

B06.2

Hot property – managing the property portfolio

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1 Introduction

“Land Registration systems operate throughout the world as the legal basis of recording, with certainty, the ownership and other legal rights in and over land. Such Systems provide the machinery for confident property transfer, the operation of a secure mortgage market and protections for the citizen. The effective operation of land and title registration systems are fundamental to successful market economies providing confidence for private ownership and property transfer and, as a consequence, engendering social stability.”¹

Union Railways Property (URP) is a subsidiary of London & Continental Railways (LCR) and is responsible for the acquisition, management and disposal of all land associated with the construction and operation of the Channel Tunnel Rail Link (CTRL), a new £5.5bn, 106 kilometre high speed railway linking London and the Channel Tunnel. This involves the allocation of land to specific Scheme Titles for the granting and registration at the Land Registry of two separate Leases. A Scheme Title is an aggregation of smaller titles into a homogeneous single title that allows for simpler registration of subsequent property transactions; scheme titles are usually associated with urban re-development.

Titles are dynamic and as a result so are their extents. The representation of these dynamic extents is the main focus of this paper. Traditional paper based systems didn't clearly relate the map boundary record to the Title Register as they are a combination of additions and subtractions of land and rights. Based on the 'General Boundaries' rule, boundaries are usually governed by agreement rather than by reference to a cadastre or survey. As the life-cycle of the title progresses, paper based map records become difficult to interpret. Most current Digital Land Terrier or ownership registers reflect the paper based model which in turn makes the map component also difficult to interpret. From its inception, URP was determined to implement a solution that simply and clearly displays the current land holdings together with all associated benefits and burdens.

A URP project team evaluated a number of proprietary computer Land Terrier and Property systems. The team found that the systems examined dealt with the mapping and extents components separately from the property ownership, rights and liabilities. What URP sought to achieve was to integrate these components into a homogeneous system able to support the business processes involved in land acquisition, disposal, and management. A fundamental requirement of the envisaged system was the ability to be able to immediately visualise and analyse the current extents of Title in an intelligent register to ask:

- What do I own?
- What are the extents of my rights and liabilities?
- What have I sold?
- What is the Status of my active acquisition and disposal cases?

¹ Inventory of Land Administration Systems in Europe and North America – HMSO July 2001 – Page 9

- Do I need to acquire additional land and/or rights?

The business processes would need supporting by the automated production and distribution of the conveyancing documents for each case. These requirements led to a need to record and maintain a copy of the Register under URP’s control. URP was able to draft Register Entries which HMLR would later incorporate into the Land Register once the standard milestones of Exchange, Completion and Registration have been reached for each case.

2 Business Objectives

The overriding business objectives for LCR are that all the land and rights necessary for the operation of the CTRL have been acquired so that the Lease can be granted, fulfilling the obligation with Government. Coupled with this was the requirement for an accurate, accessible register of land for case officers to query and to automate the production of plans and documents in support of the business process of property transactions and land registration. This needed to be achieved with increased business efficiency – more with less resources. Following the initial data capture of the base title details and extents, the recording of any changes to this information should be a by-product of the business processes involved in each property transaction, providing an audit trail of URP’s actions in relation to each segment of land.

An important aspect of the application is that it needed to take account of the predicted changes in Land Registration contained in the Land Registration Act 2002. When the Act comes into force on 13th October 2003, it implements a framework for a more comprehensive register of land and lays the foundations for an electronic conveyancing system.

3 Technical Solution

The creation of a paper based system was not an option. Following an evaluation of existing computer aided systems, URP concluded that none completely satisfied the business objectives. URP decided to develop a bespoke solution and jointly with Terraquest, developed a Logical Requirement Specification that was sent with an Invitation to Tender to short listed solutions providers.

An important aspect of the logical model was the idea of a virtual current extent derived ‘on-the-fly’ by performing all of the operations of addition and subtraction in the register in sequence. We have coined the phrase ‘Title Algebra’ to describe this process and for the mathematically minded the following equation demonstrates this process:

$$e_n = \bigcirc_{n=1}^{\dot{O}} f_n(e_{n-1})$$

where e is the extent and f_n is the operation defined by the Register Entry number n .

In order for this to be achieved, industry standard database and geospatial technologies were required that were capable of creating a single tightly integrated application based around the Microsoft™ OLE/COM automation model. URP chose to implement the system using Oracle 8i spatial™ and Intergraph GeoMedia™ and a development contract was awarded to Intergraph (UK) Limited. Further analysis was required to translate the logical model into a physical design. Geo-Aid Limited was contracted to perform this task and to provide support throughout the development phase.

