

Issues Related to Boundary Mapping in Ireland (5390)

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Key words: eConveyancing, boundary identification, boundary definition, boundary recording, boundary surveys, boundary mapping, filed plans, title plans, special registration maps.

SUMMARY

eConveyancing was identified as a vital part of Ireland's eGovernment strategy as early as 2003 and the Law Reform Commission published a report (2006) which described a proposed model for eConveyancing. In preparation for the eConveyancing system, the Law Society of Ireland published its eVision (2008) which recommends radical change in current conveyancing practice, and similarly the Irish Institution of Surveyors (IIS) published a Green Paper (2008) which outlined proposals to introduce standards and procedures for boundary surveys. In August 2010 the Property Registration Authority (PRA) in Ireland completed the conversion of its ownership databases of folios and mapping into digital form, such that the register now contains 93% of the land of the State. The completion of the Land Register has recently been accelerated and compulsory first registration (CFR) will be extended to all counties on 1st June 2011.

However, the reforms for boundary surveys proposed by the Irish Institution of Surveyors were only likely to be accepted if they had broad support, so an Inter-Professional Task Force for Property Boundaries (IPTFPB) was established which includes architects, planners, solicitors, barristers, engineers and surveyors. The IPTFPB conducted an electronic survey of property professionals on "Issues Related to Boundary Mapping in Ireland" and this paper outlines the rationale behind the establishment of the IPTFPB and the results from this survey. These findings indicate significant support across a range of professions for reforming the current system of boundary mapping in Ireland. The impact of these findings is expected to bring about a number of legislative changes to facilitate the adoption of improved methods for identifying and defining boundaries.

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1. INTRODUCTION

Ireland has a dual system of land administration for land tenure consisting of the Registry of Deeds (RoD) and the Land Registry (LR), both of which are managed by the Property Registration Authority (PRA) which was established in 2006 (Oireachtas, 2006).

The RoD was established in Ireland in 1707 as a repository to voluntarily register deeds relating to land and property. Priority was given to registered deeds, so the legal profession adopted registration as the norm under their duty of care for their clients. Today the RoD contains an index of names of sellers rather than owners, and both a memorial and an abstract of the deed (which is returned to the solicitor). The RoD system is both slow and expensive to search and the results are inconclusive.

A new system of land registration was established in 1891 to address these deficiencies and the original focus of this new system was on rural areas. Most farmers during this post famine period in Ireland paid substantial annuities to absentee English landlords, so the State introduced a scheme to assist these tenant farmers purchase their landholdings on condition that their title was registered in Land Registry.

In 1887, the Ordnance Survey had initiated a new survey of Ireland at a scale of 25 inches to 1 mile, in addition to the already available map at 6 inches to 1 mile surveyed between 1825 and 1842. Consequently, it would have been imprudent in the 1890s for Land Registry to begin to create an additional cadastre, so it was decided to use the large scale Ordnance Survey topographic maps to record property boundaries. This practice has continued to this day, and is now one of the issues at stake, due to the availability of modern surveying technology which allows position to be accurately surveyed using GNSS to the size of a coin.

The adoption of topographic features on Ordnance Survey maps as property boundaries has given risen to Ireland's non-conclusive boundary system (Irish terminology for general boundaries). This system has three main distinguishing features from fixed boundary systems:

- The location of the title boundary within the topographic feature is not determined;
- The ownership of the topographic feature (if there is one) containing the boundary is not established;
- The position of non-conclusive title boundaries is regarded as approximate.

One of the difficulties of this Irish system is the absence of supporting evidence for registered boundaries. If a dispute arises between adjoining neighbours, all that is officially available to clarify the issue is a Land Registry index map where the position of any boundary is regarded as approximate, and Land Registry state that they are not in a position to give advice on

boundaries (PRA, 2011). Consequently, surveyors have to hunt down all other relevant evidence to attempt to clarify the issue, which permits many interpretations of the various versions of mapping involved. Consequently, the current land registration system is non rigorous and often quite expensive to resolve.

Many organisations both public and private have been involved either collaboratively or independently for over a decade now in modifying different portions of the land registration and conveyancing systems to prepare for the implementation of an eConveyancing system in Ireland. A considerable number of the major elements are now in place to ensure the introduction of eConveyancing in Ireland.

2. PREPARATIONS FOR eCONVEYANCING IN IRELAND

The Irish Government's eGovernment strategy (Department of the Taoiseach, 2002) outlined a wide range of proposals under three key infra-structures, namely telecommunications, legal & regulatory environment and eGovernment initiatives. eConveyancing was identified as an eGovernment initiative which was expected to result in significant benefits to a wide range of stakeholders. The identification of conveyancing as one of the processes where significant reform could be achieved was driven by a number of factors:

- The overall process was perceived as being inefficient, complex and paper intensive, which resulted in relatively high costs being incurred by private house purchasers;
- Advances in technology had resulted in an increased demand to conduct business online. In Ireland, and internationally, Governments were actively encouraging and implementing an electronic agenda;
- Conveyancing in Ireland, as in other common law jurisdictions, has evolved over several hundred years. It was recognised that reform of substantive land law in Ireland was a key element in the overall strategy to simplify elements of Irish Law so as to make them more easily understood and accessible.

Additional funding was made available through successive National Development Plans to drive reform in providing key government services electronically and the Law Reform Commission and Land Registry benefitted from these initiatives.

