

# The ungodly jumble: Residential address identifiers and embedded uncertainty

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## ABSTRACT

Property assets exist simultaneously as physical structures, legal constructs and digital abstractions, yet the systems used to identify and evaluate them often struggle to reconcile these overlapping realities. This paper examines the growing disconnect between the physical attributes of residential property, the legal and historical complexity of title, and the digital layers produced through contemporary mapping, modelling and automated valuation. While tools such as digital twins, geographic information systems (GIS), automated valuation models (AVMs) and machine learning aim to deliver precision and scale, each introduces its own assumptions, simplifications and inherent

uncertainties. Address identifiers such as the unique property reference number (UPRN) promise consistency, but cannot account for the nuanced and frequently non-conforming nature of legal title boundaries, historical parcelling or rights and obligations embedded in property records. Through exploring these tensions, the paper highlights how system-generated certainty can obscure material ambiguities, and how over-reliance on automation risks misidentifying characteristics essential to valuation, lending and risk assessment. The analysis argues for a rebalancing of professional practice that recognises the limits of computational abstraction and reinforces the importance of human expertise in interpreting the layered, sometimes contradictory realities that underpin the built environment. This article is also included in **The Business & Management Collection** which can be accessed at <https://hstalks.com/business/>.

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## INTRODUCTION

### 'An ungodly jumble': Oliver Cromwell discussing English land law

Residential property (a home) represents a human currency across all cultures; it is both illiquid and liquid, allows mobility



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in finance and funding, and underpins a large proportion of the wealth of nations. Whether as investment, as a home for family members, as a tenant, a lodger or family member seeking to save for their own home, as statutory or non-statutory housing assistance for the vulnerable or displaced, whether in portfolios, as an asset in insurance or pension funds, property supports in the most fundamental manner real social cohesion. These resources and rights as refuge are universal, whether or not the national jurisdiction has an established framework for land governance and property rights.<sup>1,2,3</sup>

In the UK, housing exists in a main portfolio as c. 30 million residential units and these portfolios subdivide further:

- Owner-occupiers (not first or second charge).
- Owner-occupiers (a first and/or second charge).
- Investment property (not first or second charge).
- Investment property (a first and/or second charge).
- Social and statutory housing.

What any of the above portfolios require, what every owner must have and what every service provider demands are accurate address and property identifiers with which to record a relationship with the property.

Human beings shift in and around these property rights and realities as previous owners, owners, future owners, lease or freeholders, inspectors, statutory guardians, and embedded with, or contracted to, financial institutions offering lending or insurance services. As owners, the occupiers similarly are in constant flux as family members, tenants, and in funding ongoing maintenance and extension and construction roles when property is improved, repaired or extended.

Risks and perils may be below ground, above ground and even in the air of the

property. They may be historic risks, current risks or future risks, such as proposed through future climate change modelling. A property itself may be further deconstructed in duties to maintain certain features (ie windows and frames parts) through enforceable leasehold terms or for the whole main structure relating to freehold obligations to preserve. The combination of all these visible and invisible connections are labelled, subject to code, referencing, numbering, model assumptions and categorisation.

Property as a label has levels of meaning; however, the word ‘property’ is also itself immediately misleading when related to what might be internal area, external boundaries, construction, or the rights and easements that might exist over other land. Of enormous significance is the tension between geographic information systems and large statutory and corporate interests in addressing certainty through unique property numbering and the far more nuanced title interests in a dwelling, its freehold and leasehold interrelationships, the parcels within a title and spatial certainty, both on the ground and potentially in courts of law when disputes arise.

## THE HISTORY OF PROPERTY IDENTIFIERS

For a great deal of human history, signs, symbols and local knowledge supported how to find someone, a given profession, or a particular place.

It was not until the early 18th century that places began to acquire a recognisably modern labelling. In 1708, Prescott Street, Goodman’s Fields, in London, became one of the earliest examples of an organised attempt at accuracy through house numbering and by the end of the century house numbering was commonplace. The process of numbering was not regulated, however, and this produced widespread confusion — for example, around 1780, Craven Street in

the Strand had three sets of numbers. Street names were also confusing. In 1853 London had 25 ‘Albert’ and 25 ‘Victoria’ Streets, 35 ‘King’ and 27 ‘Queen’ Streets, 22 ‘Princess’ and 17 ‘Duke’ Streets.

A key driver for improved addressing was a postal service with an ever-widening franchise without having any mandate to enforce addressing standards. Early examples of the public’s own delivery instructions in postal addressing to the postal service often did not lack for imagination: ‘To my sister Jean, Up the Canongate, Down a Close, Edinburgh. She has a wooden leg.’

Prior to 1855, the numbering of houses in London was unregulated. This changed with the enactment of the Metropolis Management Act 1855, which, for the first time, established a legal framework for the control and standardisation of street naming and house numbering. Authority was vested in the newly created Metropolitan Board of Works, which was tasked with implementing these measures. Responding to increasing pressure from the General Post Office (GPO), the Board then began a systematic campaign to rationalise inconsistent and confusing street names and house numbers, based on a prioritised list provided by the GPO.

