

Geoinformation Issues for Developing Countries

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The BEV (The German Advisory Group for Surveys and Geoinformation in Technical Cooperation for the Developing Countries) is active in Technical Cooperation Projects financed by the German KFW and GTZ and the World Bank.

Members of the BEV represent the administrative, the private and the academic sectors.

German Technical Cooperation takes place in more than 30 countries, mainly in Cadastre and Land Management (e.g. Georgia, Cambodia, Mongolia, Namibia and in the Balkan Countries) or on planning information systems (e.g. Albania).

Croatia

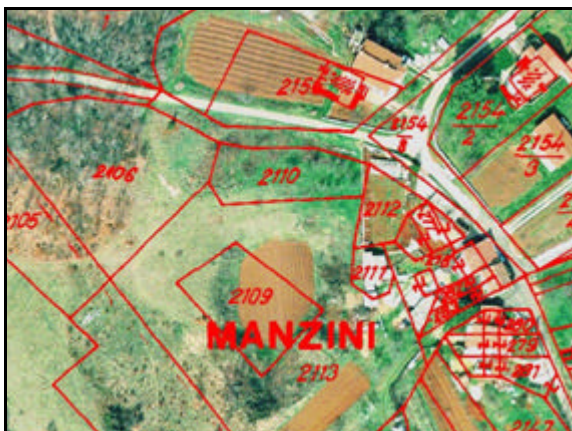
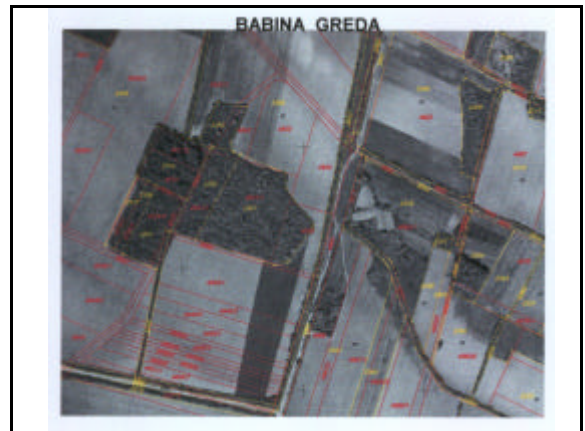
verification of cadastral maps by superposition with geocoded orthophotography

Georgia and Cambodia

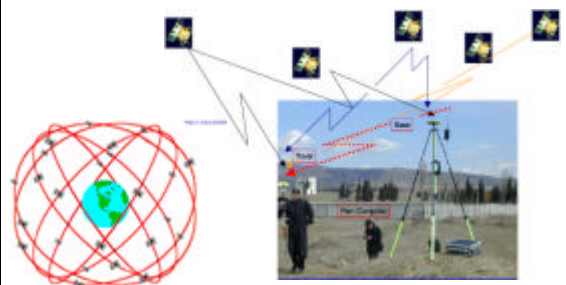
adjudication of cadastral boundaries in the field using orthophotos on tablet computers, photography of ownership documents

Albania

development of a Planning GIS on the basis of geocoded high resolution satellite images combined with field data collection on GPS controlled tablet PC's



Used Technology – Georeferencing



Mobile Data Access



Compaq iPAQ Pocket PC with „GNSS Internet Radio“



Nokia D211 GPRS modem

DGPS: 0.7 cent/min

GIS & DGPS:
Simultaneous Real-Time
Access to Distributed Data



An Urban GIS for Tirana, Albania

1. Available High Resolution Satellite Images
2. Referencing to ITRF
3. Collection of relevant municipal data
4. Scanning of analog data
5. Geocoding of scanned data
6. Introduction into ArcGIS geodatabase
7. Use of analysis capabilities
8. Digital Globe and Google Earth

Examples shown for what can be done are from a World Bank Project for the Municipality of Tirana, Albania