2.1 Law Reform Commission

In 2003, the Law Reform Commission (LRC) launched its eConveyancing Project, which involves three strands:

- a) *The Substantive Law Strand* - a joint project between the LRC and the Department of Justice, Equality and Law Reform examined Land Law and Conveyancing statutes which resulted in the publication of a report (LRC, 2005) containing a draft *Land and Conveyancing Bill* to replace in one text the old law which contained more than 150 pre-1922 Acts (Irish State was formed in 1922) dating back to 1285. This bill eventually passed into law in 2009 (Oireachtas, 2009);
- b) *The Procedural Strand* - Bearing Point Ltd was contracted to produce a report (LRC, 2006) which contained three major elements:
 - A detailed end-to-end process model of the current conveyancing process;

- A comprehensive analysis of the role played by the many public and private stakeholders of the current conveyancing process and their technological state of readiness for eConveyancing;
 - A vision and strategy for eConveyancing in Ireland supported by conceptual operating models and an outline roadmap of how to achieve it.
- c) *The Administrative Strand* - deals with the application of information technology to conveyancing transactions and of how various public and private bodies provide a service for, or information used in connection with, such transactions. An eConveyancing Steering Group was established in 2007 to make a detailed assessment of the most appropriate model for eConveyancing in Ireland, including the preparation of proposals to Government as to the design, establishment, operation, governance and implementation of the proposed model (O’Sullivan, 2007). However, due to the changing economic climate and lack of government leadership, this group was dissolved in 2009. Currently the main stakeholders are collaborating to determine a way forward.

2.2 Property Registration Authority

The Information Society Fund was established in 1999 to enable the identification and prioritisation of projects in a government action plan to create an information society. By the end of 2005, €206.6M had been made available (www.taoiseach.gov.ie) to support over 200 projects across a wide range of government departments and State agencies.

Access to funding permitted Land Registry develop a strategy for the provision of eServices within the wider context of the longer term objective of implementing an eConveyancing system (Figure 1). To date most elements of this diagram have now been completed, and the introduction of eLodgements, eRegistration and the extension of the Land Register are now rapidly progressing.

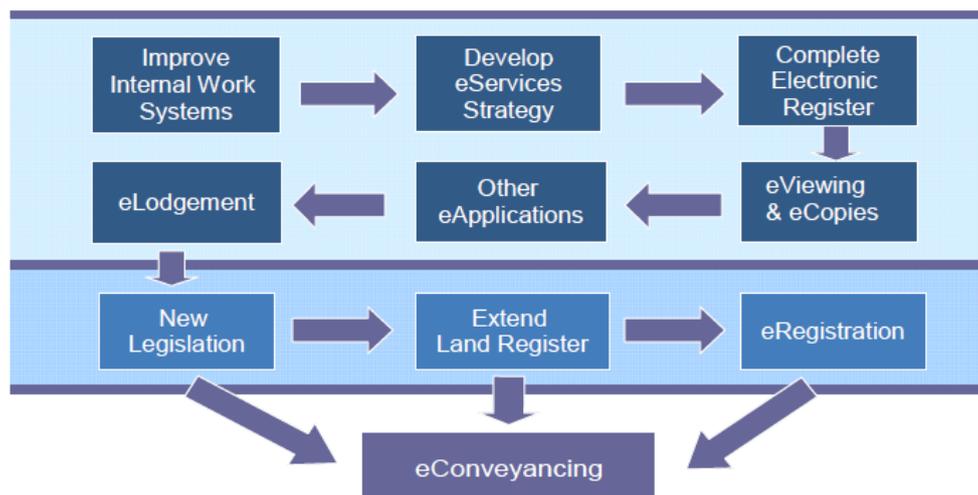


Figure 1 - PRA Plan for implementation of eConveyancing (O’Sullivan, 2007)

2.2.1 Conversion of Folios to digital form

sub-urban areas and rural towns) and 1:5000 (for rural areas).

Scanned images of the Land Registry’s maps were overlaid with the new OSi ‘up-specified’ maps and the correspondence of the PRA boundaries with respect to the features on the new OSi maps was carried out on a boundary segment by segment basis (Prendergast, 2008). If a boundary segment was located within the specified tolerance (Table 1) of the OSi features, then the lines on the new OSi maps were adopted as the legal boundaries. The contractor did not re-digitise these boundaries, but copied the coordinates of the OSi features into the Land Registry boundary layer.

These tolerances are generous, though smaller tolerances would have prevented the PRA from associating the boundaries to the OSi features. This could potentially have created enormous confusion. Therefore the digitisation project carried out a national rectification of all registered boundaries in Ireland, and if the OSi features were surveyed correctly then the outcome should be good, and in many cases it is. In some cases however, the OSi feature may be incorrectly surveyed and the title boundary is now associated with this incorrectly positioned feature. In other cases the registered boundary was outside the tolerance to permit the association, so individual rectifications are now required to correct these. Another aspect of the digitisation is that the boundaries on the new digital mapping legally supersede the boundaries on copies of old paper records held by landowners and solicitors. The difference between boundaries on these old maps and the new digital boundaries has also given rise to some disquiet by landowners. Notwithstanding these issues the PRA digitisation project was a significant achievement and one of the fundamental elements required for the introduction of eConveyancing in Ireland.

The PRA are to be congratulated for the improved cartographic quality of their index map (Figure 3) which is a significant improvement on the old paper maps. They are also to be congratulated because the map is in vector format and they have used the new GPS compatible ITM coordinate reference system. However, some underlying mapping issues are still present including, a) the digitising tolerances did not resolve some issues such as discrepancies due to the inaccuracy of maps originally submitted for registration (figure 4), and b) in other cases they have adopted errors from an incorrect

Table 1 - Tolerances permitted to move boundaries into association with OSi topographic features during digitising project (PRA, 2007).

