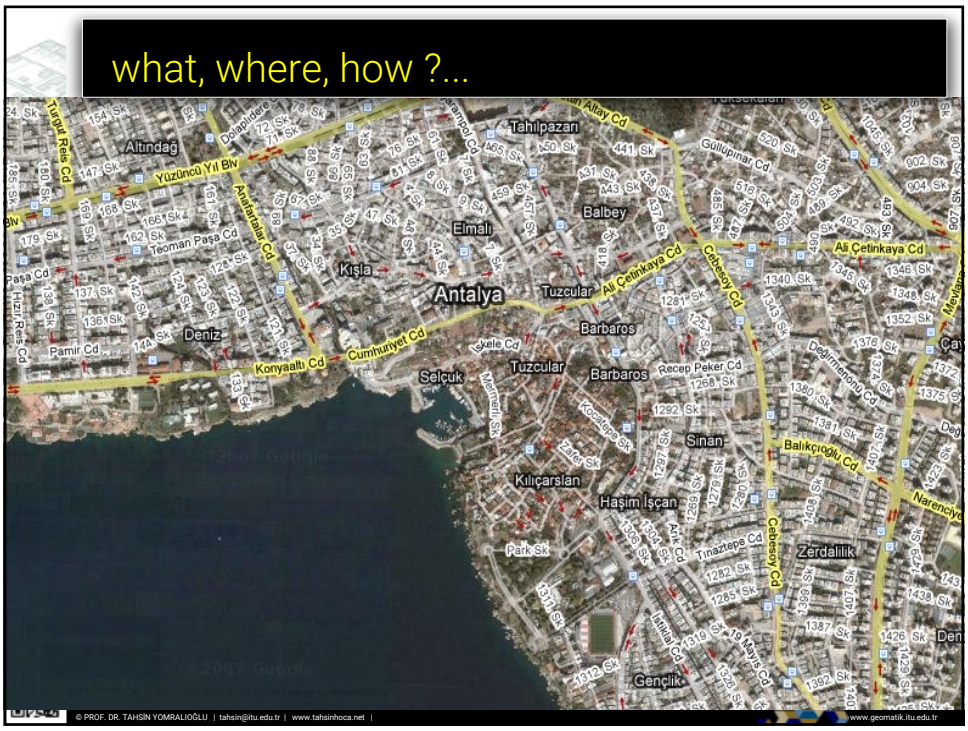
Local governments mostly benefit from UIS in zoning and engineering activities. However, it is seen that it is still widely used by municipalities with a short UIS history in units that can be located directly within the application area of UIS/GIS such as planning, map directorate, environmental protection etc.



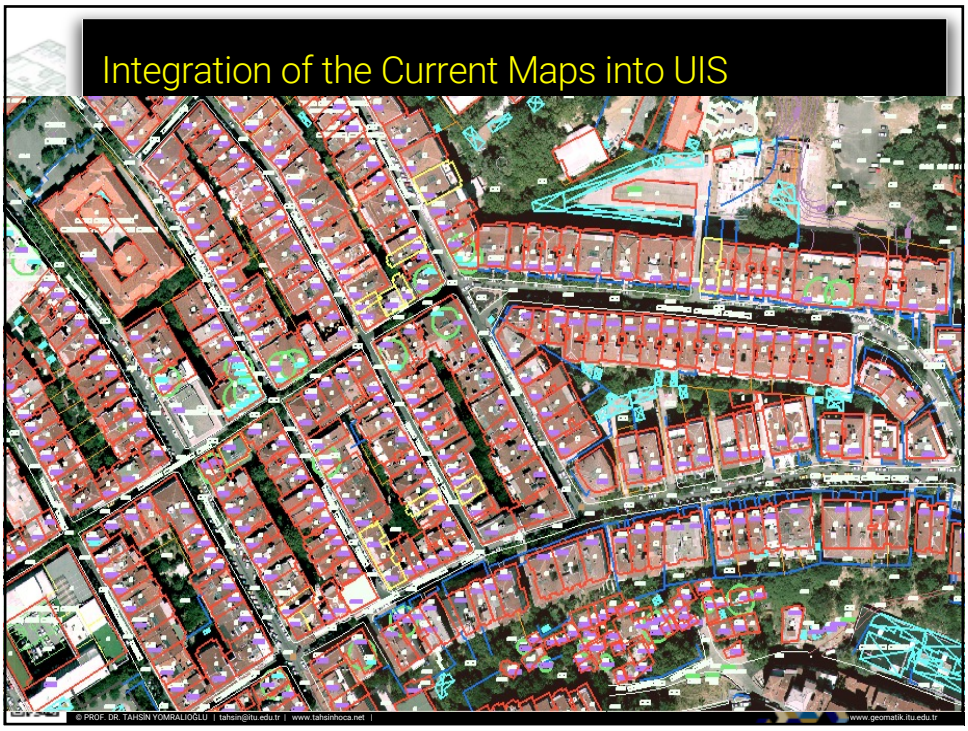
209


Geographical data layers...
Hydrology
Forest
Geology
Energy
Climate
Transportation
Administrative
Soil
Base Maps
Jeodezik Kontrol
Geoid
Harita İndeksi
3D Arazi Modeli
Eğim Haritası
Bakı Haritası
Potansiyel Heyelan
Yerleşime Uygunluk
Arazi Kullanım
UIS&GIS CENTER
Erozyon
Turizm Haritası
Yol Haritası
Çığ Haritası
Jeomorfoloji
Arazi Kullanım Kabiliyet Sınıfı
İTÜ

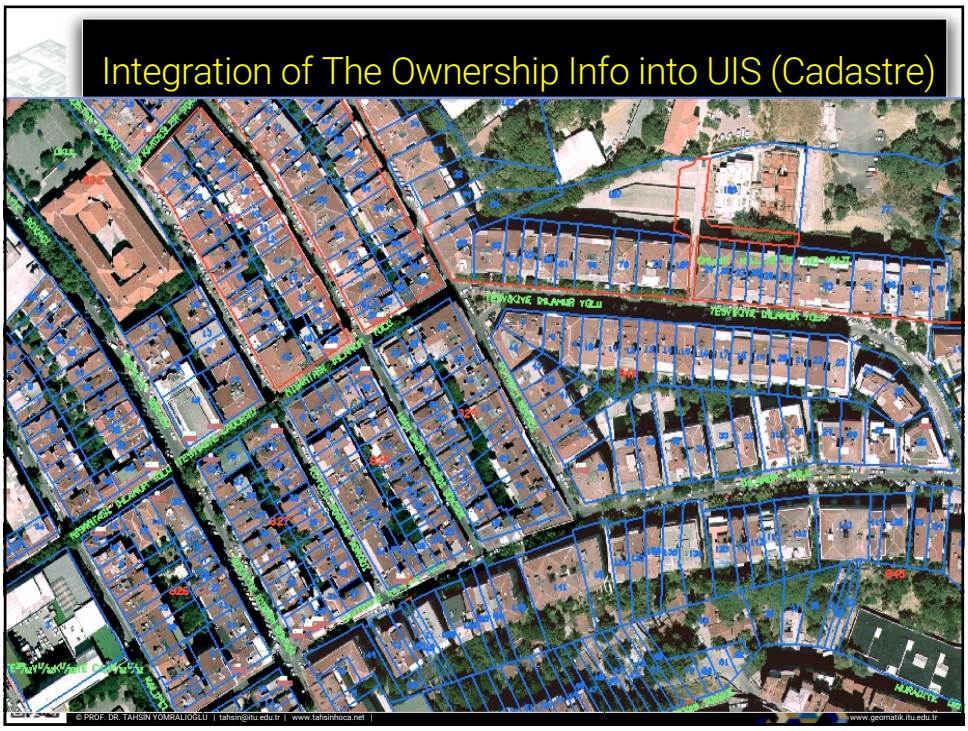
210


what, where, how ?...
Altındağ
Tahılpazarı
Elmalı
Balbey
Kışla
Antalya
Tuzcular
Barbaros
Deniz
Selçuk
Sinan
Kılıçarslan
Haşim İşcan
Zerdalilik
Gençlik
Cumhuriyet Cd
Konyaaltı Cd
Ali Çetinkaya Cd
Cebesoy Cd
Balıkçıoğlu Cd

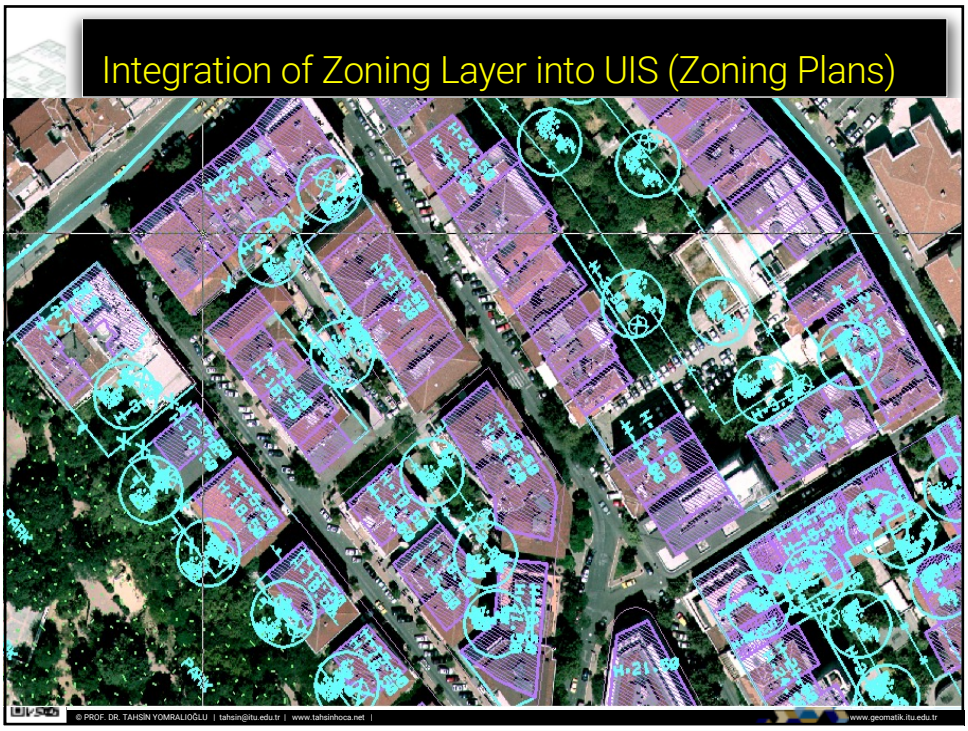
211


Integration of the Current Maps into UIS
© PROF. DR. TAHSIN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

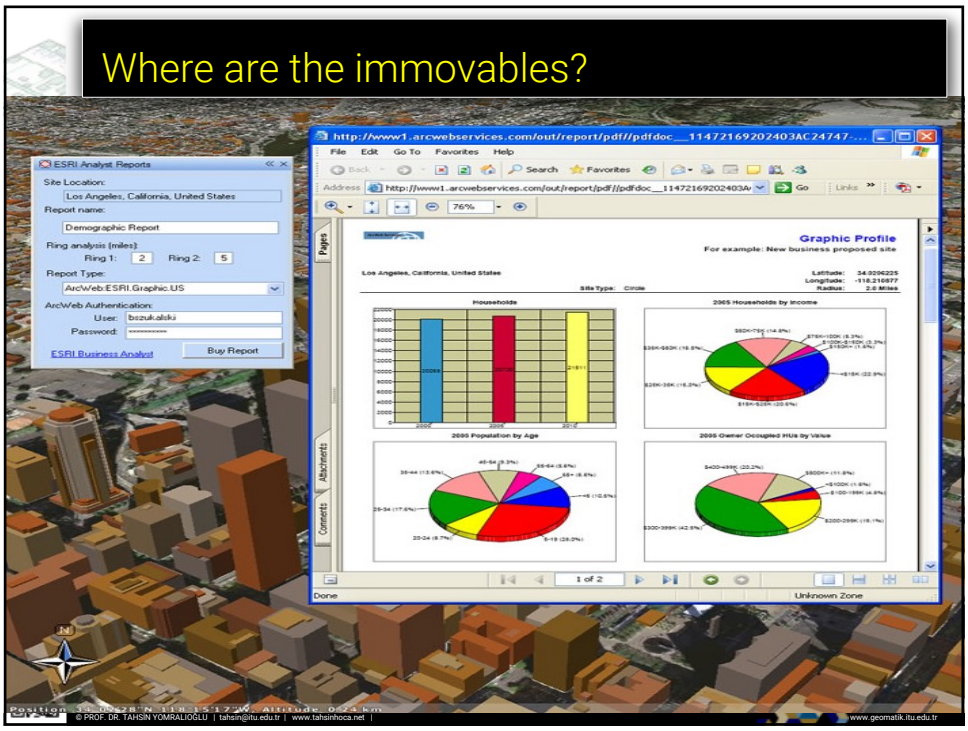
212


Integration of The Ownership Info into UIS (Cadastre)
© PROF. DR. TAHSIN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