Project execution: 6 months in 2005

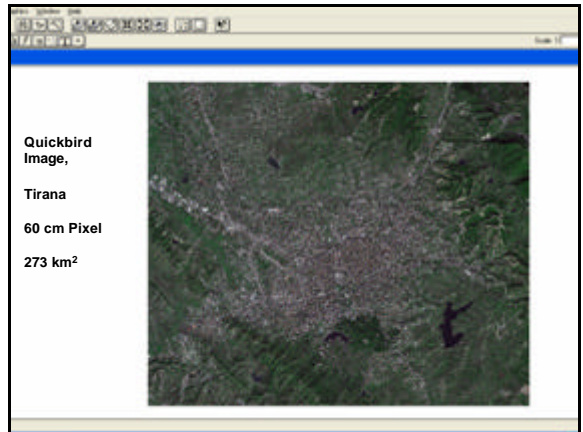
acquired were

- 1 Quickbird satellite image (273 km²) – orthorectified product
- 1 server with ArcSDE linked to Oracle
- 2 ArcExplorer
- 10 ArcView

field survey

ITRF connection for GPS/DGPS contracted for 4 primary points, densification via RTK to 60 control points for geocoding of satellite image, detail survey with GPS linked field computer

cost: 200 000\$ for 60 km²

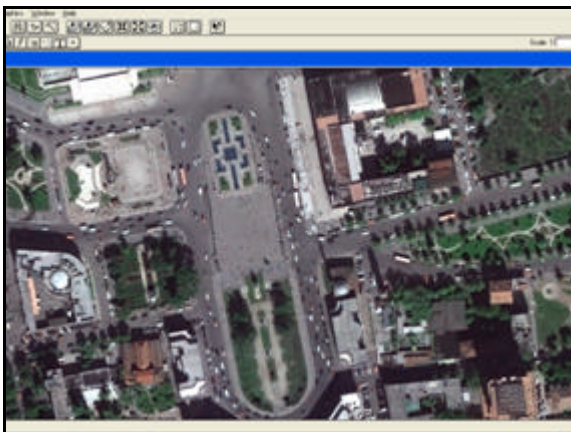


Quickbird
Image,

Tirana

60 cm Pixel

273 km²



GPS Network Supporting IGS (274 sites)



SALS Buildings

FEATURE DATASET	FEATURE CLASS	ATTRIBUTE	USE TYPE	STATUS
BUILDINGS	Buildings (Program)	Condition	-	-
		Forward via field study	-	-
		Public	-	-
		Private	-	-
		Religious	-	-
		Residential	-	-
		Commercial - Retail	-	-
		Commercial - Professional	-	-
		Commercial - Financial	-	-
		Commercial - Accommodation	-	-
		Commercial - Entertainment	-	-
		Commercial - Office	-	-
		Governmental	-	-
		Healthcare	-	-
		Industrial	-	-

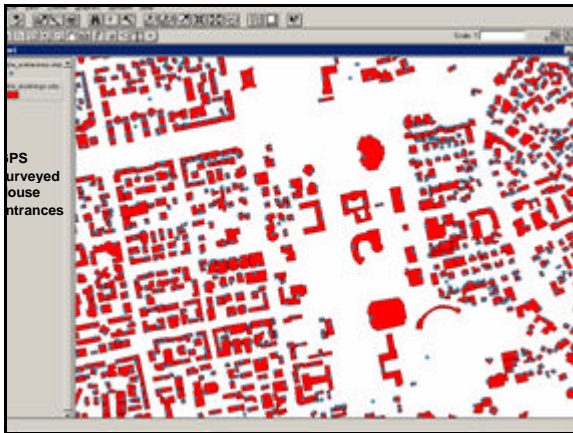
		SPRS_Facno_Number*** Number of Building is spatially joined with SPRS_PARCID_NUMBER of PARCEL ID		
		SPRSTAT_Build_Number*** Number of Building is spatially joined with SPRSTAT_Build number subset from SPRSTAT map.	-	-
		Legal Legal Status: Subordinate to Planning Map Office of Legislation & Appropriations	-	Legal Dept
		Name If used via field study & cross-check with SPRSTAT from map office for schools and governmental institutions	-	-
		Relig_Usage Forward via field study as CB reference	-	Present Absent
		Material Forward via field study	-	Brick Concrete Concrete Steel
		Age of Building Table from SPRSTAT map for buildings constructed before 1950. "After 1950" group is based on change detection between SPRSTAT map and satellite image.	-	Before 1945 1945-1960 1960-1980
		PO Does not map roads out of street, buildings that are grouped under "After 1950" category.		1980-1990 1990-1996 After 1996