Scales	Rural Agricultural	Urban, Sub-urban & Rural
1:10,560	± 20.0m	± 3.0m
1:2,500	± 5.0m	± 2.5m
1:1,250	± 2.5m	± 2.0m
1:1,056	± 2.0m	± 1.0m
1:1,000	± 2.0m	± 1.0m

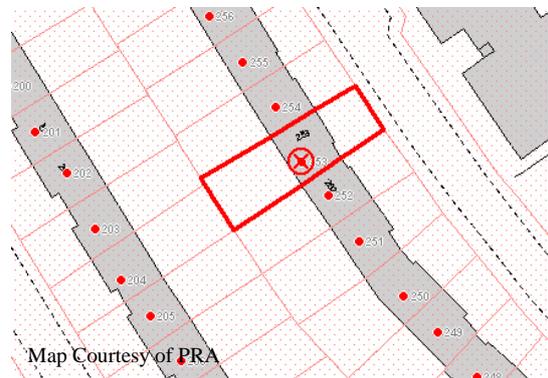


Figure 3 - Map extract from the PRA website www.landdirect.ie

OSi map.

However, this movement of boundaries is set to continue indefinitely to correspond with coordinates of revised OSi features during updates of OSi mapping. Land Registry state that each boundary alteration is assessed individually by Land Registry staff and their decision is guided by an examination of:

- OSi orthophotos (currently in colour at a 1 meter resolution). OSi have orthophotos of 0.25m resolution for many urban areas but no statement yet whether Land Registry intends to use them;
- Any dimensions available on the registration map (not normally available due to a legacy Land Registry procedure of not accepting dimensions on maps submitted);
- The mapping tolerance applicable is $\pm 1.0\text{mm}$ at the original registration map scale (PRA, 2007). Previously it was $\pm 0.35\text{mm}$ (PRA 1998);
- Refer to a ground survey if available (to date rarely available).

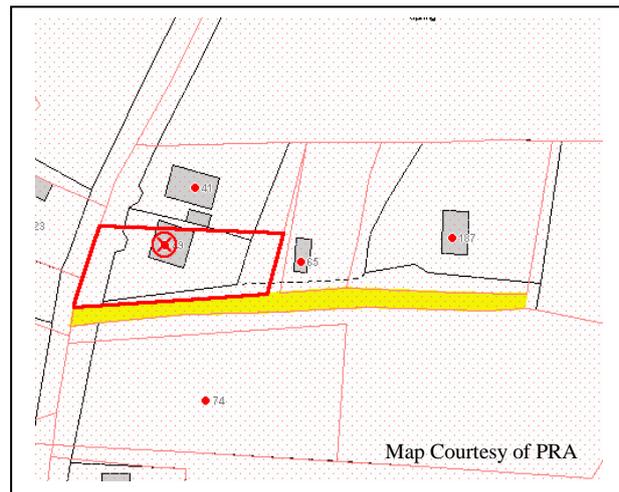


Figure 4 - Map extract from PRA website www.landdirect.ie showing multiple PRA boundaries clearly not corresponding to the boundaries used on the ground. (black lines on OSi map) Distances are larger than the digitising tolerances, so not corrected.

2.2.3 Extending the Land Register

The Registration of Title Act (Oireachtas, 1964) provided specific provision to extend compulsory registration on a geographical basis, and Carlow, Laois and Meath were the first Counties where registration was made compulsory on 1st January 1970 (Figure 3). However, no further extension took place until April 2006 and this lack of progress in extending compulsory registration since the 1970s is both disappointing and regrettable (McDowell, 2006).

The extension of compulsory first registration to the entire country from 1st June 2011 represents a decisive step towards completing the Land Register in Ireland. Together with the far reaching reforms included in the Land and Conveyancing Law Reform Act 2009, the extension of compulsory registration to all areas of the State will benefit consumers by reducing registration delays and the associated costs of registration and will pave the way for eConveyancing (Ahern, 2011). Ahern also stated that International reports have consistently highlighted the fact that efficient property registration systems contribute to economic progress and national competitiveness.

Although, this compulsion only relates to transfers of property initially, additional triggers will be necessary to complete the process. The prize of having a complete land register to enable the analysis and management of all the land of the State is the stimulus to ensure this process should be done as quickly as possible, however it is complex and will probably take 10 to 15 years to complete.

2.3 Law Society of Ireland's eVision

The Law Reform Commission (LRC) requested the Law Society of Ireland to devise a vision for eConveyancing. The resulting eVision document (Law Society eConveyancing Task Force, 2008) reflects three years of research and consultation and proposes a number of radical changes to current policy and procedure. It states that the current conveyance process has been used by the State as a tool for implementing social policy, such as tax collection and statutory enforcement, and suggests that basic residential conveyances now require multiple enquiries that have little to do with ownership, transfer and security of title. The primary recommendation of the eVision is that the conveyance process be paired back to basics of simply transferring title. Much detailed legislative, procedural and administrative reform will be necessary to achieve this, including a number of interesting recommendations from the surveying perspective, which are:

- a) A recommendation to move from 'caveat emptor' (buyer beware) to seller disclosure for property transactions because it is no longer considered appropriate for the introduction of eConveyancing. This moves the responsibility from the buyer (to ensure they acquire what they think they are purchasing) to the seller (to make a declaration of what they are selling). If any issues are subsequently discovered which were not disclosed, the seller may have a case to answer.
- b) A recommendation that title to all land in the State, and any interests in land must be registered in the Land Registry. The two main effects of this proposal are:
 - That all properties currently registered in the Registry of Deeds (currently estimated at two to three hundred thousand mainly urban properties) should be transferred to and registered in Land Registry and that the Registry of Deeds should subsequently be closed;
 - That no interest should affect title unless it is registered, (i.e. if it not registered then it does not affect the title, so many exemptions to registration which currently apply should no longer apply). Currently a large number of registration exemptions are

