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As governments seek alternative ways to fund public services and provide affordable access to basic housing, the spotlight has again fallen on land asset values, particularly where an increase in value may be attributed to government actions.

Discussion about landownership, rights and values tends to polarise opinion. It would be sensible, therefore, to have a dispassionate discussion on re-centring land in our political economies well before government action. This would enable a scarce resource to be effectively husbanded, reflecting public and private interests.

As digital technology extends into every aspect of our lives, it is easy to lose sight of our global dependence on land. As Tony Mulhall notes, political economy

‘As digital technology extends into every aspect of our lives, it is easy to lose sight of our global dependence on land’

Tony Mulhall
Associate director, professional standards, RICS

But land is not just a resource for mineral extraction; more importantly, land is the space we occupy. Paradoxically, at a time when digital technology enables close contact without the need for physical proximity between us, the spatial distribution of land for its various functions has never been more important or yielded such benefits for those who control it. Rapid land asset appreciation in the centres of major global cities has coincided with the expansion of technologies that provide 24-hour global connectivity.

The particular significance of land was recognised in the past, and was only relegated over the course of time. The political economy of the 18th century for instance distinguished the unique properties of land from other forms of capital. Classical economics, the orthodoxy of the period, recognised the difference between capital in the form of productive agricultural land and capital in the form of finance. As the Industrial Revolution took place, however, land was subsumed into a broader definition of capital, where it remains today. What we now understand as neo-classical economics positions land as just another capital input, disregarding the multiple and sometimes irreplaceable roles it plays in our societies.

Land is, for example, critical in national formation, cultural identity and environmental sustainability. It provides physical resources, food security and a store of capital. It serves a host of unique and essential functions now understood as ecosystem services or natural capital — many of which are not amenable to monetisation, but without them our societies would soon collapse. Moreover, the neo-classical formulation envisages land as just another input that can respond instantaneously to the urgencies of supply and demand, arriving at a point of equilibrium predicted by the model.

Yet land does not perform in this way. The neo-classical economic model of perfect competition does not fit the way land operates. Increasing recognition of the fundamental aspects of land and the unique role it plays in the natural and built environment justify a review of its position in our political economy. The operation of land as a store of capital, distinct from its natural, cultural or productive function, is one of the reasons why we might wish to treat it differently.

Land is naturally scarce and its value accounts for some of that scarcity. But land can also be artificially and deliberately scarce. We live in increasingly regulated societies where access to resources may be controlled in the public interest. Land is one of these, and its use for a particular purpose in a particular location may be restricted for good reasons.

The implication of that policy-induced scarcity, though, is a form of land rationing, which almost inevitably leads to a rise in land asset prices — and has unintended public consequences.

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Related competencies include:
Access and rights over land, Economic development, Spatial planning policy and infrastructure
Journal takes global focus for conference

Members of the land professional group will be presenting a selection of papers at the World Bank Land and Poverty Conference 2020 on 16–20 March in Washington, DC. Copies of this edition will be distributed at the event, hence its international tone.

bit.ly/WBLPconf20

RICS outlines policy priorities

The RICS Government Relations team has three policy priorities for 2019–20: housing supply, saving the high street and climate change. The team will help the organisation advise decision-makers on these issues.

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A grid for Guyana

Surveying in Guyana for a road upgrade and a river crossing meant one team of contractors had to resort to more traditional techniques

Phil Wright
Between the coastal belt of Guyana and the border with Brazil lies the road from Georgetown to Lethem, the critical north–south trade link for the smaller country. The Guyanese government intends to upgrade the Linden to Mabura Hill stretch of this road and design a new river crossing at Kurupukari.

Mott MacDonald contracted Malcolm Hughes Land Surveyors to carry out a topographic survey of the 120km stretch and complete a bathymetric survey at the site of the potential river crossing. The road being upgraded starts in the north, 103km south of Georgetown, while the proposed river crossing is further along the Georgetown–Lethem corridor, 108km by road beyond Mabura Hill.

These new infrastructure projects, with better transport links and all-weather roads, will improve traffic flow and support the national economy. The crossing is especially important because the only way to cross the 600m channel at present is on a private ferry, which operates at irregular intervals and only during daylight hours.

Planning and preparation

Malcolm Hughes staff planned a visit to Guyana, to include meetings with the Guyanese government, Mott MacDonald and representatives from local support firms as well as a review of the road and river crossing area. This planning stage was essential to appreciate fully the terrain and conditions in which surveyors would be working, as well as identifying the most appropriate survey methodology.

The nature of the landscape meant that we could not depend on modern techniques and technology. For instance, the use of drones and aerial LiDAR was considered, but because the specification for the survey included 50m either side of the road — into the jungle, under a heavy tree canopy — we reverted to traditional surveying methods, which are reliable in all situations.

A project plan was established to ensure the health, safety and welfare of our staff while in Guyana, and included the following measures:

- security
- insurances
- equipment transportation
- satellite phones
- staff travel, inoculations and visas, among other requirements
- anti-snake venom kits.

Work began in early March 2019, with a pressing deadline to complete all surveying by early to mid May before the rainy season started. Accommodation was booked along the route. Securing the services of local people, including drivers, was another major factor in the success of the project.
stations are occupied by receivers concurrently for at least 20 minutes. This enabled the control to be linked between the primary stations and established a secondary network with closed loops that were adjusted successfully. At Kurupukari, the secondary control consisted of static observations radiating from the main control point with occupation times of between 30 minutes and an hour. Temporary control markers were set up, with wooden pegs installed every 100m, to carry out the survey along the route. Construction survey control was then established along the entire route, and tied back to the more accurate higher-order control to maintain spatial and dimensional integrity.

Guyana uses a localised Provisional South American 1956 Datum for its national survey grid. Here we did rely on a more 21st-century approach: it was decided with Mott MacDonald that we would use the WGS 84 ellipsoid, the default global GPS coordinate output. Essentially, the project was viewed as being in its own grid system. Because there was no current geoid model available to convert the ellipsoidal to orthometric heights, it was also agreed that we would present data as WGS 84 ellipsoid heights.

**Carrying out the surveys**
The Linden to Mabura Hill road runs through undulating topography in the watershed of the Essequibo and Demerara rivers. The road starts in Wismar and ends at Mabura Hill and there are two communities based on the road, called 47 Miles and 58 Miles. It is mainly a fair-weather road surfaced with laterite, and because of poor maintenance some sections can become impassable during the rainy season. The average width is around 20m and the total length of the road is about 122.5km. The stretch of road to be upgraded connects the township of Linden to Mabura Hill, a small logging community.

Detailed surveying was carried out along the road, including 50m either side into the jungle, using total stations and GPS. Heat and dust were the main challenges: although the road was not always busy, when a vehicle did pass it would create a mini dust storm that affected visibility. The jungle areas had to be controlled, and establishing protection zones and employing local assistants were key to keeping the team safe from unknown threats, including snakes.

The survey work at the site for the proposed river crossing was carried out by a team of two surveyors and a local assistant who doubled up as the driver. The task was to survey five transects at the existing ferry crossing, consisting of the main centreline of the proposed bridge together with two transects upstream and two downstream of this at 50m intervals. Another eight river transects and seven rock bars were surveyed downstream of the proposed crossing.

After sourcing a local boat and boatman, we began the river work. Because of the unusually low water levels and varying depths each section was surveyed by a variety of methods, including an Ohmex Sonarmite transducer fixed to a GPS pole to echo-sound the level of the deep areas from the boat. The rock bars were walked with GPS, while steep, dense banks on the sides of river and central islands made GPS observation impossible so traditional land survey methods were used. After the river work, we also surveyed a 1km stretch of the approach road either side of the crossing.

This was a challenging project. Staff worked away from home for nearly three months in an unknown environment in sometimes difficult conditions. The rains started early, in late April, but the team completed all the required work and returned safely in mid May.

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**Related competencies include:** Engineering surveying, Geodesy, Hydrographic surveying, Surveying and mapping

**Further information:** This article is an extract from Geospatial Engineering 2019 published by the Chartered Institution of Civil Engineering Surveyors, and is reproduced with permission.
Housing crisis

‘People with a particular political outlook blame the planners, greedy developers, foreigners or the retreat from welfare’

Nick Gallent
Bartlett School of Planning

In the 1970s, US-based academics Horst Rittel and Melvyn Webber wrote a paper contrasting the ‘tame’ problems of science, which they said were resolvable through the calm application of scientific rationality, with the ‘wicked’ problems of the social world, which are difficult to decode and resistant to any solution.

