

SHALOM – Management of Cadastre: Preliminary Results of Applications and Future Plans

Jonahan GAVISH, Larisa WOZNESENSKY and Joseph FORRAI, Israel

Key words: Cadastre, e-Governance, Land management, Survey of Israel, Improvement of Cadastral Practice

SUMMARY

The principle of the SHALOM system is the support of managing cadastral operations at the Survey of Israel (SOI).

The developed system is modular in character and integrates cadastral operations in different departments and with supervising surveyors in private practice, as well as with other government organizations.

The introduction of the system of the SOI started in 2008, at the main office as well as in the offices of district surveyors. The procedure of checking mutation plans was introduced for an experimental period.

The system permits management of computerized work procedures in cadastre, including monitoring various tasks, archiving documents, managing and recording telephone requests, advice given etc.

The system is connected to various means of managing quality and of constructing a cadastral database. The system provides solution based on WEB for the GIS as well as for individual projects and for archiving.

A senior manager, who is not directly involved in monitoring, can obtain reports which are lateral in character, can obtain a comprehensive picture and provide critical evaluation of the work performed.

The system will lay a basis for future management of cadastral projects which will be fully digital.

SHALOM – Management of Cadastre: Preliminary Results of Applications and Future Plans

Jonahan GAVISH, Larisa WOZNESENSKY and Joseph FORRAI, Israel

1. INTRODUCTION

The land registration method in Israel is based on the Torrens system (registration of titles). The state (through the services of the Survey of Israel, SOI) is responsible for the description of the land parcel boundaries as registered in the Land Registry Office (Forrai et al, 2004).

SOI is the top professional geodetic and surveying authority in the country, setting standards, initiating legislations, licensing surveyors, supporting and initiating research and development, actively managing and maintaining the national geodetic infrastructure, the national GIS, and is responsible for mapping, topographical and cadastral. SOI supervises, approves, collects and maintains all cadastral mapping.

The land administration practice in Israel involves both the governmental and the private sectors (Kraus and Forrai, 2006). Although the part of the governmental authorities is relatively dominant, there is a growing trend of deeper involvement of the private resources in the process. This tendency is based on different backgrounds and motivations, some derived from ideologies and some based on economic considerations.

The private sector (which is composed of some 500 active licensed surveyors) carries out a great variety of tasks. One of the most important of them is the preparation of mutation plans, which serve as required technical documentation of any change in land registration.

According to the existing law, each mutation plan has to be carefully checked and approved by SOI before starting with its registration procedure. SOI should complete increasing supervising tasks with permanently decreasing professional personnel. These opposite trends result in queue of mutation plans waiting for the beginning of their examination.

According to the survey regulations, the Director General of SOI authorized private surveyors - by delegation of power - to execute the supervision of mutation plans prepared by other licensed surveyors. SOI keeps the right of the final approval to itself, but also commits itself to complete it within 21 working days (Forrai and Kirschner, 2007).

Each year, some 1200 – 1600 mutation plans and some 200 new cadastral block maps have to be examined and finally confirmed under the full responsibility of SOI. An optimal management method can essentially contribute to the effective completion of the task.

This idea resulted in a decision to develop a comprehensive, fully computerized management system for the management and control of the cadastral activity at the Survey of Israel.

