

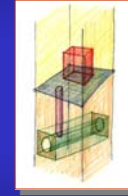
THE EXISTING LEGAL CADASTRE IN ISRAEL



- Introduced in 1928 by the British mandatory government in than Palestine.
- Based on Torrens principles (Registration of Title), dividing all land registration into continuous blocks and parcels.
- Two-Dimensional (2D) and deals with property located on the surface only.
- The property right in a land parcel, extends from the center of the earth – radially outwards into space , including all that is built or cultivated upon its surface.

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REGISTRATION OF CADASTRAL SPATIAL RIGHTS IN ISRAEL R&D PROJECT



SURVEY OF ISRAEL
MAY, 2004

R&D TEAM:
URI SHOSHANI, MOSHE BENHAMU, ERI GOSHEN, SHAUL DENEKAMP and ROY BAR

3D CADASTRE R&D PROJECT - BACKGROUND



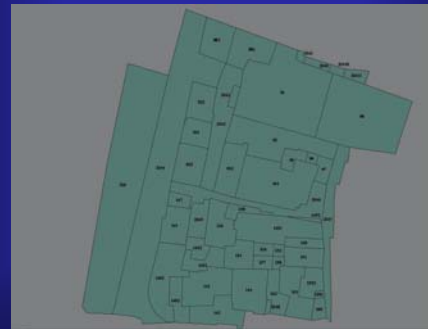
- Fast economic development, population growth from 6 millions people up to 13 millions by 2050, increasing building density while preserving the remaining open spaces.
- The existing cadastral system, due to being 2D, is unsuitable for the multilayer reality that has evolved already in recent years.
- Cabinet Decisions from 1999:
 "... arrangement of conditions for exploitation of land parcel for several uses, above and below the surface, taking into account the status of the original owner of the land and the possibilities of a partial expropriation of its rights...",
 "... providing geodetic, cadastre, planning, engineering and legal solutions ...".

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THE EXISTING LEGAL CADASTRE IN ISRAEL



Example of a part of a registration block :



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3D CADASTRE R&D PROJECT - THE PRINCIPAL OBJECTIVES



1. A solution for the definition and registration of parcels in space.
2. Formulation of proposals for changes in the existing Land Law, the Planning and the Construction Law and the Survey Ordinance, considering the applicable engineering and planning constraints.
3. Accumulation of the altimetric data to be added to the 2D cadastre thus creating the 3D database.
4. Formulation of a solution for the management of the legal coordinated cadastre information, in 2D and 3D GIS environment.
5. The examination and development of suitable software for the visualization of 3D cadastre.
6. Formulation of a suitable modification of the Survey Regulations in order to facilitate registration of 3D cadastre.

3D CADASTRE R&D PROJECT - BACKGROUND



- The Survey of Israel initiated and specified in September 2002 a R&D project for the coming two years.
- The R&D project is carried out by 5 experts coming from several disciplines: Cadastre, Geodesy, GIS, Law, Planning and Construction, Geology and Soil Engineering.
- Two governmental commissions monitor the work of the R&D team. The first, monitors the research work. The second, examines the legal changes recommended by the R&D team and will represent them to the cabinet.
- The Ministry of Finance approved a budget of app. 1 million USD's for the R&D project and for preparing pilot projects.

"SPATIAL SUB-PARCELS" – PRINCIPLES OF THE PROPOSED SOLUTION

Labels in diagram:
 Above-Terrain Space
 Sub-Parcel No. 1 Upon The Surface
 Sub-Parcel No. 2 in The Subterranean Space
 Sub-Parcel No. 3 in The Subterranean Space
 The Subterranean Space

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"SPATIAL SUB-PARCELS" – PRINCIPLES OF THE PROPOSED SOLUTION

- The spatial registration will be achieved by sub-dividing the surface space into spatial sub-parcels.
- The definition of the surface parcel will remain unchanged.
- The Title Rights to the surface parcel will be preserved to the existing definition of the surface parcels as extending infinitely above and below the surface.
- The spatial sub-parcel will be defined as a final volume object.
- Any project established in above or below the surface, will be bounded and defined stereometrically by a final 3D outline and its volume.