One important marker of a wicked problem is that its interpretation will be coloured by political leaning. The housing crisis, for example, is presented by some as mainly a failure to extend asset ownership in support of economic growth; but more broadly, by others, as a failure to provide the right to decent and stable homes in locations well connected to schools, jobs and social opportunity.

More generally, there is a split between those who present housing outcomes as a product of too much state intervention – mainly planning regulation – and those who attribute housing inequality to the excessive freedoms of the market, such as the movement of money across borders, the rapid expansion of mortgage lending, and not enough state intervention in the form of good-quality public housing and good planning. In England, a number of key narratives are used by different observers to explain the housing crisis.

Behind the housing crisis

First, too few new homes are being built for a mix of reasons — including a slow and locally politicised planning process, and the failure of housebuilders to get on and provide the housing we need, for a long list of reasons centred on business models.

Second, the housing market is too open to overseas investors and this form of direct consumption is driving a cost crisis and accentuating the tensions arising from a lack of new supply.

Third, we’re too reliant on private housebuilding and private consumption. The loss of a public housing component is core to the current housing crisis; this includes the right to buy introduced in 1980 and the lack of new council housing over the past 40 years.

Fourth, there is a lack of plurality in the private sector. Too little space for SMEs and too much volume-build and self-build means a low level of systemic resilience: a cycle of boom and bust driven by investor behaviour, funding and finance unsuited to niche providers and smaller development opportunities being missed.

Fifth, the tax system is gumming up the housing market. Upfront costs such as stamp duty payable on purchase are too high and, at the same time, the way we tax the unearned income from housing, relative to other assets and to work drives overinvestment and the cost crisis.

And sixth, it’s all about credit and debt: credit supply, in the form of domestic mortgages, pushes up asset prices, while debt trading fuels the supply of credit, making for a crucial and problematic circularity at the heart of our relationship with housing.

This final explanation captures an essential argument: that housing has become caught up in a set of economic processes that now substitute for growth built on increased labour productivity. It is vital to understand the links between these core narratives, and that there are supply, consumption, welfare, tax and credit–debt dimensions to the housing cost crisis.

Accepting the inherent wickedness of our housing plight means acknowledging the complexity and connectedness of many underlying processes, from supply through credit expansion to patterns of consumption, and avoiding simple answers that ignore the role assigned to housing in modern economies — as a place to park wealth for the few, to the detriment of a great many households.

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Related competencies include: Housing strategy and provision, Spatial planning policy and infrastructure

Further information: This article is a revised version of a post on Policy Press’s Transforming Society blog (bit.ly/policypressblog). Whose Housing Crisis? was published in April 2019 (bit.ly/whosehousingcrisis).
Head in the sand

Without sand there would be no concrete, no asphalt and no glass. But with rapid urbanisation and population growth, are we in danger of running out of this crucial resource?

Pascal Peduzzi

It would be impossible to build the schools, hospitals, roads, solar panels and other infrastructure necessary to achieve the UN Sustainable Development Goals (SDGs) without a supply of sand and gravel. But global consumption of sand and gravel is estimated at 40–50bn tonnes a year. Without regulation, extraction of such large volumes of aggregates has a major impact on our environment. Land is lost through river or coastal erosion, the water table is lowered and sediment supply decreased. Despite this, policy-makers have not put it on their agenda and the public is largely unaware of the issue.

Aggregates account for the largest volume of solid material extracted globally, about 18kg per day per person on the planet. This raises three major concerns. First, we cannot extract such a volume without an enormous impact on the environment. Second, given our dependence on these resources, how do most governments and decision-makers not have a greater awareness of the issue? Aggregates are assumed to be so common that no one worries, despite our reliance on them. Third, with population growth, urbanisation and the necessary improvements in infrastructure to achieve the SDGs, the demand for aggregates will increase.

Governments need improved policies for dealing with the extraction and use of aggregates. We need to have global monitoring in place and to improve the way we consider this material.

For instance, Dubai is among the world’s most spectacular architectural developments, but it has put significant pressure on marine aggregates. The city is home to the Burj Khalifa tower, the tallest building in the world at 828m; the Palm Jumeirah and Palm Jebel Ali, artificial sets of sand islands; and the World Islands project, 300 islands representing a map of the globe. These three projects required more than 750m tonnes of sand in total. While such development is impressive,
31 per cent of office space in the centre of Dubai was vacant in 2013. The projects thus represent real-estate speculation: selling luxury villas on the sand for millions of dollars, or selling the sand islands for tens of millions of dollars each.

So how can we reduce the impact of our sand consumption? The simplest answer is to consume less. This is easier said than done, but the following could be considered.

- **Avoid speculative construction**: some prestigious buildings or tourist attractions are built but remain empty, such as Burj Khalifa tower; or the Kangbashi district in China, a district of Ordos city that was designed to host 1m inhabitants.

- **Re-use existing infrastructure**: services can be retrofitted or adapted to a new use.

- **Reduce demand for sand**: don’t overdesign buildings. Build for the long term, substitute different materials and recycle concrete from demolition; the latter option has great potential, as it also reduces the need for landfill. Introducing a landfill tax will subsidise concrete recycling, and help the transition.

- **Retrieve material from waste**: incinerator bottom ash, or slag, can be substituted for sand, for instance.

Sand extraction has different impacts depending where it comes from and how it is extracted. Generally there are two types of site — dynamic and static.

- Rivers, beaches or the marine environment, for instance, are dynamic, and sand is part of the ecosystem providing shelter and habitat. Removing sand from rivers can therefore have a serious environmental impact, including changes in turbidity and loss of biodiversity. It also affects river flow, potentially leading to riverbank erosion, and changes in flood and drought frequency or intensity.

- Extraction of marine sand is also increasing significantly, which destroys the benthic areas — at the bottom of the sea — where micro-organisms live, feeding small fish that in turn feed bigger ones. This has an impact on biodiversity and fisheries. Operating in dynamic areas such as this should only be done after extensive environmental impact assessment.

- Marine sand extraction has an impact on seabed flora and fauna, while dredging and extraction of aggregates from the sea bottom destroys organisms, habitats and ecosystems as well as affecting biodiversity, usually leading to a net decline in faunal biomass and abundance or a shift in species composition. Long-term recovery can occur only where original sediment composition is restored. Sand extraction also has an impact on fisheries.

- The worst case is where sand is taken from beaches as it can destroy the ecosystem. Beaches protect land against storm surges, as well as against sea water infiltration into aquifers. They are specific ecosystems, and mining them affects biodiversity and plans for recreation.

- The safest source remains sand taken from quarries or produced by crunching rocks from mountains, as these are static environments where aggregates are a deposit or part of the rock. It is easier to reduce the impact of extraction in such conditions, and a government concession or licence is required. An environmental impact assessment should be carried out before extraction and funds reserved to restore the site afterwards.

Although we are not yet running out of sand, it is becoming rare in some locations — so we need to be smarter when we use it.

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Minerals management, Sustainability

**Further information: 2019 Sand and Sustainability: Finding new solutions for environmental governance of global sand resources is available online**


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**RICS’ view**

RICS welcomes the UN spotlight on natural resources, in particular sand used as an aggregate, under Sustainable Development Goal 12 to ensure sustainable consumption and production patterns. Raw materials are essential to society, but demand is increasing as global population grows. This is not a concern unique to sand but one that affects all natural resources, including water, timber and fisheries.

Governance, standards and management are key, but in developing nations these are not necessarily in place or they are enforced ineffectively, making this a global issue that plays out at a local scale. This creates challenges, because while extraction in countries such as the UK may be a well-established and effective practice, it is complex to transfer this to other countries. However, learning and effective standards should be accelerated through better transfer of knowledge and experiences. With the spotlight on sand and other construction materials, we must take care that the social, environmental and economic issues associated with the supply of one resource are not simply transferred to another.