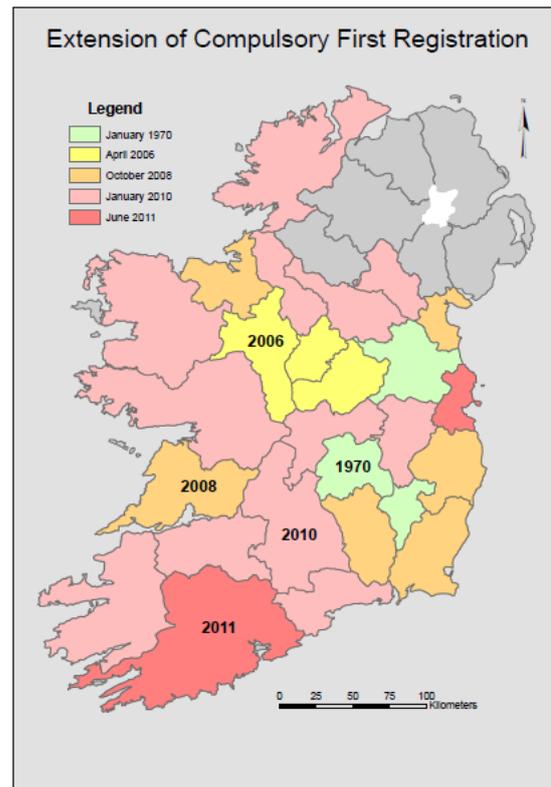


Figure 5 - Extension of Compulsory First Registration in Ireland by county

provided for under sections 69 and 72 of the Registration of Title Act (Oireachtas, 1964). Other examples include a spouse's family home protection and outstanding taxes which are a charge on property. The recommendation is that all of these exemptions should be removed to ensure that the Title Register is definitive, conclusive and all encompassing.

One of the main aims of the eVision is to ensure that property professionals can be confident in the reliability of information being supplied by an eConveyancing system, so there is a need for quality assurance (validation of electronic information), standardisation (of data definitions and forms) and professionalisation (better understanding of the different roles played by each of the property professionals).

2.4 Irish Institution of Surveyor's Green Paper

The Irish Institution of Surveyors (IIS) considered the period of the PRA digitisation project from 2005 to 2010 to be a window of opportunity, so they established a Commission on Land Registration (LRCom) in autumn 2006 to investigate and report on issues related to boundary mapping in Ireland. The group met approximately once a week from late 2006 to spring 2008 where case studies of current boundary disputes were analysed and land registration mapping systems and cadastres in other countries were researched.

The IIS Green Paper (Prendergast *et al*, 2008) acknowledged the use of a non-conclusive boundary system in Ireland and stated that these non-conclusive boundaries are not reliable enough for eConveyancing, but that conclusive boundaries could supply the reliability required.

It recommended that title boundaries would first need to be determined on the ground and then surveyed to a high standard to be permitted to be registered as conclusive. It proposed the formulation and adoption of new standards and procedures for boundary surveys in this regard.

It also stated the registration of boundaries as conclusive was provided for under the current legislation and it proposed a gradual approach of migration towards conclusive boundaries over a number of decades. The proposals recommended that conclusive registrations should be adopted for the creation of all new boundaries, to ensure information on these types of boundaries was recorded to a high standard in Land Registry. The LR digital mapping would record a variety of extra information about boundaries registered as conclusive, which should be validated before registration to ensure it met the agreed standards. It also recommended that the sections in the Land Registration Rules (DoJ, 1972) referring to registration of boundaries as conclusive were written for a paper mapping record and would need to be revised to cater for the digital mapping era and modern surveying technologies.

Although the Green Paper received wide recognition at home and abroad, senior management of the PRA were unconvinced and OSi senior management declined to engage lest it compromise its role in preparing mapping for registration purposes. Therefore, the policy,

legislative and procedural changes necessary to implement the recommendations would require more compelling arguments from a more authoritative source.

2.5 Inter-Professional Task Force on Property Boundaries

The IIS Commission on Land Registration then met with members of the Law Society's eConveyancing Task Force to discuss the recommendations in their eVision document for the Land Registry's folio database. The IIS stated that their Green Paper had a corresponding aim in recommending change of the Land Registry's mapping database and that these two reports were complementary in identifying changes required to prepare for the introduction of eConveyancing. The IIS highlighted some of the difficulties arising from the PRA digital mapping project and proposed establishing an inter-professional group with representation from all the professions involved in the property sector to investigate these mapping issues.

The Inter-Professional Task Force on Property Boundaries was set up in early 2009. All of the Irish professional bodies involved in the property sector were invited to participate and Ordnance Survey Ireland (OSi) and the Property Registration Authority (PRA) were invited to participate as observers. The OSi opted not to be involved, and the PRA withdrew their participation in June 2010, once ideas which were contrary to their current operational model were being committed to paper. The Law Society, Engineers Ireland, Bar Council, Irish Planning Institute, Royal Institute of Architects of Ireland and the Irish Institution of Surveyors each nominated a number of representatives from their respective professions to sit on the Task Force. Solicitors, planners, barristers, engineers, architects and surveyors are currently actively engaged in this important inter-professional forum.

The aims of the Inter-Professional Task Force on Property Boundaries (IPTFPB) are to:

- a) Analyse how the current system operates and identify its strengths and weaknesses.
- b) Carry out a scoping exercise to identify issues related to boundary identification, definition, recording and dissemination of this data and its related information in Ireland.
- c) Evaluate the significance of the issues identified and develop best practice approaches which are comprehensive and sustainable.
- d) Prepare a cost benefit analysis for the solutions developed.
- e) Determine and promote final recommendations at policy, administration & service delivery levels.