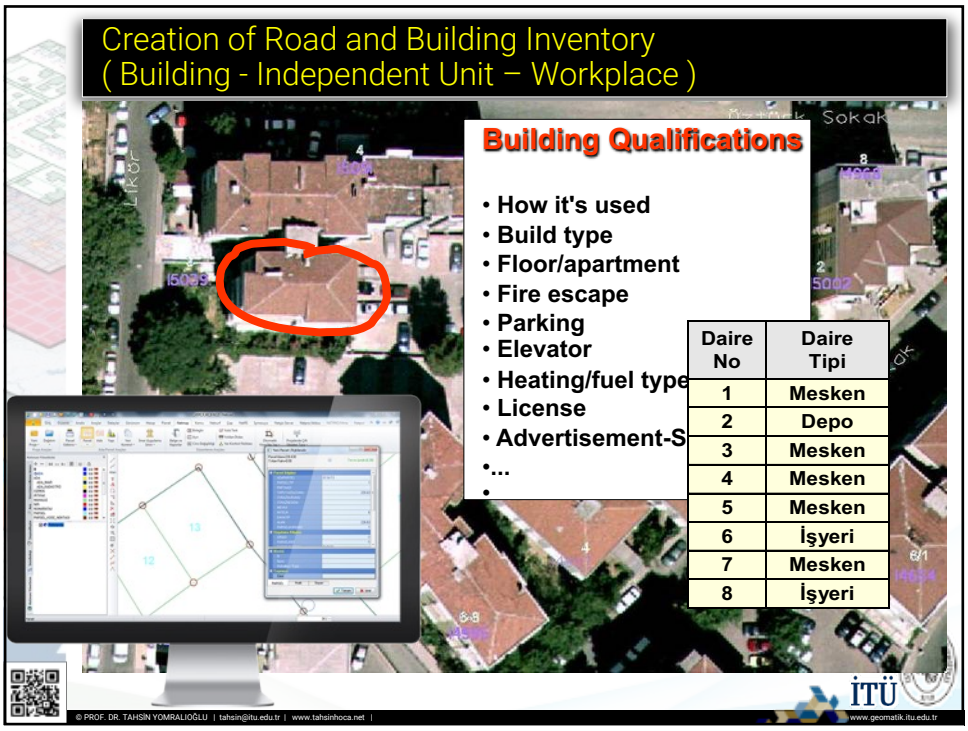
213


Integration of Zoning Layer into UIS (Zoning Plans)
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

214


Where are the immovables?
ESRI Analyst Reports
Site Location:
Los Angeles, California, United States
Report name:
Demographic Report
Ring analysis (miles):
Ring 1: 2
Ring 2: 5
Report Type:
ArcWeb:ESRI.Graphic.US
ArcWeb Authentication:
User: bozuk.alski
Password:
ESRI Business Analyst
Buy Report
Graphic Profile
For example: New business proposed site
Households
2005 Households by Income
2005 Population by Age
2005 Owner Occupied HUs by Value
Done
Unknown Zone
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

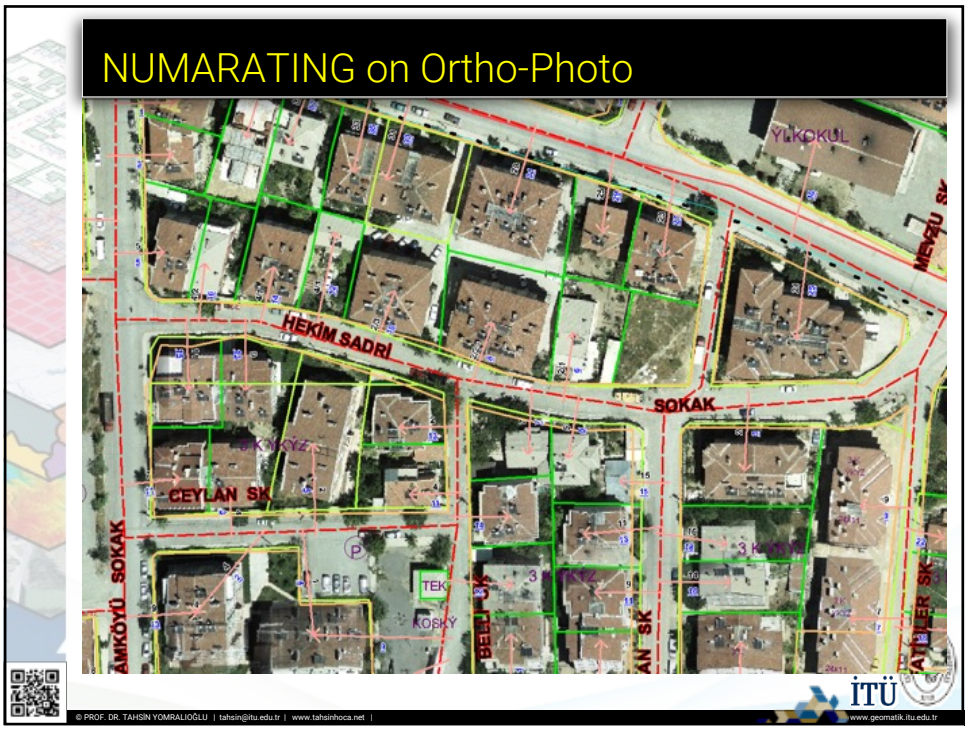
215


Creation of Road and Building Inventory
(Building - Independent Unit – Workplace)
Building Qualifications
• How it's used
• Build type
• Floor/apartment
• Fire escape
• Parking
• Elevator
• Heating/fuel type
• License
• Advertisement-S
•...
•
Daire No
Daire Tipi
1
Mesken
2
Depo
3
Mesken
4
Mesken
5
Mesken
6
İşyeri
7
Mesken
8
İşyeri
İTÜ

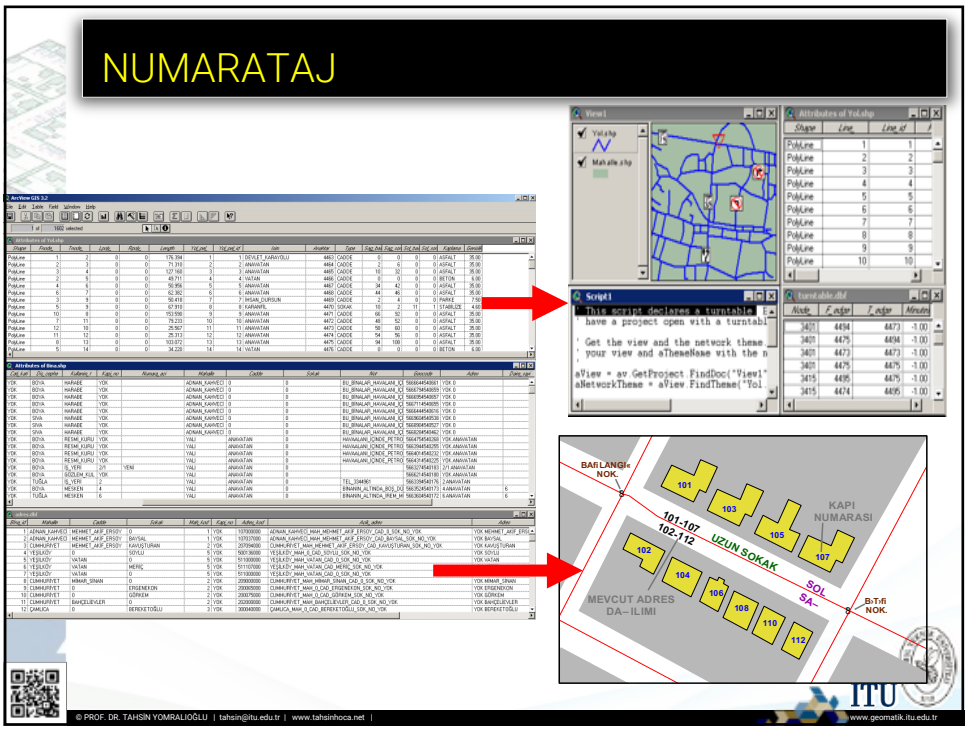
216


Creation of Road and Building Inventory
(Address Information System = Numarataj)

217


NUMARATING on Ortho-Photo
HEKİM SADRI
SOKAK
CEYLAN SK.
İTÜ

218


NUMARATAJ
BAŞLANGIÇ NOK.
101
103
105
107
KAPI NUMARASI
101-107
102-112
UZUN SOKAK
102
104
106
108
110
112
SOL SA-
MEVCUT ADRES DA-ILIMI
BİTİŞ NOK.
İTÜ

219

Integration of Road and Building Inventory into UIS (Building- Independent Unit Labeling)

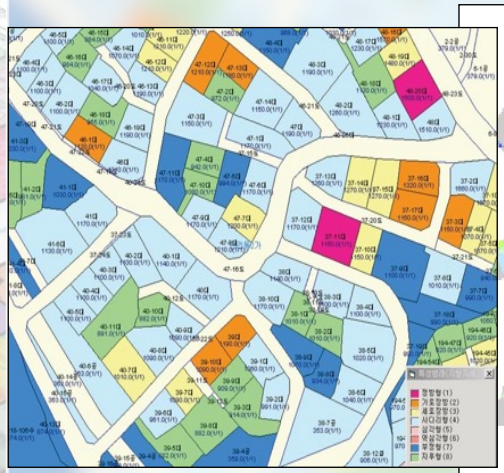
Building – Independent Units and Workplaces are given unique identification numbers.

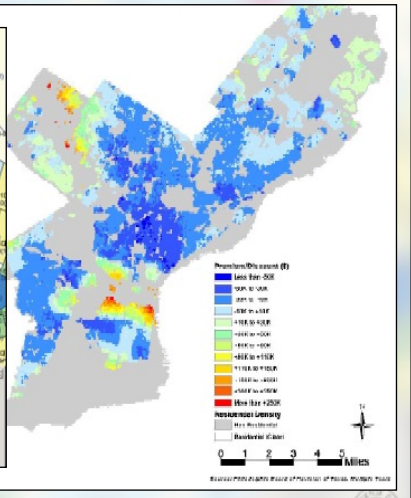
This number (KBSNO) is printed barcoded on polyester label and pasted in the field.

The number contains Barcode Code / Neighborhood Identification Number and Independent Building Sequence Number information.