In the same period, London was formally divided into 10 postal districts, each designated by a compass point code — for example, EC (Eastern Central) and WC (Western Central) (see Figure 1). This initiative laid the groundwork for the development of the modern postcode system, although the full implementation of postcodes did not occur until well into the 1970s.

Despite encountering public resistance to the alteration of familiar street names and house numbers, the reform proceeded at a significant scale. By 1871, approximately 4,800 street names had been changed, and around 100,000 properties had been renumbered. Nonetheless, the widespread adoption and everyday use of house numbers by the

general population evolved gradually over subsequent decades.

This entry from Sir Rowland Hill, a famous postal addressing reformer and originator of the first London postcodes, illustrates the state of confusion:

On arriving at a house in the middle of a street, I observed a brass number 95 on the door, the houses on each side being numbered respectively 14 and 16. A woman came to the door, when I requested to be informed why 95 should appear between 14 and 16; she said it was the number of a house she formerly lived at in another street, and it (meaning the brass plate) being a very good one, she thought it would do for her present residence as well as any other.

Throughout the whole period the powers to enforce were local administrative and the Post Office never had any statutory powers to enforce addresses; they did, however, have a great deal to gain from standardisation.<sup>4</sup>

In the 1860s the larger cities began to settle on a first letter identifier — Manchester (M), Liverpool (L), Birmingham (B), etc. — and thereafter postcodes proliferated with demands for consistency, increasing industrialisation and the rapid growth of cities between the wars.<sup>5</sup>

## THE EVOLUTION OF UK MAPPING

Running parallel throughout all the evolution of postal addresses were the innovations in mapping, beginning with the creation of the Ordnance Survey. Initially primarily for use by armies on manoeuvre (suppressing rebellious Scots) or for coastal defences, it soon became apparent that maps assisted with audit, taxation and increasingly as welcomed records of our towns and cities.

The first formal Ordnance Survey map was published in 1801 of Kent, which, given the Napoleonic fleet’s interest in the shortest



landing point from France to England, was perhaps inevitable.<sup>6</sup>

### Maps and addresses join forces

It became inevitable that postal and property identifiers would merge interest with mapping efforts documenting the growth of urban centres. For the GPO it was not until 1959 that the Postmaster General, Ernest Marples, first trialled the six-digit postal code in Norwich. This was followed by other trials throughout the 1960s, which resulted in a gradual nationwide rollout of postal codes that was finally completed in 1974.

By the early 1980s, the UK had established a comprehensive database encompassing both business and residential addresses, known as the Postcode Address File (PAF). Although the data was being electronically recorded at that time, the maintenance of the file remained reliant on paper-based processes, resulting in delayed and infrequent updates. Subsequent advancements in digital technology facilitated the development of an integrated digital maintenance system, which by 1992 enabled near real-time updates. As a result, the PAF currently undergoes approximately 4,000–5,000 updates daily, amounting to around 1.3 million updates annually. The system now includes over 30 million deliverable addresses distributed across 1.8 million postcodes. The Ordnance Survey now routinely improves its products utilising these lists and gazetteer.<sup>7</sup>

### The role of the local authority

Local authorities (LAs) have a statutory role in controlling and delivering new built development through the Planning Acts. This inevitably allows them to agree on new and emerging settlements, new road names and, finally, on property numbering and referencing. Yet with the increasing complexity of addressing, the development of very large high-rise buildings, greater complexity for the emergency services, the increasing list of services plugged into homes from gas

and electricity to telephones and eventually super-fast broadband services, providers have always wanted greater accuracy from addressing.

### Convergence in addressing and geospatial resources

In the UK LAs, the Ordnance Survey and various governmental and non-governmental agencies (ie Geoplace LLP) work together to maintain a National Street Gazetteer (NSG) and National Address Gazetteer (NAG). These systems have at their heart the unique street reference number (USRN) and unique property reference number (UPRN). The UPRN is a geocoded and addressable identifier (including defibrillator locations) and is increasingly used across government, agencies and financial institutions.

These 12-digit codes include X–Y coordinate location data and Ordnance Survey seeks to accurately locate the UPRN within the building boundary centre of a given address. Developed as a response to the emerging emphasis on geospatial systems and ability to handle and harness large datasets across multiple domains, the UPRN is intended as a life cycle identifier from construction through and beyond demolition (see Figure 2).