The development phase of the Project was based loosely around the Rapid Application Development (RAD) methodology that allowed for the quick release of modules. The benefits of this approach were that the URP team were fully involved in the analysis and development of each module, data capture was an available function prior to full release of the system and user feedback enabled a more user friendly system to be developed.

3.1 Register Entries and associated extents

Each Register comprises three standard parts:

- A Register – information on extent and benefits;
- B Register – information on ownership and restrictions;
- C Register – information on burdens, charges etc.

Each Register part comprises a number of entries, each entry recording some aspect of a transaction on the Title. Each register entry can potentially have associated land or rights extents. These relationships are shown in the extract of the Logical Model (Figure 1). Physically each part is represented by a database table and each entry is a row in the table. All extents are modelled as a single feature class called Extent-on-Plan (EOP), occurrences of which are also stored as rows in the database. Each EOP is an addition (or subtraction) to the total title extent dependant upon the nature of the entry. The EOP may also be an subtraction (or addition) in an associated title. For example, in a Transfer of Part transaction the extent represents a removal on the source title and an addition on the destination title. (Which may be a new title)

In addition to the standard Register entries, the system design and implementation takes into account the requirement to register the subsoil removals from densely populated urban areas where tunnelling is required. During the calculation to determine the current extent tests are applied to ensure that subsoil extents are not included in operations being performed to calculate a surface extent.

3.2 Calculation of Title Extent

As conveyances add and subtract land to a title over time, it becomes very complex in nature and difficult for the human mind to reconstruct the title extent. Indeed, the example we use in this report produces quite surprising results!

The Land Terrier application applies a sequential calculation as described by the 'Title Algebra' function taking into account whether the entries are an addition or subtraction and at what level it exists.

THIS IS A PRINT OF THE VIEW OF THE REGISTER OBTAINED THROUGH LAND REGISTRYDIRECT SHOWING THE ENTRIES SUBSISTING IN THE REGISTER ON 29 JAN 2002 AT 14:56:31. THE ENTRIES SHOWN DO NOT TAKE ACCOUNT OF ANY APPLICATIONS PENDING IN THE REGISTRY. FOR SEARCH PURPOSES, THE ABOVE DATE SHOULD BE USED AS THE SEARCH FROM DATE.

THIS TITLE IS DEALT WITH BY TUNBRIDGE WELLS DISTRICT LAND REGISTRY.

TITLE NO: K349702

REGISTER LAST UPDATED ON : 12 JUN 1996 AT 23:59:59

A REGISTER

COUNTY

DISTRICT

KENT

TONBRIDGE AND MALLING

1. (22 October 1970) The Freehold land shown edged with red on the plan of the above Title filed at the Registry and being land on the South side of Warren Lane, Aylesford.
2. The land edged and numbered in green on the filed plan has been removed from this title and registered under the title number or numbers shown in green on the said plan.
3. Property remaining in this title is now known as Stable Cottage, 100 Lower Warren Road, Aylesford.

B REGISTER - TITLE ABSOLUTE

1. (12 June 1996) Proprietor: THE SECRETARY OF STATE FOR TRANSPORT of Great Minster House, 76 Marsham Street, London SW1P 4DR.

END OF REGISTER

Figure 2 – HMLR Title Register

Figure 2. is an Office Copy of the Register obtained from HM Land Registry. We will use this title to demonstrate the concept of title algebra to calculate the current extent of a title. We will also show how the calculated current extent is spatially intersected with the project scheme titles and then 'posted' to those titles.