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"SPATIAL SUB-PARCELS" – PRINCIPLES OF THE PROPOSED SOLUTION

- Allowing extension and adaptation of the existing registration system to the new spatial cadastral reality without infringement to the system itself. Necessary amendments will be made in the Land Law, Planning and Construction Law and the Survey Ordinance.
- The final registration of the subterranean sub-parcels will usually be made only after the project has been completed, measured "as-made" and registered accordingly. During the planning and construction stages only a warning note will be registered.

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"SPATIAL SUB-PARCELS" – PRINCIPLES OF THE PROPOSED SOLUTION

- A spatial project, which extends above or below a number of surface parcels, will be thus subdivided into spatial sub-parcels, in accordance with the existing surface parcels.
- It will be possible to consolidate the spatial sub-parcels, within a registration block, into one spatial parcel.
- No infringement to the rights of property, except for proper purposes and limited to the minimal required extent.
- The stability of the existing structures built on the surface of the earth, will be achieved by setting off distances to them and to the spatial sub-parcel as well, imposed by engineering considerations.

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"SPATIAL SUB-PARCELS" – PRINCIPLES OF THE PROPOSED SOLUTION

Labels in diagrams:
 3D presentation of the spatial sub-parcels on the background of the existing land parcels.
 Plane projection of the spatial parcel on the existing land parcels.

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"SPATIAL SUB-PARCELS" – PRINCIPLES OF THE PROPOSED SOLUTION

- The future cadastre will be incorporated into the national GIS system and will be managed by GIS means. This will result in a more efficient planning, exploitation and management of all three spaces of the land.
- All maps and plans will be based on a digital database, as vectors, GIS and digital maps. The spatial activities will be shown three-dimensionally (perspective and sections) in a plane projection on the computers monitor.

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PILOT PROJECTS:
1) A MODERN PLANNED COMPLEX

RA D PROJECT
 3D CADAST RE
 SURVEY OF ISRAEL
 MAY, 2004

Levels

Ownership	Description	Height	Layer
private company	underground railway station	210	-4
municipality of Modi'in	public garden	225 - 216	-3
private company	central bus station	221	-2
municipality of Modi'in	bridge to bus station	227	-1
government of Israel	public areas	232	
government of Israel and municipality of Modi'in	commercial and public buildings	256	1-5