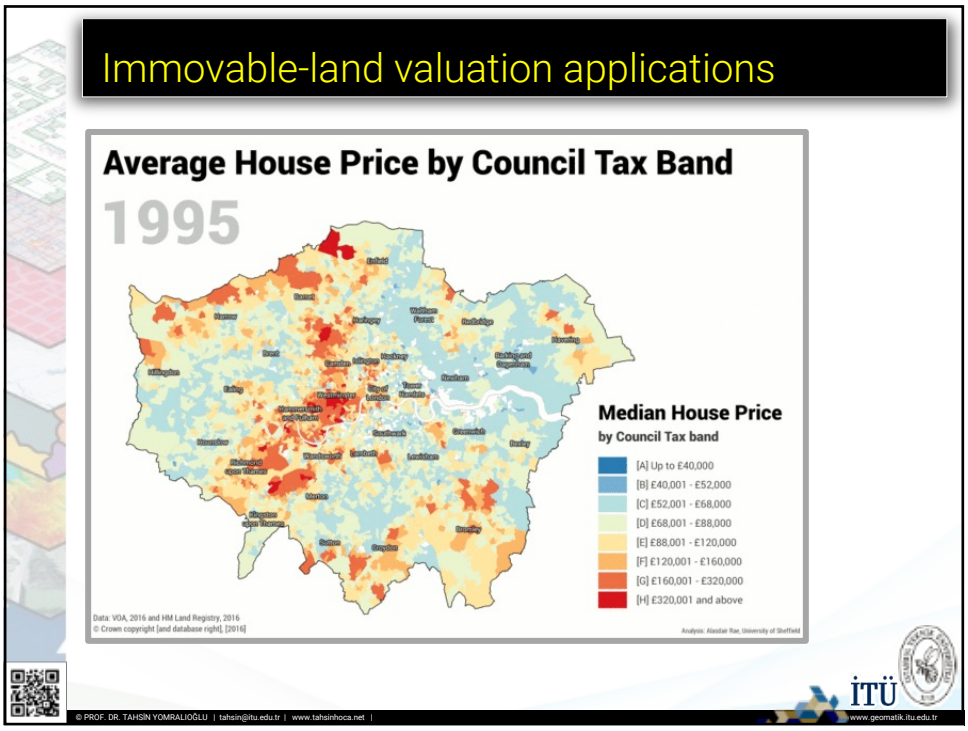
220

Immovable-land valuation applications

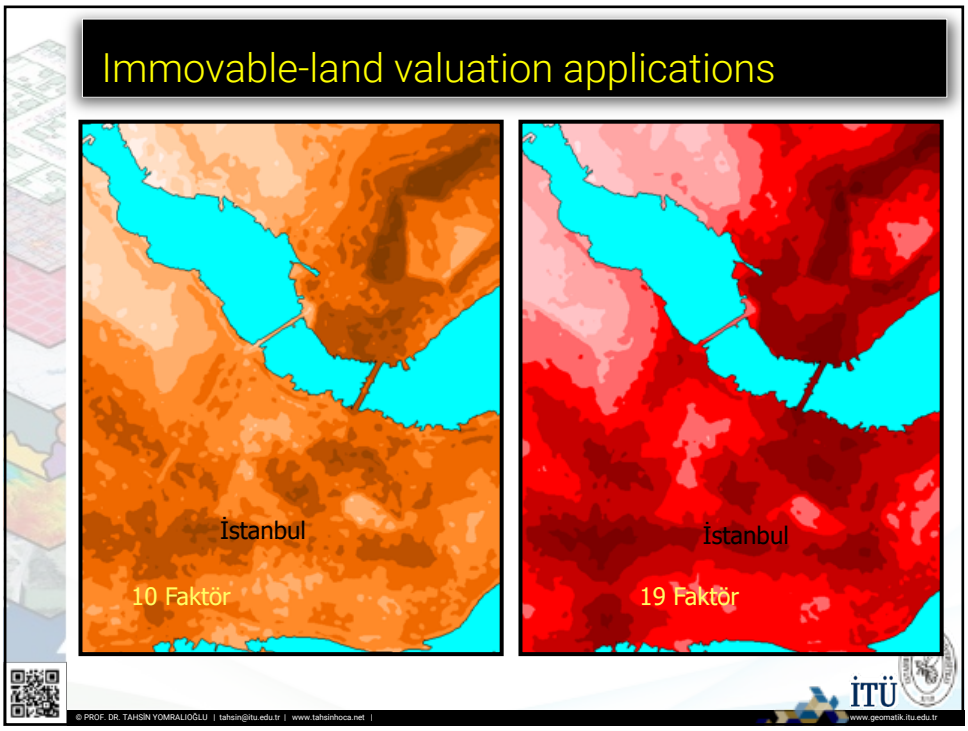




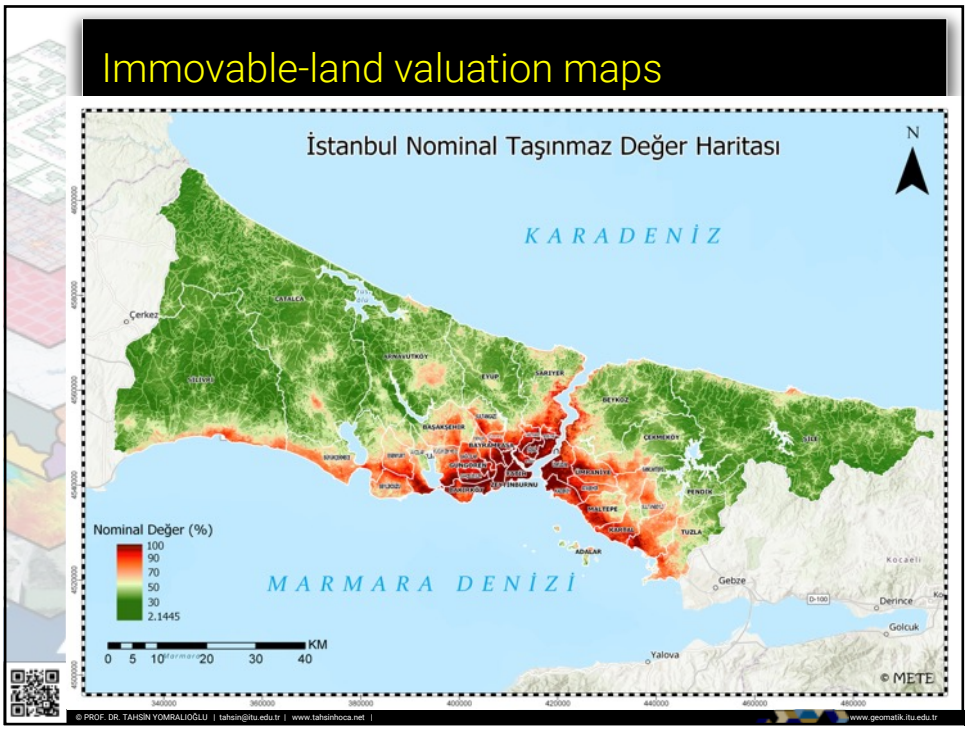
221


Immovable-land valuation applications
Average House Price by Council Tax Band
1995
Median House Price
by Council Tax band
[A] Up to £40,000
[B] £40,001 - £52,000
[C] £52,001 - £68,000
[D] £68,001 - £88,000
[E] £88,001 - £120,000
[F] £120,001 - £160,000
[G] £160,001 - £320,000
[H] £320,001 and above
İTÜ

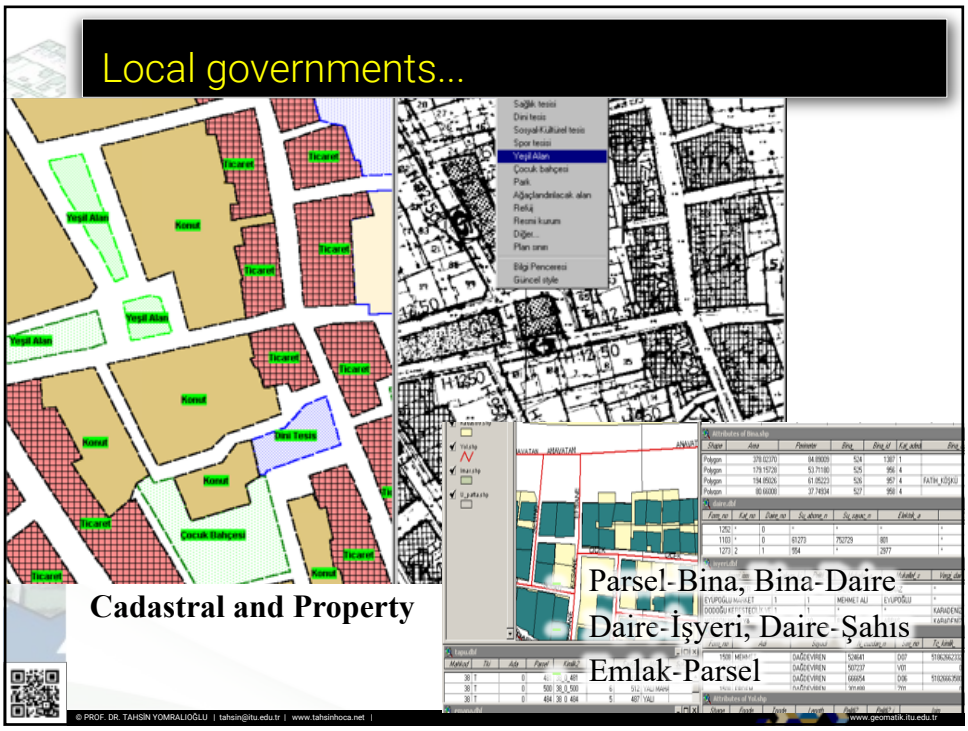
222


Immovable-land valuation applications
İstanbul
10 Faktör
İstanbul
19 Faktör
İTÜ

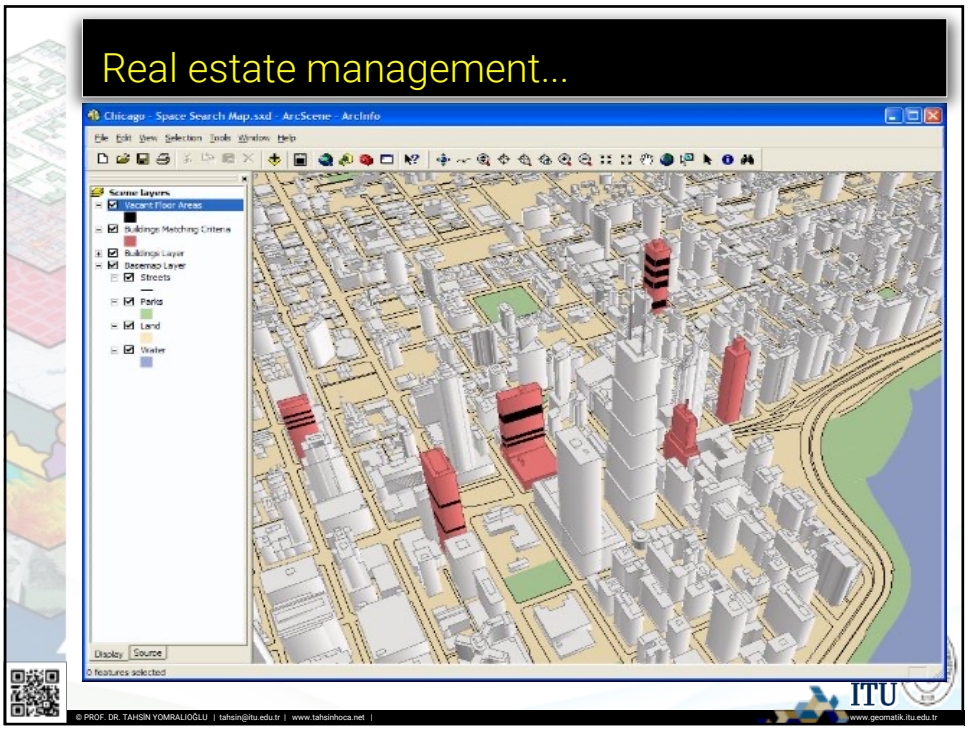
223


Immovable-land valuation maps
İstanbul Nominal Taşınmaz Değer Haritası
N
KARADENİZ
MARMARA DENİZİ
Nominal Değer (%)
100
90
70
50
30
2.1445
KM
0 5 10 20 30 40
Çerkez
Gebze
Derince
Golcuk
Yalova
© METE
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

