

# Irish Institution of Surveyors



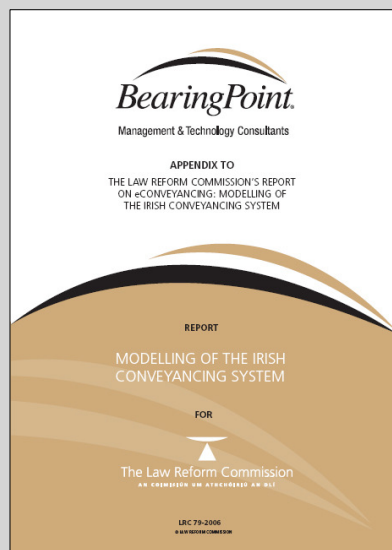
## Workshop 1

# Utilising GNSS in NRTK Mode for Boundary Surveys in Ireland

Dr Paddy Prendergast, Chair IIS Commission on Land Registration

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## LRC e-CONVEYANCING REPORT - 2006



### Vision & Strategic Objectives

- **Process** - develop & implement an electronic conveyance process
- **Information** - conversion of information into digital form
- **IT Systems** - develop & implement IT architecture (Hub) to deliver services
- **Legislation** - reform of relevant primary and secondary legislation
- **Education** - enhancing stakeholder skills to use the new system

### Project Board established to Coordinate Developments

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# Law Society e-Vision for e-Conveyancing



**e-Vision (July 2008) - radical proposals for change of existing conveyancing system in preparation for e-Conveyancing**

- **Move from 'Caveat Emptor' to 'seller disclosure' for property transactions - responsibility now on vendor (IIS consider Disclosure Report should include a boundary survey map)**
- **Proposals that Land registry should contain titles of all land in the State and all the interests to that land**
  - **Registration of all lands currently in RoD to be transferred to LR and close RoD**
  - **No interest should affect title unless it is registered (no exemptions) - Title should be **definitive, conclusive & all encompassing****

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# e-CONVEYANCING

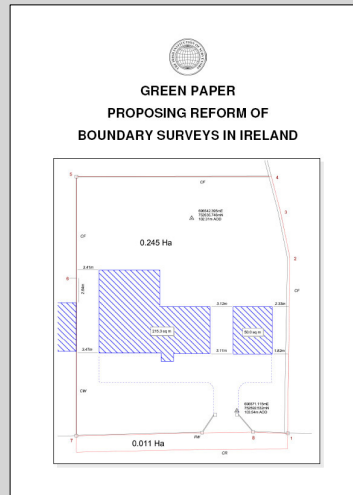
**e-Conveyancing System = Single Information Hub**

**Property professionals need to have confidence in reliability of information supplied by e-Conveyance system**

- **Quality assurance - validation of electronic information**
- **Standardisation - of forms and data definitions**
- **Professionalization - better understanding of different roles played by property professionals**

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## IIS Reform Proposals for e-Conveyancing

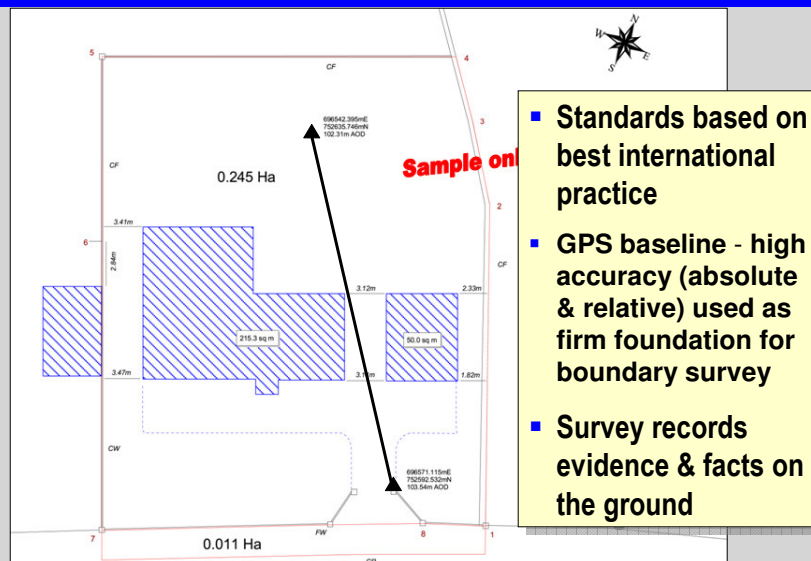


- Green Paper (August 2008) - two documents
  - Outlined the reasons why reform of the current system was necessary- needed to persuade a number of crucial powerbases of need for reform - Law Society & PRA & others
  - Proposed new concepts and standards for boundary surveys – IIS only 20 years old so did not have reputation to leave this out, so needed to describe in detail what was being proposed
- Issued as a discussion document to stimulate debate - definitely achieved this aim

