



State of the Nation 2019: Connecting Infrastructure with Housing

Foreword



Andrew Wyllie CBE
President, Institution of
Civil Engineers

To underpin an economy that is able to thrive, the UK needs more homes and the right infrastructure to support their delivery, encouraging the creation of strong, productive and sustainable communities.

There are some clear opportunities to improve: housing and infrastructure must be phased better; funding models could support a better pace and quality of growth to create resilient communities, and coordination at national, regional and local levels, including adjacent geographies, could be enhanced further.

In parallel, as new technologies and the low carbon agenda continue to shape expectations, there is a new and urgent potential to align housing and infrastructure to make better places.

This report examines the policy and legislative changes required to further upgrade and develop our infrastructure networks in order to meet the growth in demand brought about by the expansion of the economy, population growth, developments in technology and the government's housebuilding programme.

The report considers how we should seize the opportunities now provided by new technology, enabling us to fundamentally rethink how more integrated housing and infrastructure is provided.

These pragmatic recommendations also reflect a collective desire to protect the environment, ensure any future developments are sustainable, and safeguard and cherish the key role that local communities have as an integral part of our planning processes.

ICE is uniquely placed to convene and connect those who work in infrastructure with the housing sector. Through numerous regional workshops, focus groups and interviews, we have been able to utilise the knowledge of our networks to discuss the issues explored in this report with over 170 organisations and professionals. We are very grateful for all those who gave their time to help us shape this report.

We realise that these recommendations can be implemented only through collaborative stakeholder engagement in which the governments across the UK have a key role, and I hope this publication marks the start of a productive conversation about how the country properly coordinates and connects changing housing and infrastructure needs in the future.

I would like to thank everyone who has contributed to the production of this report, and extend my special gratitude to the project's Steering Group, its chair Rachel Skinner and the ICE policy team.

We are confident that the implementation of the recommendations contained within our report will allow the UK to accelerate its economic growth, further improve living standards and create additional jobs, and we look forward to working together to successfully achieve these objectives.

STEERING GROUP

Rachel Skinner

Head of Transport (Planning & Advisory),
WSP & ICE Vice President
(Steering Group Chair)

James Bailey

Director, PwC

Nick Gallent

Professor of Housing and Planning, UCL

Robbie Owen

Head of Infrastructure Planning and
Government Affairs, Pinsent Masons

Martin Tugwell

Programme Director,
England's Economic Heartland

Ian Wall

Chair, Scottish Council for
Development and Industry

Jim Young

Construction Director,
CHAP Construction Ltd

REPORT AUTHOR

David Hawkes

Policy Manager,
Institution of Civil Engineers

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Executive Summary

Delivery of economic infrastructure to enable and support new housing developments is vital. Infrastructure is the fabric of our society that binds our communities together. It strengthens the connections between people and places, creating vibrant and sustainable communities. Housing, including the location of development and the quality of the building stock, affects the quantity and type of demand in all other infrastructure sectors.

There is agreement that the UK has not been building enough new homes in recent years, although the pattern of demand and need is spatially variable. London has a particularly acute housing crisis, but all parts of the country – cities, towns and rural areas – lack the housing needed to support economic growth and deliver broader well-being.

The need to build more homes is therefore well understood and accepted. Demand for housing is projected to keep growing, while increasing housing supply will likely increase demand across all infrastructure sectors.

There is much scope within the current system to consider infrastructure more strategically instead of seeing it as something that runs as a consequence of development. Meanwhile, there are two factors that have the potential to reframe this debate. Firstly, the recognition for urgent action related to climate change and an increasing demand for low carbon solutions. Secondly, rapid advances on many technological fronts are providing new opportunities to overhaul the infrastructure systems people rely on to go about their daily lives.

The UK requires a new way of planning strategic infrastructure systems for housing at a local, regional and national level. This should seek to reform the way infrastructure is planned and delivered around a common objective: to provide the essential services that people will need, both in the initial communities created and in the prospering places that they will become.

This report makes a number of recommendations that, taken together, can bring about a broad reform to the way infrastructure is delivered with housing while taking advantage of the technological and climate-led opportunities to come.

Strategic thinking, planning and delivery

Strategic infrastructure is planned primarily at a national level. There is potential to create far better alignment between budgets, funding streams, the analysis of available data and local needs to avoid poorly planned housing developments with inadequate infrastructure provision. By creating integrated regional housing and infrastructure strategies that are based on evidence, have cross-authority agreement and go beyond individual political cycles, infrastructure for housing could be planned in a far more strategic way than at present. Feeding these strategies in at a national level would allow housing and infrastructure to be planned in a far more integrated way. Having housing as part of its formal charter would enable the National Infrastructure Commission to develop joined-up, evidence-based strategies on housing and infrastructure requirements.