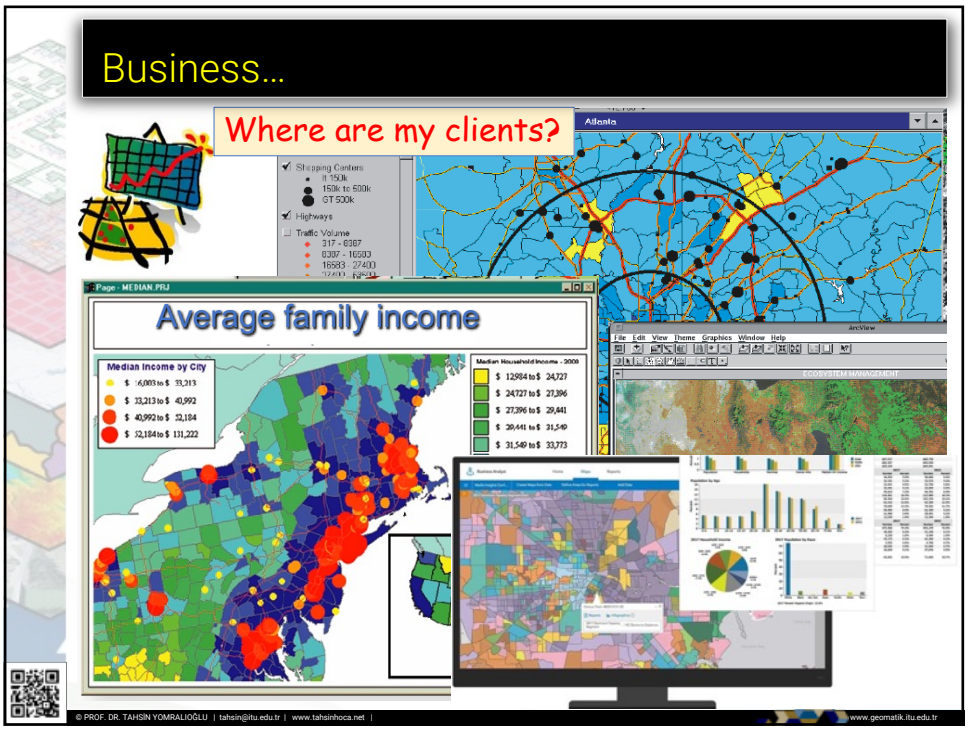
224


Local governments...
Cadastral and Property
Parsel-Bina, Bina-Daire
Daire-İşyeri, Daire-Şahıs
Emlak-Parsel
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

225


Real estate management...
ITU

226


Business...
Where are my clients?
Average family income
ITU

227

228

229

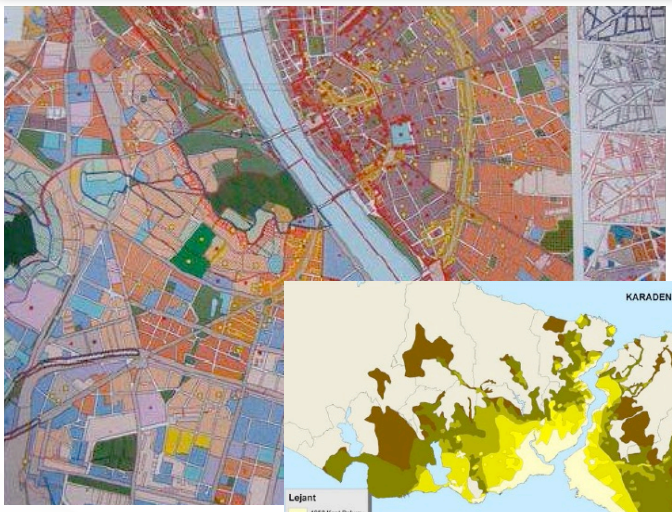

Part II
İTÜ

230


Planning
Land use
Urban plan
Green area
Demography
Economic development
Sports field
İTÜ

231

Planning



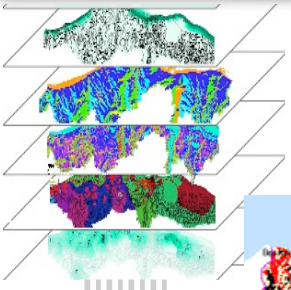
Spatial development

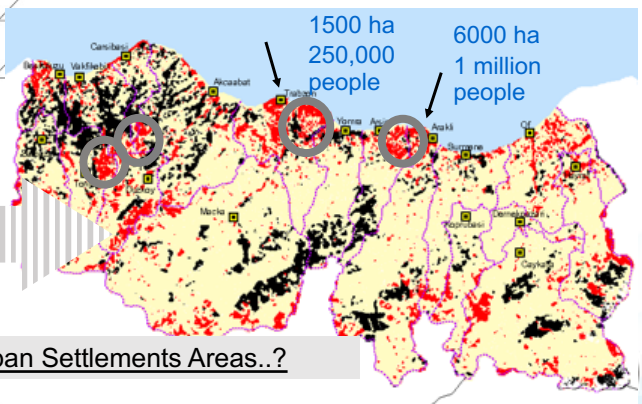
Urban plans

232

Planning...

AKKS
Slope
Lithology
Land Cover
Landslide areas





Potential Urban Settlements Areas..?

233


Plan and Satellite Image
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

234


Infrastructure management...
İGDAŞ
İGABİS
İGDAŞ
NINTH ST
ELEVENTH ST
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

235


Ulaşım yönetimi…
PAINEL ANALÍTICO DE ACIDENTES RODOVIÁRIOS - PARE/DF
ACIDENTES POR ANO E CLASSIFICAÇÃO
ACIDENTES DE TRÂNSITO - NATUREZA
TIPOS DE ACIDENTES (ACUMULADO)
ACIDENTES COM VÍTIMAS FATAIS (ACUMULADO)
31
TOMBAMENTO
OCORRÊNCIAS
ACIDENTES DE TRÂNSITO - VEÍCULO ENVOLVIDO
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

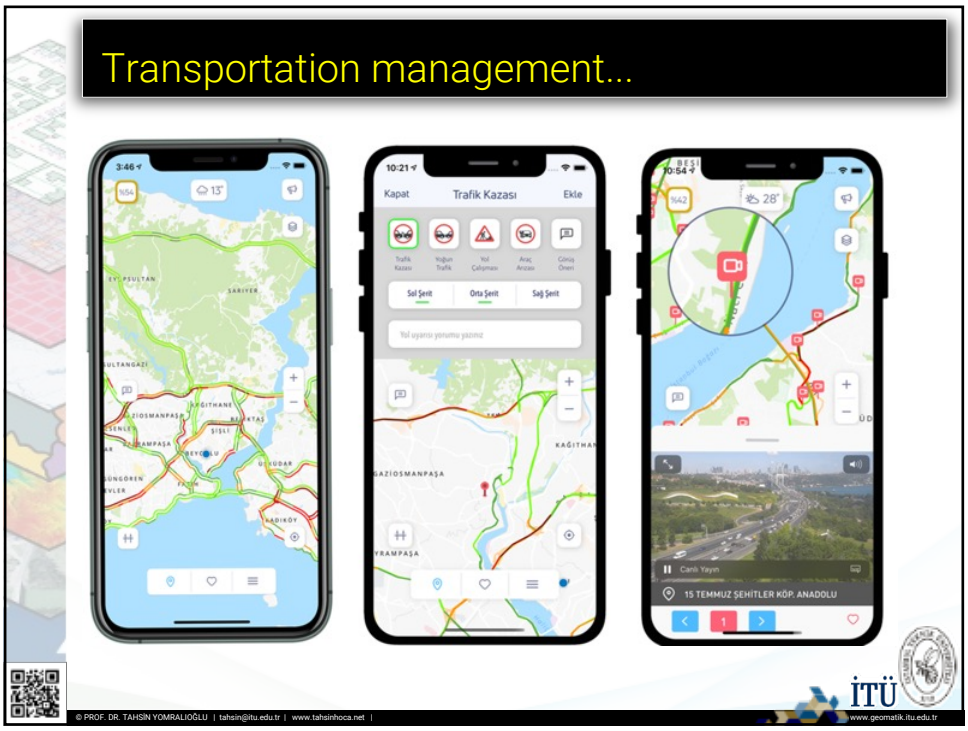
236


Transportation management…
İSTANBUL BÜYÜKŞEHİR BELEDİYESİ
UYM
ULAŞIM YÖNETİM MERKEZİ
İTÜ
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

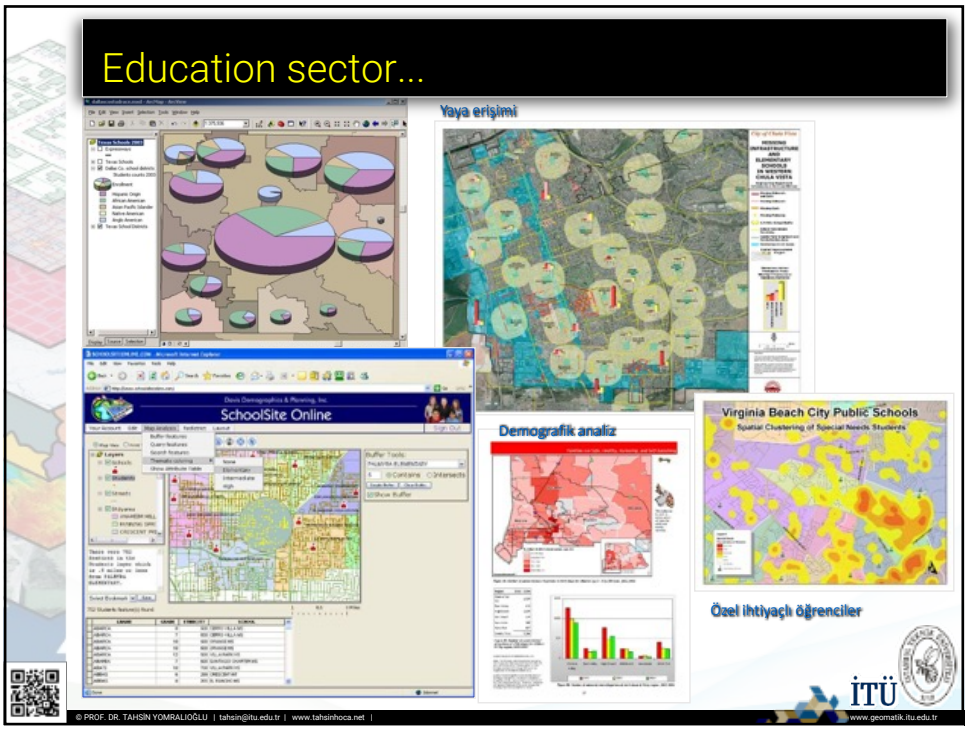
237


Transportation management...
KONTROL MERKEZİ
Yol Kademelenmesi
FATİH BELEDİYESİ ULAŞIM PROJESİ
Yol Döşeme Kaplama Cinsi
FATİH BELEDİYESİ ULAŞIM PROJESİ
Levhalandırma
FATİH BELEDİYESİ ULAŞIM PROJESİ
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

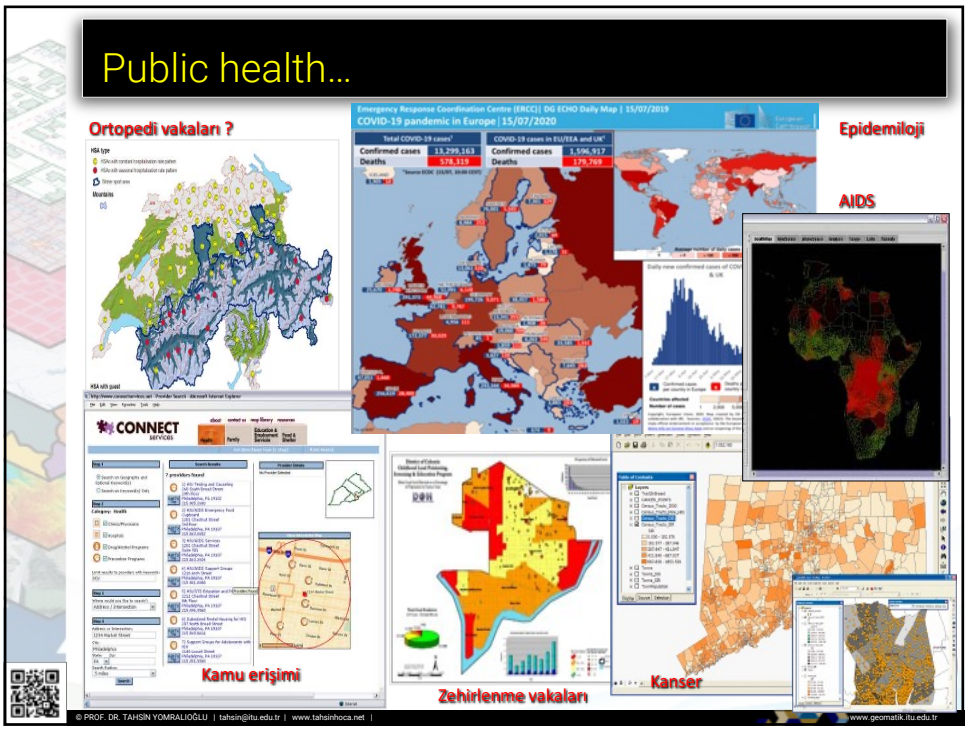
238


Transportation management...
Kapat
Trafik Kazası
Ekle
15 TEMMUZ ŞEHİTLER KÖP. ANADOLU
İTÜ
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