PILOT PROJECTS:
1) A MODERN PLANNED COMPLEX

RA D PROJECT
 3D CADAST RE
 SURVEY OF ISRAEL
 MAY, 2004

A 3D Model of The Town Center of Modi'in

PILOT PROJECTS:
1) A MODERN PLANNED COMPLEX

RA D PROJECT
 3D CADAST RE
 SURVEY OF ISRAEL
 MAY, 2004

A Vertical Cross-Section

PILOT PROJECTS:
1) A MODERN PLANNED COMPLEX

RA D PROJECT
 3D CADAST RE
 SURVEY OF ISRAEL
 MAY, 2004

3D Presentation of The Roads

PILOT PROJECTS:
2) THREE ANTIQUITY COMPLEXES

RA D PROJECT
 3D CADAST RE
 SURVEY OF ISRAEL
 MAY, 2004

THE OLD TOWN OF ACRE

PILOT PROJECTS:
1) A MODERN PLANNED COMPLEX

RA D PROJECT
 3D CADAST RE
 SURVEY OF ISRAEL
 MAY, 2004

A Plan for Spatial Registration Purposes

PILOT PROJECTS:
2) THREE ANTIQUITY COMPLEXES

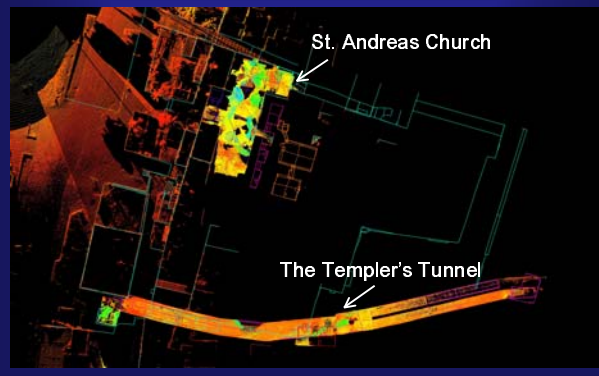
RA D PROJECT
3D CADAST RE
SURVEY OF ISRAEL
