

A GIS Based Cadastral Database at the Survey of Israel - Infrastructure for Future Modern, High Accuracy Cadastre

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Israel

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Registration Method

- The registration method accepted in Israel is registration of possession rights (Registration of Titles) based on Torrens principles
- Torrens Principles – parcels boundaries and areas definition on the basis of land surveying initiated by the State.

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Cadastral Process

Cadastral Parceling

Original Settlement of Rights

Parceling Change

Urban Development Plans

Mutation Plans

Existing Cadastral Parceling

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GIS Based Cadastral Database

The main goal:

Promoting Israeli cadastre according to the main principles of "Cadastre 2014" ("good land governance" and supplying up-to-date and reliable cadastral information to the public through internet);

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Objectives

- To make cadastral information available to the Survey, private surveyors, government offices and private citizens.
- Uniformity, Homogeneity and Quality Control.
- Creation of Legal Coordinated Cadastre, and its extension to the third dimension.

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Planning the Database

ALTERNATIVES:

- Re computing the best available original survey data, i.e. field books and mutation plans: optimal accuracy of data.

Or . . .

- Digitize cadastral maps : Faster, less accurate.

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Establishment

- **1988 - First steps ;**
- **During the 90's :**
 - acquisition of hardware and software, training personal ;
 - Map Digitazing;
- **2000 - Establishing a seamless Cadaster Database;**
- **Since 2001 - updating the information through approved mutation plans.**

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Accuracy

1. **Researches show a 20 cm. "built in" error in original measurments;**
2. **80% in the 10 – 35 cm. range;**
3. **75% of blocks had area problems;**

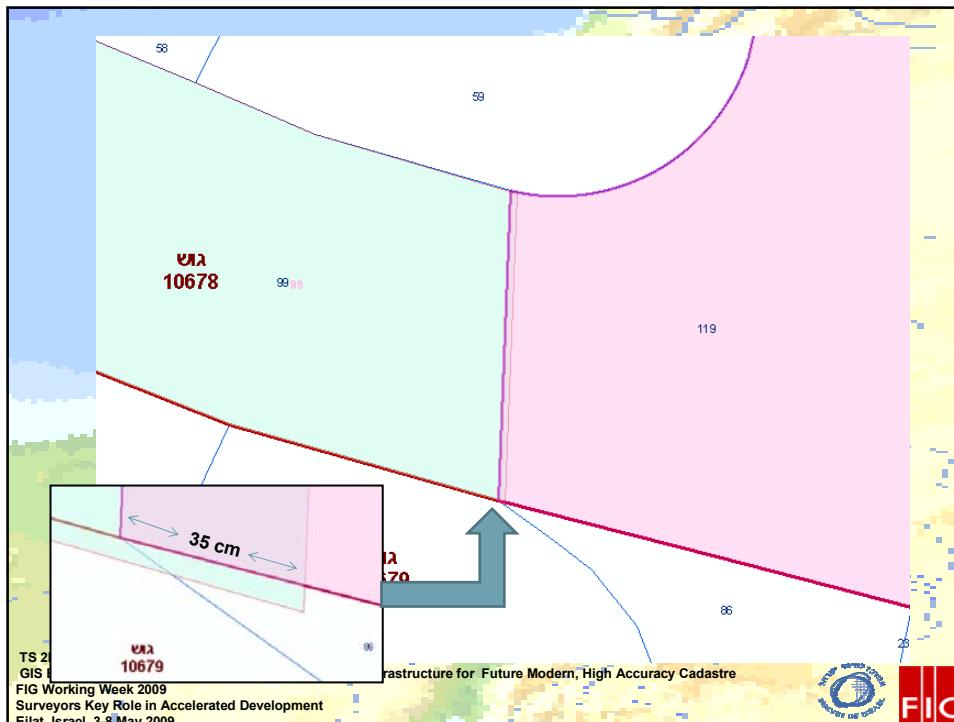
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Discrepancies