This global issue is an opportunity for RICS, which represents the only profession operating throughout the property life cycle, including mineral resource management and material specification for construction projects. RICS professionals and standards can help make urbanisation well planned and resource-efficient, with the environmental performance of supply strategies compared on a consistent basis to make the cities and infrastructure of the future more sustainable and more resilient.

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Although developers broadly accept that land value capture needs to be reformed and extended this will have varied consequences for valuation, as recent research suggests

Richard Dunning

Whether considered broadly as planning gain or through a tight definition of land value capture, the future of developer contributions to public finances through community infrastructure levy (CIL) and planning obligations in England is uncertain. Calls to extend land value capture, however contentious, are not limited to the fringes of politics, as can be seen by the creation in early 2018 of the parliamentary select committee on the issue.

The resurgence of interest is not limited to England either. The Lincoln Institute of Land Policy, a think tank based in Cambridge, Massachusetts, has been promoting land value capture for decades and is apparently having successes.

Agreement that land value capture should be reassessed is rife, but Philip Booth wrote in 2012, coming up with a credible policy is an altogether different issue. ‘The general premise that if the state creates value by declaring land developable, the state should be a beneficiary of that value, is unimpeachable. Knowing exactly what that value might be or when return of it to the state might take place is quite another matter ... How to arrive at land values is a fundamental issue that appears to confound everyone from real-estate experts to government officials’ (bit.ly/PABooth2012).

Although there is international interest in land value capture, development and landownership arrangements around the world vary. Each country has its own rationale for creating a particular form of land value capture, and these often have distinct agendas. There is a danger therefore of trying to enforce uniform best practice between countries with different land value capture aims and institutional contexts.

For example, if land supply is constrained in one area because land is owned by a small number of people, what impact will adding an affordable housing requirement have on the release of land to the market? How will differences in the number and type of organisations bidding for land affect the way a land value capture mechanism imported from another jurisdiction will operate? If policy is being transferred wholesale between countries, then governments and voters should be aware of the explicit logic of the capture mechanism and be able to explain its likely outcomes.

To help understand these issues myself and colleagues at the University of Liverpool and University of Sheffield have recently researched attitudes to land value capture in the development sector in England and Scotland for RICS. We interviewed 20 experienced surveyors, planning consultants, landowners, housebuilders and land promoters about their approach to valuing land and developments, and their engagement with land value capture practices. Interviews considered the existing system, whether it should be amended and, if so, how.

All interviewees agreed that the state should capture a proportion of the uplift in land values from development, and some argued that there was scope to revise this proportion upwards. However, they consistently maintained that recent public calls for further value capture through development had led to confusion over the purpose of doing so in the first place.

The rationale for extending or introducing new forms of value capture is often designed to achieve more specific goals than Booth suggests. Political arguments for amendments to land value capture may be based on the notion that housebuilders’ profit should be further taxed, that landowners are supposedly passive recipients of land value uplift, or that land prices might be threatened by

Agreement that land value capture should be reassessed is rife, but coming up with a credible policy is an altogether different issue
additional taxation. But each of these logics differs from the existing planning gain and taxation system rationale in England.

The dominant objective of planning obligations is to make development acceptable on a site in planning terms — although there is a large critical literature on the role of affordable housing here. For CIL, meanwhile, it is about meeting infrastructure needs in the area around a development, and for corporation tax it is about funding state expenditure at a national scale.

Commenting on this, one developer in the south of England remarked: ‘People have got to ask themselves what their priorities are. Do they want housing or money for infrastructure? The answer is probably both, but if so, they must acknowledge that there is only so much value in land.’

Responses to our questions on the impact of land value capture were diverse. While the development sector is routinely considered a single entity in the media, there needs to be clarity about the different roles played by landowners, land promoters and housebuilders in relation to land value capture. It may be self-evident in the surveying profession that the motivations across these categories differ; however, such heterogeneity is rarely given column inches. We found distinctly different perceptions about the purpose of land value capture, and about where this money should be spent, within and between these groups.

Crucially for land value capture mechanisms, there are also differences between the points that landowners, promoters and housebuilders extract profit from the development process. This has different impacts on whether and what level of land value capture is likely to result in development, depending on the stage at which uplift is assessed. On paper, land values may be assessed at any stage in the process, but in practice making these assessments with precision is complex, prompting diverse approaches.

In deciding to discuss development with a promoter, a landowner does not require a well-evidenced residual valuation but may be informed by its own perceptions of the market. Without a clear development plan, it is not possible to assess accurately the change in land value from initial use to completed development. As one planning consultant, operating across England, noted: ‘Until you get detailed designs there is uncertainty, so when a developer is negotiating to buy the site it will put some sort of contingency, such as “We will give you $x amount of money because we don’t know exactly how much the junction might cost.” But as it could be higher, the developer covers itself by giving a reduced land offer for the site.’

There are high-quality valuation methods that could be used to support new forms of land value capture. However, the efficacy of these new mechanisms will depend on the degree to which they take account of discrete stages in the development process. This is to an extent why planning obligations and CIL are effective — there is a moment in time where value can be assessed by multiple parties using the same data to agree what may be extracted from development. Altering this approach is possible, but there needs to be an awareness that these will operate in the context of highly variable markets, where there are diverse attitudes towards the value that is present and could be captured.

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Related competencies include: Spatial planning policy and infrastructure, Valuation

Further information: RICS land value capture research will publish in the spring.
Flexibility is the best policy

Sustainable development in a market economy requires trade-offs to ensure the needs of business and planning are balanced

Tony Mulhall
Reference to sustainable development is frequently made as if it were a discrete and absolute measure. In reality, it is a concept with economic, social and environmental dimensions and, more recently, a cultural one – all having their own measures, some of which are not easily comparable. Trade-offs must be made between these in pursuing an overall goal in very different places. Furthermore, in creating sustainable communities, governments increasingly rely on the private sector to provide more public benefits through the planning system. Achieving this in a market economy is about realising planned objectives while maintaining the business case for development.

All 167 countries that have signed up to the New Urban Agenda (bit.ly/newurbagenda) have committed to pursue its aims, embracing UN Sustainable Development Goal (SDG) 11, ‘Make cities and human settlements inclusive, safe, resilient and sustainable’. The development planning regulatory system is one of the main mechanisms through which governments implement this. The Office for National Statistics, for instance, is now tracking progress towards meeting these goals in the UK, and most other signatories are setting up similar monitoring systems.

England’s National Planning Policy Framework (NPPF) was originally published in 2012. A significant revision was published in 2018 with minor amendments in 2019. Through the different versions is woven the golden thread of sustainable development, aligning them with SDG 11 – meaning that, when planning decisions are made, they are done by reference to the NPPF’s entire content.

**Keeping up standards**

What standards are necessary to ensure that all the objectives of this SDG are met? Do the same standards apply internationally? Do they even apply across a single country? If other standards need to flex to maintain progress, which should they be, and how is this to be legitimate and transparent?

Because they are specific to their location, sustainable development policy objectives are often difficult to compare. But expectations for housing space represent something to which almost everyone can relate. Although certain countries or regions have residential space standards, others do not — which means the size of dwellings is determined by reference to market norms that reflect the availability of space and cultural acceptance of dwelling sizes.

The average size of typical accommodation in 2010 in the national housing markets of four developed regions — the USA, Germany, the UK and Hong Kong — ranges from floor areas of 45m² in Hong Kong up to 232m² in the USA. Germany and the UK were fairly similar at 94m² and 90m² respectively. But these metrics are not fixed; in the 1950s the average new house size in the USA was 111m², that is about half the current size. Even within these national characteristics there may be considerable regional and urban variation. For example, in the UK, accommodation size norms that are acceptable in central London may be unacceptable in a provincial city.

Other considerations also have an impact on size. Increasingly stringent standards to improve socio-economic conditions or to mitigate social or environmental concerns usually have implications for construction costs and the land area required for development, and ultimately affect land values. Whether an adjustment in land prices takes place may depend on how prescriptive and non-negotiable these standards are.

Although national planning policy sets headline criteria for sustainable development, many of the detailed requirements are set at local plan level. This results in considerable differences and latitude for interpretation, resulting in uncertain outcomes in decision-making.