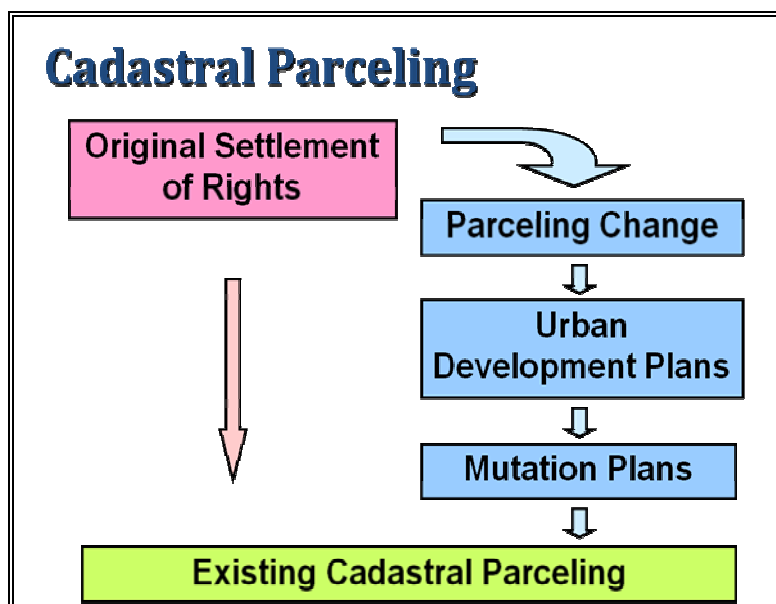
2. THE CADASTRAL PRODUCTION IN ISRAEL

For the application of the Torrens registration method in Israel ("registration of titles"), the State is responsible for maintaining the geodetic control network which enables precise reconstruction of surveyed boundaries in the future (Forrai et al, 2008).

According to the Torrens principles, the subject of registration is the land parcel. The boundaries of a parcel and the objects situated inside the parcel (such as buildings, walls and fences) are thoroughly surveyed, and the area of the parcel is calculated. This type of registration ensures an effective and convenient way for proper real estate management, effective planning and land transactions.

Settlement of rights, according to the Torrens principals, began in 1928 and has been in progress ever since. The state initiates and finances settlement procedures. Up to now 95% of the country has been settled.

Any change in the original settlement of land rights (like merging or subdivision of existing parcels) has to be carried out by means of preparation of a so called mutation plan, made by a private licensed surveyor. (pictures no. 1, 2)



Picture no.1 – the cadastre process

According to the Israeli Law of Planning and Construction, the preparation of a mutation plan has to be carried out on the basis of municipal plans (urban plans) approved by the competent authorities of planning and development. The municipal plan, frequently drawn on the background of a topographic map, sketches the approximate position of new cadastral boundaries and the intended use of new parcels (e.g., residential area, industrial zone, public

area etc.). The accurate position of boundaries is defined in a mutation plan, on the basis of surveying. (Forrai et al., 2004.)



Picture no. 2 – mutation plans

Examination process (quality control) of mutation plans starts in SOI in one of five District Surveyors' Offices, where the original cadastral drawings are kept and used for the mutation plan preparation by licensed private surveyors. The most important part of the checking process concerns the correct reconstruction of parcels boundaries according to available legal sources, while the registered area of the original parcels is strictly preserved. Another important part of the check process deals with performing the computerized test of submitted work files, prepared according to pre-defined standard formats. Following a successful examination procedure, these work files are uploaded into the database of the national cadastral GIS.

The surveyor provides the new parcels of a mutation plan with a temporary numbering (commonly, starting from number 1) and calculates the area of the new parcels. As soon as the plan is accepted by SOI as "approved for registration", it may be presented to the Land Registry Office, which provides the new parcels with final numbering (starting from the last number of the parcel registered in the specific block), registers the area of each new parcel and its ownership. The "final numbers" of new parcels are transferred then back to the SOI in order to update parcel numbering on the original mutation plan drawing, on the cadastral block map and in computerized databases.

3. PRESENT STATUS

3.1 Assimilating the system

In 2008 the system was assimilated in the Haifa district office. For approximately 6 months it was applied to checking the mutation plans. A number of deficiencies and errors have been discovered and in accordance with users wishes the system appeared in a new version (1.20) which reduced the number of tasks in a mutation plan checking, detailed definition of the state

of the activity life, a system for downloading information requested according to various characteristics etc.

The experience gained in the pilot project in Haifa, gave a green light for the incorporation of the project in all cadastral units of the Survey of Israel.

From the beginning of 2009, system incorporation and users training had began in the division of mutation plans control in a variety of tasks. A routine use of the "SHALOM" system was started in Tel Aviv, Jerusalem and Beer Sheba district offices for checking activities of supervising surveyors, advising and decision making.

A new revision is anticipated in view of the experience gained.

In order to permit functioning of the cadastral divisions of the Survey of Israel it has been decided to continue using the old system as well as the "SHALOM". The successful completion of the assimilation stage, will permit the end of the duality, estimated by the end of 2009. Starting with 2010 all new tasks will employ the "SHALOM" system.

3.2 Interfaces

It is intended that the project will achieve interconnection between the various divisions of the cadastre at the Survey of Israel. The user will be able to obtain an up to date information if the following connections are achieved:

3.2.1 Cadastral GIS

Cadastral GIS database: "SHALOM" is defined as an administrative system. There for it will serve as an administrative surrounding to all the tasks that involve input and quality control of the cadastral data handed from surveyors to the Survey of Israel. The control application is integrated with GIS environment applications which provide spatial quality control tools.