Initially each professional body was asked to make a presentation to the Task Force to identify issues relating to boundary mapping which were of concern from their own perspectives. This was followed by a colloquium in November 2009 to widen the debate and to assess if the concerns identified were valid. The colloquium found that the issues identified were more prevalent than expected, and consequently the investigation was fully vindicated.

3. METHODOLOGY USED FOR THE SURVEY AND THE ANALYSIS

3.1 Questionnaire Survey

The IPTFPB decided to conduct an electronic survey to collect quantitative data to determine the scale of the problems being experienced and qualitative data on the detail of the issues involved and suggestions on how they might be resolved. The survey was developed iteratively during the spring of 2010 and piloted first by members of the Task Force and then by a select group of professionals to ensure the questions were understood and the questionnaire was viable.

The survey was conducted in two periods from 20th June to 10th September 2010 and then again from 25th January to 30th March 2011. Insufficient responses were received during the first period, which necessitated opening the survey for a second period to ensure specific sample sizes were achieved for each of the professions.

3.2 Validity of the replies received

Minimum sample sizes were computed using the calculator on the Relevant Insights website at www.relevantinsights.com/research-tools to ensure the results had a confidence level of 90% with a margin of error of +/-10%.

Table 2 - Responses received from 20th June 2010 to 30th March 2011

Profession	Population Size	Required sample for +/-10% Error Margin	Responses Received	Sampling Error to Date	Completion Rate
Land Surveyors	375	57	65	± 9.3%	17.3%
Solicitors	7,500	67	105	± 8.0%	1.4%
Engineers*	400	58	46	± 11.5%	11.5%
Architects	2,415	66	55	± 11.1%	2.3%
Spatial Planners	700	62	39	± 13.0%	5.6%
Barristers	2000	65	1	∞	0.05%
GIS Analysts	?	?	2		
Others	?	?	10		
Total			323		

351 responses were received, but 28 were blank so these were excluded, which left 323 valid responses. The sample sizes from both solicitors and land surveyors meet the specified requirement and have margins of error less than ± 10.0%. Although the sample sizes for engineers, architects and spatial planners did not meet the specified target, their margins of error are not appreciably above ± 10.0%, so these results can also be used. However insufficient responses were received from barristers, so these cannot be considered to represent the view of the members of the Bar Council of Ireland.

It should be noted that surveys are normally conducted using the “Probability Sampling Theory Framework”, which helps to avoid selection biases, but “Convenience Sampling” is now regularly used for web based surveys, which chooses samples from a particular sub-group of a population rather than randomly. In this case the target populations were the members of the participating professional bodies involved in the property sector in Ireland,

with the assumption that they have multiple experiences to draw upon from their professional practice with regard to the survey topic. It should be emphasised therefore these results represent the views of property professionals, rather than the views of the general public.

3.3 The Quantitative Results

As expected nearly half of all the responses (323) were received from Dublin (129), then Cork (35), but there is a good geographical distribution of responses from the rest of the country, except County Longford (figure 6). However, responses from Northern Ireland are conspicuously absent except for County Derry.

The first surprising result was that over a quarter of professionals (27.7%) were not aware that property boundaries registered in the Land Registry or in the Registry of Deeds are non-conclusive and are not guaranteed by the State. Non-conclusive boundaries were defined in the survey as “The Register does not contain sufficient information to define the boundary either legally or geometrically. Consequently, the boundary is open to challenge, and is not guaranteed by the State.”

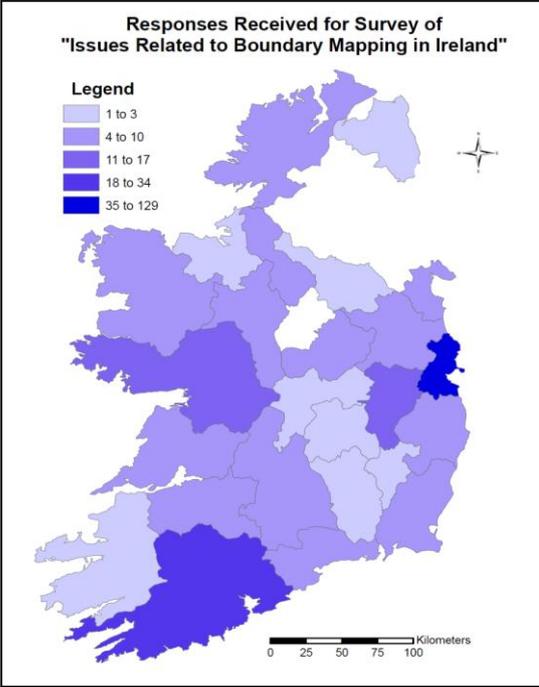


Figure 6 - Responses Received

Another striking finding was the high percentage of respondents (78%) who recorded having difficulties with existing boundary mapping. Prior to the survey a figure of 25% to 30% would have been considered as high, but an average of 78% suggests a much deeper problem. The table below outlines the types of issues encountered, the highest of which was inconsistency between areas shown on Title maps and areas measured on the ground.