**Affordable housing obligations**

Countries are increasingly introducing planning policies for provision of adequate affordable housing as part of market housing developments. Some jurisdictions, such as France and many US states, set a fixed, mandatory proportion to be achieved through local plans.

The UK, which operates a discretionary planning system, instead leaves the level of affordable housing to the local authority based on evidenced need. It is in the application of this policy that the interplay between regulatory policy obligations and the land market can be observed. It also clearly demonstrates the trade-offs that occur between the social, environmental, economic and cultural objectives of the policy.

UK government policy from 2012 to 2018 has relied on viability testing to ensure that planning obligations, including affordable housing, are not set so high as to stop development being viable. The recent changes to the NPPF have sought to rebalance policy to ensure that objectives such as affordable housing are properly elaborated in the plan-led system and are not squeezed out through the normal operations of the land market.

In England, this plan-led system operates under section 38(6) of the Planning and Compulsory Purchase Act 2004 on the principle that decisions on planning applications should be made in accordance with the adopted development plan, unless there are other material considerations that indicate otherwise. One such consideration in adopting and implementing a development plan is national planning policies.
In accordance with the UK government’s 2012 planning policy, benchmark land value was a key metric in viability appraisals

Nevertheless, the system leaves considerable flexibility and opportunity for local interpretation in implementing these general requirements. Planning decisions are made on a particular application’s merits, which means taking into account what is relevant to the decision and omitting anything immaterial. There is considerable discretion for decision-makers who, ultimately, are elected members.

**The view from the courts**

The weight to be attached to a material consideration is a matter for the decision-maker, subject to public law review. Needless to say, the courts have given further guidance on this.

In *Tesco Stores v Secretary of State for the Environment and West Oxfordshire District Council* [1995] 2 All ER 636, Lord Hoffmann stated: ‘The law has always made a clear distinction between the question of whether something is a material consideration and the weight it should be given. The former is a question of law and the latter is a question of planning judgement, which is entirely a matter for the planning authority. Provided the planning authority has regard to all material considerations, it is at liberty (provided it does not lapse into Wednesbury irrationality) ... to give them whatever weight the planning authority thinks fit or no weight at all; where a decision is Wednesbury irrational if no reasonable person acting reasonably could have made it. The fact that the law regards something as a material consideration therefore involves no view about the part, if any, it should play in making decisions.

Further clarification on application in practice was given in *Tesco Stores Ltd v Dundee City Council (Scotland)* [2012] UKSC 13, where Lord Reed said: ‘Although a development plan has a legal status and legal effects, it is not analogous in its nature or purpose to a statute or a contract. As has often been observed, development plans are full of broad statements of policy, many of which may be mutually irreconcilable, so that in a particular case one must give way to another. In addition, many of the provisions of development plans are in language whose application to a given set of facts requires the exercise of judgement.’

In accordance with the UK’s 2012 planning policy, benchmark land value was a key metric in viability appraisals. The level at which this was determined, based on comparable market evidence reflecting planning policy considerations, strongly influenced the extent of developer contributions obtainable, including those for affordable housing. In effect it determined the trade-off between fulfilling one sustainable development objective and another, balancing the social good of affordable housing with the economic one of maintaining competitive returns for developers.

In a postscript to a judicial review decision on *Parkhurst Road Ltd v Secretary of State* (2018) EWHC 991 (Admin) on the matter, Mr Justice Holgate commented on the tension between the development plan and the land market. When estimating a benchmark land value for a site, the application of the market evidence should ‘reflect’ and not ‘buck’ relevant planning policies, he said, including those for affordable housing.

On the other hand, the proper application of planning policies should be ‘informed by’ and not ‘buck’, an analysis of market evidence that reflects those policies, or where appropriate, is adjusted to do so. Mr Justice Holgate went on to say that realism is needed when these matters are taken into account in decision-making. So, a judgement may need to be made on relaxing one or more planning requirements or objectives where that would render a development on the site in question non-viable according to a viability case using land values that have adequately taken planning policies into account. The policy context has changed since *Parkhurst Road*, with less emphasis on the economic returns to developers and landowners. The principles nevertheless bear remembering.

Although the law and national policy allow for flexibility at local level in its formulation and application, it is not intended that local planning authorities take decisions that undermine the objectives of their plans. What is intended is that this way, over time, the land market will adjust to factor in the costs of achieving the planning policy’s aims.

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Related competencies include: Development appraisals, Planning and development management, Valuation

Further information: The effective date of RICS’ *Financial viability in planning: conduct and reporting* professional statement is 1 September 2019 (rics.org/financialviability).
Twin–win situation

The development of connected digital twins can benefit economy and environment alike, and surveyors should prepare for this important business trend

[Mark Enzer]

Q: Can you define a digital twin?  
ME: Essentially, it’s a digital representation of something physical. But what really makes a digital twin is its connection to the physical world. Receiving data from the physical world, a digital twin unlocks value by enabling improved insights that support better decisions, leading to better outcomes back in the physical realm. At the moment our data is often poor-quality, inconsistent and siloed, so we have a lot to do to make it fit for use. If we don’t sort this out, decisions and outcomes won’t be improved.

Q: How is the digital twin different to building information modelling (BIM)?  
ME: The difference is the connection to the physical world: a right-time data connection that informs the digital twin. BIM is an excellent foundation for digital twins. It has helped the industry to understand how important effective information management is, so there should be a natural progression towards digital twins and connected digital twins. The UK BIM Framework will lead into the information management framework to underpin the National Digital Twin (NDT).

The concept of the NDT grows from the potential of connecting digital twins via secure, resilient data sharing. The NDT is envisaged as an ecosystem of connected digital twins, not one huge digital twin for everything, and the Treasury has established a task group as part of the Centre for Digital Built Britain (CDBB) to bring together other key players from government, academia and industry to help make this vision a reality.

Q: What benefits will this bring?  
ME: Each digital twin, built for a clear purpose, should enable better decisions to be made faster and more cheaply: better operational decisions, better maintenance decisions, better investment decisions, better resilience decisions. The list goes on. And this can be multiplied if we connect digital twins across the built environment.

For society, this means better social, economic and environmental outcomes per pound. For the economy, it means higher–performing infrastructure, which should lead to improved productivity and GDP growth. For the environment, it should mean less waste, more re–use, less disruption, greater resource efficiency, as well as lower carbon emissions. Digital twins can usher in the circular economy.

And for business, it means a new market built around digital assets. We will need to learn how to value and manage such assets.

Q: What can surveyors do now to prepare for this digital future?  
ME: Surveyors have a key role. They are good at dealing with data and information, but their methods may need to change in an increasingly information-based world. So, they will have to go digital.

The vision for Digital Built Britain is huge and it is not going to happen overnight. CDBB has developed a roadmap for the first three years of what could be a 30–year journey, and we really need to be generating value within those three years.

We’re making good progress, and there are still spaces in working groups and workshops that surveyors can join. Members should contact the CDBB.

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Related competencies include: Big data, GIS (geographical information systems), Smart cities and intelligent buildings

Further information: The UK BIM Framework is online at bit.ly/UKBIMF, and the CDBB can be found at bit.ly/CDBB. The next issue will include a case study of Northumbrian Water using the digital twin.
It’s a steal

With the vast majority of surveying equipment thefts going unreported, victims should notify police, manufacturers and security companies so intelligence can be gathered and better preventative measures taken.

Mark Francis, Rachael Oakley, Miles Taylor, Rachel Tyrrell and Oliver Viney

Equipment theft is a serious issue for the profession, and insurance underwriters may not be willing to support businesses in the geospatial sector unless further action is taken. With the cost of a typical piece of equipment around £20,000, it is imperative to resolve the issue.

For this reason, the Survey Association (TSA) has tried to gather all data relevant to survey equipment theft; it has been working with several organisations for many years to advise on preventing theft and what to do when member companies fall victim.

In April 2018, with the support of equipment manufacturers Topcon, Trimble and Leica Geosystems, TSA brokered a three-year agreement with SmartWater, which produces traceable liquid products that can be used in crime detection.