This can be possible only with an appropriate interface between the two systems. The interface will provide "SHALOM" users with a geographical search engine, based on spatial data queries as location of a parcel, parcels near a street, locating parcels included in a defined municipal district or according to discrepancies of area calculations etc.

3.2.2 National Geodetic Data base

This is a database of which contains coordinates and elevations, including history data for the contents, launched on February 2005 (Steinberg, 2006). The data base is fed by a computerized process. The "SHALOM" project permits the transfer of data from the National Geodetic Data base to the cadastral file.

3.2.3 Private Surveyors records

This data base includes data on all the surveyors including details and specialties. This becomes a basis for the classification of surveyors together with remarks on quality of projects they have submitted to the Survey. Using this information can help the quality control team decide on how intensive the control should be carried out.

3.2.4 Accounting system

This is a system which permits connection between cadastral operations and the data on management and fees for various services.

3.2.5 Archives

Connecting to all the relevant archive documents during quality control or advising is essential. The archives contain all the original surveys, mutation plans, computations etc. New documents received and used by "SHALOM" will be sent digitally to the archives at the end of the checking process.

4. WHAT ELSE TO BE DONE?

The "SHALOM" project plans the following for the next two years:

- Completion of designing and developing of the "Land Settlement" module.
- Establishing the interfaces mentioned in part 3.
- Assimilation and transition of the various procedures to the "SHALOM" system.
- The definition and development of the management processes of a new form of cadastral process called "a plan for defining and documenting parcel borders. The objective is to define position by coordinates (coordinate based cadastre) without changing the status of the parcel.
- Administration of data correction of various cadastral products and updating all information files.
- Specification and development of projects concerning field surveys and the enforcement of survey ordinances.

5. COOPERATION WITH PRIVATE SURVEYORS

During incorporation of the system at the Survey a full support of the licensed surveyors was experienced. The professionals expressed willingness to cooperate at all stages in order to achieve the new systems success.

The surveyors are interested in transferring files via E-mail instead of printed output. This is possible accept for those that are statutory in character. The system allows digital file management for mutation plans or any other plans submitted in uniform manner.

The "SHALOM" system will fulfill the expectations of the professional community in supplying information on cadastral activities of the Survey, through the Internet.

6. TECHNOLOGIES

As stated above there is no connection between the Internet and the production systems in order to achieve security of information.

There is a need to build a secure connection between the two networks. This year (2009) a "bridge" project has been launched which will enable transferring of E-mail and files.

Updating the software: the system is based on WINDOWS operation system, uses DOCUMENTUM over ORACLE and is supported by ESRI software for viewing geo-information. These four software products are periodically updated, thus making it necessary to update the whole system by new versions.

The cadastral system has a statutory importance, thus licensed surveyors signatures are required as proof of the document validity. It is hoped that an electronic signature will permit the submission of "electronic" documents instead of printing or plotting of graphical products such as mutation plans or settlement plans. Thus the system will be completed as a true "paperless" system and even old documents scanned will achieve a statutory status.

7. CONCLUSIONS (Intermediate)

The goal of the SHALOM project is to create and implement an organizational change where new standards and unified work methods will be implemented, including the integration of a supervision and control application. SHALOM is a comprehensive solution aiming at the establishment of a better, highly standardized and homogeneously regularized cadastral production and management practice (Forrai et al, 2008).

In the initial application stages of the "SHALOM" project, its advantages, its flaws and the reluctance of users for change, all came to light.

At the basis of the project plan several essential targets have been included:

- Achievement of control and monitoring all the routine work procedures. In order to achieve the target, a uniform work procedure has been established which included the entire professional and management tasks involved. As an example: checking completion of data, including checking the quality of the project files, completeness of the accompanying documents and the conformity with survey ordinances.
In order to achieve complete uniformity, a detailed work description of work procedures and professional definitions involved were required. The absence of internal work procedures allows the individual freedom to carry out the task, according to the individuals understanding. The absence of external procedures is felt dealings with the community of licensed surveyors.
- Another target of the "SHALOM" project was to increase the efficiency of cadastral procedures in order to shorten time and decrease the volume of the work involved. The system supports this objective through transparency of procedures with respect to the users at all levels.
There is reluctance on part of the users due to the fact that the project exposes their underachievement.
- The system permits to obtain information according to various characteristics – geodetic position, status, date targets, etc. with respect to the surveyor involved, project manager, the client etc. The result of any query can be distributed as a report. The reliability of a report depends of course upon the usage of all employees.