Described as the ‘Golden Thread’ in property identification, there is little doubt that the UPRN can materially assist in linking textual addresses (see Figure 2), geospatial systems and numeric identifiers to produce a high confidence match for any given location.<sup>8</sup>

### PROPERTY TITLE AND THE LAND REGISTRY

Title over land and property is a serious business and UK property and land law stretches back at least 1,000 years. Following the Norman invasion and given their interests in scheduling land and ‘loot’, much of English law focused on title over things. Arguments over title were

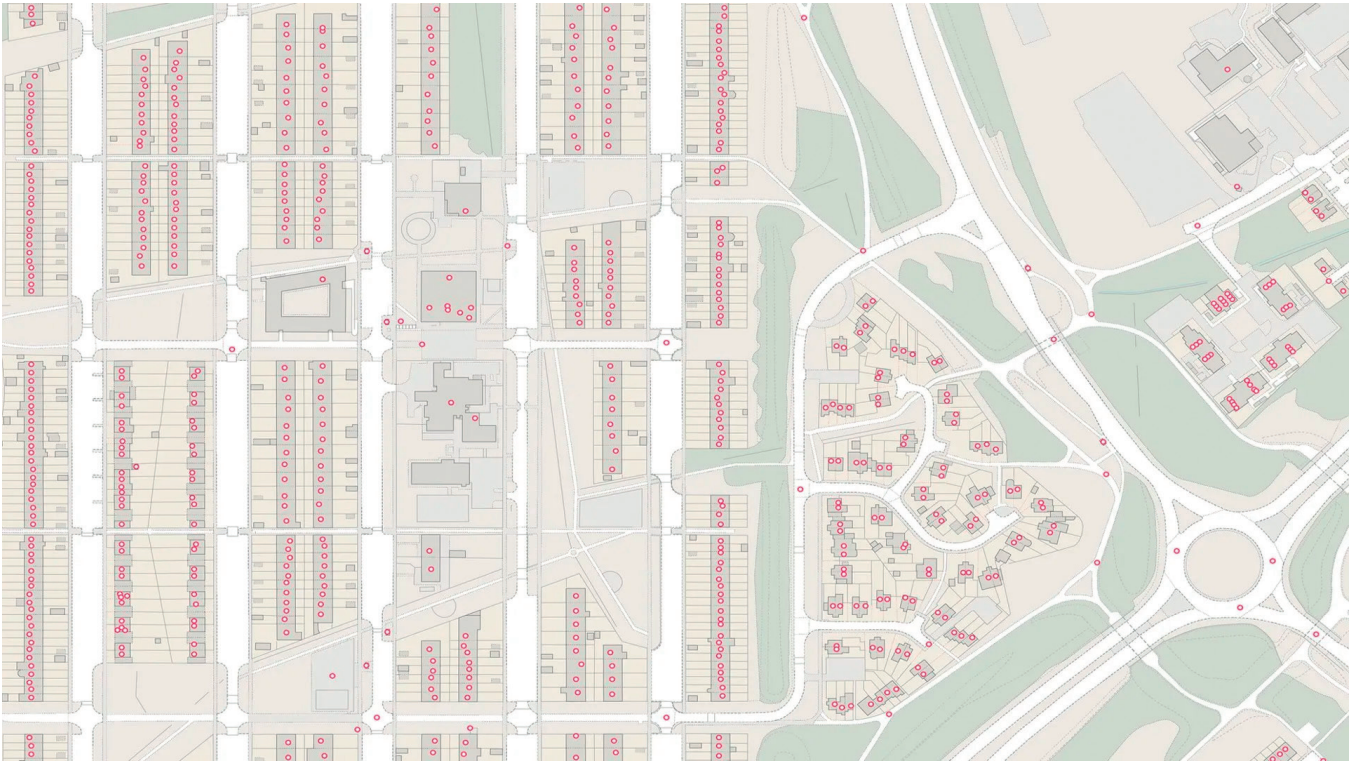


Figure 2: Example of matched UPRN centroids to property locations utilising spatial and textual matching