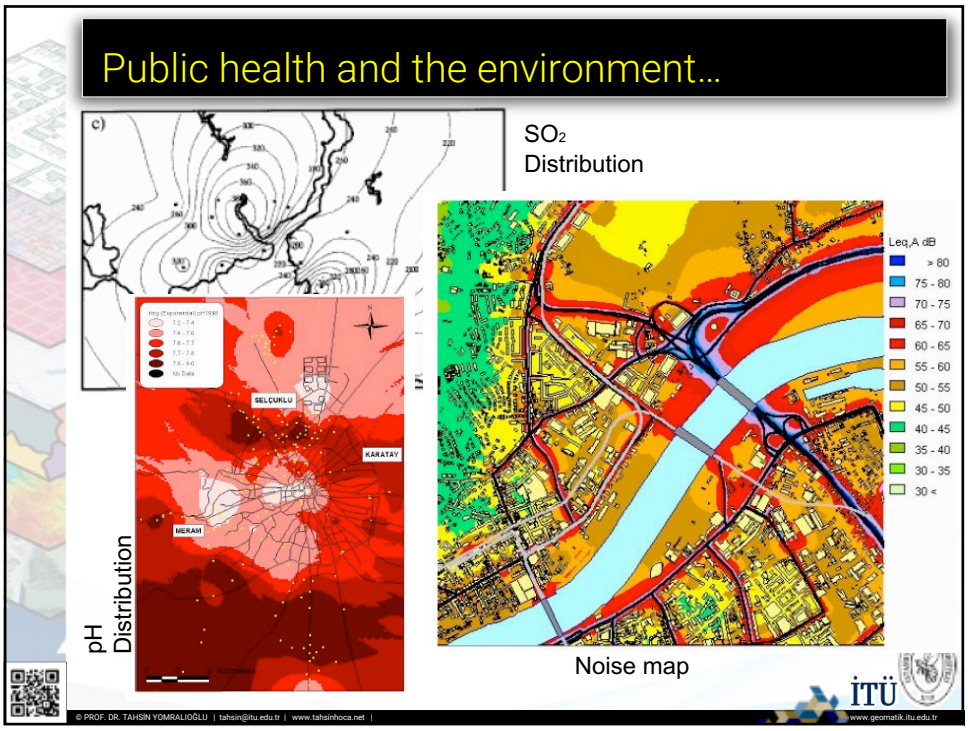
239


Education sector...
Yaya erişimi
SchoolSite Online
Demografik analiz
Virginia Beach City Public Schools
Spatial Clustering of Special Needs Students
Özel ihtiyaçlı öğrenciler
İTÜ
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

240


Public health...
Ortopedi vakaları ?
Epidemiloji
AIDS
CONNECT
Kamu erişimi
Zehirlenme vakaları
Kanser
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

241


Public health and the environment…
SO2
Distribution
pH
Distribution
SELÇUKLU
KARATAY
MERAM
Leq,A dB
> 80
75 - 80
70 - 75
65 - 70
60 - 65
55 - 60
50 - 55
45 - 50
40 - 45
35 - 40
30 - 35
30 <
Noise map
İTÜ

242


Public health and the environment…
Clean Streets Index
(Archive - released April 2016)
As part of Mayor Eric Garcetti's Clean Streets initiative, the City's Bureau of Sanitation drove all of LA's public streets and alleys (traveling over 22,000 miles!) and gave each block a "cleanliness score" from 1-3:
1. Clean
2. Somewhat Clean
3. Not Clean
How clean is your street? Type in an address or click on a street to see how it fares.
Clean Streets Index
İTÜ

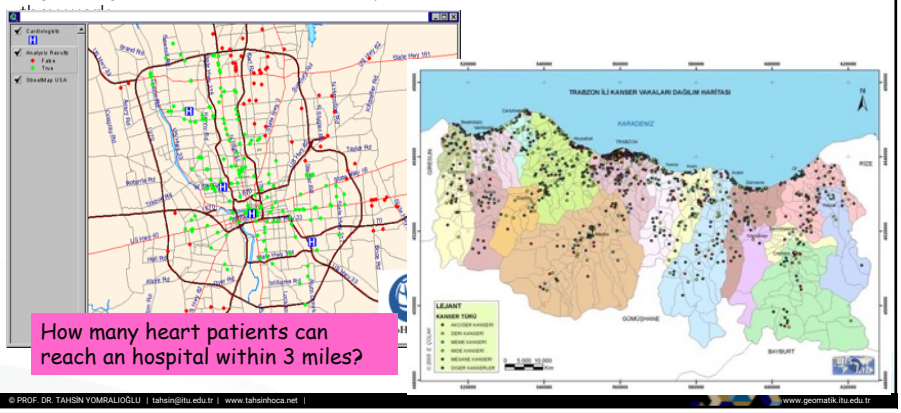
243

Public health and the environment…

When health problems are encountered, communication and patient transfers between health institutions can be planned quickly.

Information such as the health status, diseases, blood groups, etc. of individuals in any neighbourhood can be stored in the database and statistical analyses can be performed and the need of the neighbourhood's health institution can be determined.

The positions of the health personnel can be determined according to the need by registering the branches of the health personnel in the database of the institutions in which

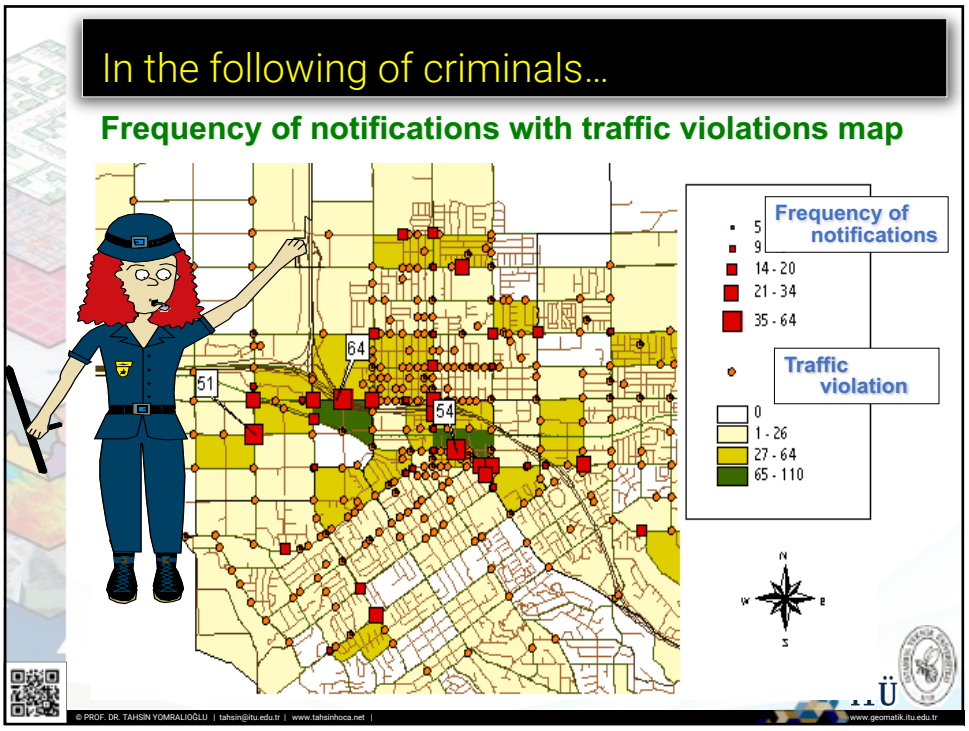


244

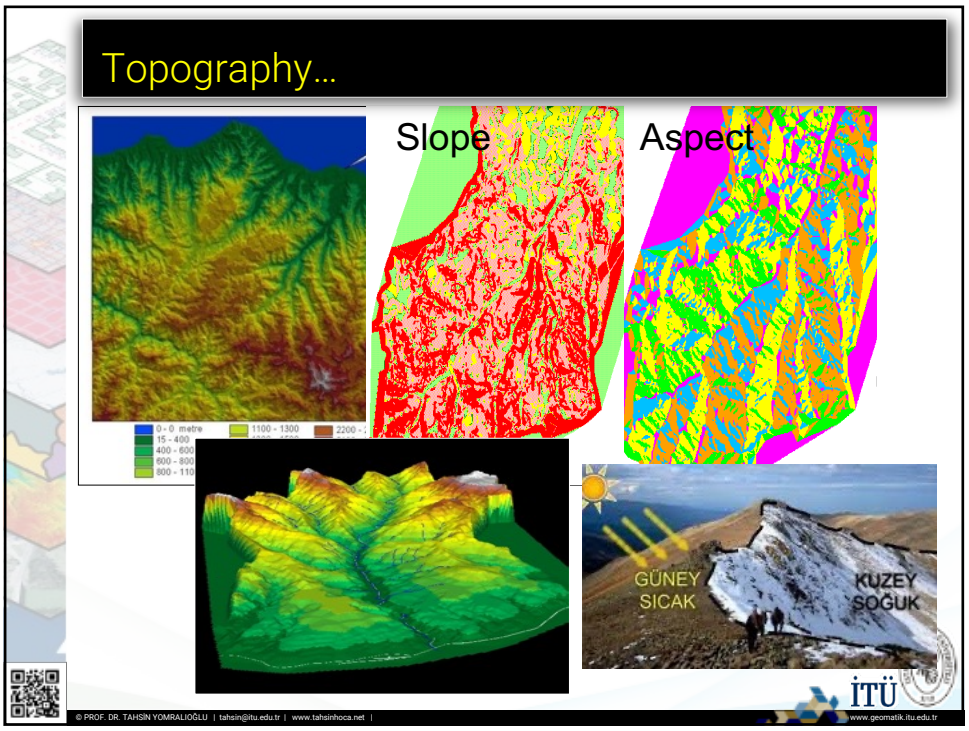
Education…

- ***Where are the most suitable schools and what are the safest routes to them?***

245

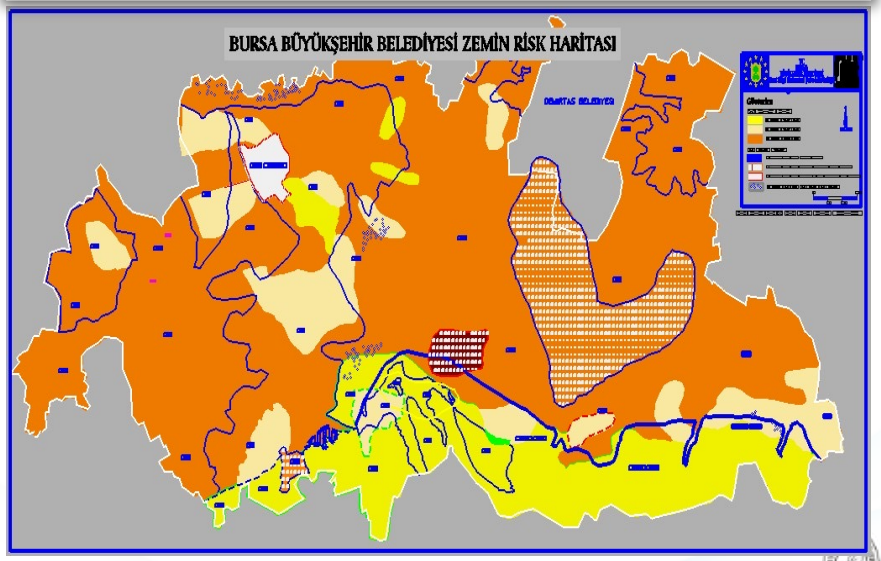

In the following of criminals…
Frequency of notifications with traffic violations map
Frequency of notifications
5
9
14 - 20
21 - 34
35 - 64
Traffic violation
0
1 - 26
27 - 64
65 - 110
64
51
54
İTÜ

246


Topography…
Slope
Aspect
GÜNEY
SICAK
KUZEY
SOĞUK
İTÜ

247

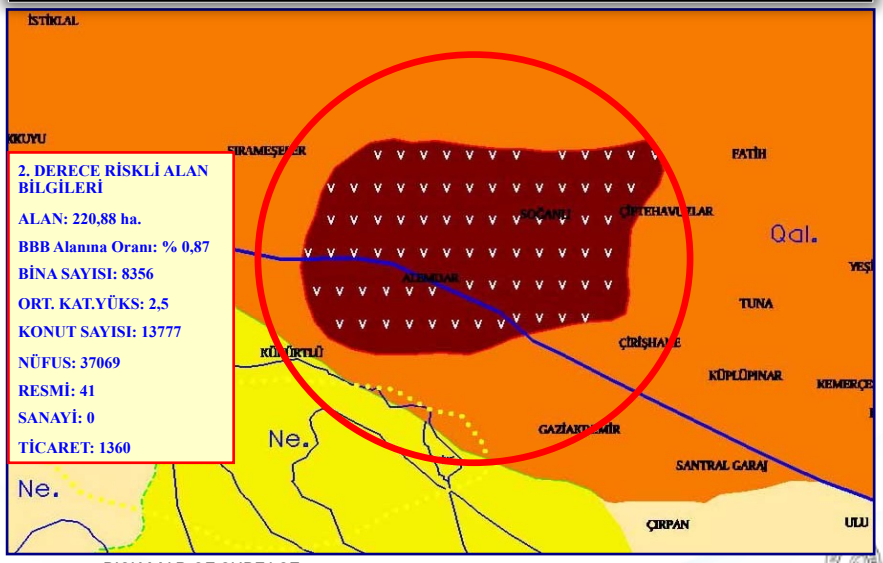
Risk analyses…



On this map, different ground regions are classified according to the degree of risk.

