



REPUBLIC of TURKEY
MINISTRY of ENVIRONMENT and URBANIZATION
GENERAL DIRECTORATE of GIS

Project :

BUILDING TURKISH NATIONAL GIS (TRGIS) and DEVELOPMENT OF GEO-DATA STANDARDS

Tahsin YOMRALIOĞLU & Arif Cagdas AYDINOGLU, Turkey



Presenter

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Introduction Data Management Issues

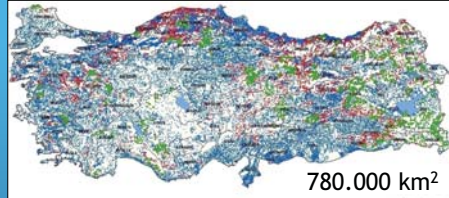
- After 1990s, digital map production
- The General Command of Mapping produced STMs, 1:5000 and smaller.
- Land Registry & Cadastre Directorate (**L-RCD**), Provincial Bank, and Municipalities produce large scaled maps, 1:5000 and larger...
- Large Scaled Map Production Regulation (**BÖHHBUY**) enclosed with feature / attribute catalog + UVDF in 2006.
- **!!** Geo information standards are not designed to solve application-driven requirements for various GIS projects and not designed to enable data interoperability.



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National GIS projects

- LRCD manages land administration activities with 22 of Regional, 1018 of Land Registry, 325 of Cadastre Dir., 122 of Cadastre Office
- **TAKBIS- Land Reg. & Cadastre Inf. Syst.**, aims to manage cadastral data for 5 million land registry processes on GIS.
- Map Information Bank (HBB)
- CORS-TR- Continuously Operating Reference Stations -Turkey
- Integrated Transportation Management
- ...
- %20 of 2950 municipalities declared UrbanGIS projects....
- ! Other public institutions and municipalities have produced GIS projects serving their needs.



CORS_TR Stations . 147



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National GIS projects

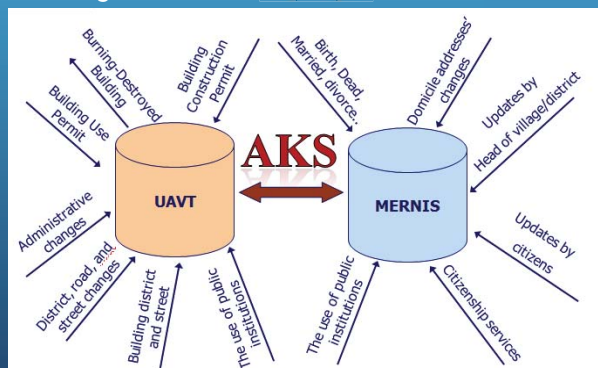
Spatial Address Registration System (MAKS) in 2011
by Interior Ministry- Gen.Dir. Of Population and Citizenship



National Address Database (UAVT)
in 2006, "Numbering and National Address Database Regulation" ...



Central Population Management System (MERNIS)
Unique citizenship ID after 2000.



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National GIS projects

- Forestry, Water GIS, Protected Sites, Land Cover, ... projects by Ministry of Forestry and Water



- Geo-data Portal



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TRGIS for e-transformation Turkey Project

- Geographic information requirement and data sharing needs started to increase...
- **TRGIS**- Building Turkey National GIS actions similar to NSDI vision.
- **Action-47** in 2004, current situation to build TRGIS was examined.
- **Action-36** in 2005, TRGIS strategy as policy encouragement was determined with a coordination body.



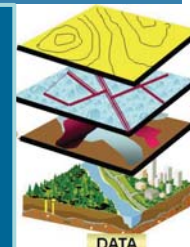
under
responsibility of
LRCD

- **KYM-75** in 2007 aims to build a geo-portal where public institutions can present their geo-information. ...



PEOPLE

- ? Policy encouragement
- ? Data standard
- ? Technical requirements



DATA

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TRGIS with General Dir. of GIS

- Ministry of Environment And Urbanization, **General Dir. of GIS** was built in 2011.
- coordinating all GIS activities
- determining standards and building TRGIS
- ...



