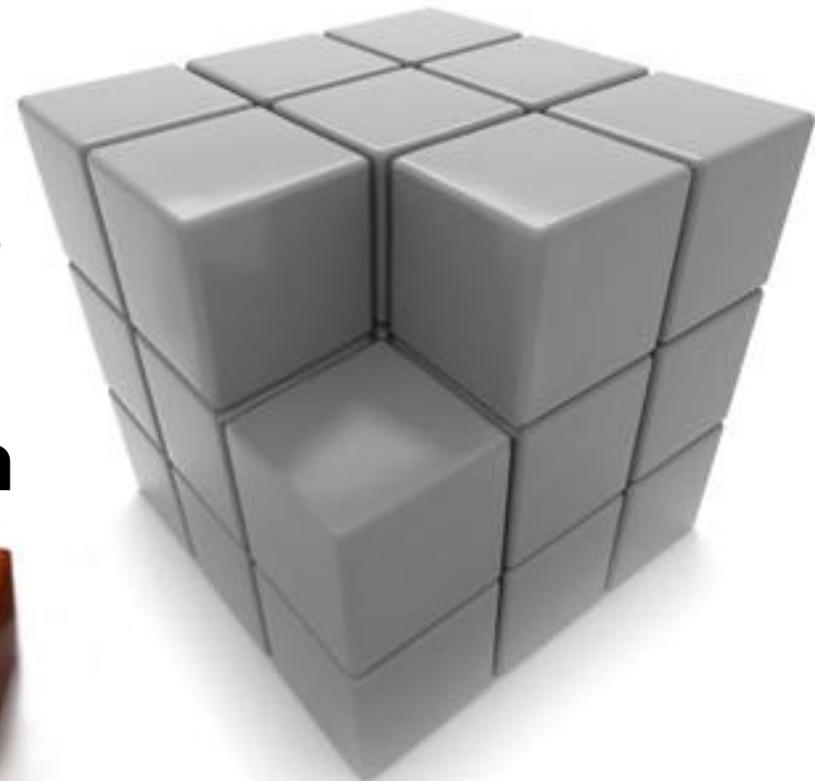




Croatian Motorways Road Database Management System

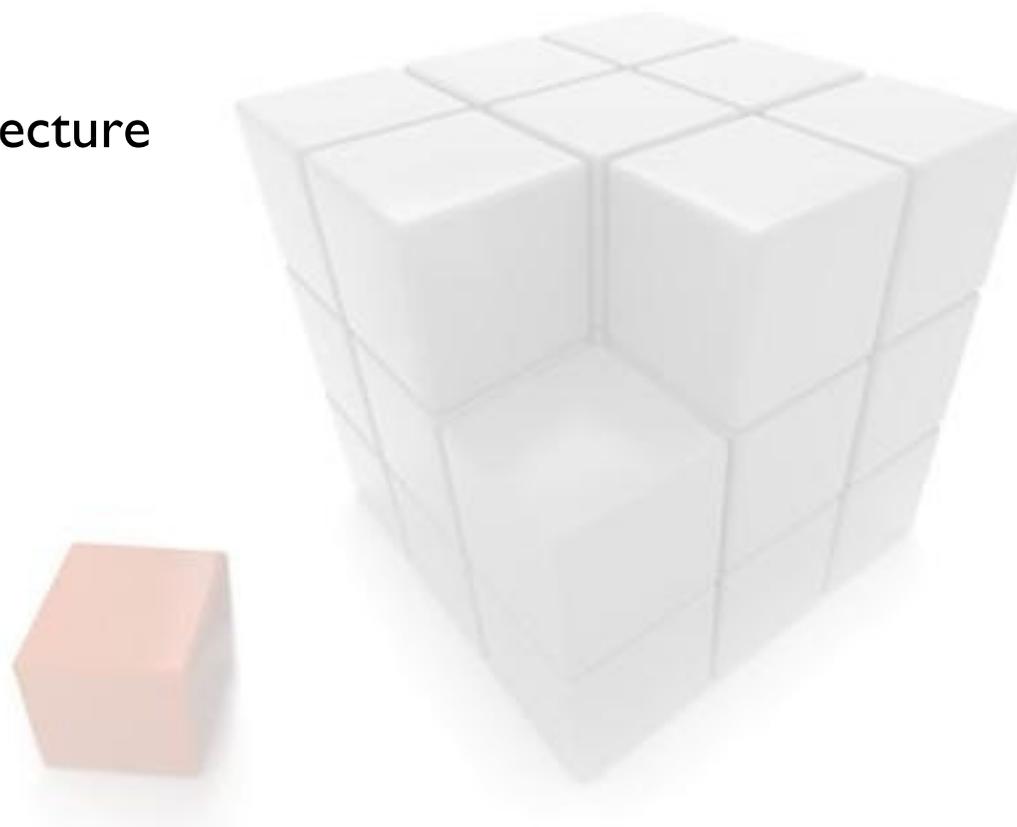
Marko Turković



Presentation overview



- ❑ About us...
- ❑ System introduction
- ❑ System component architecture
- ❑ Kosmo Desktop
- ❑ WebGIS portal
- ❑ Future development
- ❑ We've learned that...





About us...