Table 3 - Incidence of boundary mapping issues encountered by property professionals

Have you encountered any of the following boundary mapping issues?	Yes	No	N/A
a) Boundary disputes resulting from mapping issues?	87.3%	11.7%	0.9%
b) Difficulty establishing a boundary on the ground using a Title map?	90.8%	6.7%	2.5%
c) Difficulty resolving a boundary survey with a Title map?	83.7%	12.8%	3.5%
d) Inconsistency between areas on Title maps and areas as measured on the ground?	91.7%	5.4%	2.9%
e) Difficulty resolving Rights of Way and/or Easements on Title maps and Rights of Way and/or Easements on the ground?	67.8%	25.7%	6.5%
f) Differences between two adjoining Title maps? (gaps or overlaps)	72.8%	24.3%	2.9%
g) Differences between two Title maps for the same property?	52.4%	45.0%	2.6%
Total	78.2%	18.7%	3.1%

The results indicate a significant appetite for change. Professionals indicated a wide range of extra information they would like to be included on boundary/Title maps. If the recommendations are that the title and the mapping registers should be more definitive, conclusive and all encompassing to prepare for the introduction of eConveyancing, then this extra information should be considered for inclusion.

As a result of Ireland's non-conclusive boundary system, the official title maps cannot be taken as sufficient evidence of boundaries for user needs, so Certificates (Declarations) of Identity are required to certify that services and buildings lie within the boundary. 65% of professionals stated that they were concerned with certifying Certificates (Declarations) of Identity for title maps which are based on non-conclusive boundaries. If the State Agencies supplying these official maps do not accept the risk relating to them, why should property professionals be required to accept this risk? Essentially, property professionals are using their professional indemnity insurance to mitigate the additional risks involved.

Table 4 - Extra information requested for inclusion on boundary/title maps

What information is currently not included in this map that you like to be included?	Yes	No	N/A
a) Title boundaries (line of registered boundaries)?	87.4%	3.9%	8.7%
b) Physical features (including annotation of type)?	85.0%	5.1%	9.8%
c) Occupation line (current limit of occupation)?	67.2%	18.6%	14.1%
d) Legal boundary (the intentions of the parties)	89.4%	4.3%	6.4%
e) Land area (extent) of property?	86.6%	6.9%	6.5%
f) Dimensions and coordinates?	91.4%	4.1%	4.5%
g) Rights of way and easements?	94.2%	2.1%	3.7%
h) Other? (please specify below)	32.3%	9.2%	58.5%
Overall Result	84.5%	6.1%	9.4%

3.4 The Qualitative Results

The analysis of the survey results was conducted in a number of stages (Table 5). Stage one involved abstracting all the quantitative data and creating charts, tables and maps. Stage two necessitated creating individual reports for each of the professional groups involved, abstracting the qualitative responses, colour coding them and then collating them into one document. Stages 3, 4 and 5 were carried out by the analysis team including an engineer, a solicitor and a surveyor. Stage 3 and 4 involved classifying these responses into main categories, and then stage 5 identified the main issues from the responses within each category and then developed preliminary proposals on how each of these issues might be resolved. Stage 6 required the drafting of one page summaries for each issue identified setting out a) the Current procedure, b) Difficulties being experienced, and c) Proposed solutions. Finally stage 7 involved a series of four CPD workshops held between 30th March and 28th

April 2011 to inform the members of the professional bodies of the survey results, and to discuss the feasibility and practicability of solutions proposed for the core issues identified.

Table 5 - Stages of Analysis of the Qualitative Results collected by the Survey

Stage	Tasks Performed
1	Create a report from www.surveygizmo.com of the all the responses which included tables and charts of the quantitative results.
2	Create reports from www.surveygizmo.com for each profession using filters available, extract qualitative responses into word, colour code for each professional group, and combine groups into one document.
3	Initial classification of answers into a) Advocating Change, b) Neutral to Change, or c) Not Advocating Change
4	Secondary classification of qualitative data into main categories, such as: a) OSi Mapping b) PRA Map - Issues already completed c) PRA map - Accuracy Issues d) PRA Map - Rectification e) Declarations/Certificates of Identity
5	Identification of issues from within each main category
6	Formulation of preliminary proposals to resolve main issues identified and prepare a 1 page summary for each issue setting out a) Current Procedure, b) Difficulties being experienced, and c) Proposed Solutions
7	Host a series of CPD workshops to inform, discuss and collect feedback on the survey results and the solutions proposed.

The number of main issues identified are too numerous to discuss in a paper like this, so a sample of these issues are explained to provide a sense of the scale and depth of the investigation carried out. These issues are set out at 3.4.1 to 3.4.5 and are based on the qualitative data from the survey together with feedback received directly from members of the professions at the four CPD workshops.

3.4.1 Access to Digital Mapping Information

Boundaries on title maps need to be confirmed before a conveyance of the property is carried out. Access is required to the PRA digital boundaries to assess if they accurately record the parcel boundaries on the ground. If discrepancies are identified between parcel boundaries and registered boundaries, then access will be required to the original maps submitted for registration for the property in question (and possibly also for the adjacent property) and to previous versions of the PRA map to explain why these discrepancies are present.

Currently the PRA only supply paper copies of title plans of properties (extracts from the digital index map) to landowners and professionals, yet copies of title plans are supplied in digital form to public bodies. It is likely this facility was provided to comply with the requirements of the EU INSPIRE Directive (EU, 2007). Also paper copies of maps originally

submitted for registration which are stored in the instrument are only supplied to the landowner or their solicitor.

Most surveyors, engineers and architects capture and manipulate mapping information in digital form rather than working with paper in order to significantly improve the accuracy of their work, improve the efficiency of their work process and to effect cost savings for their clients. Consequently, this lack of access to PRA mapping in digital form requires paper copies to be scanned, geo-rectified and in some cases re-digitised which:

- Incurs additional costs for clients;
- Incurs extra costs where information is re-digitised;
- Increases opportunity for inaccuracy to creep into the work from scanning, geo-rectification and re-digitising.