		Condition Forward via field study	-	Fair	Good
		EDUCATION			
		Public		Kindergarten	Primary
		Private		Secondary	High School
		University			
		RESIDENTIAL			
		COMMERCIAL - Retail			
		COMMERCIAL - Professional			
		COMMERCIAL - Financial			
		COMMERCIAL - Accommodation			
		COMMERCIAL - Entertainment			
		COMMERCIAL - Office			
		GOVERNMENTAL			
		HEALTHCARE			
		INDUSTRIAL			
		PUBLIC SERVICE - Police Station			
		PUBLIC SERVICE - Fire Station			

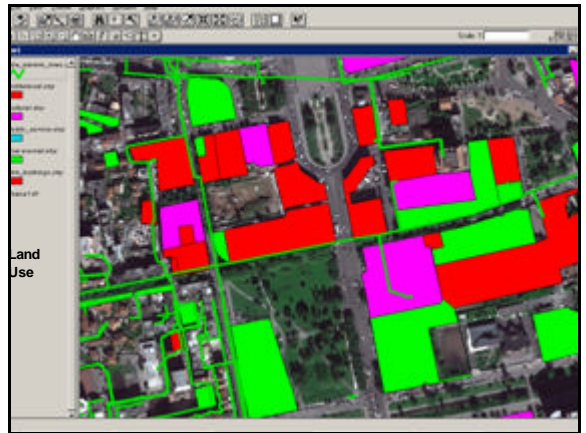
SALS Land Use

FEATURE DATASET	FEATURE CLASS	ATTRIBUTE	USE TYPE	STATUS
LANDUSE	Landuse (Program)	Condition	-	-
		Forward via field study	-	-
		Public	-	-
		Private	-	-
		Religious	-	-
		Residential	-	-
		Commercial - Retail	-	-
		Commercial - Professional	-	-
		Commercial - Financial	-	-
		Commercial - Accommodation	-	-
		Commercial - Entertainment	-	-
		Commercial - Office	-	-
		Governmental	-	-
		Healthcare	-	-
		Industrial	-	-