- ❑ **IN2 Ltd.** established in 1992 in Zagreb, Croatia
- ❑ Continuous business growth
 - 11 companies in **IN2 Group**, present in 6 countries
 - **IGEA Ltd.** – member of the IN2 Group, competence center for GIS
- ❑ Employees are our most valuable asset
 - more than 450 employees in the group, 300+ in Croatia
- ❑ Long term relationship with clients

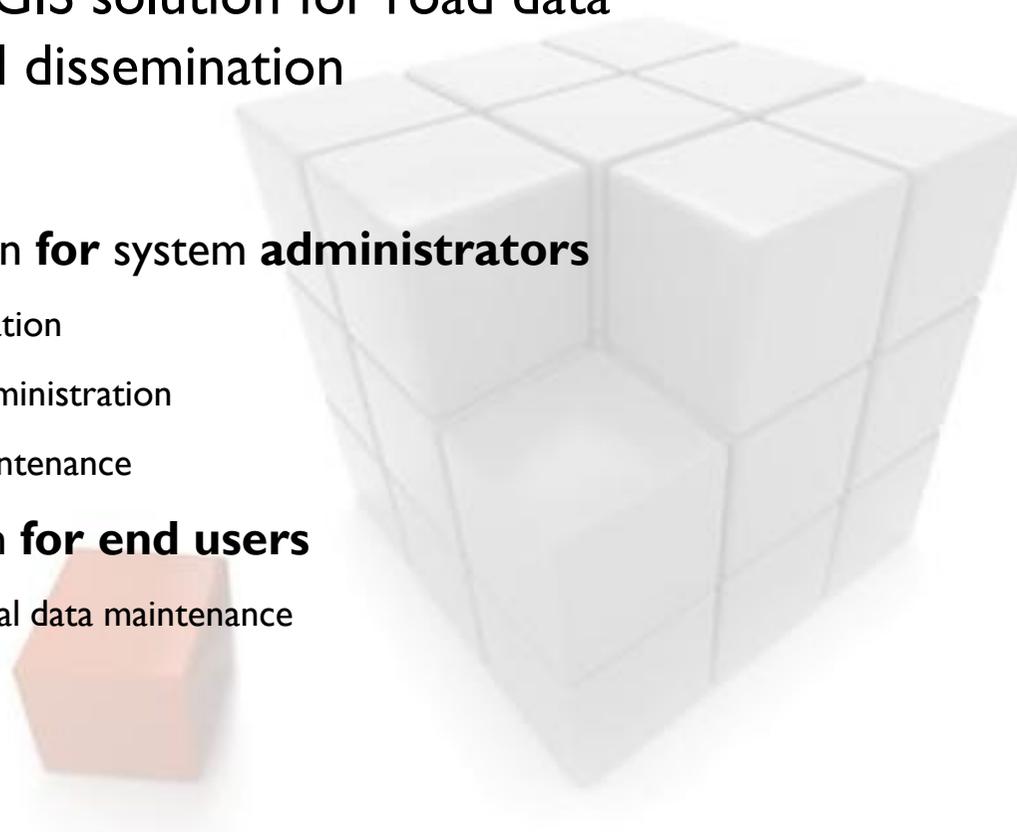
- ❑ **Croatian Motorways Ltd.** a company for operation, construction and maintenance of motorways
- ❑ 100% owned by the Republic of Croatia



System introduction



- ❑ Road database management system developed for Croatian Motorways Ltd.
- ❑ Integrated desktop + web GIS solution for road data definition, maintenance and dissemination
- ❑ Two client applications
 - **Kosmo Desktop** application **for system administrators**
 - database data model administration
 - assets access rules and user administration
 - spatial and non-spatial data maintenance
 - **WebGIS portal** application **for end users**
 - data visualization and non-spatial data maintenance
 - document management
 - analysis and reporting