Professionals need access to PRA digital vector mapping to carry out their duties accurately and efficiently. On-line download of vector boundary files from the www.landdirect.ie website is a solution proposed.

3.4.2 Rectification of Boundaries

A deed of rectification can be submitted to correct boundaries registered in Land Registry, but an agreement between the adjoining owners who have an interest in the relevant boundary must accompany the deed. Boundary rectification can also be ordered by the courts.

Movements in the position of registered boundaries due from the digital mapping project have highlighted inconsistencies between the new digital boundaries in www.landdirect.ie and boundaries on old Filed Plans. PRA has stated that the new digital registered boundaries take precedence, and this has stimulated an examination by landowners whether registered digital boundaries correctly record boundaries on the ground.

Movements of digital registered boundaries are expected to continue indefinitely into the future following receipt of updated OSi mapping by Land Registry. Land Registry have recently increased their mapping tolerance from $\pm 0.35\text{mm}$ (LR, 1998) to $\pm 1.0\text{mm}$ (PRA, 2007). The main difficulties arise when a) registered boundaries are snapped onto OSi features when they should not, and b) not snapping to OSi features when they should.

Deeds of rectification can be expensive and prolonged so many discrepancies identified are not corrected by choice. Similarly, many boundary surveys are amended before submission to ensure they do not clash with prior registered boundaries in order to minimise expensive delays. It is a significant indictment of the mapping system when the procedures of a State Agency require landowners, including other State Agencies, to degrade the information they submit to ensure registration of title proceeds. Additionally, it appears that the PRA are reluctant to correct errors identified in boundaries even when sufficient evidence of the error is supplied.

A speedy, cheap and transparent new process is required for rectifications, possibly involving an inter-professional panel. Additionally PRA should also have a new procedure to

proactively resolve obvious discrepancies in the mapping database. Finally, the State should bear the cost of rectifying discrepancies resulting from the PRA digital mapping project.

3.4.3 Areas

Purchasers are interested in areas because they supply a measure which can be related to the value of properties. However, the current procedure is that areas provided by PRA maps and folios are based on non-conclusive data, so they should be treated with care. Areas are not currently provided for properties on PRA title plans or special registration maps, but were made available through the PRA website www.landdirect.ie in November 2010. We presume this facility was provided to comply with the data specifications requirements of the INSPIRE Directive (INSPIRE TWG on Cadastral Parcels, 2010). However, the area supplied is provided to 3 decimal places (to an accuracy of 10m²) which alleges an accuracy level far above its non-conclusive nature. Additionally, the OSi mapping upon which the PRA mapping is based only provides areas to 2 decimal places.

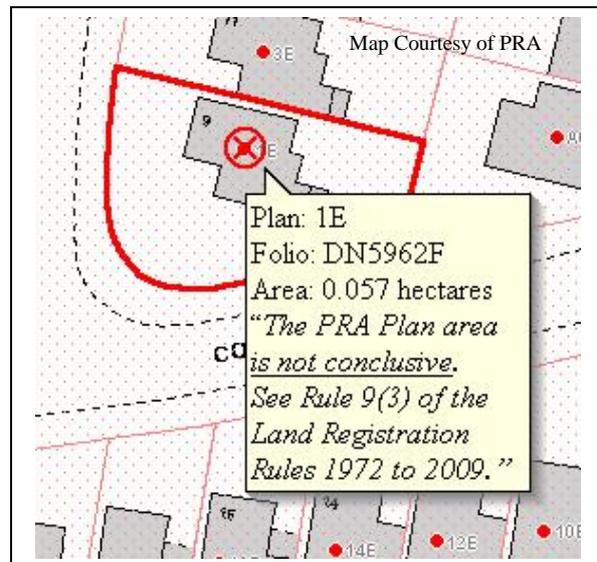


Figure 1 - New notice providing the parcel area in compliance with the EU INSPIRE Directive, but highlighting that this area is non-conclusive (source - www.landdirect.ie)

Sometimes areas are written into the text in the folios, but they regularly do not correspond with areas supplied on the www.landdirect.ie website, and both of these areas rarely correspond with areas computed from site surveys. None of these areas are supplied to any identifiable standard and if two different areas are available from both the folio and the map which takes precedence? OSi and PRA maps show multiple features on the ground with a single line and do not specify which feature the line represents, so areas computed using these lines (boundary coordinates) are suspect.

The solutions proposed include:

- a) OSi should significantly improve the absolute accuracy of boundary coordinates and re-introduce a means to identify the features bounding the published area;
- b) Standards need to be developed and adopted for conclusive registrations to significantly improve the quality of boundary coordinates and the areas computed from them.

3.4.4 Certificates (Declarations) of Identity

Financial institutions providing mortgages for property purchases need to minimise the risk to their investments, but since boundaries and areas on the Land Registry index map are non-

conclusive an additional legal document is required to provide the necessary certainty. Currently this additional document comprises a Certificate of Identity which solicitors request from architects, engineers or surveyors to certify:

- (normally) that the buildings and the services are wholly confined within the registered title boundary and that the property has title to access to a public road;
- (additionally) confirmation of the existence and location of easements and rights of ways, etc.

It is an unrealistic expectation that a conclusive opinion can be based on non-conclusive data which is open to interpretation. Significant difficulties have been experienced regarding housing estate maps. If certificates are accepted and issues arise later, questions may arise as to the validity of the certificate which increases the possibility of litigation.