Source: Crown Copyright Ordnance Survey © 2026

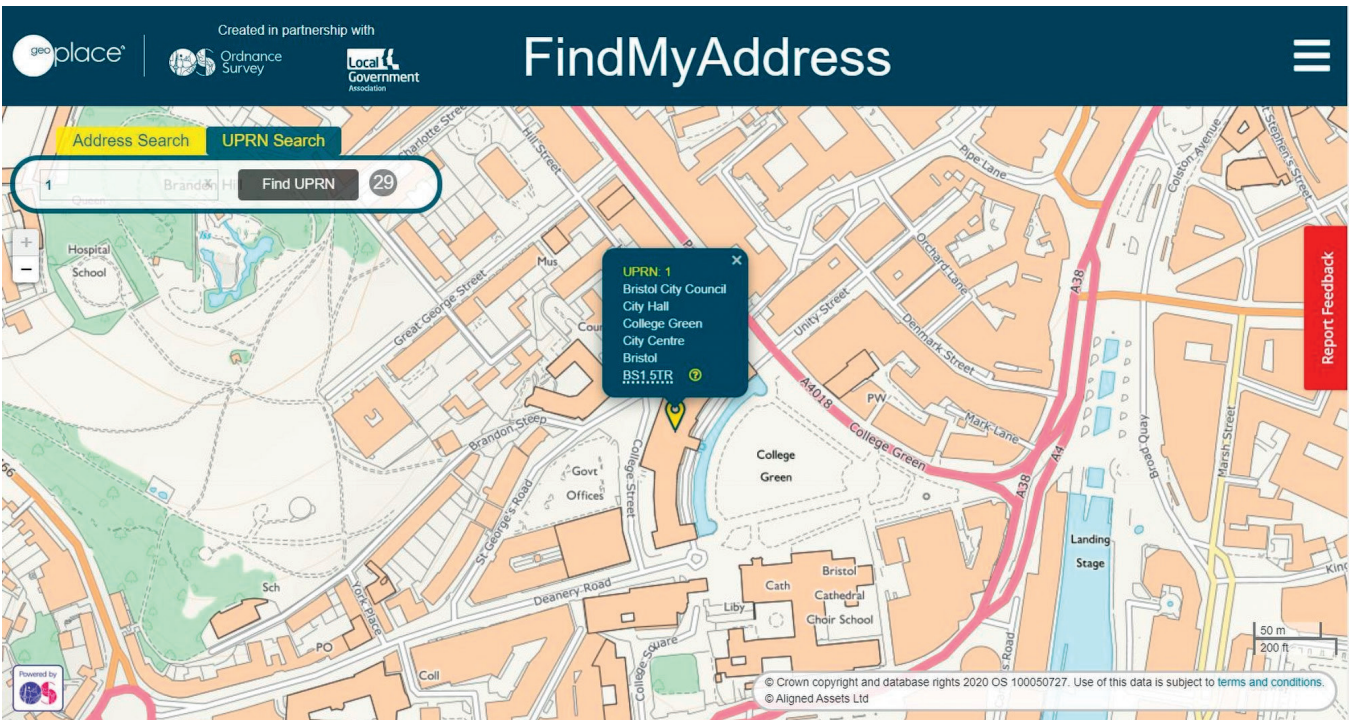


Figure 3: The very first UPRN created (UPRN Number 1) — City Hall in Bristol

Source: Crown Copyright Ordnance Survey © 2026

invariably settled under common law via the courts and legal precedent continues to play a substantial role in property rights and duties to the present day.

The concept of compulsory land registration — where certain events, such as the sale of land, trigger the requirement to register — was first proposed in 1897. It was not until the Law of Property Act 1925 reforms, however, that the government was granted the authority to designate specific areas for compulsory registration.<sup>9</sup>

The first area to be designated was Eastbourne in 1926, and today approximately 95 per cent of land there is registered. Over time, more areas were gradually added to the compulsory system. It ultimately took until 1990 for all of England and Wales to be brought under the scope of compulsory registration.

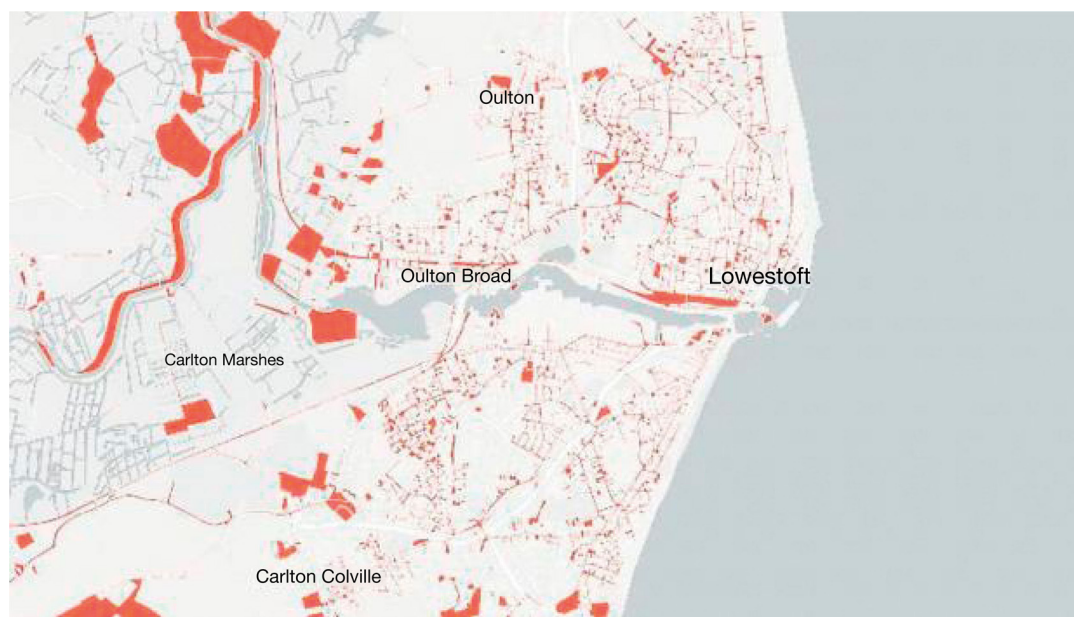
Despite compulsory registration being in place since 1990, by 2005 the Land Registry still only covered around 50 per cent of land and title; however, by 2012 this was around 80 per cent and currently is at 86 per cent.<sup>10</sup>

## THE UNGODLY MUDDLE EXPOSED

For all the progress made in the UK relating to accurate addresses, address matching, geolocation and title registration, there is a first obvious conundrum for the property professional relating to address matching and title registration when assessing property: they often simply do not relate.