System component architecture



client tier



middle tier



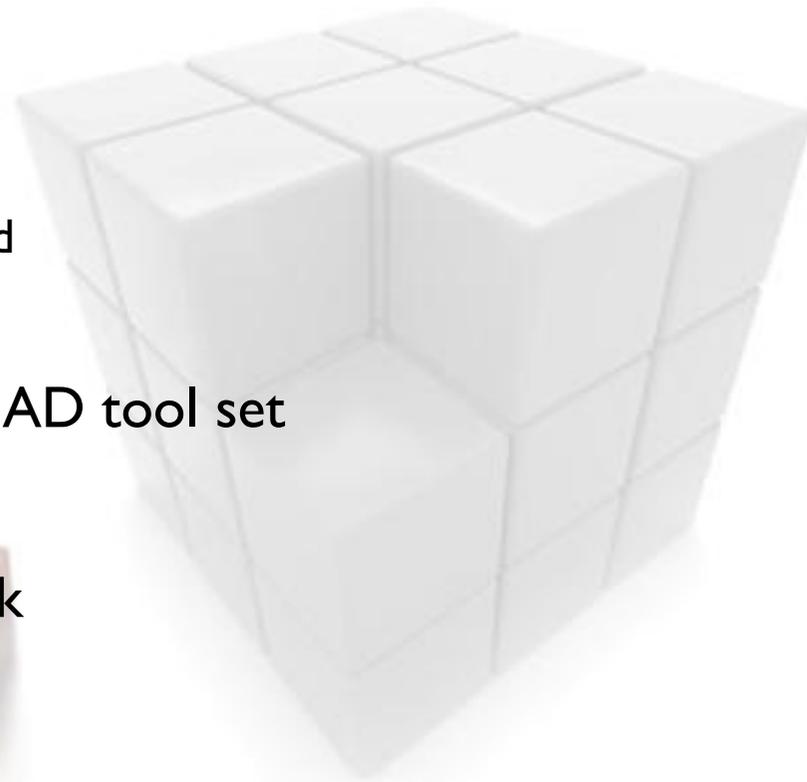
database tier



Kosmo Desktop



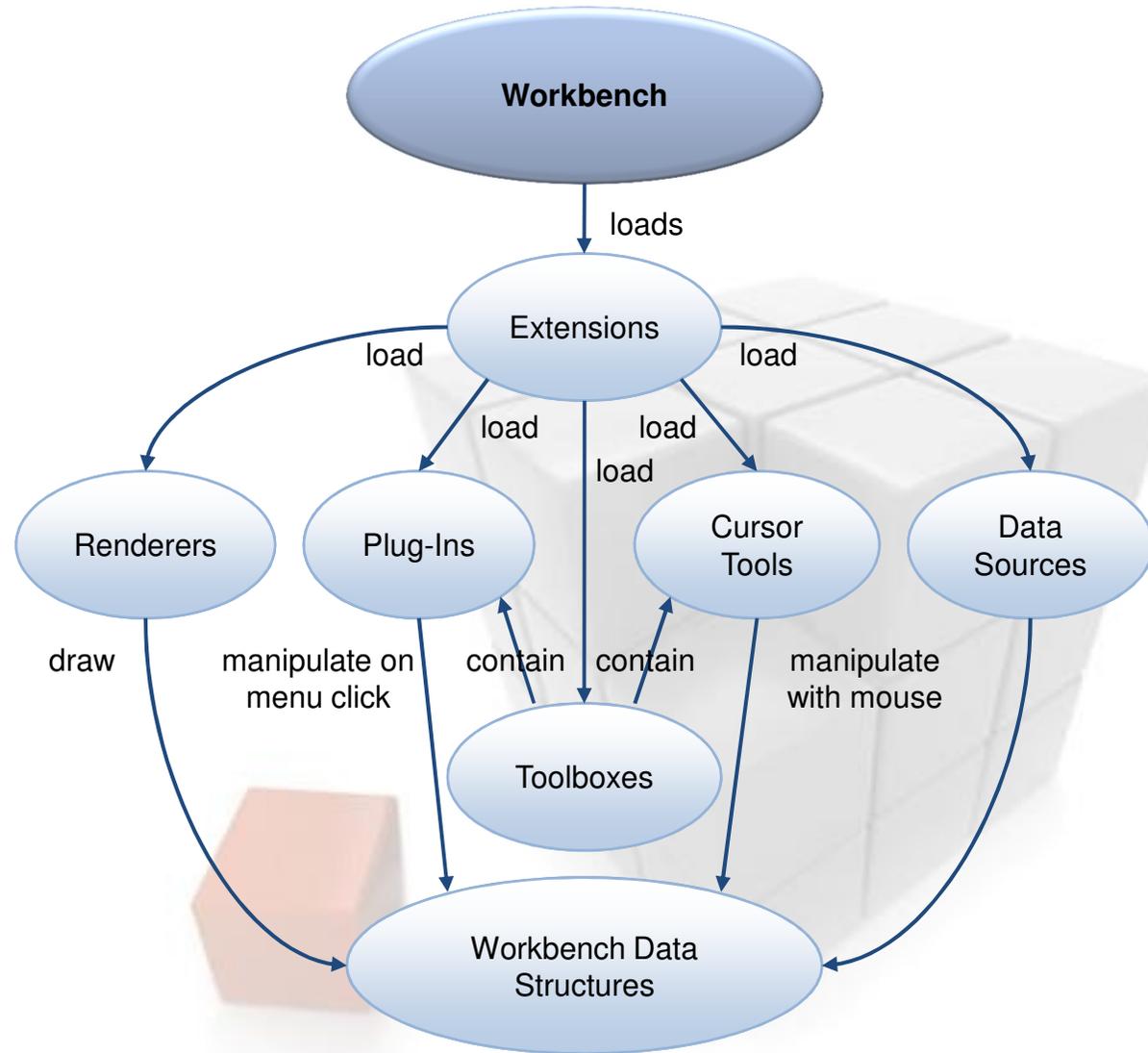
- ❑ Desktop GIS with powerful query, edition and analysis tools
- ❑ Support for major spatial databases, file formats and OGC standards
 - PostgreSQL, Oracle, MySql
 - SHP, DXF, DWG, DGN, GML, CSV
 - TIFF, GeoTIFF, PNG, JPEG, ECW, MrSid
 - WMS, WFS
- ❑ Rich and easily extensible GIS and CAD tool set
- ❑ Developed by SAIG (www.saig.es)
- ❑ Based on Java OpenJUMP framework



OpenJUMP software architecture



- ❑ Workbench
- ❑ Extensions
 - Plug-Ins
 - CursorTools
 - Renderers
 - DataSources
 - Toolboxes