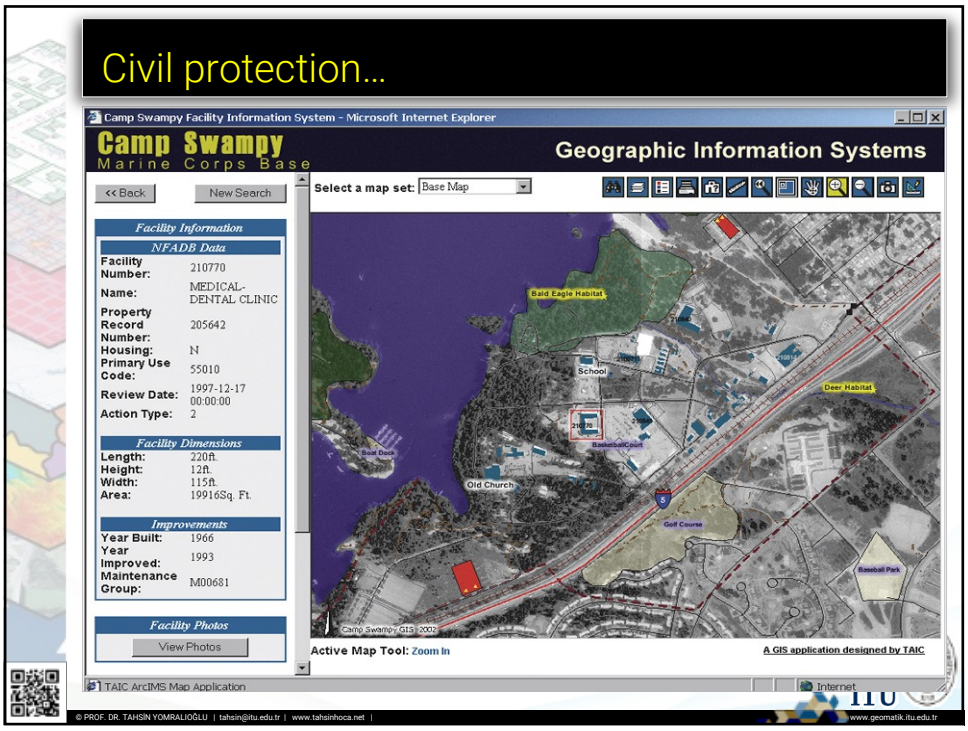
248

Risk analyses…



RISK MAP OF SURFACE
2. DERECE RİSKLİ ALAN (SIVILAŞMA POTANSİYELİ YÜKSEK BÖLGELER)

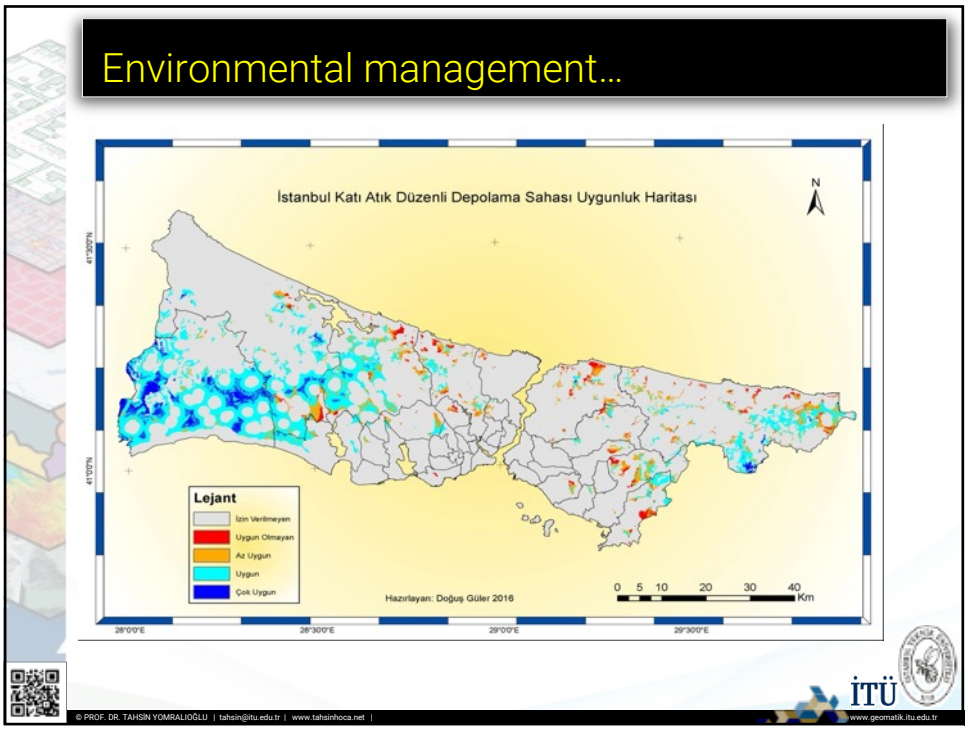
249


Civil protection…
Camp Swampy Facility Information System - Microsoft Internet Explorer
Camp Swampy
Marine Corps Base
Geographic Information Systems
<< Back
New Search
Select a map set: Base Map
Facility Information
NFADB Data
Facility Number: 210770
Name: MEDICAL-DENTAL CLINIC
Property Record Number: 205642
Housing: N
Primary Use Code: 55010
Review Date: 1997-12-17 00:00:00
Action Type: 2
Facility Dimensions
Length: 220ft.
Height: 12ft.
Width: 115ft.
Area: 19916Sq. Ft.
Improvements
Year Built: 1966
Year Improved: 1993
Maintenance Group: M00681
Facility Photos
View Photos
Bald Eagle Habitat
School
Deer Habitat
Boat Dock
Old Church
Golf Course
Baseball Park
Active Map Tool: Zoom In
A GIS application designed by TAIC
TAIC ArcIMS Map Application
Internet
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

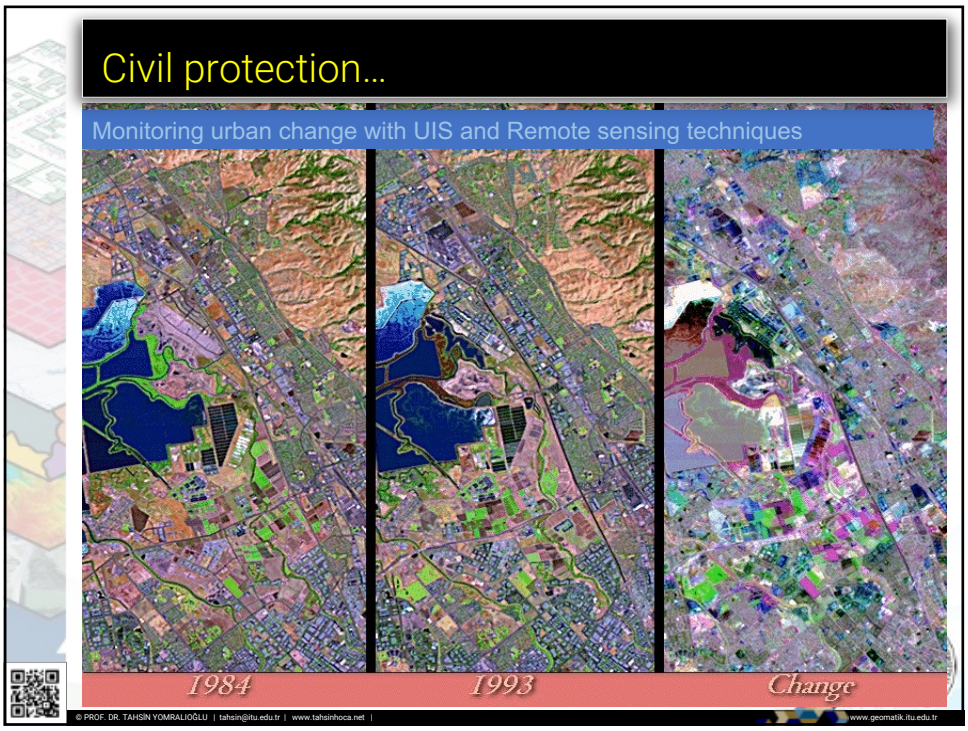
250


Civil protection…
• where can we store waste in the safest place?
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

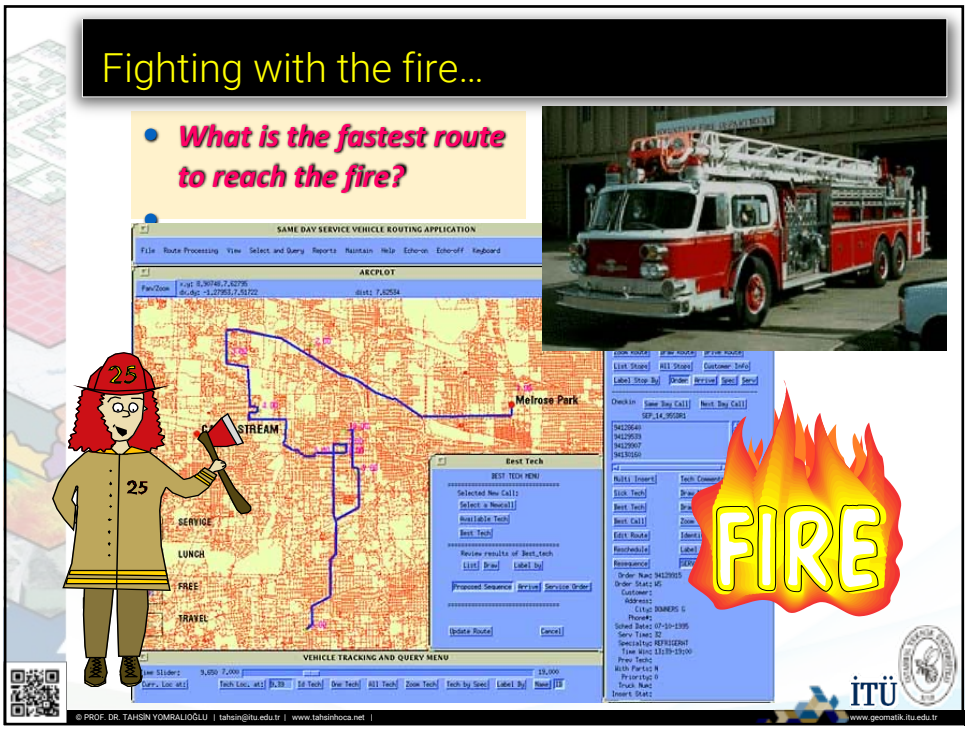
251


Environmental management…
İstanbul Katı Atık Düzenli Depolama Sahası Uygunluk Haritası
N
Lejant
İzin Verilmeyen
Uygun Olmayan
Az Uygun
Uygun
Çok Uygun
Hazırlayan: Doğuş Güler 2016
0 5 10 20 30 40
Km
İTÜ