A national priority

Nationally significant infrastructure projects should not – and do not – exist in a vacuum. New places with significant numbers of new homes are in themselves very large-scale projects that require energy generation, water supply, waste treatment, strategic transport links, digital communications as well as commercial and mixed-use spaces. By amending the well-understood and rigorous Development Consent Order process to cover larger-scale housing developments, there is an opportunity for the government to better coordinate housing delivery with nationally significant infrastructure, business and commercial projects.

The role of utilities

Careful planning and integration are needed to avoid siloed delivery of utilities infrastructure and housing, which can otherwise risk delays in delivery and cause sites to become unviable. There is benefit in encouraging regulators to build greater flexibility into regulated asset base models so that infrastructure for housing developments can be considered outside of price control periods. This would improve the current situation where there is limited scope or incentive for utility companies to look beyond their asset management periods to forward-fund infrastructure for housing developments.

Funding and financing

Planning and investment in infrastructure for housing creates an uplift in land value. Where possible, capturing this value can help deliver additional infrastructure and homes, though there are questions about whether enough value can be captured at the right stage to sufficiently cover the full cost of infrastructure. To overcome this, direct investment is required. The foundations of the Housing Infrastructure Fund need to be built upon, extending it further and moving to a continuous programme of funding to unlock more strategic sites nationwide for housing. The UK government's work in recent years on reforming developer contributions, such as developing a Strategic Infrastructure Tariff to better capture a proportion of uplift in land value, must also be carried through by the new administration.

Future-proofing developments

In many cases, homes and their associated infrastructure are being built without due consideration of the future needs of society. There is a need for future-proofed housing that addresses 21st-century issues – in particular the critical changes that are foreseen across technological, environmental and demographic fronts. A national policy direction is required across a number of areas, with the core consideration of how housing and infrastructure can be delivered to reach the net zero carbon targets while taking full advantage of appropriate technological advancements. The National Infrastructure Assessment should start to identify options for future-proofing new developments, and the government should ensure the findings develop into the Future Homes Standard.

Devolved approach

Housing policy is heavily devolved, and successes can be shared from the devolved administrations. The More Homes Scotland programme, including the Scottish Housing Infrastructure Fund, should be extended beyond 2021, while the Welsh government should consider establishing its own Housing Infrastructure Fund.



About the production of this report

In compiling this report, ICE has held evidence-gathering discussions in Scotland, Wales, Northern Ireland and the regions of England, inviting contributions from experts in the fields of housing, infrastructure delivery and planning across the public, private and third sectors. Through a national opinion poll conducted by Ipsos MORI, members of the public have also been consulted for their views. ICE has engaged with over 170 expert individuals or organisations during the production of this report.



Scope of the report

This report considers the relationship between housing and economic infrastructure. ICE defines economic infrastructure as the physical built assets within sectors such as transport, power, water, waste, digital communications and flood defences.

Recommendations



Planning

- The UK government should evolve the role of subnational transport bodies in England to incorporate other economic infrastructure and their interactions with housing to create subnational infrastructure bodiess.
- The subnational infrastructure bodies should be tasked with creating integrated regional infrastructure strategies that include housing. These should go beyond individual political cycles, both national and local, be cross-sectoral and evidence-based. Across England, these strategies should feed into the National Infrastructure Strategy to ensure effective integration of infrastructure and housing planning across boundaries and at local, regional and national scales.
- The UK government should amend the charter of the National Infrastructure Commission to include housing alongside economic infrastructure, allowing more joined-up, long-term and evidence-based strategies on housing and infrastructure requirements.
- The UK government should amend the Development Consent Order (DCO) process to enable large-scale housing developments of 5,000 or more homes to be delivered under it, ensuring greater coordination of housing delivery with nationally significant infrastructure, business and commercial projects.



Funding and financing

- Regulators should build greater flexibility into the utilities' regulated asset base model so that appropriate consideration can be given to providing infrastructure for permitted new housing developments outside of price control periods.
- The Housing Infrastructure Fund in England should be extended beyond 2023–24 and moved to a continuous programme of funding, as opposed to defined bidding rounds. Consideration should also be given to ring-fencing a specific amount of funding for areas of lower land value to ensure more strategic sites nationwide are unlocked for housing development.
- The Scottish Housing Infrastructure Fund, Rural Housing Fund and Islands Housing Fund should be continued beyond 2021 in order to sustain the momentum generated by the More Homes Scotland programme.
- The Welsh government should consider establishing its own version of a Housing Infrastructure Fund in order to unlock strategic sites for development, drawing on the principles of the Well-being of Future Generations Act.
- The UK government's commitment in 2018 to develop a Strategic Infrastructure Tariff that allows local authorities to pool resources to fund specific strategic infrastructure must be carried through by the new administration.