TRGIS and **UrbanGIS** projects in 2011

Contractor: Türksat Satellite Communication, Ankara

Subcontractor: **Istanbul Technical University, ARI Teknokent**

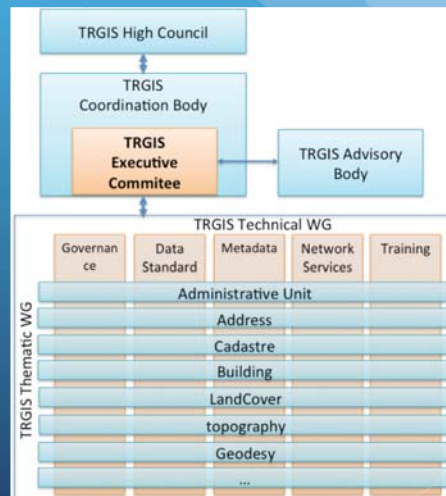
- TRGIS project: for 65 general directorates
 - defining national geo-data standards
 - geo-portal development analysis
 - determining institutional and policy requirements
- UrbanGIS project: for 2950 municipalities + 81 provincial Admin.
 - determining UrbanGIS geo-data standards
 - current situation analysis for UrbanGIS
 - Determining legal and financial requirements



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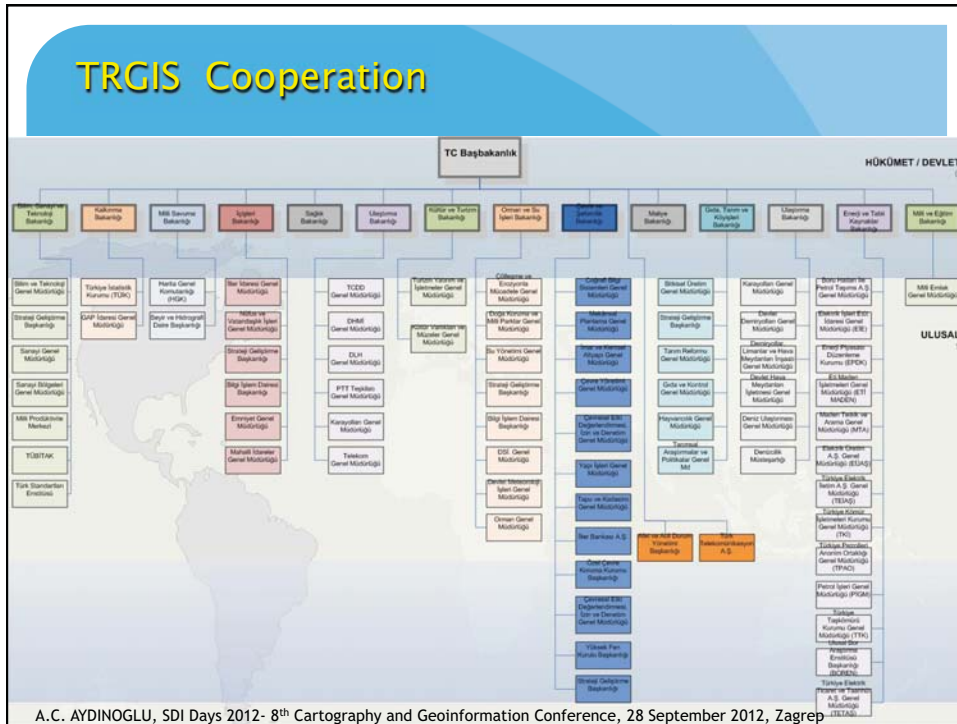
TRGIS Institutional Framework

- TRGIS Legislation
 - No.3194 Zoning Law authorizes Gen.Dir. of GIS for TRGIS regulations.
 - TRGIS regulation will enter into force in 2012, similar to INSPIRE directive.
- TRGIS vision, strategy, and other regulation needs were determined
- TRGIS administration structure was defined.
- UrbanGIS building directive for local governments