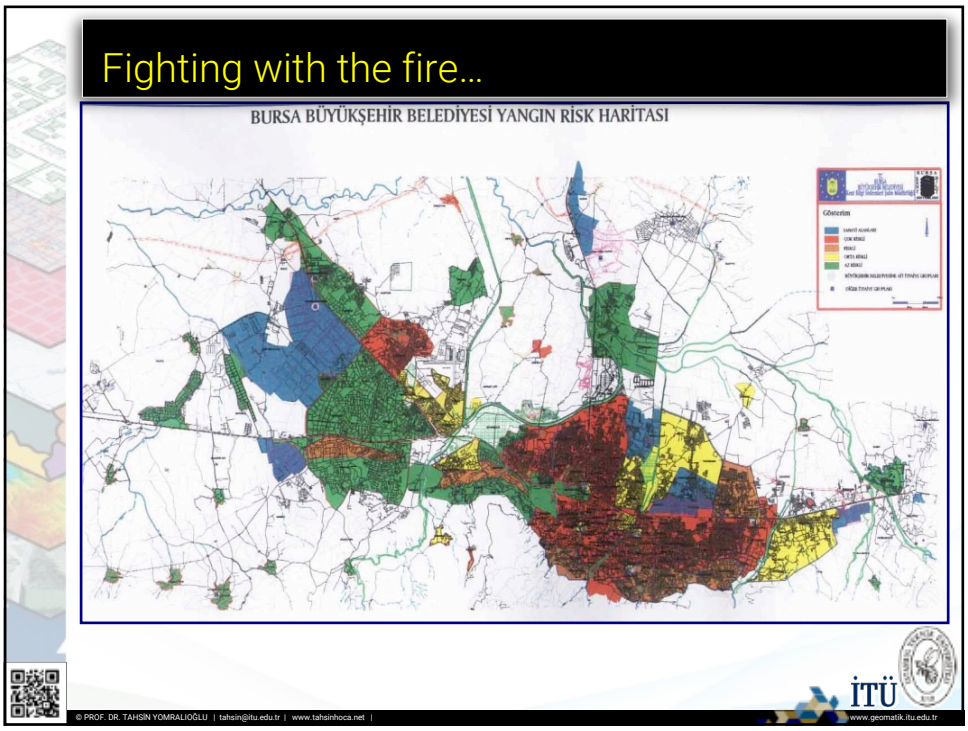
252


Civil protection…
Monitoring urban change with UIS and Remote sensing techniques
1984
1993
Change

253


Fighting with the fire…
What is the fastest route to reach the fire?
SAME DAY SERVICE VEHICLE ROUTING APPLICATION
ARCPLOT
Melrose Park
STREAM
SERVICE
LUNCH
FREE
TRAVEL
25
Best Tech
VEHICLE TRACKING AND QUERY MENU
FIRE
İTÜ

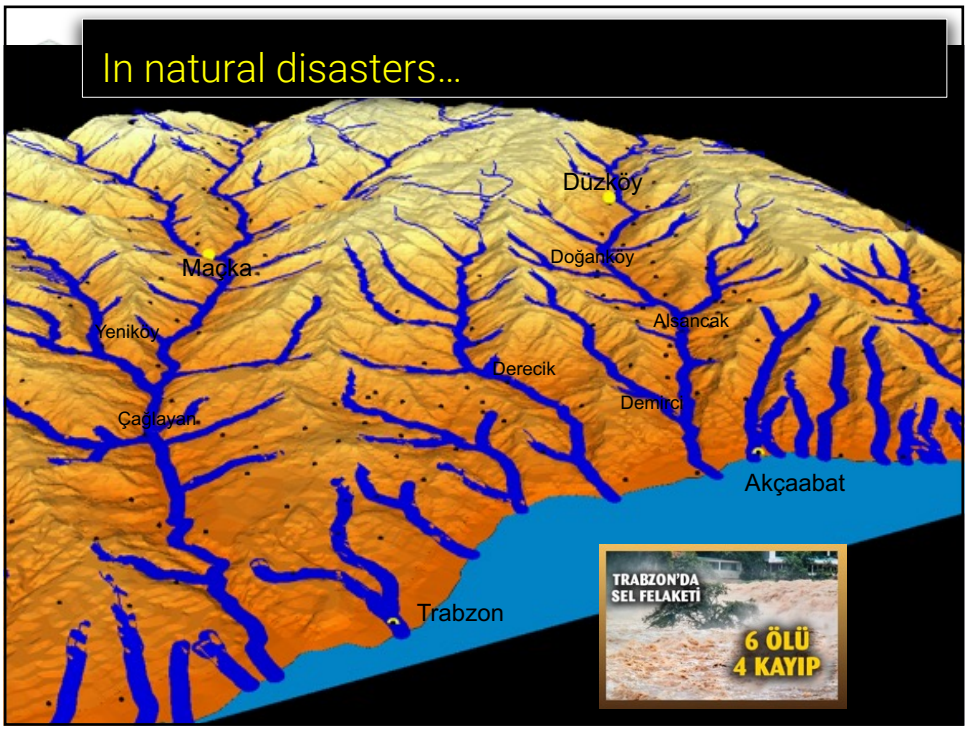
254


Fighting with the fire…
BURSA BÜYÜKŞEHİR BELEDİYESİ YANGIN RİSK HARİTASI
İTÜ

255

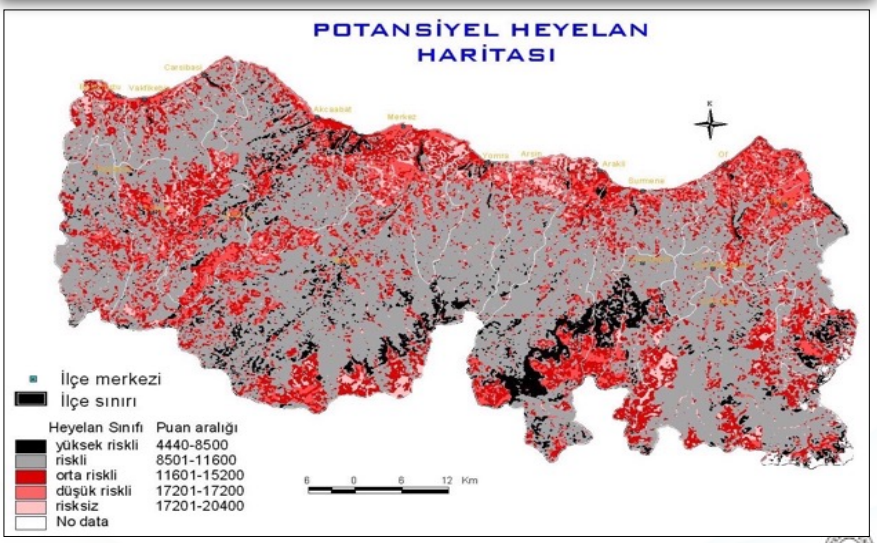

In natural disasters…
Geological Structure in the Region,
Power Transmission Lines,
Stream Beds,
Erosion Distribution,
Industrial Organizations, etc.
Damaged Structures
Damaged Structures
By marking on numerical maps and transferring quality information to the database, risk analyses can be made taking into account various possibilities without disaster and the loss of life and property in a possible disaster situation is reduced.
İTÜ
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

256


In natural disasters…
Düzköy
Doğankoy
Macka
Yenikoy
Alsancak
Derecik
Demirci
Çaglayan
Akçaabat
Trabzon
TRABZON'DA SEL FELAKETİ
6 ÖLÜ
4 KAYIP

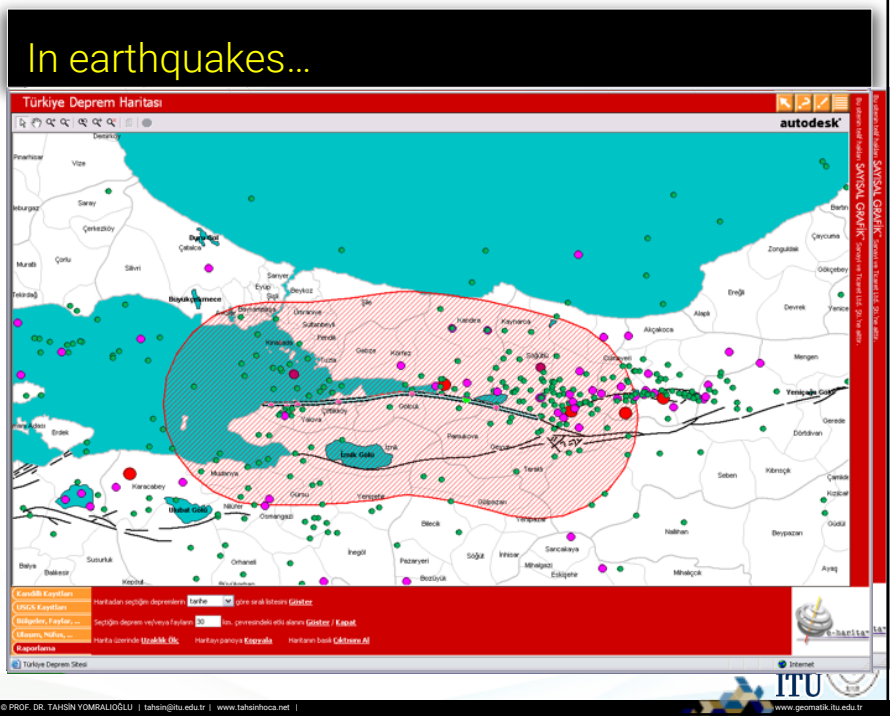
257

Detection of risky areas…



258

In earthquakes…



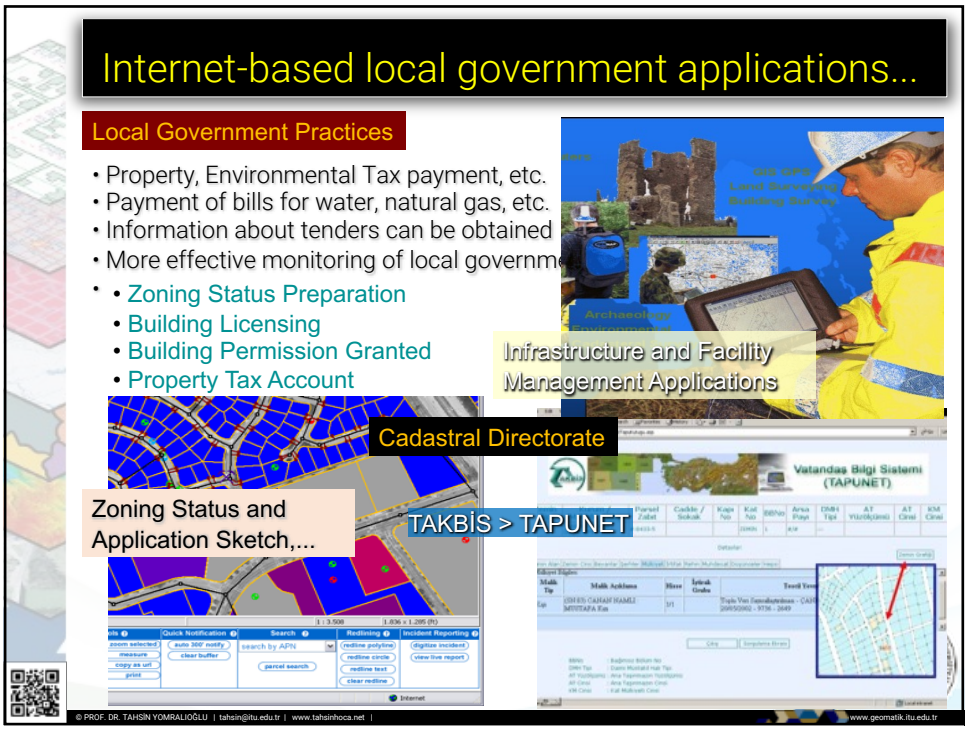
259


Mobile GIS...
Feature Properties
Trimble
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