Futureproofing

- The next National Infrastructure Assessment should identify options for future-proofing new housing developments and strengthening existing communities, ensuring that decisions are strongly linked to the transformation in transport, water, energy and digital infrastructure that technology will enable and climate change will demand. This should feed into developing and iterating the Future Homes Standard in England.

Section 1: Introduction

To create new homes and high quality places for people to live, sufficient economic infrastructure – such as energy, transport, water and wastewater, waste, flood risk management and digital networks – must be in place.

The housing crisis in context

A critical challenge for many parts of the UK is that the population is expected to grow, while the projections for household formation are above the present rate of housing completions.¹ In England alone, the forecast over the next ten years for new household formation is on average 221,000 per annum, and this figure does not consider the backlog from prior years where housing supply has not sufficiently met demand.

The failure to increase the rate of housebuilding to meet demand has, for the first time in a generation, pushed housing up the priority list for political parties. A 2016 poll by Populus for the Centre for Progressive Policy highlighted that a shortage of affordable housing was considered to be the biggest barrier for the younger generation to achieving their aspirations in life – listed by 59% of respondents.²

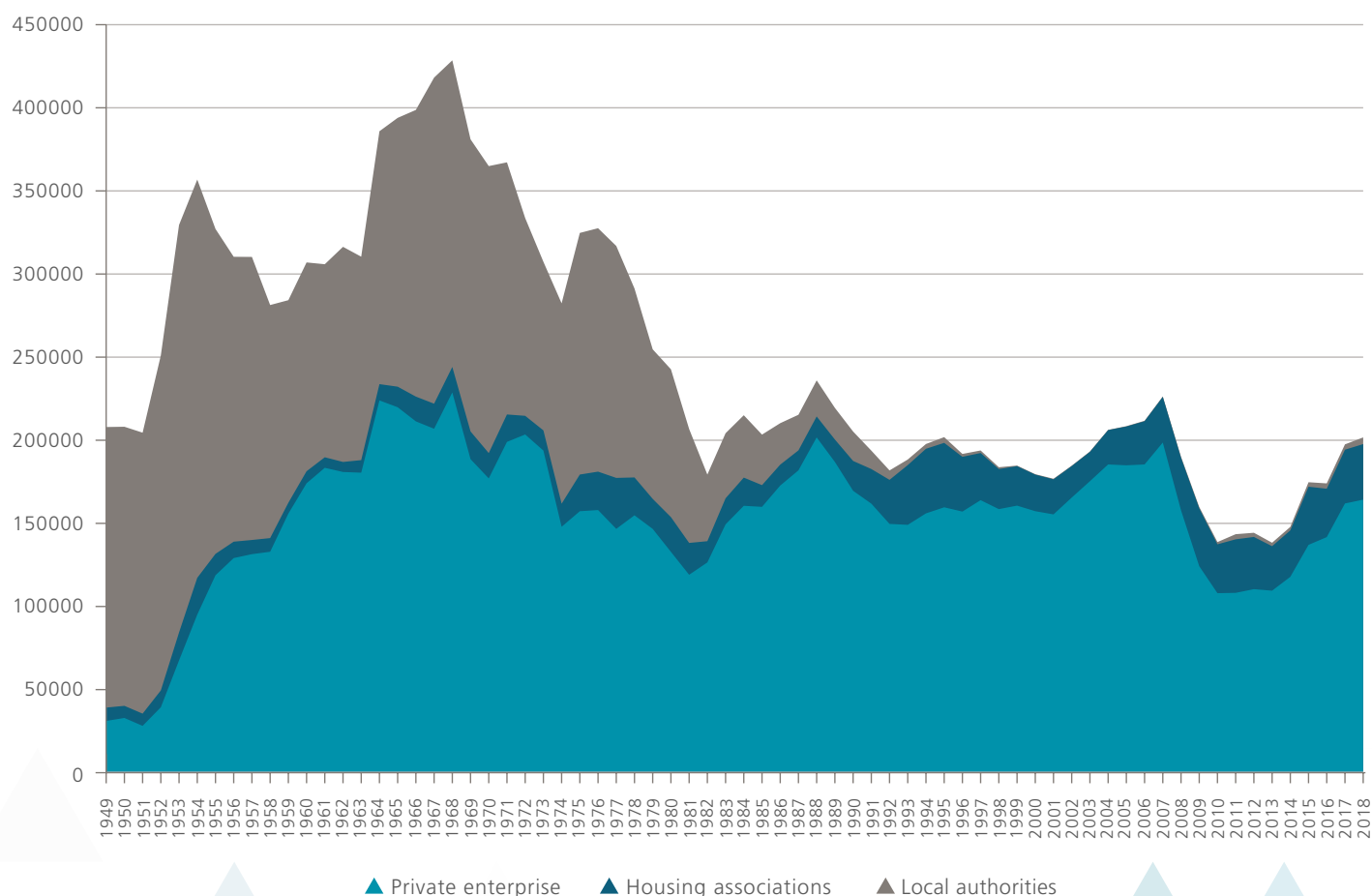
There is political consensus around the long-term undersupply of housing and the need to address this, as demonstrated through the then-Department for Communities and Local Government's 2017 Fixing our Broken Housing Market White Paper.³ It is of no surprise, then, that the Autumn Budget that same year set out an ambition to build 300,000 new homes a year on average, every year, in England alone by the mid-2020.⁴ In the period 2017–18, England's housing stock increased by 222,190 homes – 2% higher than the year before.⁵ The number of homes has been steadily growing for a several years, but is still lower than estimated need. All regions require significant additional housing investment but almost a quarter of all housing need is likely to be concentrated in London and over 60% in the four southern regions.⁶