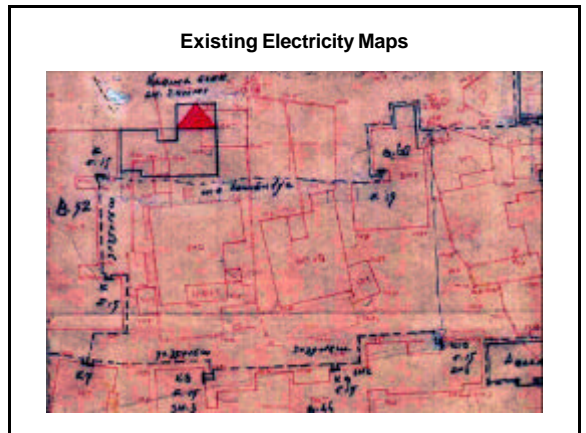
PS surveyed house entrances



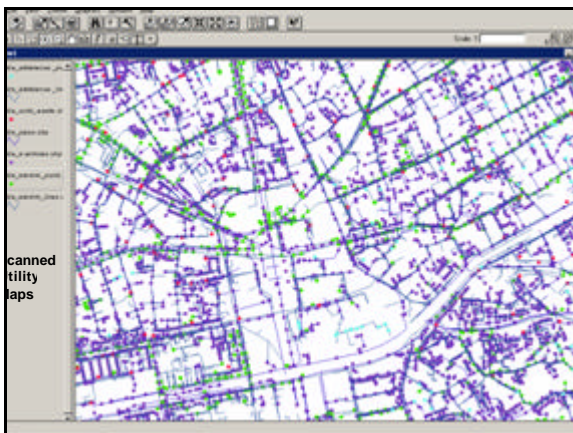
Land Use



Updating of New Buildings



Existing Electricity Maps

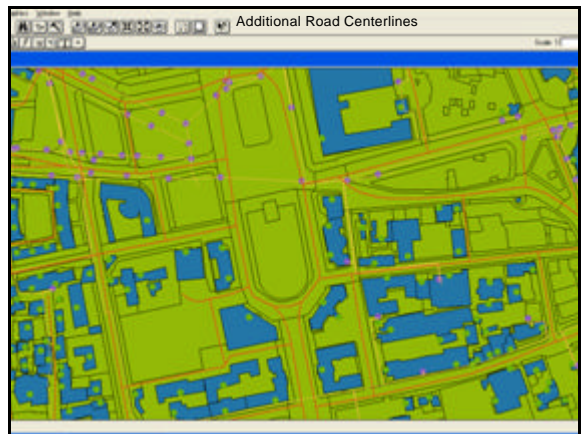
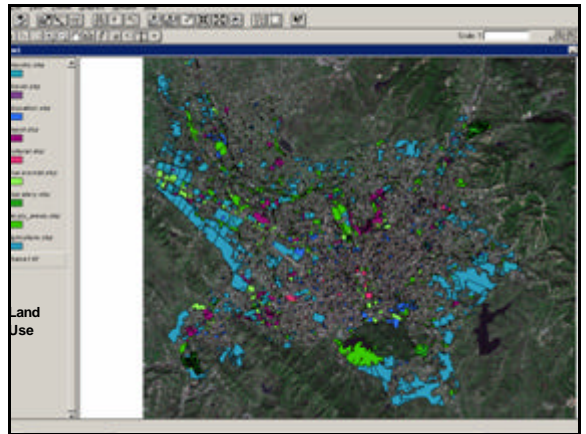
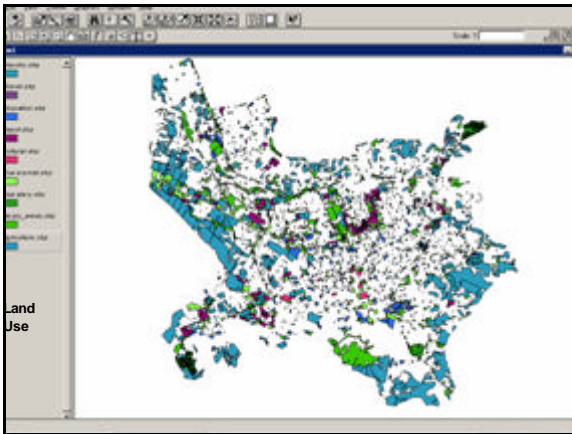
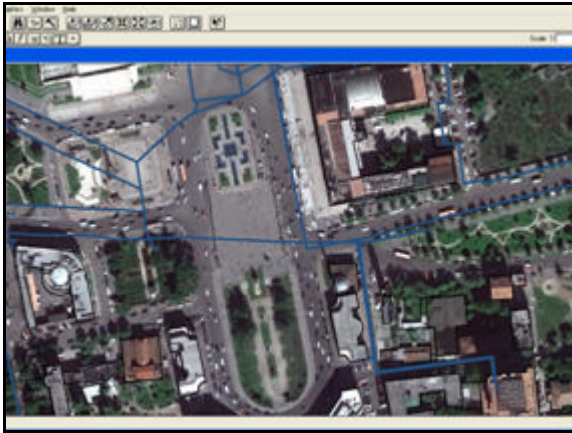


planned utility lines

3.1.1.5 Electricity:

FEATURE DATASET	FEATURE CLASS	ATTRIBUTE	SUB-TYPE	DOMAIN	
ELECTRICITY	Line (Line)	-OBJECTID	--	--	
		-SHAPE	--	--	
		-SHAPE_Length(m)	--	Overhead Underground	
		-Type	--	--	--
		-Voltage	--	--	--
		-SHAPE	--	--	--
	Electric_pole (Point)	-OBJECTID	--	--	
		-SHAPE	--	--	
		-Type	Pole Manhole Transformer	--	
	Electric Service Area * (Polygon)	-OBJECTID	--	--	
		-SHAPE	--	--	
		-SHAPE_Length(m)	--	--	
		-SHAPE_Area(m ²)	--	--	
		-Description	--	--	

* Contains a space for Street Name, however it's no longer used by Autodesk in future due to lack of existing information.



Result of Project:

The Municipality of Tirana now has data to monitor and to plan urban development

- quickly (6 months)
- inexpensively (2000 to 3000\$ per square km)
- updatable every year (by newly ordered satellite image at cost of 5000\$ and by local maintenance contract)