MAY, 2014

Laser Scanner



PILOT PROJECTS:
2) THREE ANTIQUITY COMPLEXES

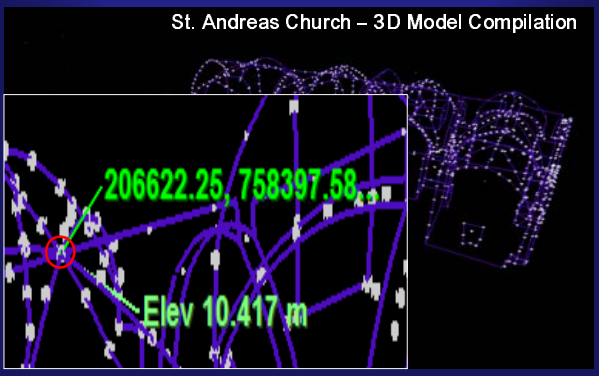
RA D PROJECT
3D CADAST RE
SURVEY OF ISRAEL
MAY, 2014



PILOT PROJECTS:
2) THE ST. ANDREAS CHURCH

RA D PROJECT
3D CADAST RE
SURVEY OF ISRAEL
MAY, 2014

St. Andreas Church – 3D Model Compilation



PILOT PROJECTS:
2) THREE ANTIQUITY COMPLEXES

RA D PROJECT
3D CADAST RE
SURVEY OF ISRAEL
MAY, 2014



PILOT PROJECTS:
2) THE TEMPLER'S TUNNEL

RA D PROJECT
3D CADAST RE
SURVEY OF ISRAEL
MAY, 2014

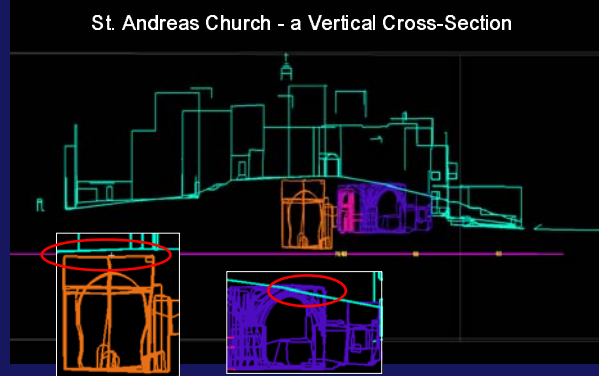
The Templers' Tunnel – Laser Scanning

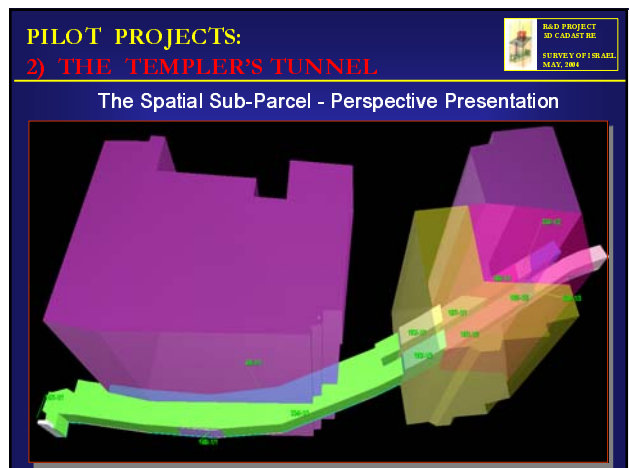
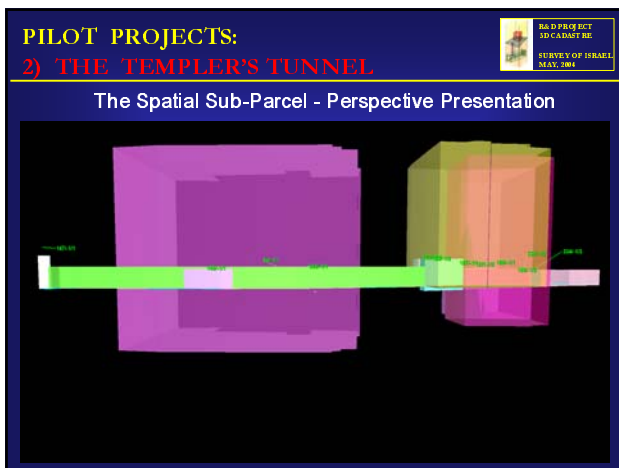
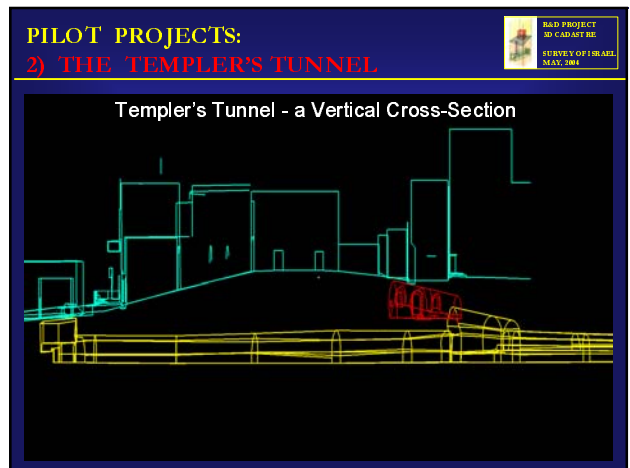
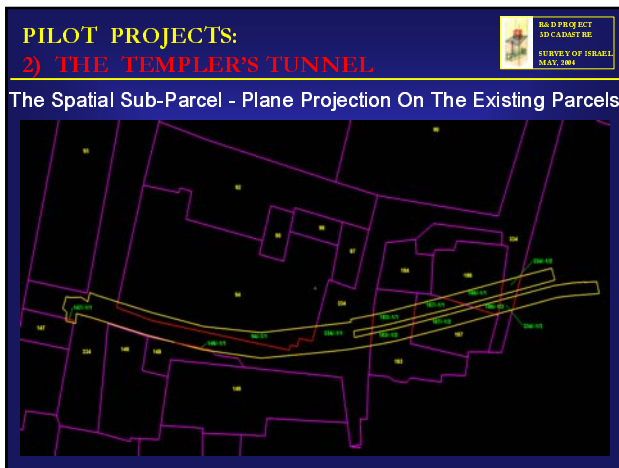
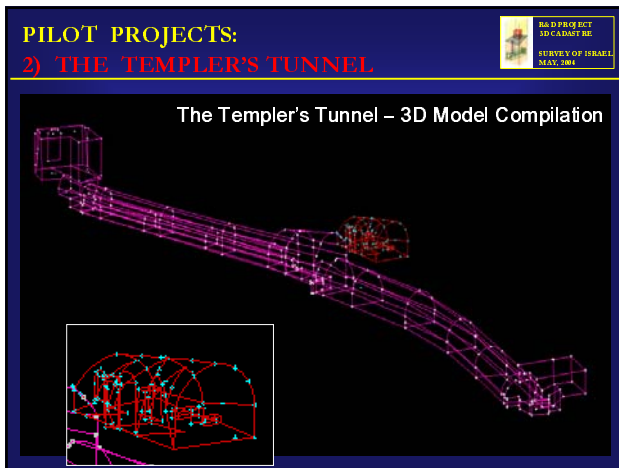