Certificates are both difficult and risky due to mapping difficulties which include:

- Boundary descriptions in title deeds may not match boundaries on PRA maps
- PRA maps & OSi maps do not correspond with accurate site surveys
- Differences in areas between LR docs (folios & maps) and areas measured on ground
- Rivers and streams move over time and boundaries can migrate with them or stay static
- Mistakes in OSi base mapping

Certificates are essentially transferring the risk associated with non-conclusive boundaries from the Property Registration Authority (and indirectly Ordnance Survey Ireland) to property professionals PI insurance. Certificates are still open to challenge, long after they are issued, so care is needed to maintain professional reputation. Additionally, the procedures for supplying a Certificate of Identity are not standardised and site surveys not always undertaken, so errors in the PRA mapping are perpetuated.

Even if boundaries were registered as conclusive, Certificates of Identity would still be necessary, but in this situation there would be far more validated information from the PRA on the boundaries, giving more certainty and confidence to the professionals involved. The IPTFPB should establish a working group of solicitors, engineers, architects and surveyors to review current standard forms and to develop a good practice procedure.

3.4.5 Other issues Identified

A sense of the relative importance of each issue and the depth of the survey is apparent from a list of all the issues identified in the survey for which summaries have been prepared. The breakdown of responses for each issue is as follows:

- Ordnance Survey Ireland maps - 1.5 pages
- PRA maps (issues already resolved by the digital mapping) - 2 pages
- PRA map accuracy - 4 pages
- PRA map scales - 1 page
- PRA map areas - ½ page
- PRA map measurements, coordinates and monuments - 1 page
- PRA map accessibility - ½ page
- Rectification of PRA map - 1 page

- PRA map easements, rights of way, etc. - 2 pages
- PRA map (other issues not previously discussed) - 2 pages
- Qualification & Accreditation of professionals preparing PRA maps - 2 pages
- Non-conclusive & Conclusive boundaries - 3 pages
- Certificates of Identity - 3 pages
- Boundaries associated with dynamic features - ¼ page
- Boundaries to the centre of public roads - ¼ page
- Multi-Unit Developments - ¼ page
- Registry of Deeds - ¼ page

3.4.6 Other Issues which Impact on the Mapping System

The Scottish Law Commission (2010) recommended a series of changes to Scotland's land registration system which includes two issues which have also been identified by the IPTFPB survey. The report found that the existing procedure for the rectification of identified inaccuracies to be unsatisfactory and recommended the removal of obstacles preventing the rectification of the register (the Title Sheet record and the Cadastral Map). The report also states that the OS mapping does not entirely satisfy the requirements of the Registers of Scotland because the map may contain errors and not be fully up-to-date. The report states that although the Land Register is likely to be based on the Ordnance Survey Mapping for the foreseeable future, it recommends the use of alternative mapping if it conforms to prescribed standards prescribed. The report considered the use of modern surveying techniques to higher accuracy standards which would set the standard of the official guarantee in respect of boundaries and the requirements for spatial data submitted to the Registry.

Wallace *et al* (2010) claim that “one of the main reasons for the sub-prime mortgage market failures, was the lack of a national cadastre to enable banks identify which loans are bad and the locations of these loans. If the banks had known the locations of the bad loans, they could have figured out which loans were ok, so the infection of the bad loans would not have spread as a contagion wildly through whole city areas. This is our main argument about tracking information through good land administration and managing land markets.” One of the main reasons why cadastres can be used to great effect is their ability to manage land markets. Is Ireland's lack of a cadastre a contributory factor in the meltdown of Ireland's property and banking systems currently estimated at €150 Billion?

The property crash in Ireland since 2007 has caused a dramatic fall in government income from stamp duty (from €9B to ~€1B) so a more sustainable annual form of property tax has been proposed, based on a Site Value Tax (SVT). The 4 year austerity plan (Irish Government, 2010) agreed with the International Monetary Fund, the European Union and the European Central Bank included a plan to introduce a property tax and the new government is considering its merits and how it might be implemented. If SVT is implemented the tax may be calculated based on three main factors; the land area of the site, the location of the site, and the proximity of the site to local services. Thus the importance of site area for taxation purposes is expected to significantly raise the importance of accurate property boundaries.

The McCarthy report (McCarthy *et al*, 2009) recommended merging Ordnance Survey Ireland (National Mapping Agency) and the Valuation Office (valuations of commercial buildings for local taxes) with the Property Registration Authority and this proposal is now being considered by the new government who were elected with a mandate for radical change in public services. This merger has the potential to resolve the issue of responsibility for mapping accuracy.

4. CONCLUSIONS AND RECOMMENDATIONS

Both the quantitative and the qualitative results from the survey indicate a significant appetite for change. A very high percent of respondents (78%) indicated that they were having difficulties with existing boundary mapping. Similarly of the 30 pages of qualitative comments received, 24 pages of these comments advocated change.

The next priority for the IPTFPB involves collating all the information collected at the four workshops to create working drafts for the summaries of all the issues identified. Then the proposed solutions will be categorised into:

- a) Changes to be developed and implemented by the professional bodies themselves;
- b) Changes to PRA/OSi/government procedures for negotiation and agreement with the PRA/OSi/government;
- c) Changes to primary and secondary legislation for recommendation to the Law Reform Commission/PRA/OSi/government.

It is also intended to hold discussions during the next few months with the major stakeholders including the Property Registration Authority, Ordnance Survey Ireland, the National Asset Management Agency, the Banking Federation and the Law Reform Commission.

A draft final report is expected be prepared and circulated to the professional bodies in September 2011. A combined workshop is then planned at the end of September for all property professionals to gather comments on the draft report. After considering and including these revisions, a copy of the final report will be circulated to the councils of each of the participating professional bodies for adoption before publication, expected in December 2011.

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