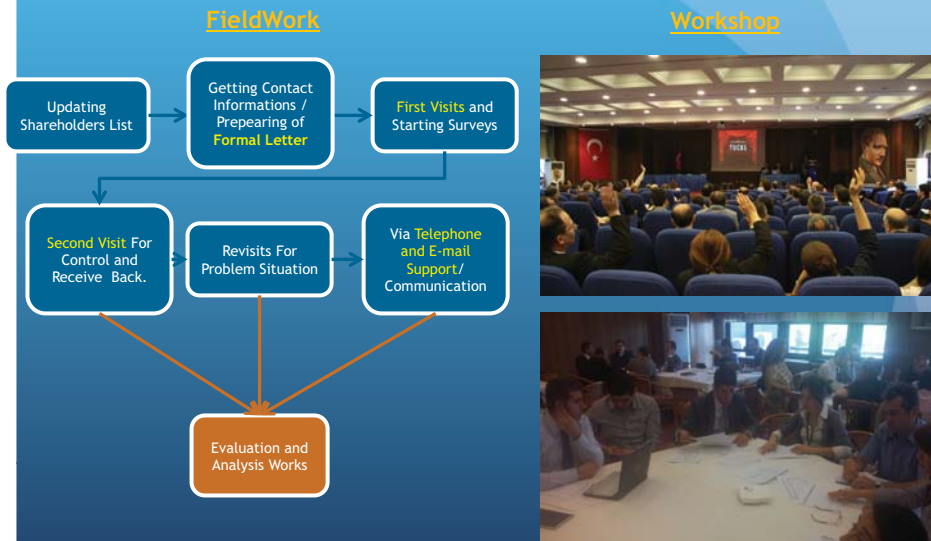
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TRGIS Cooperation



TRGIS and UrbanGIS Cooperation

Data requirement and institutional analysis



TRGIS and UrbanGIS Cooperation

Data requirement and institutional analysis

AT NATIONAL level (TRGIS);

In 15 ministries;

- 86 General Directories,
- 88 Head of Departments,
- 118 Branches,
- 366 People (Fieldwork + Workshop)
- 254 Map/Application/Product analysis

AT LOCAL level (UrbanGIS);

- the best UrbanGIS practices-
- 16 local Governments analysis
- 210 out of 2950 municipalities
- 71 Map/Application/Product analysis



Tablo 1. Uygulama/Servis Adı

No	Uygulama/Servis Adı	Bir
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Tablo 2. Coğrafi Bilgi Sistemleri UYGULAMA-3 ANKİ Veri Gereksinim Analizi

Harita No / Adı: Kayaşın Tarihçe Haritası sistemi

Bölge / İl/ilçe: TÜRKİYE

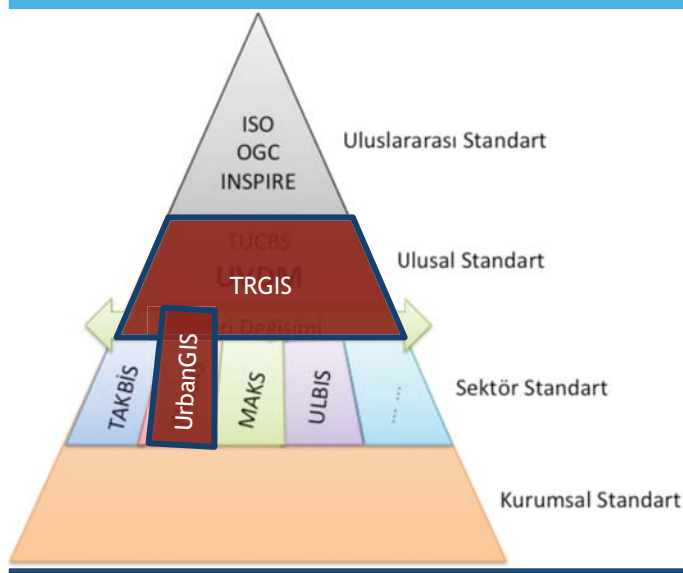
Alan / Özellik: Daha önce gerçekleştirilmiş projelerden elde edilen, belirli bir zamanda, belirli bir yerde, belirli bir derinlikte potansiyel olarak yığın halinde olmasına karşın henüz kullanılmamış verilerdir.