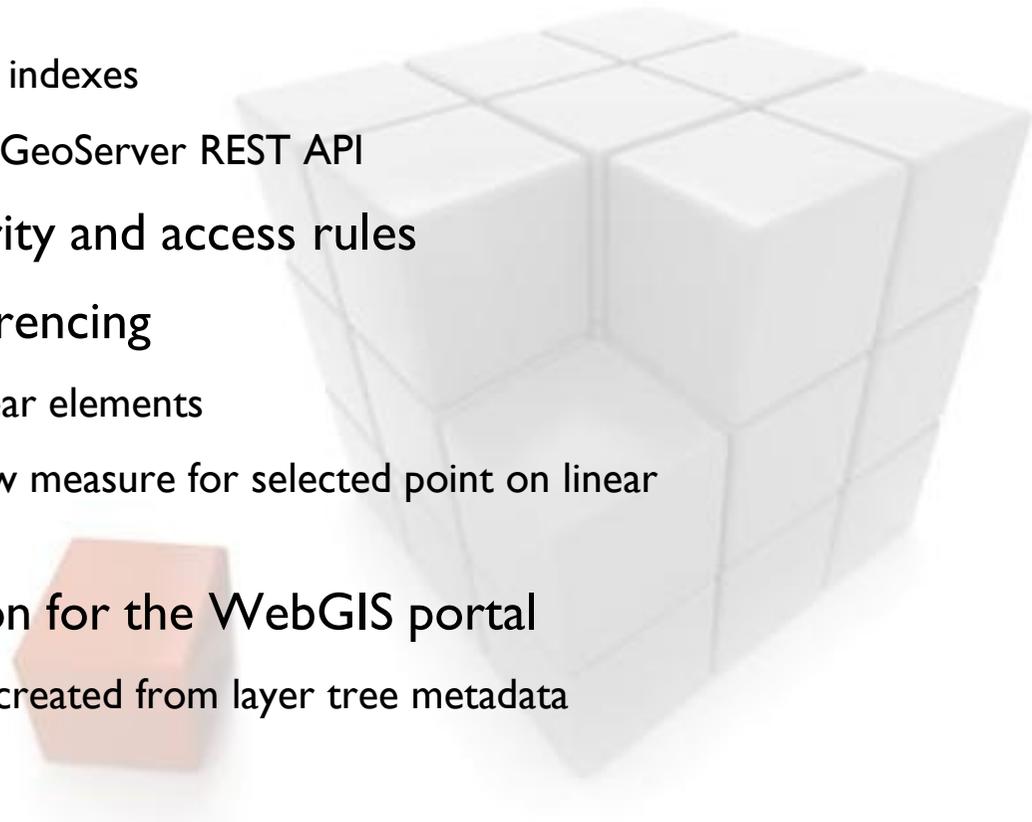


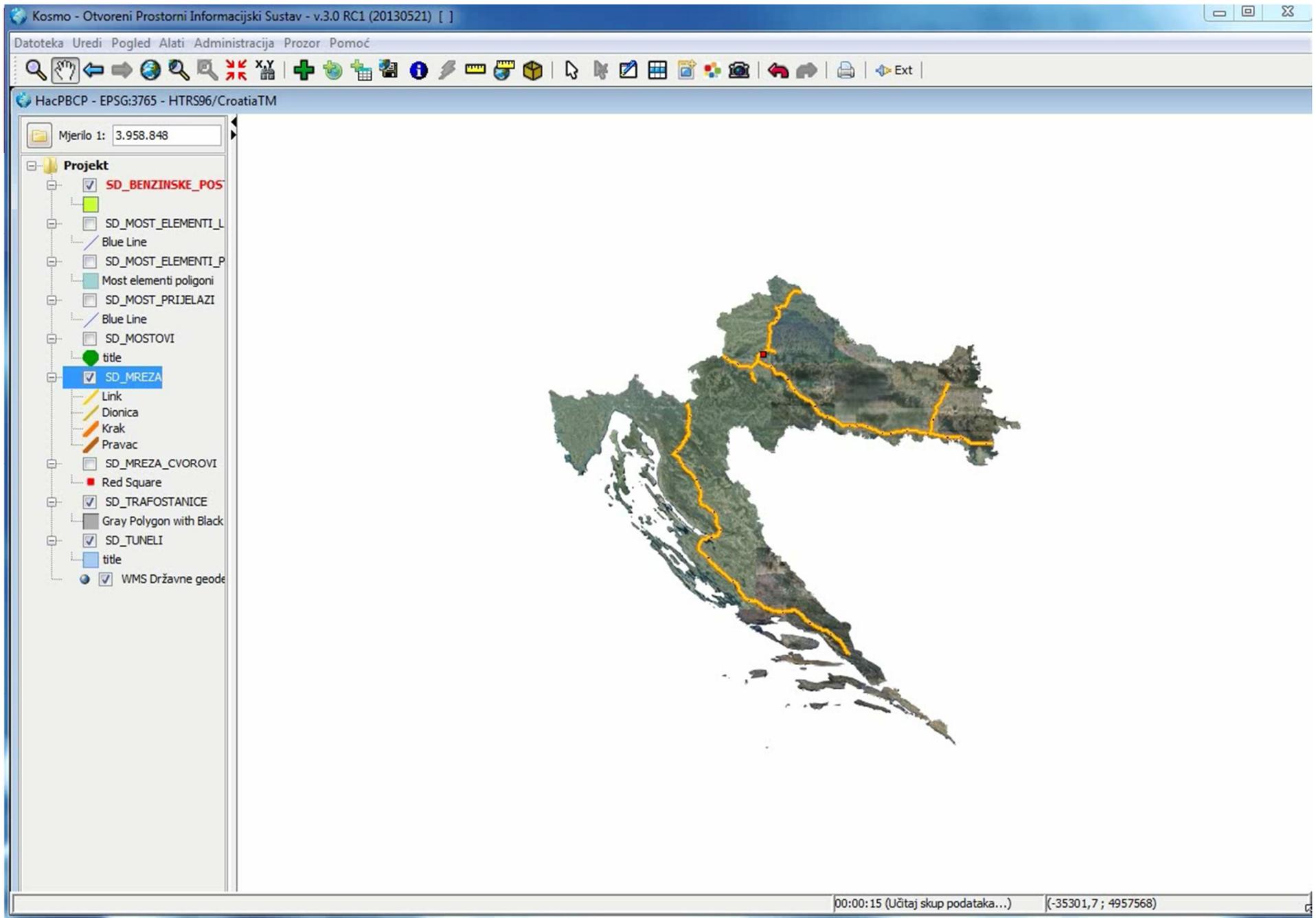
Kosmo project specific functional modules



□ Project specific modules:

- database data model administration
 - data model metadata
 - spatial metadata and spatial indexes
 - style and layer creation via GeoServer REST API
- user administration, security and access rules
- tools for aid in linear referencing
 - splitting and merging of linear elements
 - measure recalculation, show measure for selected point on linear element
- feature class administration for the WebGIS portal
 - WebGIS portal layer tree created from layer tree metadata