The agreement aims to coordinate the response to thieves who persistently target surveyors. Key to this strategy is the collection of data detailing when and where thefts occur. In the 12 months to October...
2019, SmartWater logged 58 incidents, but instrument manufacturer Leica Geosystems alone has registered as stolen nearly 200 total stations to the end of October 2019. Clearly there is a huge gap between the number of actual thefts and those reported.

Thieves often target high-value instrumentation by posing as professionals, wearing hi-vis clothing and personal protective equipment. More can be done to outsmart them, starting with prevention. A good mantra is lock it, alarm it, track it and report it. Manufacturers have fitted tracking devices, and guidance is available from the TSA website for other prevention methods, including working in pairs so that equipment is never unattended.

It is vital that all survey equipment owners report every theft whether they are TSA members or not. Victims need to report thefts to the police, TSA, the manufacturer and their insurer. They should also stress the value of the instrumentation. When the police receive a crime report, they may think the stolen item is similar to a power tool. However, a total station or GNSS equipment, for instance, are closer in value to a car or van. Victims are thus advised to report that a high-value asset has been stolen, so the police officer can prioritise the crime accordingly.

Victims should also report equipment theft to SmartWater so that the company can collect UK-wide data to identify hot spots for crime. Once it has sufficient data, it can leverage a national response from senior police and the Opal Unit – the national intelligence team focusing on serious organised acquisitive crime across the UK – to disrupt criminal activity and recover stolen property.

TSA educates members through monthly newsletters and a dedicated webpage that provides guidance on reporting incidents.

Prevention is the first defence
The Construction & Agricultural Equipment Security and Registration scheme (CESAR) is the established marking initiative for these two sectors, and has been running successfully for more than ten years. There has been a reduction in machine theft in that time, although some of this may also be attributed to individual companies taking tougher security measures. The latest iteration of the scheme, CESAR Survey, has now turned its attention to specialised surveying equipment, and aims to provide similar levels of theft deterrent.

Datatag ID Ltd, a security marking firm that is the technology partner to CESAR, marks assets to ensure their identity cannot be readily removed. These forensic marking technologies make it harder to hide the true identity of a total laser or survey station and, along with other in-built security, provide a deterrent, and criminals now regard such products as too hot to handle.

One call to Datatag’s round-the-clock secure contact centre will flag a stolen item on its database and alert the police immediately. When they find stolen equipment, police officers can scan the QR code on the tamper-evident warning and identification label to determine its status. Datatag is now in discussion with several equipment manufacturers to provide retrofit options for existing assets.

A manufacturer’s view
While there is still no simple way to prevent thefts, better adoption of the deterrents described above will curb demand for stolen equipment by increasing the risk of buying and then being unable to use it. Remote trackers and immobilisers, PIN-secured time-lock protection and snatch-and-grab alarms have successfully frustrated thieves and resulted in equipment recovery.

With Leica Geosystems alone registering 368 units as reported stolen in 2018 and almost 200 total stations stolen in the first ten months of 2019, there has been some decrease. However, this problem cannot be eradicated without complete adoption of deterrents across the industry. The company provides means of remotely locking, securing and locating equipment, while also working with TSA to incorporate measures designed to help users work safely and reduce risk.

SmartWater is forming partnerships with businesses suffering equipment theft, manufacturers and police forces and partner agencies to share details and insight, and met Opal Unit staff to discuss this intelligence. Chief Superintendent Tom Harding has raised the issue of survey equipment theft with the National Serious Organised Acquisitive Crime Group and the Home Office.

TSA continues to encourage members and non-members to report incidents to SmartWater analysts so this information can be relayed to the relevant agencies. An intelligence dashboard on TSA’s site allows members to see their incidents as soon as they are loaded on to the system and shared with analysts at the Opal Unit. SmartWater also shares reports in the same way.

Unfortunately, a high volume of incidents still go unreported. Without vital intelligence and crimes being logged, analysts cannot identify hot spots, outline patterns and share information with the police and other agencies working on national acquisitive crimes. We cannot help to combat a problem when we are largely unaware where crimes are occurring and at what level. Please ensure any incidents, no matter how small, are reported.

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Related competencies include:
Client care, Legal/regulatory compliance, Surveying and mapping

Tailings failings

Following a series of disasters in Brazil's mining industry, what can be done to prevent future failures?

Andy Birtles

Tailings dams are large containment structures designed to hold the waste — slurry or tailings — from mining processing operations, on a permanent basis. But when they fail, the results can be catastrophic. A dam collapse in Mexico in the 1930s resulted in more than 300 fatalities, while several major failures since the 1980s have had a massive environmental impact on agricultural land, creating acidic or contaminated water that needs neutralising.

As recently as this century, three significant tailings dam failures have occurred in Brazil, the most recent two in the same mining area. The 2015 collapse at the Mariana dam was a major environmental disaster: 60 million cubic metres of waste emptied into the Doce river and from there poured into the Atlantic Ocean. In January 2019, in the Brumadinho dam failure at least 248 people died and the full environmental cost is not yet known.

A number of characteristics make tailings dams vulnerable to failures. These include:

- inappropriate construction material for containment structures
- increasing the dam’s capacity beyond its original design
- inadequate geotechnical investigation and design
- substandard construction
- insufficient monitoring and control during operation
- not fulfilling the requirements for monitoring and maintenance during closure and post-closure phases.

These catastrophes have huge consequences, from the loss of life and livelihood and contamination of agricultural ground to loss of community residences, schools and hospitals, and of services such as water, power and roads. From the mining company’s perspective, there is also a massive cost in terms of business interruption, dam reconstruction, compensation, rebuilding infrastructure, environmental restoration and reputational damage.

Unfortunately, failure of a tailings dam is usually sudden, and even with monitoring it has been difficult to predict. Extreme rainfall, seismic events, the consistency of material used for dam construction or poor drainage can, among other factors, result in the retaining structures failing. Tailings material then becomes a devastating mud flow that destroys everything in its path.

What can be done to prevent similar events? Put simply, more robust operational and closure practices; wider adherence to
current established guidelines, such as those from the Canadian Dam Association; newer technology to assist with continuous dam monitoring and surveillance. The regularity of tailings dam failures also suggests that mining companies should focus more on surface issues, particularly tailings dams and waste disposal operations.

Many initiatives are now in hand to rethink the way the dams are designed and constructed, particularly the geotechnical, geohydrological and geophysical aspects of the site and the tailings material. Greater emphasis is being placed on continuous geoscientific monitoring of the dams, and on introducing more regulation of such monitoring to prevent failure. It is likely that a code of practice similar in purpose to the Code for Reporting of Mineral Exploration Results, Mineral Resources and Mineral Reserves (bit.ly/GeolRepCode) will be developed, under which the competent person responsible for the various phases of design, construction and operation, and maintenance after closure, would be accountable.

Many modern mines already use safety techniques such as radar and laser monitoring that should warn of any structural problems, and it is not unusual for additional monitoring of conditions using drones, piezometers, water-level gauges, surface marks and regular checks on the structural integrity of the containment structures.

**Technological advances**

The tools available to mine surveyors for their measurement duties have changed dramatically in recent years. Laser scanners have significantly improved the efficiency and safety of routine tasks, such as determining the volumes of stockpiles and pits at the end of each month.

A range of airborne systems are also now commonly used for any mine surveying tasks that are impractical with ground-based techniques for size, cost or safety reasons. Geophysical methods can for instance detect internal erosion processes and anomalous seepage at an early stage. However, although these have been tested to monitor and investigate earth dams, they have yet to be used more often in assessing the integrity of tailings dams.

Using radar and lasers to measure dams is time-consuming and costly because measurements have to be taken from each side, but a drone is far more efficient and reduces the risks to surveyors. No longer do they need to be in such close proximity to dust and dangerous substances; drone surveying can be done remotely and safely. Data can now be collected quickly — data that would previously have taken many hours depending on the size of the dam, and without putting the surveyors at risk. Inspections and checks can be carried out more regularly as well, because the hardware and software is now relatively easy to use.

In addition, some companies have been developing satellite systems that can improve dam monitoring in an initiative funded by the UK Space Agency’s international partnership programme. Aimed primarily at regulators responsible for monitoring many tailings sites over a large area, this will help improve transparency in the sector; the system could also provide vital extra time to deal with a potentially risky situation.