Oranlar / Ölçekte: 1:2000

Veri Adı (Sistem)	Veri Kaynağı / Ölçekte / Birim	ÜSK	Geometrik Özellik	Alan / Çözünürlük	Dinamik ve İstatistik
Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
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Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
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Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...
Yerleşim alanları		K	Nokta	50000	AKTİVE Durumlu, Çizim yapılmış...

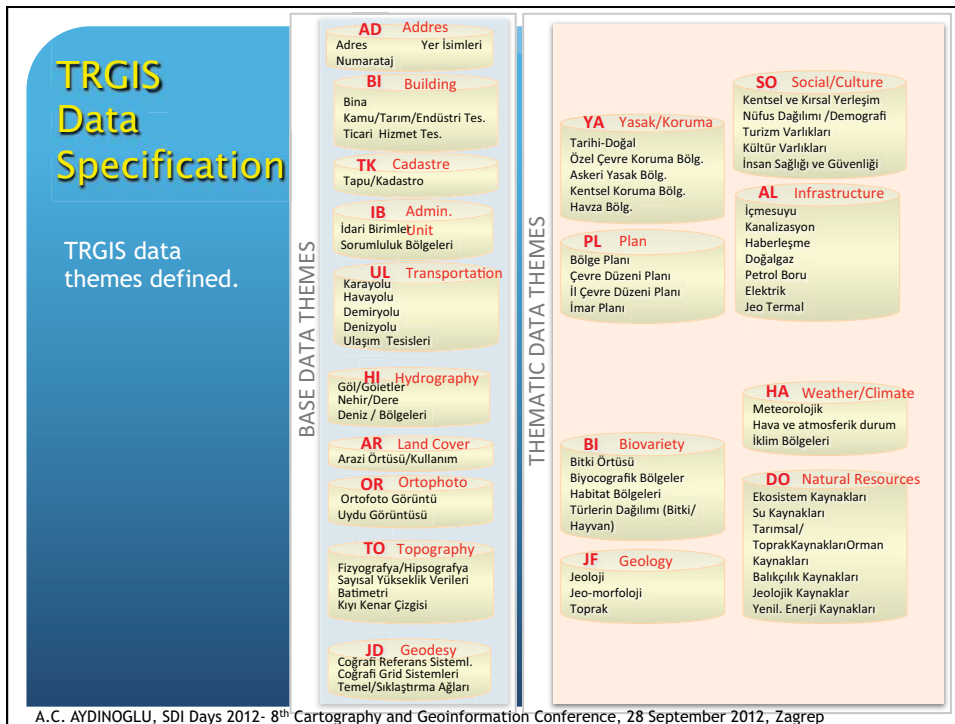
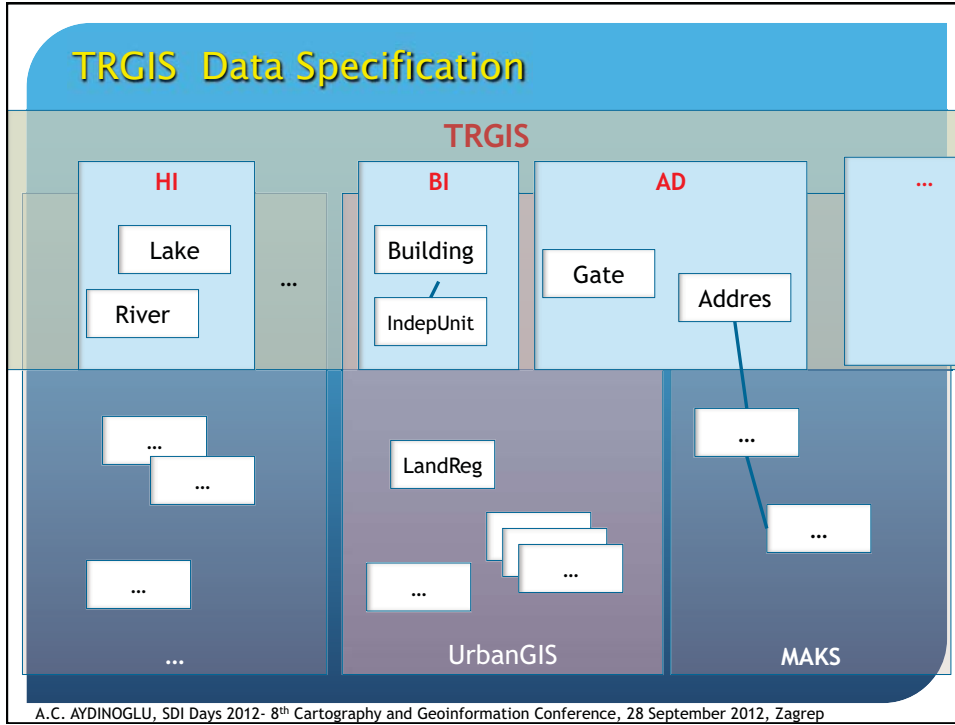
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TRGIS Data Specification