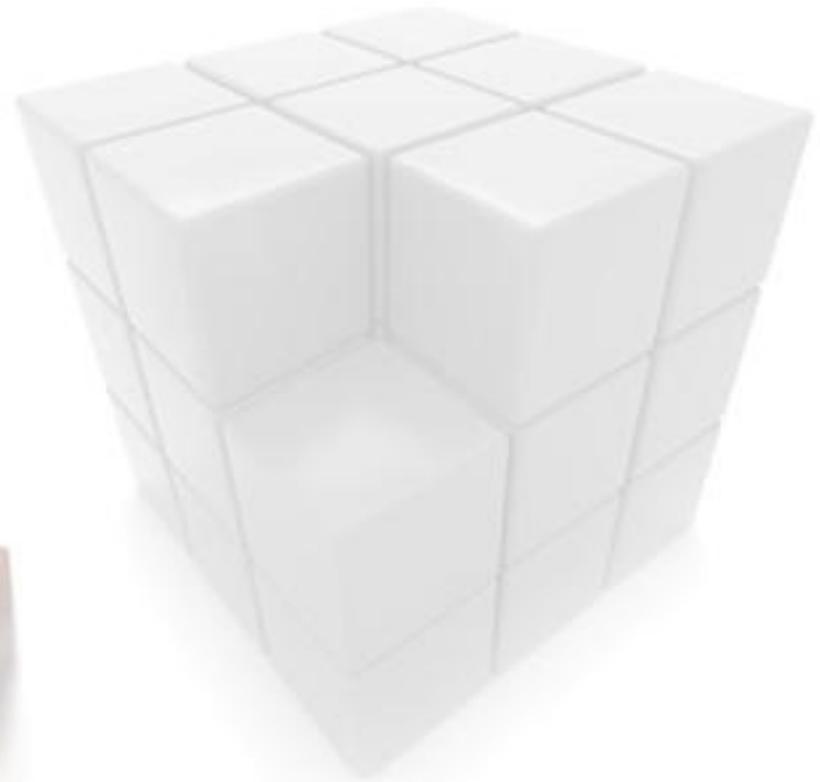
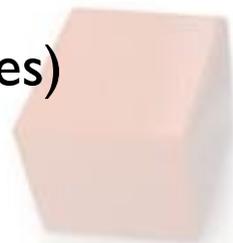




WebGIS portal



- ❑ Web application built on OpenLayers, GeoExt and ExtJS
- ❑ Spatial data visualization
 - Road database feature classes
 - Base maps from Croatian Geoportal
- ❑ Advanced data search capabilities
 - Quick search
 - Basic search
 - Advanced search
 - SQL Query builder
- ❑ Changeable UI skins (themes)
- ❑ Localization



WebGIS portal – interface I



WebGIS portal – interface II



WebGIS portal za BCP

Alatna traka
1 : 2500000

Lista slojeva

- Cestovni pojas
- Administrativne granice
- Mreža autocesta
- Čvorovi
- Linkovi
- Dionice
- Krakovi
- Pravci
- Građevine
- Odvodnja
- Sigurnost
- Elektro-oprema
- Vođenje prometa
- Ostalo
- Uređenje
- Skice i mjerenja

Pretraga
Pronađi: Slovenija

Identifikacija
Identificiraj iz: Vidljivi slojevi

Pravci	Naziv	Vrijednost
605796	ID	605796
605795	NAZIV	A4
	TIP	PRAVAC
	OPIS	Centralna linija A4
	KRAK	
	PRAVAC	A4
	DULJINA_2D	97410.53
	DULJINA_3D	97397.49
	STACIONAZA_PRAVAC_POCEKAK	0
	STACIONAZA_PRAVAC_KRAJ	97397.49
	ID_POCEKNOG_CVORA	
	ID_KRAJNIEG_CVORA	

Broj objekata: 2 Približi na selekciju: Približi

Pomoć
Identifikacija objekata
Kliknite lijevom tipkom miša bilo gdje na karti te povucite da bi nacrtali pravokutnik. Pustite lijevu tipku miša da bi završili crtanje pravokutnika. Objekti koji prostorno međusobno djeluju s nacrtanim pravokutnikom će biti identificirani u stablu u lijevom panelu.
Odaberite identificiran objekat u stablu da bi se prikazali njegovi atributni podaci u desnom panelu.

Bookmark pogleda
Dodaj Obriši Obriši sve

Ime	Datum
1 bookmark1	11.7.2014 18:10
2 bookmark42	11.7.2014 18:10

Pregledna karta
100 km
50 mi

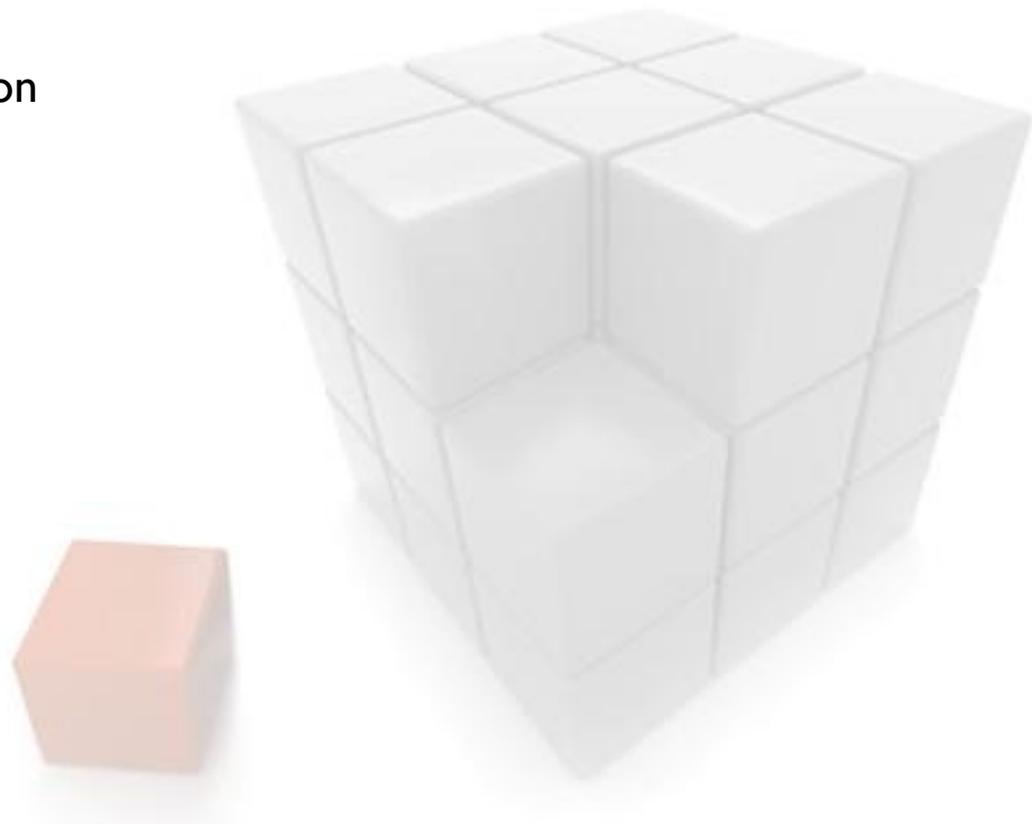
Crna Gora
Kosovo
Mjerilo 1 : 2M
Pozicija: 833800.003, 4754800.000