Meteorological forecasting and hydrological models are being used in an attempt to predict the impacts of rainfall on the reservoirs and the embankment structures. By exploiting global navigation satellite system data with base stations, accurate movement data can be gathered for key points on a structure, and movement over wide areas can be monitored to warn of landslides. Optical satellite data sets will allow the monitoring of indicators of pollutants that may leak from a tailings dam.

Remotely operated hydrographic surveying systems have been used around the world for quite some time, but only recently adapted to suit the challenges of surveying water storage and tailings dams in mining areas. One example is a battery-powered, remotely operated hydrographic survey vessel that can be fitted with either a single- or dual-frequency echo-sounder. For mine site applications, where dams are likely to have a high concentration of suspended particles in the water, the latter can record a full echogram of the sonar response, which enables the results to be analysed in detail.

The safety and stability of tailings dams is inextricably linked to the management and operation practices of mining companies. It is hoped, therefore, that dam failures will decrease in number thanks to the use of this new technology, along with increasing company stewardship, better oversight and independent review panels, as well as more widespread adherence to appropriate guidelines and regulatory frameworks. The mine surveyor has a key role to play in this process by ensuring the use of robust surveying and measurement systems.

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**Related competencies include:** Contaminated land, Environmental management, GIS (geographical information systems), Surveying and mapping, Waste management
Developers can spend significant sums on due diligence before even securing an option on land, in the hope that it might have development potential. This process is repeated for each property transaction on every matter from legal covenants to reviewing the local plan, whenever property comes on to the market, or even speculatively beforehand.

But imagine that all the data you need to analyse a site, whether related to local politics or endangered species, was available in a format that your computer could process in seconds, and instead of poring over documents you could quickly understand the site’s strengths and weaknesses. That’s what property technology start-up Urban Intelligence hopes to provide: for almost five years, the team has been working to digitise planning policy and other data necessary for traditional site appraisals.

The resultant SiteScore aims to offer a comprehensive digitised planning policy map of England and Wales, covering everything from conservation areas and article 4(2) directions to special landscape areas and community infrastructure levy (CIL) zones. It is a similar concept to a credit rating, in that it analyses evidence in data about a land parcel to calculate the likely implications for development potential, producing a range of scores that seek to measure sustainability and viability.

Using an individual land parcel as its frame of reference, the sustainability appraisal reviews hundreds of data sources, including among others:

- **site overview**: ownership; topography; and settlement
- **planning statistics**: the political allegiance of ward councillors and the council overall; local planning authority statistics; what stage the local plan has reached; appeal volumes and decisions
- **planning policy**: opportunities such as regeneration areas; constraints such as green belt or article 4 directions removing specific permitted development rights
- **demographics**: data sourced from the Office for National Statistics on population, age, deprivation, labour market and so on
- **local market**: house prices; waiting lists; authorities’ progress on their five-year housing land supply
- **environment**: nearby constraints such as heritage and environmental considerations; Sites of Special Scientific Interest; ancient woodland
- **hazards**: flood risk; sites subject to the Control of Major Accident Hazard Regulations 2015; sources of contamination such as landfill sites and noise pollution such as roads, railways and airports
- **transport connections**: proximity to town centres, railway stations, bus stops,
motorway junctions and airports with scheduled commercial services

- **services:** school access and Ofsted ratings; access to universities, healthcare facilities, supermarkets and open space.

The scores from these areas are combined to give an overall sustainability score for the site, and individual sustainability factors can be weighted up or down depending on user preferences.

**Automating valuation**

While sustainability is important in today’s planning and development context, perhaps most important to developers is valuation. Automated valuation modelling (AVM) has been growing in prominence, and you may be familiar with Zoopla’s Zed-Index or similar tools that aim to estimate property value automatically.

However, until now these have been restricted to mainstream residential valuations, where there is a large enough sample size of transaction data. It has been almost impossible to automate the addition of critical elements that affect valuations, such as environmental constraints and planning factors.

SiteScore is similar to classic residual valuation models in Microsoft Excel or commercial software such as Argus. However, it seeks to extend these by automatically providing localised contextual inputs, such as:

- likely permissible densities based on planning policy or, in the absence of any policy, on local character and appearance
- open space requirements
- residential unit requirements and housing needs identified in strategic housing market assessments and other policy documentation
- price per square metre based on data from HM Land Registry
- predicted abnormal costs according to site topography
- hazards identified in the SiteScore sustainability appraisal.

**Software in action**

The software is already being used, on a project involving Transport for London (TfL) to automate the estimation and modelling of potential housing capacity across thousands of sites in the capital. Using the AVM has enabled TfL to test a variety of development scenarios in a fraction of the time that conventional methods require.

In addition to carrying out appraisals, it’s also possible to search for sites that meet certain development criteria, whether those with a high chance of securing planning permission or a particularly significant potential uplift in value as a result of gaining such permission.

Having access to a comprehensive range of information and data on a single platform could lead to much-needed transparency in the planning and development process and help to speed up the process of releasing land for development.

The tools could also be used to develop new methods of identifying and collecting land value and strategic land availability assessments, as well as improving the effectiveness of more targeted policies such as article 4 directions and CIL.

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**Related competencies include:** Data management, Spatial planning policy and infrastructure, Sustainability
MAPPED FOR TAX

Rapid urbanisation will see increased demand for valuation professions and geospatial techniques to secure the tax revenue necessary for infrastructure

Christopher Barlow

One of the earliest maps in the world, a clay cuneiform tablet, dates back to 1500 BCE, and shows irrigation canals criss-crossing the ancient city of Nippur between the Tigris and Euphrates rivers. The map is believed to have been made for taxation purposes, and I do not think it is a stretch to theorise that the canals were financed by property tax, enabling cultivation to become more productive and the city more prosperous.

I recalled this map when I was invited to speak at the Geospatial World Forum in 2019 on the role of a valuation office for smart cities. The term ‘smart cities’ has become a catch-all for concepts related to governance and technology, for example deploying sensors to collect more information more quickly for improved decision-making. But I believe that a city cannot be smart if it has no sustainable revenue source to fund public works, and land use and ownership is not clearly recorded and mapped.

Those cuneiform tablets show that the link between governance, land use, valuation, property taxation and geospatial techniques goes back at least 3,500 years. However, that link is unfortunately — for many cities — a little stronger today than it was three and a half millennia ago. The rapid pace of global urbanisation means there will be an additional 2bn people living in cities by 2045. Cities must now plan to accommodate this massive wave of migration to urban centres — the largest ever in human history.

The most rapid growth in cities will occur in the developing world. These cities will need considerable funding for public services and infrastructure, but lack the capacity to value and to tax property at a scale needed to keep up with urbanisation. Many cities in the developing world, still need to record and map land rights. A valuation office can increase the government’s capacity to collect revenues, however: by appraising the value of properties, it enables the levying and collection of taxes to fund the public works and infrastructure needed for smarter cities.

Valuation and cadastral officers have an important role to play in clarifying land rights and uses. Information on properties and

Above: This ancient map is thought to be an early cadastral where the map depicts agricultural parcels divided by irrigation canals
The link between governance and valuation, property taxation and geospatial techniques goes back at least 3,500 years

land, including ownership and the bundle of rights, responsibilities and restrictions that are registered with it when mapped, serves many functions beyond tax because it supports real-estate markets, courts, public safety and disaster mitigation.

A golden age for GIS
Mapping techniques have long been a critical tool for valuers. With the advent of geographic information systems (GIS), we’re seeing ever more vast applications to support valuers in being more efficient and making this information more accessible. Speaking at the forum Jack Dangermond, the president of software company Esri, declared that we’re approaching the golden age of GIS. Where I believe his vision relates specifically to smart cities is in terms of the growing amount of spatially enabled information that enables larger, more efficient cities to prosper.

GIS is now a ubiquitous platform for sharing, analysing and communicating information in and between governments, and with the public and other stakeholders. For smart cities, the valuation and cadastre represents the foundation of data used to support planning and development.

The International Associations of Assessing Officers has been instrumental in adapting new technological uses to map and value lands. Its book GIS for Property Tax and Assessment Professionals chronologically reviews a steady evolution in what geospatial can do to advance the valuation profession. It also highlights how a government valuation office is now providing a more complete picture of land and property in its communities by, for instance, geo-locating properties and sharing that information with the public and key stakeholders such as banks and property developers.