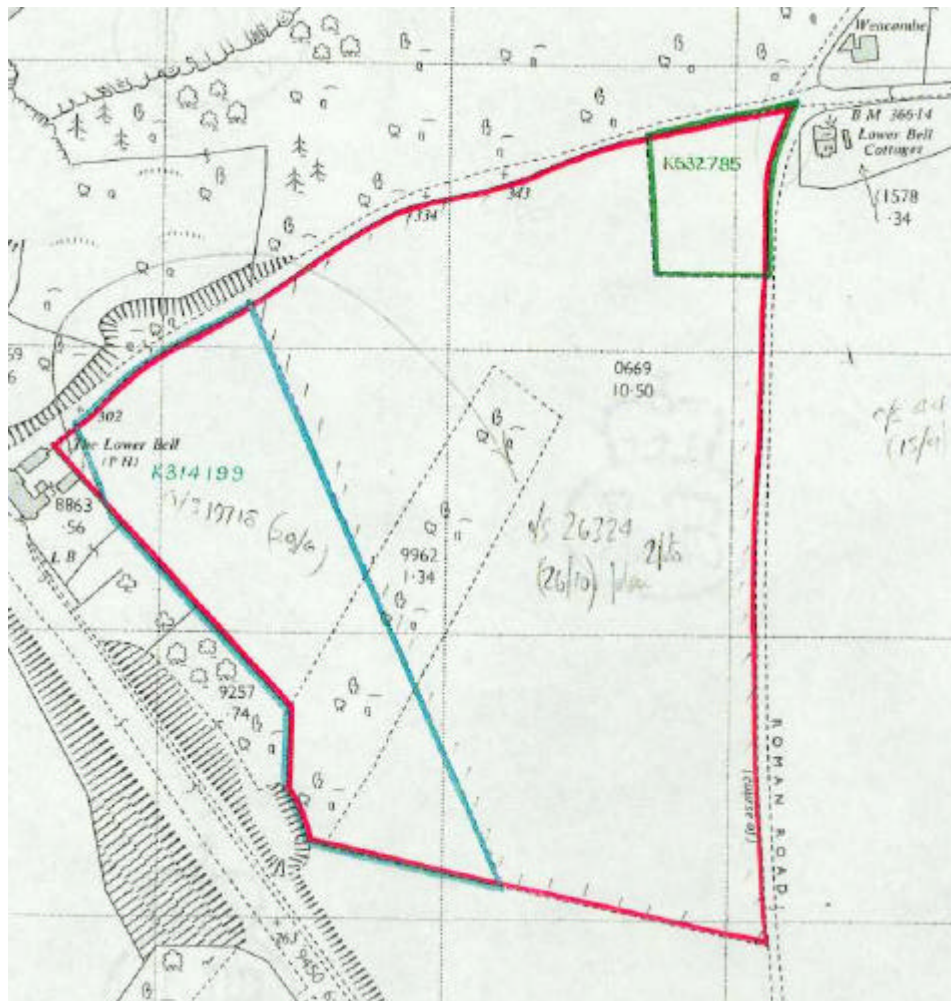


Figure 3 – HMLR Title Plan (extract))

Figure 3 shows the HMLR Filed Plan for our example. The land edged red is the original extent of the land registered as the first entry in the Register. The two areas edged green have been removed from the title by the property transaction registered as entry number 2. in Part A of the Register. This is a simple example, never-the-less it is not obvious what the current extent of the Title is.



Figure 4 – Captured Extent of Part A Entry 1

Figure 4 illustrates the original extent data captured against current base mapping and recorded as Extents on Plan with Symbology and which is linked to the relevant title number.

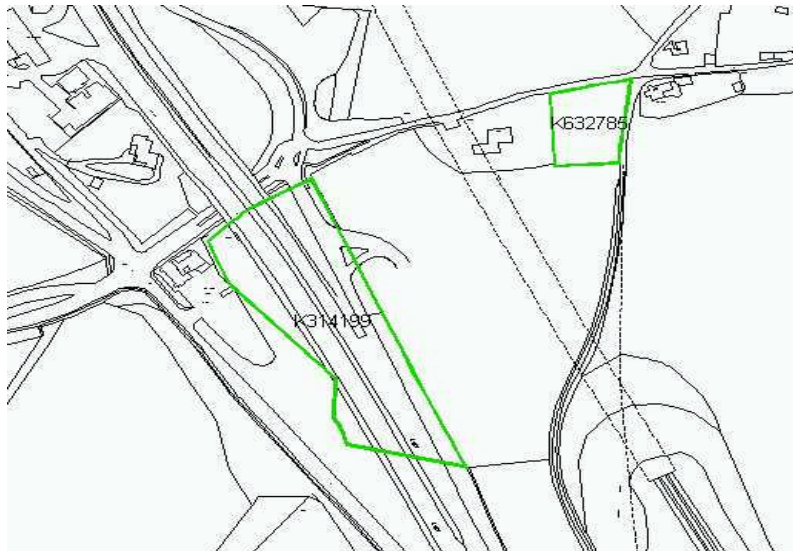


Figure 5 – Captured Extent of the Removals, Part A Entry 2

Figure 5 illustrates two areas of land that have been removed from the title and recorded as Extents on Plan with Symbology and which is linked to the relevant title number.