- base geo-data model,
- different users/ sectors need to share these data

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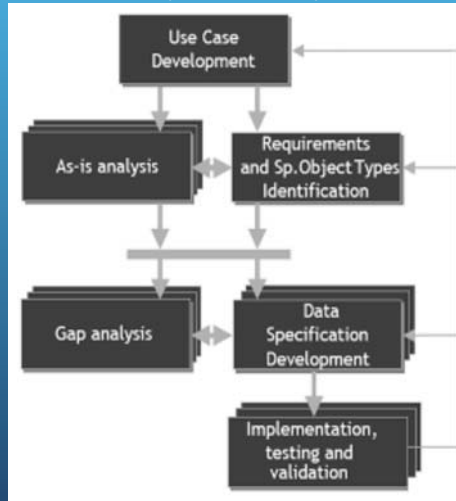


TRGIS Data Specification

INSPIRE
Methodology
for spec.
development

In Turkey current
data standards;
TABIS, BÖHHBÜY, ...

TRGIS and UrbanGIS
Data Requirement Analysis

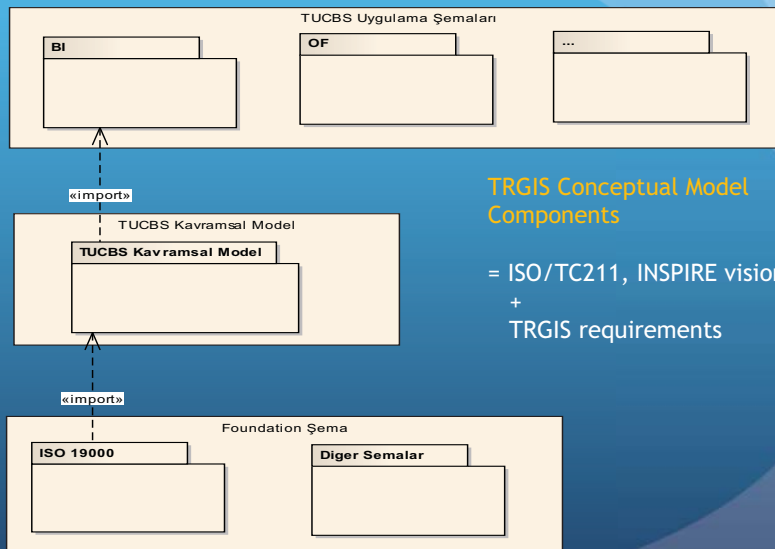


International std.;
INSPIRE,
Eurogeographics,
...

For TRGIS
themes;
AD, BI, TK, BI, UL,
HI, AR, OR, TO, JD
data models
developed.

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TRGIS Data Specification



TRGIS Conceptual Model
Components

= ISO/TC211, INSPIRE vision ...
+
TRGIS requirements

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TRGIS Data Specification

Conceptual Model Components

- for
- development of data standards and
- interoperability of geo-data sets

BASE DATA THEMES

AD Address
Adres Yer isimleri

BI Building
Bina Kamu/Tanım/Endüstri Tes. Ticari Hizmet Tes.