WebGIS portal functional modules



□ WebGIS portal features

- secure access to the data
- non-spatial data administration
- server side printing
- document management
- reporting
- buffer and slope analysis

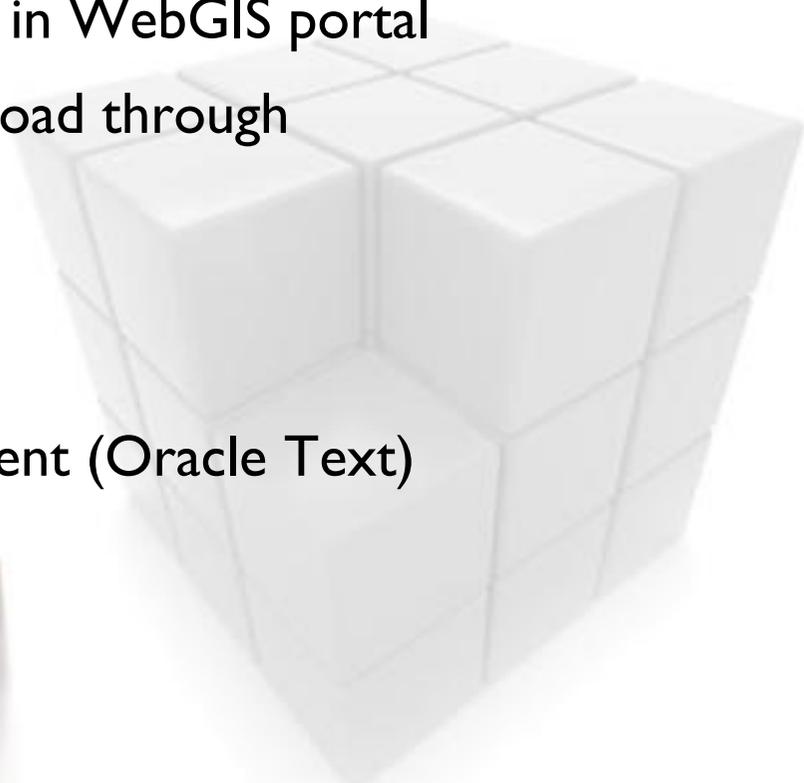




Document management module

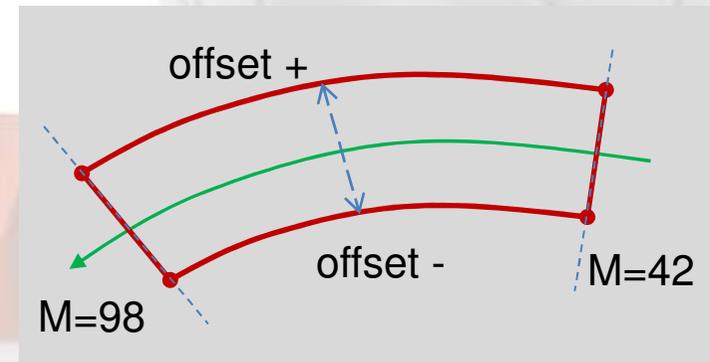
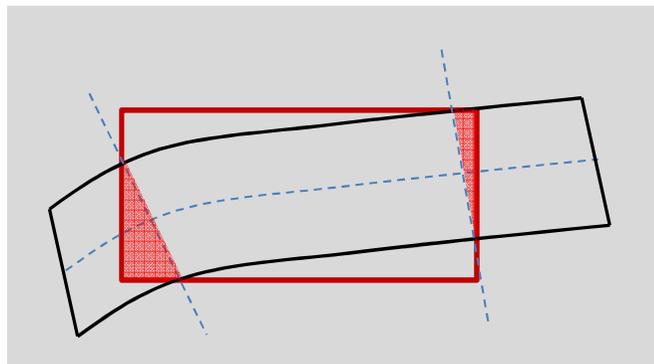


- ❑ Linking documents to road assets
- ❑ Upload and download of documents in WebGIS portal
- ❑ HTML5 asynchronous document upload through XMLHttpRequest
- ❑ Oracle SecureFiles
 - compression, encryption, deduplication
- ❑ Document search by name and content (Oracle Text)