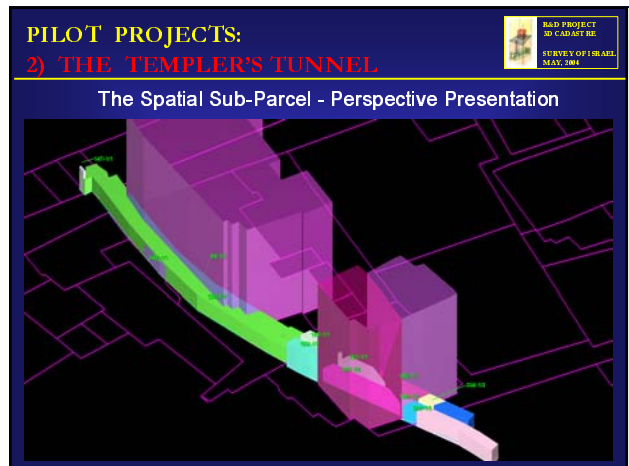
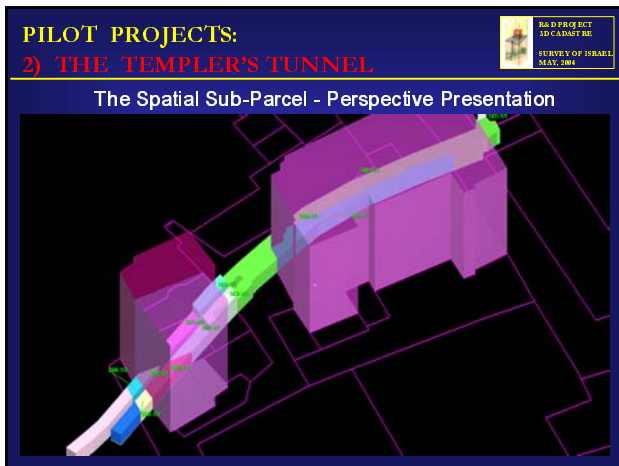
PILOT PROJECTS:
2) THE ST. ANDREAS CHURCH

RA D PROJECT
3D CADAST RE
SURVEY OF ISRAEL
MAY, 2014

St. Andreas Church - a Vertical Cross-Section







COMPUTERISED PROTOTYPE FOR 3D CADASTRE

- One of the tasks of the R&D project is the development of an active, computerized prototype of the Registration of Rights in space, in a GIS environment.
- The prototype of the GIS system is applied to the management of spatial cadastral database and will facilitate queries, visualization, production of reports and maps.
- The prototype will support testing and demonstration of the solution recommended by the R&D team.

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R&D PROJECT
3D CADASTRE
SURVEY OF ISRAEL
MAY, 2004

PILOT PROJECTS:
3) A MULTISTORY BUILDING

Multistory Building

The Subterranean Parking

A 3D Model of The Building and The Parking

The Land Parcels Regarding to The Parking

R&D PROJECT
3D CADASTRE
SURVEY OF ISRAEL
MAY, 2004

COMPUTERISED PROTOTYPE FOR 3D CADASTRE

The Original Surface Parcel

Spatial Sub-Parcels in the Parcel num 335

Spatial Sub-Parcel

R&D PROJECT
3D CADASTRE
SURVEY OF ISRAEL
MAY, 2004

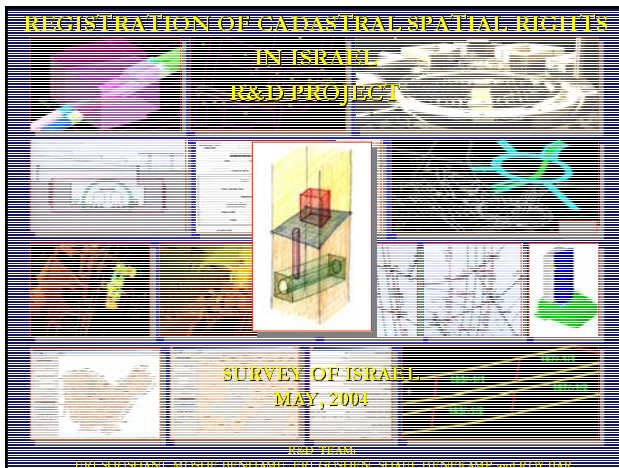
COMPUTERISED PROTOTYPE FOR 3D CADASTRE

The Templer's Tunnel

A Display of Spatial Activity Within a Registration Block

Orthophoto

R&D PROJECT
3D CADASTRE
SURVEY OF ISRAEL
MAY, 2004



SUMMARY



- A number of actions have been initiated in Israel in preparation for the 3D cadastre, including government decisions and finance of the R&D project.
- The R&D project is one of the first of its kind.
- The final results of the R&D project, due in August 2004, will hopefully lead to the realization of the 3D cadastre in Israel and will assist the authorities in the transition period.
- The R&D team has already formulated number of recommendations for the transition steps, some of them were described in the attached article.