While a UPRN may accurately match to an address (we will return to this point), the address identifier does not hold any title information whatsoever. Correspondingly the title documents cannot reflect a UPRN or USRN for a variety of reasons.

A title document is a complex instrument: it has a genesis and often a long history; it spans common law and statutory law, freehold rights and leasehold rights and obligations; it may contain covenants and charges held by third parties, including a charge against a mortgage loan. Title can be bought and sold, and it can be subdivided or expanded. Title is therefore very complex, supported in common law and through statute, and it is not easily extinguished. Title boundaries cannot and do not follow the



**Figure 4:** Example of unregistered land in and around Lowestoft, Suffolk, England

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geospatial and referencing formula applied to the UPRN. All the ‘convenience’ of the discreet UPRN number and its spatial certainty become ever more unstable in the face of title logic and title boundaries.

This is not to identify any inherent flaw in the UPRN as a useful reference and its purpose in supporting quality addressing, but rather reflects the very different use cases and evolution of the UPRN relative to title requirements.

The UPRN and title are fundamentally different (see Table 1) — one spatial, one legal — and yet each attempts to impose itself on the same imagined ground; they both relate to a property interest and they both try to apply certainty to those using the identifier or maps and to bring structure to the ungodly muddle of interests.

### All at sea

To think about our ungodly muddle and bring clarity to the subject, let us begin on the ocean and by a journey on a boat. A boat at sea is a physical thing: it has form,

it has mass, it exists; however, its ‘true’ position is a more slippery concept. A boat has a literal position on the planet that can be witnessed physically from the shore, from another boat, or from some other vantage point such as a plane: ‘I can see a boat’. A boat can also have an owner, a ‘title’, registration in a jurisdiction and obvious boundaries: a deck, cabins and its edges; beyond is the abyss.

Finding a boat’s true ‘position’ has challenged seafarers for centuries and many lives and ships have been lost through a ‘bad’ position. Longitude and then latitude were slowly conquered and with the coming of orbiting satellites, global positioning, radar reflectors and automatic identification systems, a boat’s position on the oceans could be more accurately assured.

Nevertheless, latitude, longitude and a boat’s geospatial position are all human abstractions; they standardise the literal ‘I can see a boat’ to a set of established geospatial ‘truths’, to allow a boat to be identified at any place and by any number of observers.

**Table 1: The UPRN and title ecosystems**

<i>Identifier</i>	<i>Allocated UPRN</i>	<i>Title parcel (Land Registry)</i>
Nature	Geospatial identifier	Legal construct
Basis	Derived from address, coordinates and spatial hierarchy	Rooted in common law, deeds and statutory registration and subservient to conditions and precedent on the ground
Managed by	Ordnance Survey/GeoPlace	HM Land Registry
Precision	Typically to building or sub-building level (eg a flat)	To the legal boundary of a plot or land parcel and potentially with rights and easements on other land
Granularity	Fixed point in geographic space	Variable extent, may include multiple UPRNs or none
Interoperability	Not interoperable with title data	Does not incorporate or recognise UPRNs
Use cases	Modelling, licensing, risk assessment, digital addressing, service delivery	Ownership, transactions, legal rights, obligations
Update cycle	Frequently updated via local authorities and data feeds	Updated upon registration of land or property events
Legal standing	Limited legal authority	Carries legal weight, supported by statute and overseen by the courts
Data structure	Structured limited spatial identifier (numeric, geotagged)	Textual/legal documents, schedules, and boundary plans

From the shore, ‘I can see a boat’ is the best an observer can say, and we must investigate further to find the truth of it. This ‘abstraction’ of position is of course hugely helpful to the boat’s crew, hugely helpful to other boats plotting a course, and can then be overlain against any number of other abstractions and physical realities at sea. The boat may be inside a national boundary or in international waters, it may be moving inside a protected area, above a fishing quota, a disputed zone, over a wreck, near an offshore oil or gas rig.

We can confirm that a boat has an owner in title; we can also abstract its position to an agreed standard; finally, we can overlay any number of real or abstracted boundaries against its position and from that, if we are skilled enough, deduce its standard position and even its likely purpose (a fishing boat).

The boat appears to be floating freely in its medium but is in fact tightly coordinated by multiple statutory and legal agencies and a wide range of positional abstractions.

### **A house as a boat**

If we think in this way with a house as a boat, with a crew, potential passengers and a purpose, we can start to properly address our ‘ungodly muddle’ and identify key themes and interests now placing the title in the context of other real and abstracted forms and attributes.

The property (dwelling) is sold with some class of title over land; the building element also has a literal position and a portion, a spatial point, a human abstracted position overlay. The carrying of the human abstracted position allows a geographic information system to allocate an identifier and for convenience we will focus on the UPRN.

As we have seen, the UPRN is allocated via a statutory process and carries a northern and easting geospatial identification so that its position is recognisably distinct from neighbours in any spatial or referencing gazetteer.