Figure 6 – Data captured Title plan

Figure 6 shows all the Extents on Plan involved in the Original base title and is the digital equivalent of the HMLR Title Plan. These extents are linked to the Register Entries to create an Intelligent Register.

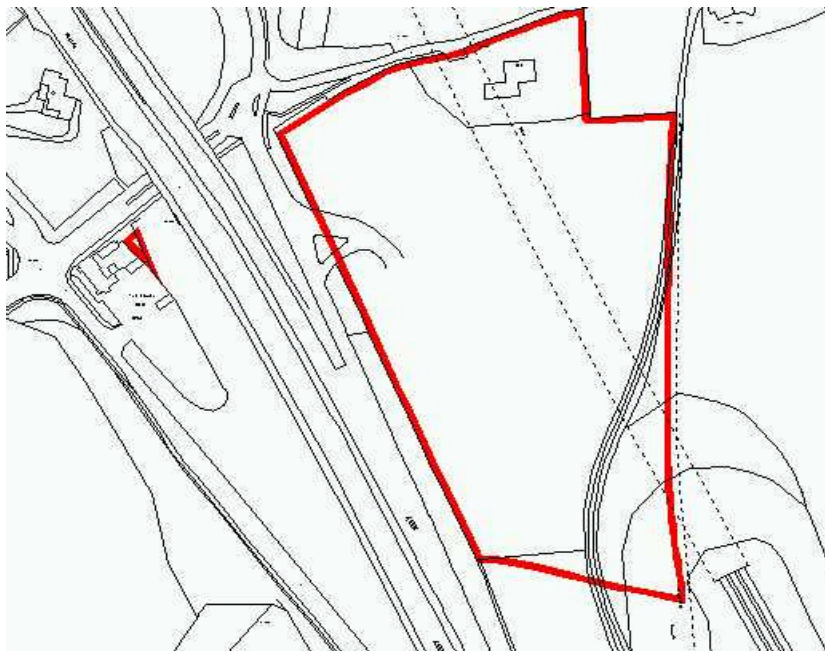


Figure 7 – Computed Extent – Current landholding

Figure 7 shows the calculated extent i.e. the additions and removals of a title. (note the small section to the west that was not obvious in the original HMLR Title Plan)



Figure 8 – Current Landholding and Scheme Title Intersection

Figure 8 shows the Calculated Extent intersected with the Proposed Scheme Titles. The two blue extents indicate a separation of subsoil or tunnel acquisition and surface acquisition each with a separate Scheme Title. The base Title needs to be ‘managed’ so that the land is divided into the correct class of Title.

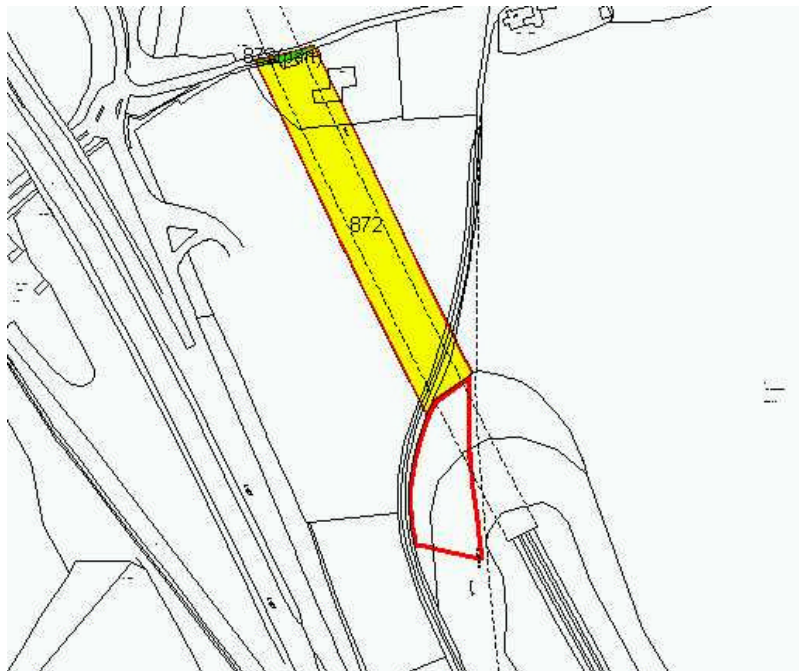


Figure 9 – Land to be transferred to Scheme Titles

In Figure 9 the land tinted yellow is allocated to a subsoil Scheme Title and the land edged red with no shading is allocated to a surface Scheme Title. Each of these becomes a removal in the Source Title and corresponding new register entries are automatically entered as part of a controlled Case procedure.