TK Cadastre
Tapu/Kadastro

IB Admin.
İdari Birimler/Zinc. Sorumluluk Bölgeleri

UL Transportati
Karayolu Hava yolu Demiryolu Denizyolu Ulaşım Teçhizatları

HI Hydrography
Göl/Çiğdemler Nehir/Dere Deniz / Bölgeleri

AR Land Cover
Arazi Ortusu/Kullanım

OR Orthophoto
Ortofoto Görüntü Uydu Görüntüsü

TO Topography
Fizyografya/Morfolofya Sayısal Yükseklik Verileri Batım ve Kuv. Kesit Çizimleri

JD Geodesy
Coğrafi Referans Sistemleri Coğrafi Grid Sistemleri Temel/Sıkıştırma Açıları

TRGIS Conceptual Model Components

- Principles,
- Reference model,
- Scale/Resolution
- Generalization,
- General Feature Model,
- Feature Cataloguing,
- Application Schema Rules,
- Geomtry,
- Topology
- Geo-data identification
- Temporal data management
- metadata
- Data quality and sharing principles
- ...

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TRGIS Data Specification

TRGIS Conceptual Model Components Object Identifier

Each geo- object has unique / mandatory TRGISNo attributes.

- Identify by Thematic Structure of Data

AdminUnit Code (IDBK)

Numbering Code (NUKO)

LandOwnership Code (MUKO)

IB	Aksular Köyü	TR9011205012
AD	Aksular Köyü A Sok. (T.N.:32) No:14	TR9011205012A032/014
MB	Aksular Köyü 150 Ada 9 parsel	TR9011205012M150/009

- Identify by Data Provider

{ TR . BBBBBB . CC . DDDDDDD }
TR: Identifier of Data Provider, BBBBBB: Thematic group of data, CC: Identifier in data providers own database, DDDDDDD: ...

- UUID / GUID: Universal Unique Identifier (ISO 11156)

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TRGIS and UrbanGIS Data Specification

TRGIS Conceptual Model Components Metadata:

Identifies information about geographical data sets/services



- (1) Geographic data services
- (2) Geographic datasets
- (3) Feature (Object Identifier, Version)

In scope of draft TRGIS-Metadata 9 classes and 25 mandatory of 61 metadata elements defined.

- (1) Data Identity
- (2) Classification
- (3) Keyword
- (4) Geographical Position
- (5) Data Standard and Reference Informations
- (6) Lineage
- (7) Geographic Data Quality and Validity
- (8) Data Right of Usage/ Distribution
- (9) Metadata Reference Informations

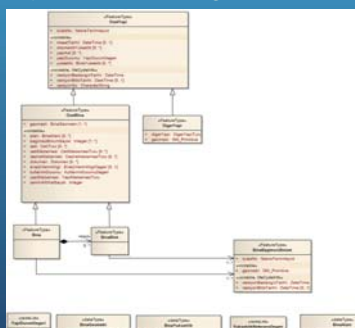
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TRGIS and UrbanGIS Data Specification

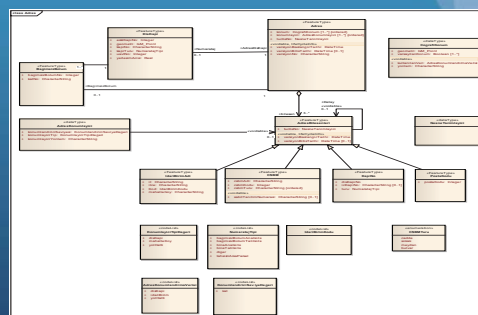
UML data models for TRGIS (10 base geo-data themes and UrbanGIS)

- considering ISO/TC 211 and INSPIRE standards,
- compatible with TRGIS expectations and
- including TRGIS data requirement analyses

Draft TRGIS:BI Building UML Data Model



Draft TRGIS:AD Address UML Data Model



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TRGIS and UrbanGIS Data Specification