This distinct property reference can then be subject to any number of layers invisible on the ground or visible by deduction to a trained eye.

As with a boat, a property can be precisely located and yet legally uncertain — or legally bounded and spatially vague. The UPRN locates the building (the vessel); title explains the voyage. This voyage may be temporal but on the journey position, layout and structure may have changed many times.

As example, a conservation listing may be in addressing and textual terms extremely loose (tithe barn); it will, however, have a clear reference identifier relating to the listing. The listing may defy a UPRN identifier and may stray over several USRN boundaries. The listing reference may refer to part of a feature at a wider address title (a wall, a gate) or may even cross multiple title boundaries.

### **LAYERS GROWING FROM A POINT**

This complexity and the temporal and spatial components again and again refuse to conform to a simple geospatial hierarchy. A historic listing due to some quality of design or construction, the property may be among a peer group of properties similarly considered worthy of recognition such as a conservation area, a national park, or an area zoned for further development.

A building might be inside any number of statutory geographical designations, for local administrative rental licensing scheme, referenced by ground features such as coal fields or other compensation areas. The property may have a council tax designation, an energy rating or exemption record, or extensive and complicated planning history; however, within the mind of a geographic system, the illusion exists that all can be tagged, mapped and modelled.

Regardless of any of these associated relationships, their geographic hierarchies, the identification of the asset via multiples

of organised address matching identifiers, nothing can easily unpick the simple reality: the title package, its extent, its components, rights, duties, obligations and duration will not easily conform to the simple geospatial abstraction of any single identifier or point.

A title boundary and its various schedules, maps, legal covenants, owners', freehold and leasehold duties and rights becomes as deep and mysterious as any sea.

This paradox that abstracted identifiers can settle so much and settle nothing is at the very heart of the confusion between those who champion 'digital golden threads' in property identifiers and the obvious frustration of those who settle title matters based on unpicking myriad interrelationships in the common and statute law of property.

Two tribes stare across an ocean of misunderstanding, which is simply that a property can with some degree of accuracy be shown as a position relative to other things, the geographer's sweet spot, while the title pleases a conveyancing solicitor in all its multiple untidy forms and ungodly jumble.

Even the illusion of a settled title plan has within it a minefield of spatial and legal possibility.

The Court of Appeal in *Clapham and others v Narga* assessed adjoining properties separated by a stream and a fence. It reinforced the importance of the established 'general boundaries rule'.<sup>11</sup>

- (1) Title plan boundaries are of limited relevance to determining where precise boundaries lie. Precise boundaries must be determined by looking at the pre-registration deeds and the de facto position on the ground.
- (2) The purpose of a filed plan is to identify the property concerned and not to identify where its boundaries are. The general boundaries rule in s. 60 LRA 2002 means that the filed plan does not determine the exact line of the boundary.

- (3) This requires conveyancers to look 'underneath the title' so that any discrepancies in space and time can be identified and addressed. Moreover, plans used to define the routes of rights of way are often of poor quality.

The court remarked in *Narga* that:

The purpose of a filed plan is to identify the property concerned, not to identify where its boundaries are. The whole point of the general boundaries rule, formerly found in rule 278 of the 1925 Rules and now found in s. 60 LRA 2002 is that the filed plan does not determine the exact line of the boundary.

### AN ILLUSION OF ACCURACY

There is another even more fundamental risk associated with geographic systems and UPRN referencing and that is the vexed matter of the textual address.

It seems a settled matter that a property might have a discreet address and that a UPRN can or will always have been properly allocated to the target address.

Unfortunately addressing requires transposing alpha and numeric attributes into a set of digital fields and then 'finding' a matching UPRN from 40 million records with its encoded geospatial reference.

It is certainly the case that addition of a full postcode can help strengthen the likelihood of a proper match; however, it remains far from certain.

### The illusion exposed

Let us start by seeking to identify a residential property number '7', in a single road, 'Boscombe Spa Road', with a town identifier, 'Bournemouth' and with a unique full postcode, 'BH5 1AS'.

In seeking to address match this property, we can immediately see five discreet addresses all in the same road and all in the same full postcode (see Figure 5).

House Name	27	House Name	29	House Name	31	House Name	Victory Court	House Name	Flat 7
No	7	No	7	No	7	No	7	No	37-41
Road *	Boscombe spa road	Road *	Boscombe spa road	Road *	Boscombe spa road	Road *	Boscombe spa road	Road *	Boscombe spa road
Area		Area		Area		Area		Area	
Town	Bournemouth	Town	Bournemouth	Town	Bournemouth	Town	Bournemouth	Town	Bournemouth
County		County		County		County		County	
Postcode *	BH5 1AS	Postcode *	BH5 1AS	Postcode *	BH5 1AS	Postcode *	BH5 1AS	Postcode *	BH5 1AS

**Figure 5:** Seeking to match a UPRN to Flat 7, Boscombe Spa Road, Bournemouth, BH5 1AS

An experienced professional might connect the evidence with the likelihood of apartments set within their own grounds. It should also be obvious that a house number can also be a house number and vice versa, creating their own layers of prospective confusion. If we add a further search parameter that the block name is in this case ‘The Litzo’, then it would be possible to now limit the confusion and identify a UPRN for that block (see Figure 6).