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## STANDARDS FOR BOUNDARY SURVEYS



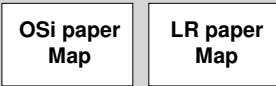
- Standards based on best international practice
- GPS baseline - high accuracy (absolute & relative) used as firm foundation for boundary survey
- Survey records evidence & facts on the ground

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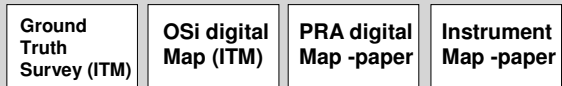
# Green Paper Proposal

## Current Conveyance Process



- Paper map accepted and unchecked – general assumption that OSi & PRA maps are correct
- cursory check of paper map on ground
- Survey to identify issues, but these difficult to resolve - LR system not positive towards rectifications

## Supply high quality information to the Conveyance Process

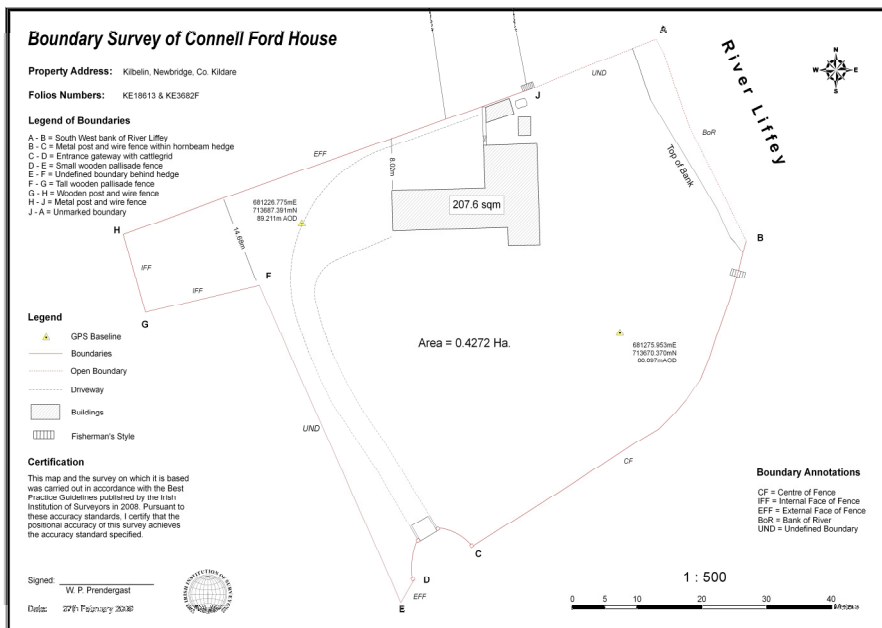


1. Does digital boundary correspond with submitted boundary? - confirm that digitising protocol has been carried out correctly within the tolerances specified
2. Do PRA digital boundaries correspond with features on latest version of OSi map? – should do if within the digitising tolerances
3. Do PRA digital boundaries correspond with Ground Truth Survey (GTS)? – mostly not, so have to try to identify why

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## Example of Boundary Survey in compliance with standards in Green Paper





## Policy Strand (Long Term?)

- **Inter-Professional Task Force on Property Boundaries**
  - BC James Dwyer SC & George Brady SC
  - EI Colman Horgan & Gerry Healy
  - IAVI Mr Patrick Jordan & Mr Phil Farrell
  - IIS Brendan Sweeny, Paul Corrigan, Mike Flynn (Secretary) & Paddy Prendergast (Chair)
  - IPI Sarah Moran & Brendan Allen
  - LS Gabriel Brennan & Patrick Sweetman
  - PRA Diarmuid Clancy & Greg McDermott (as observers)
  - RIAI Mr James Pike & Mr Paul Kelly
  - SCS Helen Murray & Pat McGovern
- **Five meetings to date - Terms of Reference now finalised**
- **Colloquium on 18<sup>th</sup> Nov in RIAI to include key people in debate**
- **Investigate & report on the need for policy reform - summer 2010**

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## Procedural Strand (Short Term)