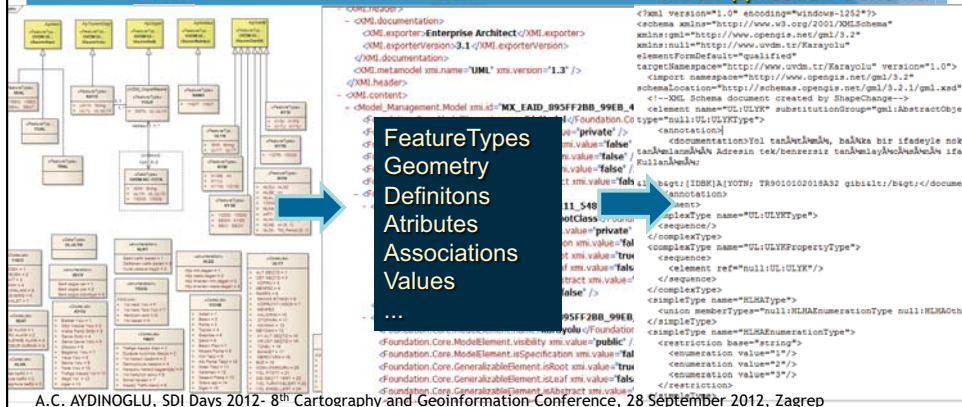
TRGIS.GML ;

- software/hardware independent open access supplier,
- compatible with **GML3.X** data transformation format should produce.

UML

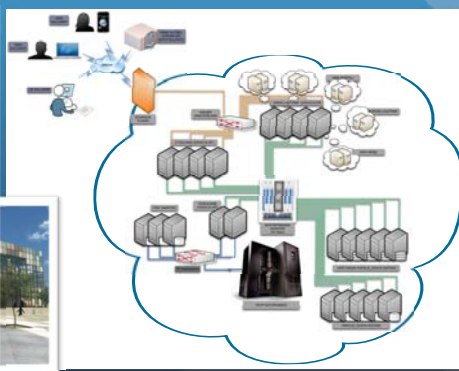
XMI

XML Application Schema



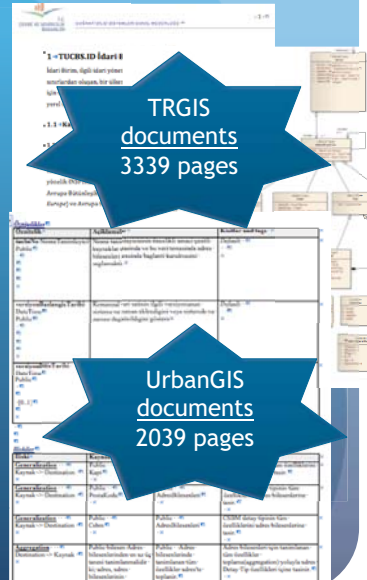
TRGIS Technical Framework

- TRGIS Portal was built and tested.
- ! TRGIS metadat and validation process.
- Cloud TRGIS opportunities and minimum requirements depending on technology criterias



TRGIS and UrbanGIS Documentation

- TRGIS Conceptual Model Components
- TRGIS/UrbanGIS Base Data Themes Identifier
- TRGIS/UrbanGIS Base Data Themes Requirement Analysis
- TRGIS Metadata Policy and Essentials Determination
- TRGIS/UrbanGIS Data Themes Application Schemes, Feature Catal., and GML
- TRGIS/UrbanGIS Legal Requirements Analysis
- TRGIS Portal Implementation Rules
- TRGIS Strategy of Dissemination and Training
- TRGIS/UrbanGIS Poster and Flyers
- TRGIS/UrbanGIS Introduction Slides



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Conclusion

- TRGIS regulation and instutional framework enter into force in 2012
- Data specifications
 - "TRGIS base data themes" should be accepted until 2013.
 - TRGIS thematic data themes" should be defined until 2014.
- TRGIS portal service tests, metadata validation, in 2013
- Data quality is not at required level. Investment and requirements should be optimized for geo-data production and sharing.
- Capacity building and SDI education activities should be arranged for all TUCBS stakeholders.
- Strategy should be developed for Public awareness
- ...

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Thanks...

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