- One of the principal advantages of the system is the Intranet / Internet based architecture, which permits opening file in the system, a transfer of information from the client directly into the computerized file, extraction of information etc. This advantage has not been fully exploited yet.

ACKNOWLEDGMENTS

Authors thank Dr. Ron Adler for his constructive comments which resulted in the improvement of this paper; Dr.Gershon Steinberg, Michael Klebanov, Taldor Company and SOI experts for their contribution, in particular to Yochai Beit Yaakov.

REFERENCES

Forrai, J., Murkes, S., Vosnesensky, L., Klebanov, M., 2004, Development of a Better Cadastral Practice at the Survey of Israel, FIG Working Week Athens, Greece, May 22-27, 2004

Forrai J., Gavish Y., Voznesensky L., Bar-Maor A., Development of an Advanced Cadastral Management System at the Survey of Israel, FIG Working week Stockholm, Sweden, June 14-19, 2008

Forrai, J., Kirschner, G., 2006, Operating Supervising Surveyors – Two-year Experience of an Unusual Governmental Enterprise, XXIII FIG Congress, Munich, Germany, October 8-13, 2006

Kraus, J., Forrai, J., 2006, The Necessity for Interdisciplinary Cooperation as a Part of FIG Activity, XXII FIG Congress Munich, Germany, October 8-13, 2006

Steinberg G., 2006, New Survey Regulations for Israel, XXII FIG Congress Munich, Germany, October 8-13, 2006

BIOGRAPHICAL NOTES

Dr. Joseph Forrai was awarded M.Sc.(1974) and D.Sc.(1980) degrees at Technical University of Budapest, Hungary. Dr. Forrai was Lecturer and Senior Lecturer at TUBudapest, Tel Aviv University, Israel Institute of Technology (Technion) and Bar Ilan University (Tel Aviv) since 1976. Appointments at the Survey of Israel: Chief of Research Division (1987-1992); Head of Photogrammetry Department (1989-1993); Deputy Director General (1993-1994), Chief Scientist (1995-2003), Deputy Director General for cadastre (since 2003). Professional and research background (partial): crustal movement detection; photogrammetric data acquisition (national GIS topographic data base); permanent GPS station network; GPS support for geodynamics; improvement of national cadastral practice. Memberships of the Israeli Society of Photogrammetry and Remote Sensing (president between 1995-2001); Association of Licensed Surveyors in Israel (responsible for FIG relations); Israeli Cartographic Society.

Johanan Gavish received his B.Sc. from the Technion – Israel Institute of Technology, Division of Geodetic Engineering in 1979. In 2001 he received his M.Sc. from the Technion, also in Geodetic Engineering. Since 1982 he has been with the Survey of Israel, where he was involved in cadastral measurements during the period 1983-1990. As a head of the GIS department 1990 - 2008, his main responsibility was the defining and building the Israel National Cadastral Database. In 2008 he was nominated as Deputy Director General of the Survey of Israel for Geo-information and Mapping.

Larisa Voznesensky was awarded M.Sc. in Hydraulic and Construction Engineering at the Institute for Water Transport of Leningrad (1981) and accomplished study of Geodetic Engineering in the Technion – Israel Institute of Technology (1992). Licensed surveyor from 2000. Appointment at the Survey of Israel: inspector of mutation plans (1992- 2001); deputy of district surveyor of Tel-Aviv and Central Area of Israel (2001 – 2003); chief engineer of SHALOM project (since2004); district surveyor of Tel-Aviv and Central Area of Israel (since 2007)

CONTACTS

Yohanan Gavish
Survey of Israel
1 Lincoln St., Tel Aviv 65220
ISRAEL
Tel. + 972 3 623 1998
Fax + 972 3 623 1812
E-mail: john_g@mapi.gov.il

Larisa Voznesensky
Survey of Israel
1 Lincoln St., Tel Aviv 65220
ISRAEL
Tel. + 972 3 5178371
Fax + 972 3 5100310
E-mail: larisa@mapi.gov.il

Joseph Forrai
Survey of Israel
1 Lincoln St., Tel Aviv 65220
ISRAEL
Tel. + 972-3-6231900
Fax + 972-3-5624766
Email: forrai@mapi.gov.il
Web site: www.mapi.gov.il