- **IIS Focus Group established in May 2009 - B Sweeny (Chair)**
- **Identify 20 highest priority items which surveyors have to deal with within the existing PRA system and conveyancing system which can be tackled / resolved in the short term**
- **Circa 12 meetings to date - developing concepts of how to integrate extra information from green paper proposals into conveyancing practice**
- **10 to 15 page document identifying specific changes required by particular groups - now in testing phase**
- **To be published by end 2009**

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## Educational Strand

- Develop Masters course to enhance skills of Boundary Surveyors - too long
- Develop individual modules, have validated at masters level, provide as soon as possible, assess to get credits so exemptions when masters created

- Module development has already started

- IIS considering launch of 'Boundary Surveyors in Training Programme' in early 2010 - more anon

Module Name	Module Content
Land Law 1	Theory
Land Law 2	Case Studies
Planning Law	Theory & Case Studies
Environmental Law	Theory & Case Studies
Alternative Dispute Resolution	Arbitration, Adjudication, Mediation & Conciliation
Expert Witness & Evidence	Theory & Case Studies
GNSS, CRS & Computations	GPS observations and adjustment
Boundary Surveys & CAD	Boundaries, Survey Practice & Map Preparation
PRA Mapping Practice	<a href="http://www.landdirect.ie">www.landdirect.ie</a> & mapping procedures
Land Management	Land Registration systems, ISDI & INSPIRE, etc
Research Skills	Technical Report writing & Research Skills
Professional Development	Ethics, Duty of Care, Liability & Professionalism

Not restricted to IIS members or primary degrees

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## Standards Strand - 1

### ▪ Standards proposed in Green Paper included:

- GPS baseline for Survey Control - @ 2 sigma (95% confidence)
  - ❖ Absolute accuracy +/- 100 mms
  - ❖ Relative accuracy between stations +/- 10mms (to be confirmed by total station)
  - ❖ Relative accuracy between traverse stations (if used) +/- 10 mms
- Boundary features - @ 1 sigma (67% confidence)
  - ❖ Relative accuracy of any boundary features to be 10% of the width of the specific feature (subject to a minimum of +/-25mms)
    - So for a 4m wide hedge, 10% = 0.4m, so RA = +/- 40 mms
    - But for a 10 cm block wall, 10% = 1 cm, so RA = +/- 25 mms
- If boundaries are to be registered as conclusive
  - ❖ RA of boundary marks to survey control +/- 10 mms @ 2 sigma

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## Standards Strand - 2

### ▪ Network RTK not recommended for GPS baseline (top of page 29)

- There is no record kept of the correction supplied by the NRTK system. All raw data needs to be stored by the surveyor because it must be possible to validate the result within:
  - ❖ a proposed new PRA procedure;
  - ❖ if another surveyor subsequently finds a problem;
- Coverage by the mobile phone network is not complete. Holes have been identified in the system in certain areas and coverage along the west coast is patchy;
- Different weather conditions and different geometry of the satellite constellation can give results of up to 200 mms difference between subsequent observations.

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## Standards Strand - 3

### ▪ Boundary features may be surveyed using GPS if appropriate. The following techniques are considered suitable (top of page 29):

- Standard RTK from the survey control stations of the GPS baseline;
- Network RTK, but the GPS baseline stations should also be included in this survey to supply a relative fit correction onto the GPS baseline. This may now be a problem, because:
  - ❖ **Association** - each NRTK observation is independent, so there is a need to develop an appropriate survey methodology to link NRTK observations with survey control - QBN specification (April 2009) banned use of NRTK for this reason
  - ❖ **Traceability** - Surveyor needs to prove accuracy of boundary survey for certification, IIS audit of boundary surveys (during initial period), validation of conclusive boundaries by PRA (later)

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## Standards Strand - 4

- **Network RTK results getting better and better, so am not in favour of excluding new technologies & techniques if surveyors can benefit from using them**
- **Prefer to develop a survey procedure to allow surveyors to exploit these technologies & also highlight specific needs of this application to industry**
- **Standards proposed in Green paper were used by a group of IIS surveyors during the last 12 -18 months**
  - Need to review application and interpretations of these standards (Workshop 2 on 28<sup>th</sup> October) and republish standards in a single document - two separate standards??
    - ❖ A - for carrying out a Ground Truth Survey
    - ❖ B - for surveying agreed boundaries for conclusive registration

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## Summary

- **Copies of all presentations (.pdf) to be made available on IIS website**
- **Various ideas for survey procedure to link NRTK observations with survey control to be tested and recommendations made**
- **Supply of correction data by system suppliers to be tested and recommendation made as to how it should be supplied and indexed**
- **These recommendations to inform the drafting of IIS standards for Boundary Surveys in Ireland - to be published early 2010**

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