Furthermore, combining GIS tools and imagery in desktop reviews of properties has quickly improved their efficiency, as illustrated in the work of the Hillsborough County Property Appraiser in Florida. The county is legally mandated to review a quarter of all properties a year, so it initiated an ambitious project to avoid having to carry out field inspections for all of these. The appraiser aimed to integrate its valuation mass appraisal software and GIS platform by using oblique and street-level aerial imagery with software such as parcel sketch to measure parcels and property characteristics, such as parcel size or building height, as well as property verification tools.

Results have been impressive — not only did the office reduce costs in terms of fuel, vehicle repairs and staff time by decreasing

the number of field trips, it also proved that this method can increase accuracy and generate more tax revenue. Since implementing the new desktop review, Hillsborough added $103m in tax receipts and changed more than 30,000 property records.

The defensibility of appeals is another benefit of using technology. For example, maps including values for properties can be published online so the public can do a quick comparative neighbourhood review themselves. This is directly related to revenue generation for cities, as reduced need for valuation appeals results in more tax levied. More location-specific data is available than ever before, and the technology to create and process it is becoming more widely available and easier to use. Data produced by a valuation office is invaluable to stimulate smart city initiatives.

For example, a research project by KPMG and Cape Town with Thomson Reuters examined the benefits of a decade-long modernisation of the city’s valuation technology. The study examined benefits from modernisation at departmental, municipal and societal levels. The research team was surprised to learn about the varied use of valuation data beyond the office’s requirements:

- the courts used data in making estate inheritance rulings
- it supported title offices in checking for fraud
- public works drew on the data to direct improvements to the water services
- the transportation office used it to establish better bus links to lower-valued neighbourhoods.

The study noted that location-specific data was a common unifier of data sets. Location — be it an x, y coordinate, address or postal code — can be mashed with other data sources through GIS platforms, concluding that the varied uses of this rich data source were only now being realised and that many further, even smarter applications could be produced.

Technology continues to advance at speed. At the World Bank Land and Poverty Conference 2019, a presentation on machine learning to value property in Kigali, Rwanda showed how researchers had combined remote sensing techniques with algorithms that taught computer systems to identify property characteristics, in turn generating valuations. This is a possible way for the Rwandan government to evaluate the potential effect of modernising property tax administration on revenue, and creating the basis for a mass appraisal system to produce a tax roll remotely. Geospatial techniques are enabling massive leaps in the production of more accurate and cost-effective valuations.

The link between the valuation office and a smart city initiative is strong and has lasting impact, especially when the data is unified with other data sources based on location for wider GIS applications. The future is bright for the valuation profession, because these geospatial skills and practices are vital in making our cities smarter by addressing acute funding needs.

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Related competencies include: Big data, GIS (geographical information systems), Taxation, Valuation
The price is right

How can right-pricing work in the UK planning system, and what does it mean for valuations?

Stephen Ashworth

Since the Town and Country Planning Act 1947, land values have had to take account of policy requirements — though they have often done so slowly and imperfectly. In its 2018 and 2019 changes to the National Planning Policy Framework (NPPF), the UK government has embarked on a radical re-education of the market.

The price paid for land is now said to be irrelevant in assessing the viability of a local plan or a development. Instead, land should be ‘right-priced’, at levels that reflect planning policy requirements — sometimes well below historic values. Right-pricing means educating the market to take planning policy requirements seriously and reflect those costs in land’s market value.

The primary functions of the planning system are to ensure the right development happens in the right place at the right time, and to prevent inappropriate development. An important secondary objective is to ensure that development makes the maximum reasonable contribution towards any costs that it imposes on the community and public purse.

The starting point for this is the development plan. In a perfect world, development plans should cover the long term, being both strategic and visionary. Focusing on city-regions, strategic-level plans should provide a flexible framework in which development comes forward, shaping places for the future. They should be supported by clear, properly programmed and sensibly funded infrastructure plans, with some of the finances coming from the development thus enabled. Beneath the strategic-level development plans, local and neighbourhood plans should then follow.

The suite of strategic, local and neighbourhood plans should set proper standards for quality of the development, amenity, affordable housing, design and infrastructure. All plans should be clear and precise. Too often plans are caveat and hedged, which invites negotiation and is bad practice. It is also bad economics. If planning requirements are clearly set then the costs of meeting those requirements will be reflected in land prices.

Another element of the right-pricing process is that local and neighbourhood plans should be clear about the most appropriate use of land. They should identify land that will be used for public purposes and sites for uses such as affordable housing or private rented accommodation. It should be clear that proposals for other uses on those allocated sites will not be accepted. That process of definitive and determinative allocation will then ensure the value of that land reflects the proposed use.

On large sites, the proper planning of an area can mean some owners benefit from a windfall while others are stuck with low values. For instance, the owner of a commercial centre or market housing reaps a reward that the owner of a school site does not. Planning policy should make it clear that consents in such areas will only be issued if agreements contain equalisation or pooling mechanisms, under which each owner shares the costs and values fairly.

If a privately negotiated compromise has not been reached, equalisation clauses can be included in planning agreements; with local authorities having, and exercising, enforcement rights to secure collaboration. This process should not take any existing ransom value from a landowner, but it should ensure that the planning system itself, by requiring a certain disposition of uses or infrastructure, does not inadvertently transfer value from one owner to another.
Assessing the plan policies
All development plans should be underpinned by a clear understanding of the viability of development across the area they cover. Any planning policy requirements should be assessed and should not generally exceed a level that, after allowing for a sensible developer profit, reduces residual values in the area below a sensible benchmark.

What should that sensible benchmark value be? Clearly, it has to be at a level that encourages landowners to sell. Too often, and too simplistically, the benchmark is taken as existing use value plus an arbitrary amount such as 20 per cent. This may be fine for a large farm, where 20 per cent above agricultural value still realises a significant sum of money. But it is wrong for a small plot where that 20 per cent may not cover the disturbance and transaction costs. The present use value is also a factor: 20 per cent on existing commercial values may be significant, whereas 20 per cent on the cost of a former green belt field is not. Local context is important.

There probably needs to be a discussion about the appropriate or sensible profit percentage for developers. National Planning Policy Guidance refers to a range of 15–20 per cent of gross development value, but historically rates have not been this high.

Should profit instead be based on development costs? If based on cost, is it sensible to allow a 20 per cent return on the underlying land asset, which is could be traded as risk-free because it could be traded on at the same value? Is it appropriate to allow a 20 per cent return on costs that are debt-rather than equity-funded? Should the same percentage be applied to small schemes, where a relatively minor cost overrun could wipe out the profit, compared to a large scheme where there may be significantly greater flexibility? Sometimes a profit much higher than 20 per cent can be justified; in other locations and for some uses, the figure should be much lower.

Viability, benchmark values and profits should be central to the local plan process with examiners listening to and considering objections, and reaching clear conclusions. Once that process is complete it should settle land value questions. Planned in this way, policy right-prices land.

Enforcing the right price
Until recently, the NPPF almost invited viability negotiations one application at a time. That has now changed, and bespoke viability assessments are discouraged. Development is expected to meet the proper policy requirements.

There will, inevitably, be cases where it cannot bear the full cost of infrastructure and benefits identified in planning policies. Ground condition could be found to differ from those expected for instance, while infrastructure requirements may emerge that had not previously been identified. Where that is the case then planning policy-level obligations can be relaxed. In most cases, policy will dictate the land price—that is, it will right-price land.

Where there have been relaxations at either local plan or application level, planning obligations have become increasingly sophisticated over the past ten years. If these obligations, including infrastructure contributions, have been negotiated down in response to justified viability concerns, review clauses are then used. These provide for further financial review if development does not proceed quickly or the outcome figures need checking partway through the process. Effectively, these mechanisms seek to right-price land after planning permission has been received. Importantly, the maximum extra contribution is normally capped at the policy-compliant level.

It is often argued that right-pricing in this way will slow release of land on to the market. There is some truth in that: part of the problem is the time it takes for the market to learn about, and believe in the longevity of, new policies and costs. That education can be accelerated by judicious use of compulsory purchase powers.