Reporting module

- ❑ Jasper Reports
- ❑ Dynamic Reports
 - implemented with Oracle APEX Interactive report in iframe
 - integrated with OL/GeoExt application via JS interface
- ❑ Summary Reports
 - query the combined area or length between arbitrary measurements
 - clipping procedures implemented in Oracle Spatial



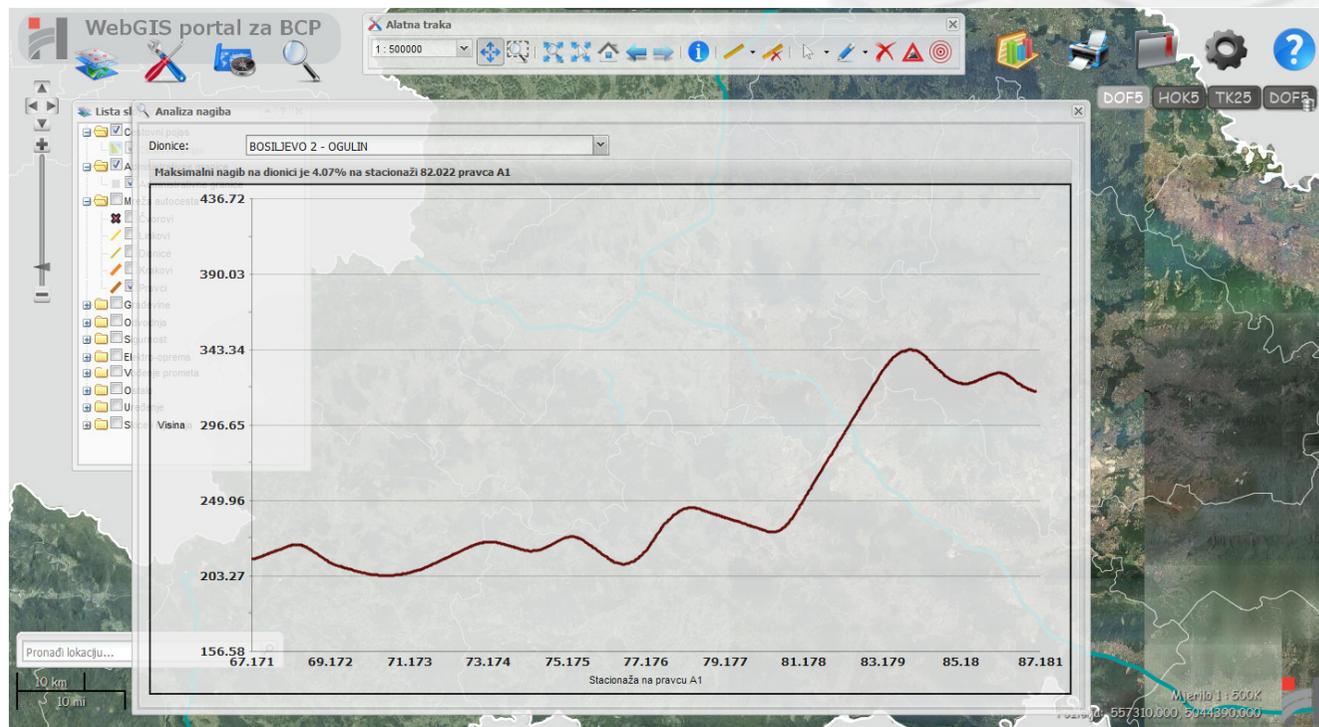
Buffer and slope analysis

❑ Buffer analysis

- Query spatial features in arbitrary distance from arbitrary point

❑ Slope analysis

- Calculate the maximum slope for the linear element



WebGIS portal video



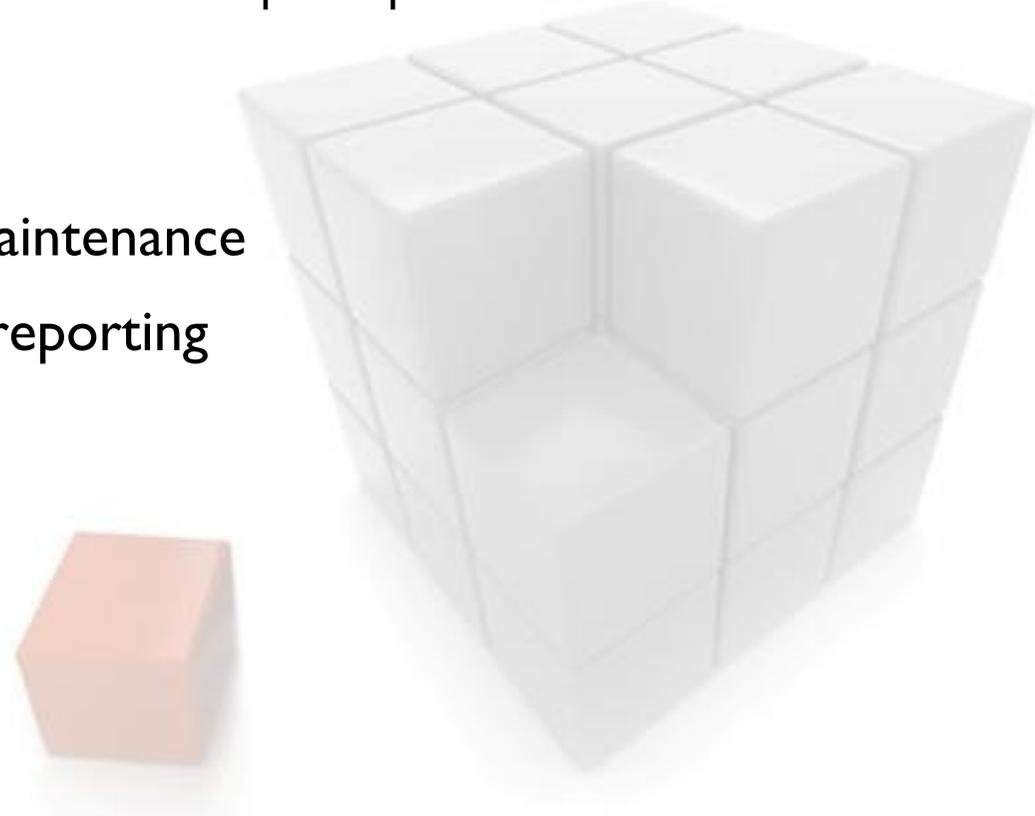
The screenshot displays a WebGIS portal interface for BCP. The main map shows a topographic view of Bosnia and Herzegovina, with labels for various cities and regions including GORJAN, LUDBREG, NOVI MAROF, KOMIN, SVETA HELENA, BOBOVICA, KOSNICA, VELIKA GORICA, POPOVAČA, KUTINA, NOVSKA, INGRADIŠKA, OŠIJEK, ĐAKOVO, VELIKA KOPANICA, LIPOVAČ, BOSNJEVO 2, OGULIN, BRINJE, OTOČAC, PERUŠIĆ, GOSPIĆ, GORNJA PLOČA, MASLENICA, ZADAR 2, BENKOVAC, PIROYAC, ŠIBENIK, VRPOLJE, DUGOPOLJE, BLATO NA ČETINI, and RAVČA. The map is surrounded by labels for neighboring countries: Slovenija, Rumunjska, Srbija, Italija, Crna Gora, and Kosovo.