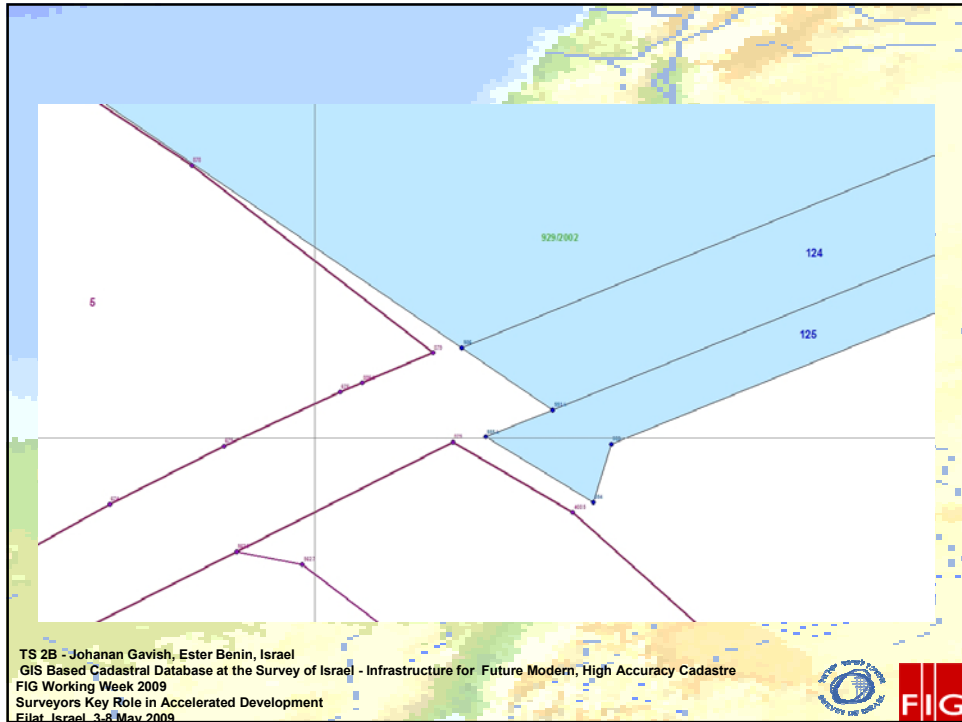
1. Discrepancy between the area computed and the area registered
2. Discrepancy between borders of neighboring blocks
3. "Disappearance" of a parcel

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Ranking Border Points

Analytical = Measured under 1998 Ordinances;

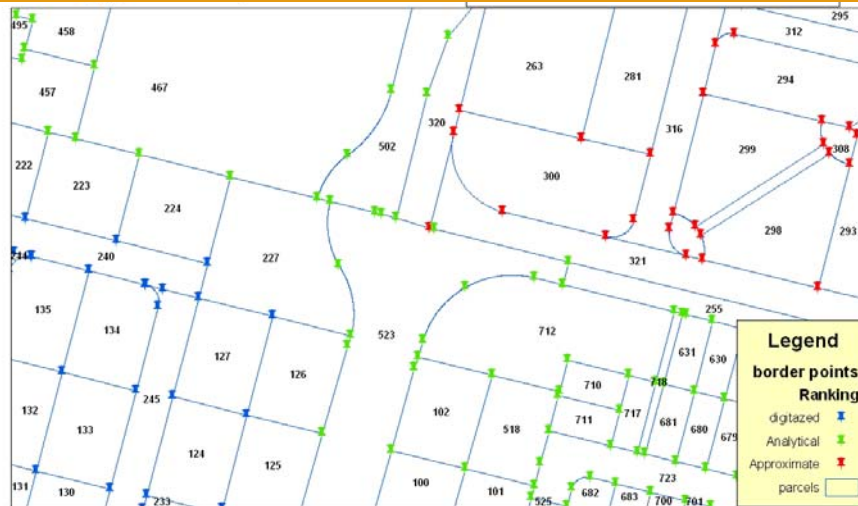
Approximate = Calculation from field books;

Digitized data.

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Ranking in current Database



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New Cadastral DataBase

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- **Data Source:**
 - New parcels;
 - Processing of historic cadastral materials ;
- Defining cadastre processes ;
- Transition to homogeneous and accurate geodetic network (IL2005);
- Determination of points' coordinates for parcel boundaries restoration;
- Keeping track of coordinate changes in time.

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New Cadastral DataBase

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- Parcel_N_id – Border Point Unique Identifier
- Ranking (Accuracy_Level);
- Control_id - Identity with a Geodetic Control Point;
- Legal_X_Coord ,Legal_Y_Coord , H ;
- Legal_Coord_System ;
- Point_Type ;
- Source - Measured, Calculated ... ;
- Process_id - which Process created the point.

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New Cadastral DataBase

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Ranking Border Points:

- A newly established point;
- An original point/monument (measuring an original point is the highest);
- Method of surveying: GPS is the highest;
- Calculation from field books;
- Digitized data.

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Point Ranking

| Point Ranking | Accuracy | Marking type | Source data | Definition in current database |
|---------------|----------------|--|-------------------------------------|--------------------------------|
| 1 | "0" | A point measured and/or calculated as part of an analytical cadastre project in state owned open areas or with the Director Generals' approval | | |
| 2 | 0.05 | Ground monument | Original point or newly established | Analytical |
| 3 | 0.2 | No found | Field books | Analytical |
| 4 | 0.5 | No found | Field books | - |
| 5 | 0.8 | No found | Geometrical | Approximate |
| 6 | Scale depended | No found | From digitized maps | Digitized |
| 9 | >0.8 | A point with calculation error or any other problem that prevent accurate rank determination | | |

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