Property risk professionals might miss the significance here of this mix of alpha-numeric

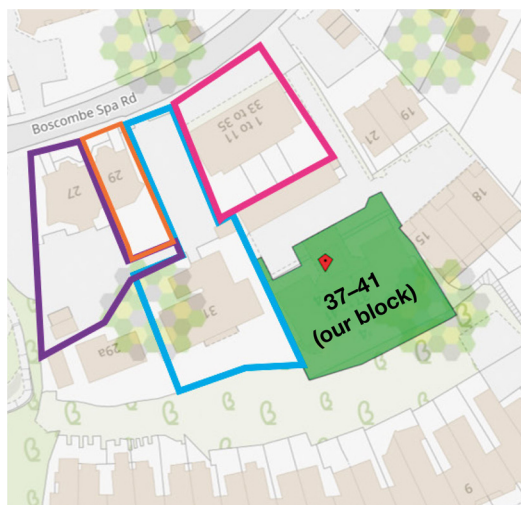
address identifiers with or without a UPRN. Digital systems and algorithms seeking to address match have a bias weighting to the attributes they prefer. All things are not equal and even before we accept user error in entering an address into a system, the system itself will have ‘preferences’ for which addressing format it might prefer and which attributes carry most importance.

Once we have formally cross-checked our address and found a firm address point to be able to allocate a UPRN to either the block and/or then to the flat within the block (a nested UPRN), we now seek to assess the title with the Land Registry, but we must go back to step 1 as the Land Registry cannot accept and will not recognise a UPRN when seeking a search for a title parcel.

The UPRN will not carry across from digital systems supporting modern spatial address matching for all the layers we have discussed, and the title parcel is literally blind to the UPRN as a spatial solution and ‘paddles its own canoe’ in supporting external queries.

### The UPRN and the multiverse

The UPRN is currently excluded from title searches and this single ‘truth’ should help explain why some conveyancing solicitors remain unconvinced as to the real value of digital libraries, automation, machine learning (ML), blockchain solutions and artificial intelligence (AI) innovations in



**Figure 6:** The automated Land Registry return for a request for title parcels relating to ‘The Litzo’ Flat 7, 37-41, Boscombe Spa Road, BH5 1AS  
Source: Crown Copyright Ordnance Survey © 2026

property transactions. Even within the use of the UPRN as ‘anchor’ for the many layers in delivery of assessments relating to property assessment, caution is advised.

If we simply assume that an alpha-numeric address has been properly matched with a UPRN and that the UPRN with its supporting spatial coordinates accurately plots the building, we must assume modelling has an impact on the outputs of any risk or other model.

The safest modelling approach would be to dispense with an alpha-numeric traditional address and postcode and simply append the spatially robust UPRN to any risk assessment. For lenders, surveyors, solicitors and insurers, however, this is inevitably the wrong way round.

Assessment whether of a single property or as a portfolio begins with a traditional address. This is unavoidable as owners, sellers and buyers (consumers) commence any professional or financial activity in credit, or in property transaction via a home address.

A credit application, any form of reference check, anti-money laundering (AML) compliance and the appointment of any professional will start its journey with a named person and a named address.

Therefore, putting the cart before the horse and complicating the modeller’s role, a traditional address must find its digital twin in the form of a UPRN. This is a key moment in all asset referencing and allows, when done correctly, the address and its UPRN to benefit from the modelling expertise of a multitude of providers. As with addressing conventions, however, the modelling assumptions, the design of the model and any black-box parameters can all significantly influence the outcome of a given result.

### Case study

In the following example, a purely geospatially rendered flood assessment utilising a height terrain and hydrological model has its anchored UPRN in place.

The flood scoring model is simply a radius master instruction within the flood model, being: ‘find the highest risk score within the prescribed radius from the UPRN seed point’. The spatial query is essentially filled with terrain ‘buckets’ or pixels, each with a level of water based on the flood model inputs.

Passing through licensed providers’ and resellers’ own unique spatial and textual solutions, however, a third party solution provider has then squared the circle by adding a more geospatially consistent and convenient ‘bounded box’ solution: ‘find the highest risk score within the prescribed bounded box from the UPRN seed point’. This ‘bounded box’, of course, already on our plan, captures four residential title boundaries, a potentially registered or unregistered waterway and the statutory public highway (see Figure 7).

In both spatial treatments (box or circle), model assumptions change the outcome and in both cases the model used, and its scoring method, is blind to title considerations and even to other structures within the title extent (the outbuilding to rear of title address adjacent Wealdstone Brook).