The interface includes a top toolbar with a scale of 1:2500000 and various navigation and tool icons. A 'Lista slojeva' (Layers List) panel on the left shows a hierarchical list of layers, including 'Cestovni pojas', 'Objekti', 'Odvodnja', 'Sigurnost', 'Elektro-oprema', 'Vođenje prometa', 'Uređenje', and 'Osnovno'. The 'Osnovno' layer is expanded, showing sub-layers like 'Benzinske postaje', 'Cestarski prolazi', 'COKP', 'Geodetske točke', 'Mostovi', 'Odmorišta', 'Odmorišta površine', 'Panoi', 'Prateći objekti odmorišta', 'Stacionažni markeri', 'Čvorišta', and 'Tuneli'. A search bar at the bottom left contains the text 'Pronađi lokaciju...'. A scale bar at the bottom left shows 100 km and 50 mi. The bottom right corner displays the coordinates 'Pozicija: 415900.000, 4960300.000' and the scale 'Mjerilo 1 : 2M'. The 'in2' logo is visible in the bottom right corner.

Future development



- ❑ mobile application
 - non-spatial attribute editing
 - display of current GPS position on the map in top and side view
 - link photos to road assets
 - add georeferenced videos
- ❑ module for road asphalt maintenance
- ❑ module for road problem reporting



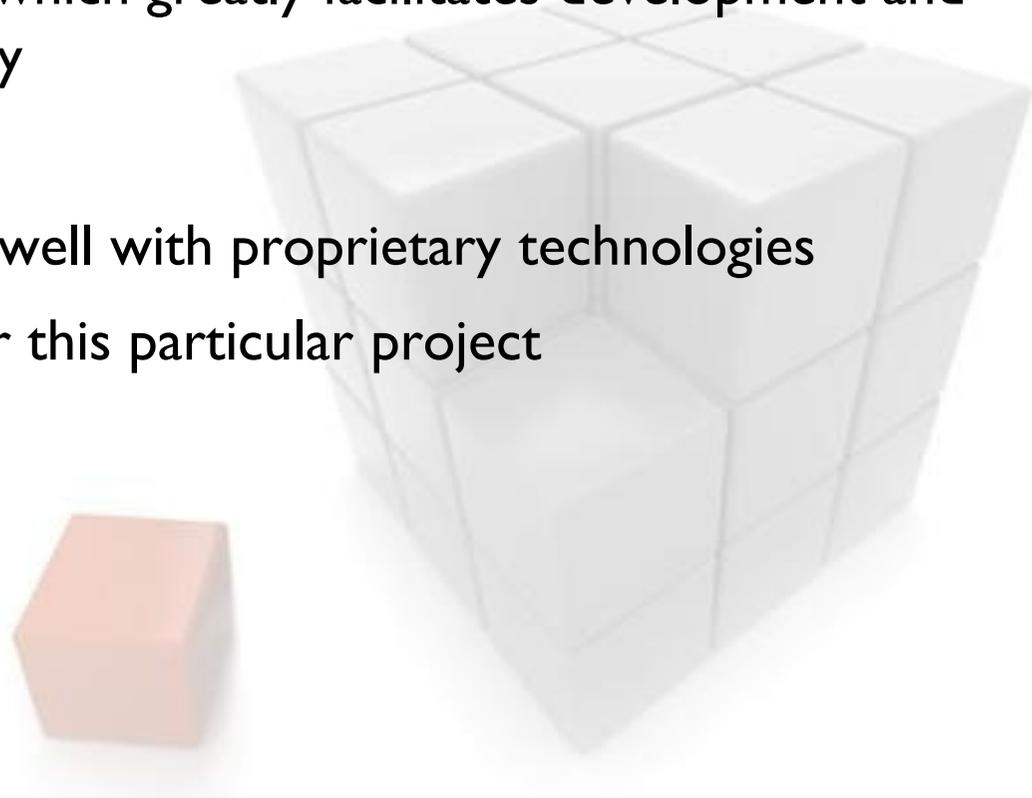


Once again, we've learned that...



...FOSS4G

- is mature and flexible enough for complex systems
- has a large community which greatly facilitates development and ensures software quality
- is very versatile
- if necessary, integrates well with proprietary technologies
- was the right choice for this particular project





Questions anyone?

in2

Thanks for your attention! 😊

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