260


Mobile GIS: vehicle tracking systems...
İTÜ
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

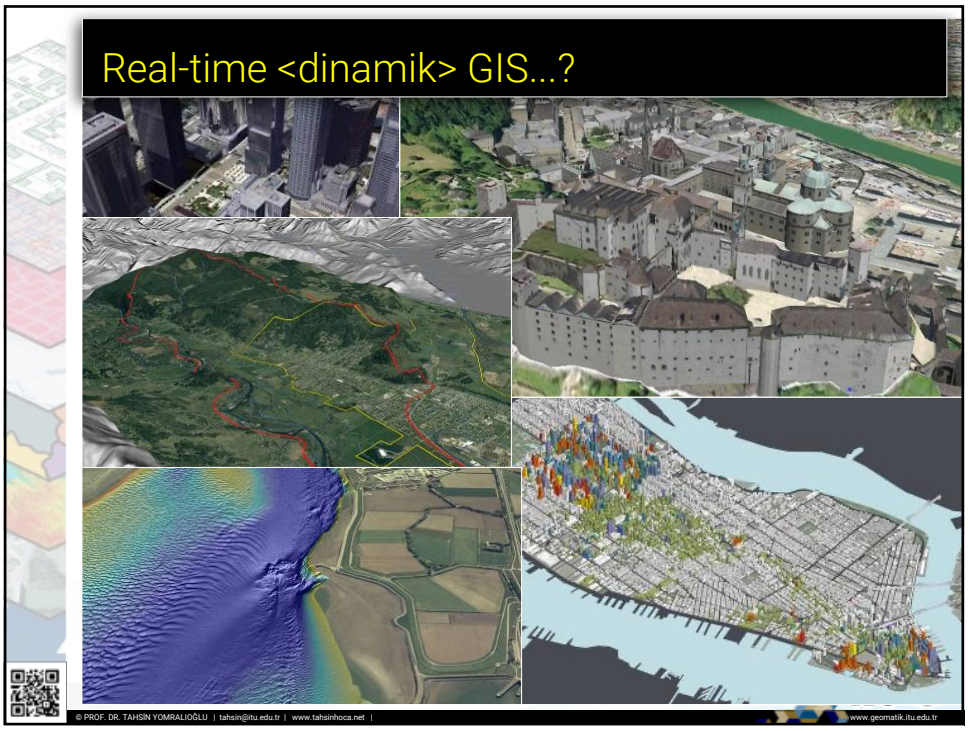
261


Internet-based local government applications...
Local Government Practices
• Property, Environmental Tax payment, etc.
• Payment of bills for water, natural gas, etc.
• Information about tenders can be obtained
• More effective monitoring of local governme
• • Zoning Status Preparation
• Building Licensing
• Building Permission Granted
• Property Tax Account
Infrastructure and Facility Management Applications
Cadastral Directorate
Zoning Status and Application Sketch,...
TAKBİS > TAPUNET
Vatandaş Bilgi Sistemi (TAPUNET)
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

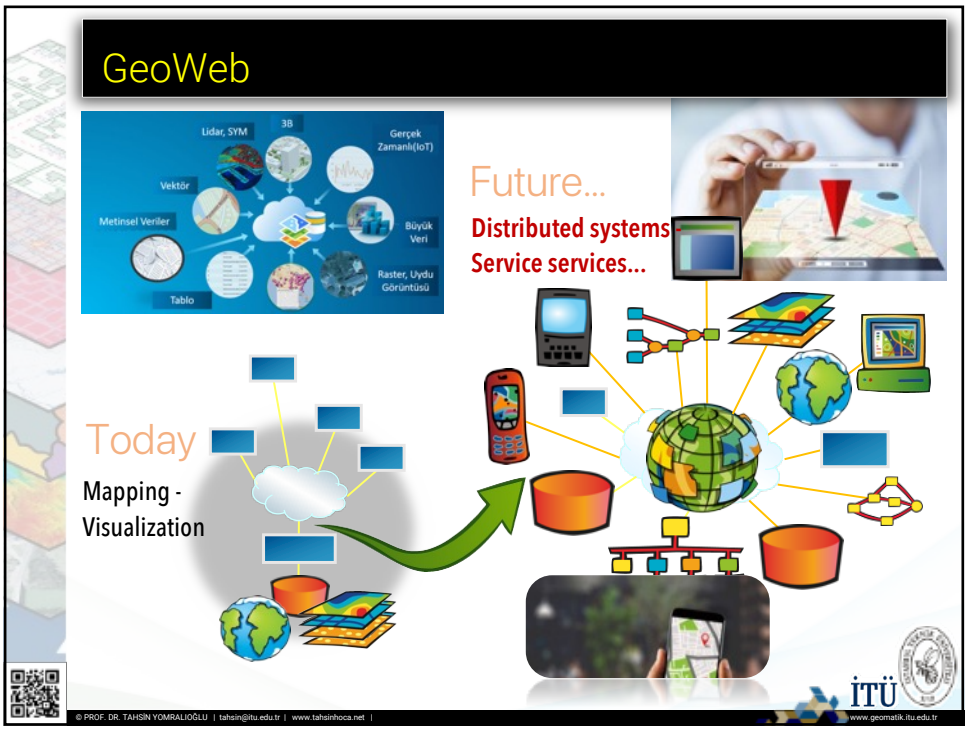
262


«Dashboard» Applications...
Dashboards change the way you understand relevant up-to-date information from a community or an organization, making data consumption easy and convenient. Dashboards that are publicly shared are only visible. Many dashboards are created and shared to help make decisions, visualize trends, and monitor status in real time.
COVID-19 Küresel Yayılım Paneli
Dünya'da
123.292.803
Türkiye'de
Doğrulanmış Vaka
3.013.122
Vefat Sayısı
30.061
İyileşme
2.825.187
Toplam Test Sayısı
36.355.374
İllere Göre Risk Durumu
Türkiye COVID-19 Süreç Grafiği
esri Türkiye
İTÜ
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

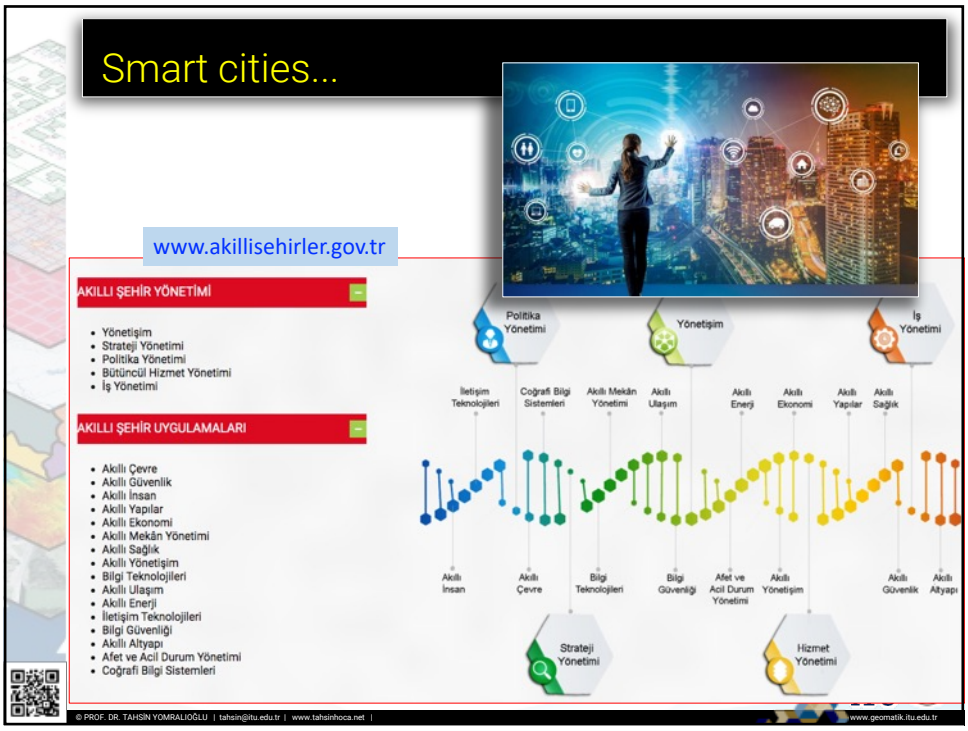
263


Real-time <dinamik> GIS...?
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

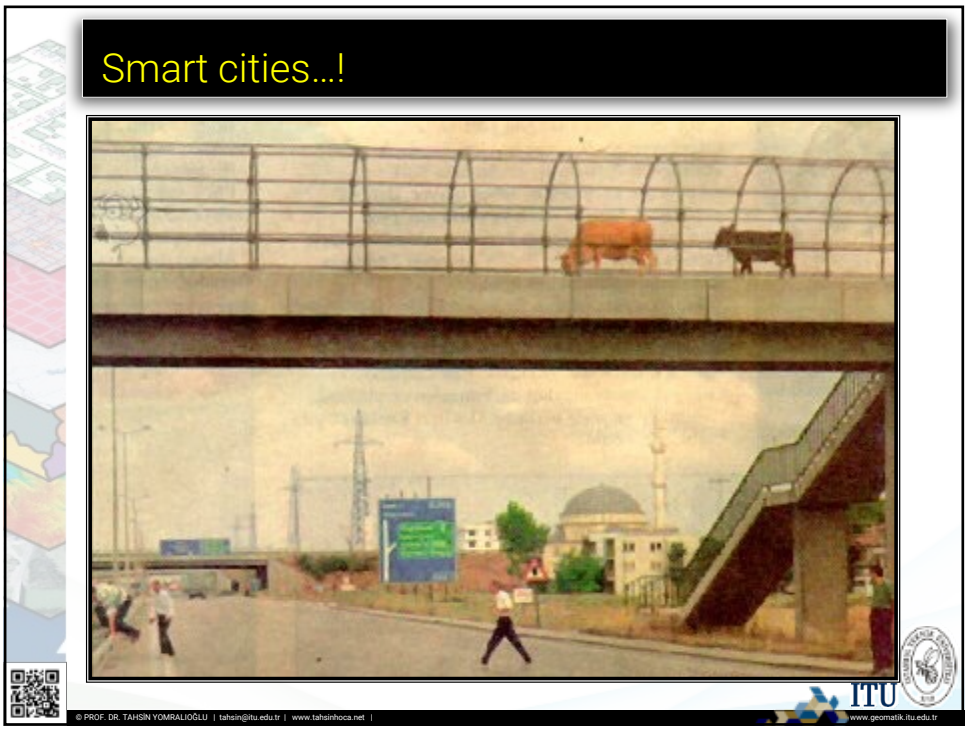
264


GeoWeb
Lidar, SYM
3B
Gerçek Zamanlı(IoT)
Vektör
Metinsel Veriler
Büyük Veri
Raster, Uydu Görüntüsü
Tablo
Future...
Distributed systems
Service services...
Today
Mapping -
Visualization
İTÜ
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

265


Smart cities...
www.akillisehirler.gov.tr
AKILLI ŞEHİR YÖNETİMİ
Yönetişim
Strateji Yönetimi
Politika Yönetimi
Bütüncül Hizmet Yönetimi
İş Yönetimi
AKILLI ŞEHİR UYGULAMALARI
Akıllı Çevre
Akıllı Güvenlik
Akıllı İnsan
Akıllı Yapılar
Akıllı Ekonomi
Akıllı Mekân Yönetimi
Akıllı Sağlık
Akıllı Yönetişim
Bilgi Teknolojileri
Akıllı Ulaşım
Akıllı Enerji
İletişim Teknolojileri
Bilgi Güvenliği
Akıllı Altyapı
Afet ve Acil Durum Yönetimi
Coğrafi Bilgi Sistemleri
Politika Yönetimi
Yönetişim
İş Yönetimi
Strateji Yönetimi
Hizmet Yönetimi
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

266


Smart cities...!
© PROF. DR. TAHSİN YOMRALIOĞLU | tahsin@itu.edu.tr | www.tahsinhoca.net |
www.geomatik.itu.edu.tr

267


URBAN INFORMATION SYSTEMS
Thank you...
Prof. Dr. Tahsin YOMRALIOĞLU
İTÜ
GEOMATİK

268