When compulsorily acquired, the land compensation assumes that planning policy requirements would have been met, forcing landowners to confront the change in values that new policies can cause. To date, local authorities have not been keen to use these powers. This may well be changing. Clearly, compulsory purchase orders (CPOs) take time, and are costly, although the delay and expense is often exaggerated. However, it will only take a few policy-compliant compensation payments and successful CPOs to educate the market.

There has always been tension between a planning-led viability appraisal value and an RICS Red Book value. The latter has, traditionally, given significant weight to comparables, so too often developers have assumed a relaxation or waiver of policy requirements. The change in policy means that comparable values will, almost necessarily, have to edge closer to compliant schemes.

There will always be an optimism gap, because developers will continue to assume an ability to negotiate planning obligations and will make growth assumptions. However, comparable and policy-compliant values should align more closely. When that happens, land will have been right-priced.

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Related competencies include:
Development appraisal, Spatial planning policy and infrastructure, Valuation

Focused on city-regions, strategic plans should provide a flexible framework in which development comes forward, shaping places for the future
Spain’s land readjustment system has been successfully used for more than 60 years to allocate rights and responsibilities for development and infrastructure proportionally between private and public sector.

Pablo Molina Alegre
Land readjustment is the principal way in which urban expansions occur in Spain. It provides a way for multiple landowners to pool their land, fulfil their obligations under planning law in accordance with an urban plan, and share in the benefits of new development.

Since the inception of Spain’s land–use planning system in 1956, two main characteristics have remained at its core.

- The right to property is construed as a set of rights and duties of equal importance that vary for each owner or property. The exact content of a specific property right arises from the determinations of the urban plan on each property. Among their obligations, landowners must pay for and provide all the infrastructure, as well as grant land to the city to provide green zones and public facilities.
- A private owner is a relevant stakeholder in developing plans, and the public sector and private owners can create urban plans. When the private owner acts as the relevant stakeholder, the public sector works as an informal partner in building the city’s infrastructure.

At the time of the Spanish Land Use and Planning Act 1956, there was increased migration to its cities along with industrialisation that led to uncontrollable urban expansion. But the planning system lacked the capacity to provide the required public infrastructure, community facilities and affordable housing.

Although the 1956 Act advocated the compulsory acquisition of land for public development, such a measure exceeded the capacity of the state. This resulted in the introduction of mechanisms for cooperation between the state and the private sector for city expansion and urban infrastructure. The 1956 Act therefore introduced a land readjustment mechanism that was already being used in Italy and Germany, and had precedents in the Spanish city expansion legislation of 1893. This system was introduced alongside another for compulsory acquisition or expropriation, and these continue to coexist in the Spanish legal system, although land readjustment has become the main tool for planning.

**How the land readjustment system works**

The system works under the assumption that, in a specific development area defined by the plan, all owners have the same set of rights and obligations. In other words, the plan identifies all owners in a development area, referred to as a sector, as being in the same situation; accordingly, under the non-discriminatory principle of equal rights and obligations, the administration must treat each in the same way.

All landowners in one sector must jointly assume all the obligations and duties that the plan, the urban planning act for each region and the 2015 Land Act (Real Decreto Legislativo 7/2015) impose on them. Among those obligations, the owners must:

- build and freely give to the administration all the public infrastructure that the area requires — such as sewage, roads, streets, public lighting — to become part of the city
- grant to the administration land that is suitable for public buildings, sports venues and so on, in all public zones
- allocate to the administration land where the administration’s share of future development — by law between five and 20 per cent of the value of the development and normally ten per cent — can be built. That share of the value of future developments in the sector belongs to the administration, regardless of whether that administration is a former owner in the area or not
- demolish all buildings and evict all occupants in the sector that are incompatible with the plan
- allocate a minimum of 20 per cent of the total buildable area to affordable housing.

In turn, all owners in the sector share 90 per cent of all building rights that the plan defines for the sector and for any possible land uses, assuming the administration has taken a ten per cent share of future development as is typical. The proportion in which those owners will share the benefits of developing the sector is related to the proportion of surface area of the original plot they own in relation to the total surface area of the sector.

That proportion is reduced by the amount that has to be allocated to the administration as part of the value capture mechanism — usually ten per cent, but it can vary from five to 20 per cent as stated. For example, if an owner held 12 per cent of the surface area of the land in the sector before the readjustment, that owner would normally receive 10.8 per cent of the total value of the final development; that is, their original 12 per cent minus the ten per cent of this that is to be directly allocated to the administration.

Note that rights are allocated as a proportion of the total value of the plan, which, in turn, will afford them specific rights to build the different uses that the plan provides, according to the intrinsic value of each. The cheaper the use allocated to that owner, the more building rights will be assigned — in the previous example, to add up to that owner’s 10.8 per cent.

The rights of the original owners and of the administration will apply to the new plots that the plan has designated for building; the rest of the land will be allocated to the administration for public facilities and infrastructure. In terms of cost, each owner will contribute to meeting the obligations of the development in proportion to the total value they have been allocated by the land readjustment except for the administration, which pays nothing for the ten per cent value allocated to it by the land readjustment project (proyecto de reparcelación), a document approved by the administration after a consultation in which the affected parties can participate and oppose the readjustment. It is as such a complex document that must be flexible and rigorous in redistributing properties and allocating value of the land.

Land readjustment is respectful of owners’ rights, because it is easy to verify whether all owners have been treated equally. It enables private initiative, with its more efficient approach to time and cost, to provide the infrastructure that the city needs. On the downside, the system is out of the reach of ordinary citizens, because of its technicalities, and depends entirely on the quality of the appraisers in the land readjustment team.

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**Related competencies include:** Cadastre and land administration, Economic development, Legal/regulatory compliance
Addressing the unaddressed

Where the streets have no name, residents don’t exist – so an innovative approach by one charity has given residents in Kolkata a new lease of life

‘With an address I now exist,’ confirms Rupa Mondal, a slum dweller in Kolkata, India. ‘When I was studying, I found it embarrassing that I didn’t have an address and couldn’t identify where I lived, like other people in my class. Now I have pride, feel like myself, and my family have a true identity recognised by the government.’

Addressing the Unaddressed (ATU), a not-for-profit charity, is well on the way to providing unique addresses for the 1.5m slum dwellers in Kolkata. To achieve this, it follows a well-defined process that has been honed over the past six years.

First, the charity works with the community to explain the benefits, meeting local councillors and the residents themselves – a process it calls sensitisation. Then, to allocate an address to each dwelling, an ATU employee stands in front of a slum with a smartphone and converts a GPS signal into a 12-digit alphanumeric code, such as 7MJCG969+C8Q6. This is printed on a sign that is attached to the individual dwelling.

This open-source plus code – effectively a street address for those people who would otherwise lack them – links directly to Google Maps, making it easy to locate individuals living in a slum. This code is an intelligent address that has official recognition. A household-based survey is then carried out, recording details of the occupiers and their:

- healthcare
- indoor air quality.

This data is shared with the local authorities and other NGOs working in the slums. Finally, workshops are arranged with organisations such as the post office so slum dwellers can access those services.

With an address, slum dwellers can have post delivered to their home rather than to a table shared by more than 300 families. They can also open a bank account and save money securely, set up a utility account, register for a voter’s card, and more readily obtain an ID card and hence receive social benefits. Emergency services can locate them easily, and children can be included in immunisation programmes.

With Google’s support, the charity has now provided 100,000 dwellings in Kolkata slums with postal addresses. At €2 per home this offers a new life for more than 400,000 slum dwellers. ATU founders Alex Pigot and Tina Roche say: ‘The success in Kolkata will act as a reference point for our Address Academy, which we will shortly set up in the city. We will freely share our expertise globally with full details on our website, to enable others to copy our work.’

The UN estimates that there are 883m people living in slums around the world. By the end of 2019, at least everyone in the slums of Kolkata should have an address.

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Related competencies include: Cadastre and land administration, Economic development, Legal/regulatory compliance
Further information: ATU won gold in the Technology for Good category at the Global Good Awards (globalgoodawards.co.uk).

Addressing the Unaddressed aims to have provided all slum dwellers in Kolkata with a code equivalent to a house number by the end of 2019
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