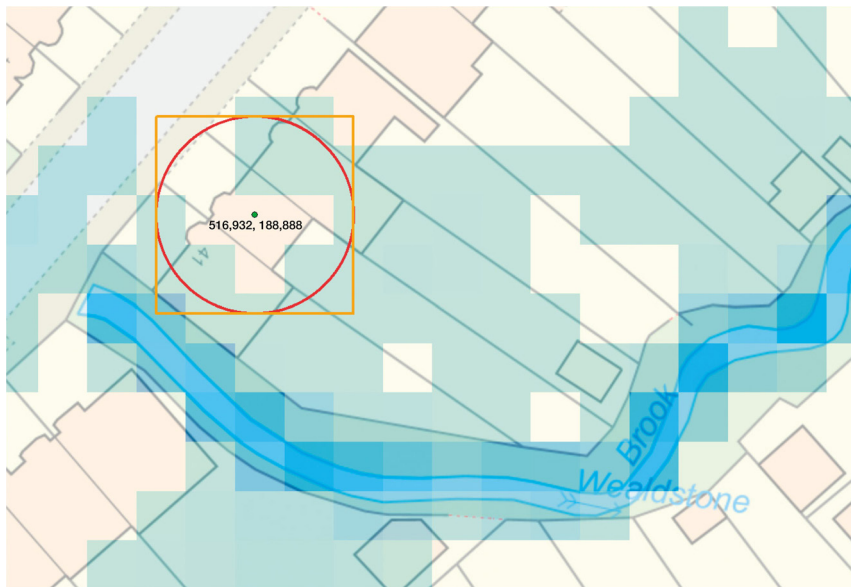
The spatial system is a slave to its parameters, and the title system is slave to the historical decisions relating to a particular parcel or parcels of land. The two systems swim in the same waters but neither can comprehend or satisfy the other’s needs.

## CONCLUSION

### Navigating the muddle: Title, UPRNs and property clarity

The exploration of property identifiers — specifically the contrast between UPRNs and Land Registry title documents — highlights a fundamental and unresolved tension at the heart of modern property data, regulation and risk.

While UPRNs offer a geospatially precise, machine-readable and scalable method for tagging physical assets, they exist in a parallel environment to the complex legal and historical



**Figure 7:** A UPRN-driven radius score is for convenience enclosed within a square risk range and a subsequently higher flood value ascribed (bottom left of square). Note that neither UPRN-derived risk area as circle nor bounded square recognises the title boundaries of riverside, roadside and other residential addresses

Source: Crown Copyright Ordnance Survey © 2026

domain of property title and ownership. The two systems serve fundamentally different masters: UPRNs support digital modelling, analysis and location referencing, while title documents uphold legal rights, obligations and enforceability under common law and statute. This creates what can only be described as the ‘ungodly muddle’ where address matching, spatial abstraction, legal ownership and risk assessment often appear to ignore the fundamentals of each other’s requirements.

Policy makers and those improving and modernising open-source systems must reflect on this tension between title systems and geospatial efficiency and seek solutions that are consistent and promote transparency.

Professionals and commercial institutions must clearly identify the purpose to which data is being applied and which pathway it is travelling along: the digital addressing and risk management point or the nuanced legal and title landscape.

Modern systems and technologies bring efficiency and visibility, but they do not

dissolve legal nuance. Conversely, legal structures underpinning title are often blind to or unaccommodating of the efficiencies brought by modern spatial identifiers.

Three key insights emerge:

- *UPRNs are essential but insufficient:* They provide a critical anchor for geospatial systems and property modelling as a digital twin to the lived experience of property, but fall far short of interfacing meaningfully with the legal title system.
- *Title remains foundational:* Despite digital advances, title documents and boundary plans, however archaic, remain the final word on rights, duties and ownership in land.
- *Integration is not inevitability:* While calls for a ‘digital golden thread’ promise unification, the fundamental difference in purpose and origin of UPRNs and title means that true interoperability may remain elusive without legal and structural reform.

The challenge, then, is not choosing between geospatial precision and legal certainty, rather within existing limited systems, recognising that both must coexist in an uneasy but necessary partnership. Attempts to reduce the ‘richness’ of legal title to an automated process relying on digital resources will fail and may well be counterproductive in consumer service.

Models, systems and decision makers must be critically aware of their own tools’ assumptions, limitations and blind spots. Only by bridging legal reality and digital abstraction with care, clarity and humility can the property sector move from muddle to mastery. We do not need to reduce one system to fit the other; we need fluency in both.

The proponents of an automated digital future, of property data reducible, of the atomisation of results, need to consider the rich tapestry that is English title law; this will not conform easily to a binary answer driven by ML.

In our earlier papers the authors argued for a structured approach to property assessment, for proper validation and curation of risk data and against its misapplication at scale through automated reports at conveyancing.<sup>12,13</sup>

The issues are live in all automated systems; they exist at desktop review for valuation or property risk, and for any physical visit onsite or any personal search of repositories they always exist. None of these issues will be resolved, however, unless we understand how title and buildings interrelate within their own ecosystems and then beyond their own fixed points and preferences. The challenges require informed professionals who understand how the two processes endlessly circle each other while seemingly never meeting.

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