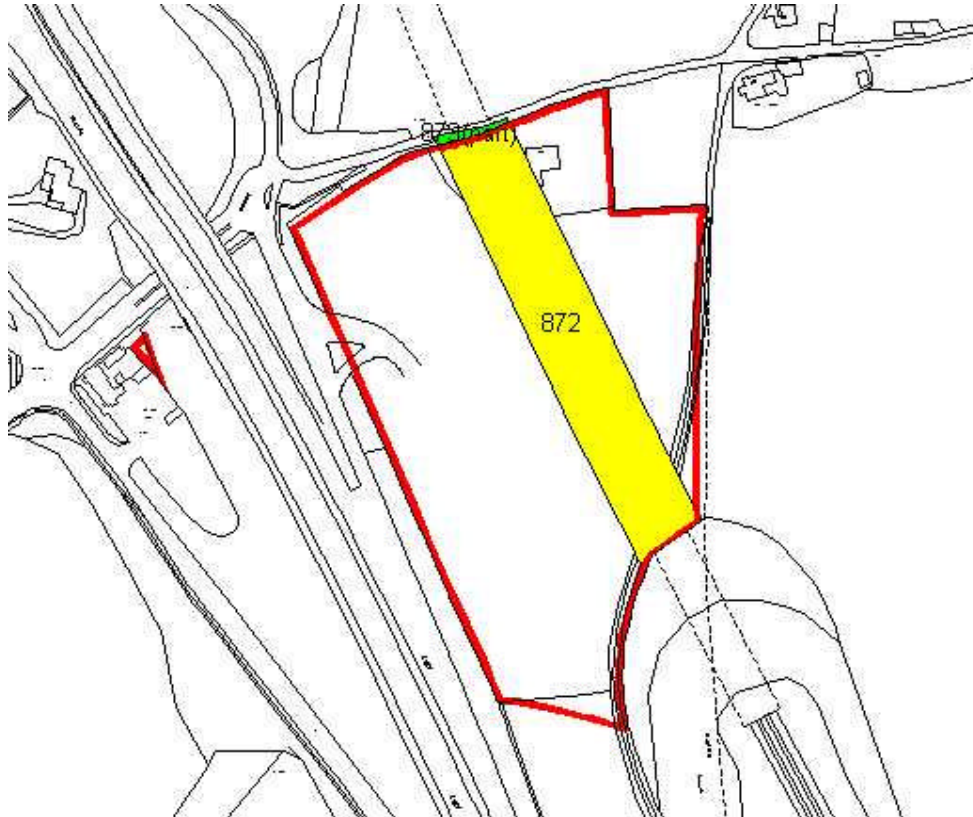


Figure 10 – Land available for disposal

Finally Figure 10 shows the extent of the original Title after the railway interests have been removed. This title is now ready for disposal.

This example has demonstrated the management processes involved where the title is already owned; similar processes are invoked where acquisitions involve only part of a Title i.e. a Transfer of Part.

4 Conclusion

In this paper we have concentrated on the applications' ability to dynamically reconstruct a title extent, a feature that we believe is both innovative and unique. Other spatial extent and title operations are provided to enable the user to manage estate holdings. For example, the extent of required Scheme titles can be planned and disparate titles can be merged into the appropriate Scheme. Subsequently, land no longer required to operate the railway (i.e. is outside all scheme titles) can be prepared for disposal at an optimum valuation. During this process of planning disposals, tools are provided to ensure that all necessary easement benefits are created to allow access to the railway land and that burdens are created to allow adjacent land owners access where there is a statutory requirement to do so (for example highway maintenance). The functionality extends to deliver all of the functional requirements of a strong Land Terrier and Title management system including combinations of the following:

- Total ownership extent by Party
- Ownership within an area
- Search by Property Address

- Search by Party
- Benefits and Burdens
- Creation of Standard HMLR documents. E.g. TR1/TP1
- Plan production

Following the successful implementation of this application by URP, the decision has been taken to make the application commercially available.