- 1 MHCLG (2016), Live tables on household projections
- 2 Centre for Progressive Policy (2016), New survey reveals the lack of trust in our economic system
- 3 DCLG (2017), Fixing our Broken Housing Market
- 4 MHCLG (2019), Brokenshire hails package to build homes and opportunities in communities
- 5 House of Commons Library (2018), Tackling the Under-supply of Housing in England. (*Change in dwelling stock is not just a product of building new houses. Conversions and change of use can add to the dwelling stock.*)
- 6 ICE (2016), National Needs Assessment

In terms of the devolved administrations, the Scottish Government has set a target to build 50,000 affordable homes between 2016 and 2021,⁷ with the Welsh Assembly committed to building 20,000 affordable homes over the same period.⁸ The Northern Ireland Executive plans to build 7,600 social homes in the period to 2021.⁹ London has the highest demand for new housing by region, with the new London Plan expected to set a target of 65,000 new homes a year, at least 35% of which is targeted to be affordable.¹⁰ Scotland has broadly reached its targets to date, and lessons can be learned from this success as an encouragement to other administrations.¹¹

As Figure 1 shows, building 300,000 homes UK-wide has not been achieved in the last 40 years. This is not just an issue of more houses needing to be built by more housebuilders, however. It is of no coincidence that the peak period of the 1960s saw huge swathes of infrastructure built across the country in a coordinated way through the New Towns programme.¹³

Figure 1: UK housing completions by tenure, 1949 – 2018



Source: MHCLG¹²

- 7 Scottish Government (2016), Affordable Housing Supply Programme
- 8 National Assembly for Wales (2016), Oral Statement – 20,000 affordable homes target
- 9 Northern Ireland Executive Office (2018), Outcomes Delivery Plan 2018–19
- 10 Mayor of London (2018), Draft London Plan
- 11 Shelter Scotland (2018), Review of Strategic Investment Plans for Affordable Housing
- 12 MHCLG (2019), Live tables on house building: new build dwellings (Table 241)
- 13 DCLG (2006), Transferable Lessons from the New Towns

Links between housing and infrastructure

There are a number of infrastructure-related barriers to housing supply, including a lack of existing infrastructure to support new housing development, worries that new housing development will place unsustainable pressures on existing infrastructure, and the under-resourcing of infrastructure to accommodate new housing provision. Investment in infrastructure and public services has not kept pace with economic growth and housing delivery, meaning there is first a deficit that has to be addressed.

It is important to state there are no legal obstacles to housing and infrastructure being delivered in a better and more integrated way than at present. However, too often there are no shared objectives between the public and private sector, and between different public sector bodies, to deliver housing and infrastructure in a coordinated way. This is often as a result of them being thrown together by circumstance, rather than working in strategic partnership with early engagement. We have reached a point where, rather than the UK's housing stock and economic infrastructure being engines of growth, they form one of the biggest barriers to growth and a huge driver of regional and local inequality because they are not being delivered and planned well together.¹⁴

¹⁴ UK2070 Commission (2019), Fairer and Stronger – Rebalancing the UK Economy

Phasing infrastructure and housing

Infrastructure delivery for housing has been shown to be dependent on the ability of planning authorities to negotiate the delivery of infrastructure with developers, for all parties to overcome the politics involved in the process of negotiation and for local planning authorities to secure sufficient financing for necessary infrastructure projects.¹⁵

An RIBA report into tackling infrastructure problems found that inadequate infrastructure is making the housing crisis worse.¹⁶ An RTPI report identifying the deliverability of housing in the south west of England found that poor connections to telecommunications, transport and water services mean that potential sites for housing remain undeveloped because they are unviable or politically challenging to bring to market; these issues are exacerbated where the infrastructure is required early in the development, which then has an adverse impact on cash flow.¹⁷

Putting the infrastructure in place first, or at least in conjunction with development through collaborative engagement, can lead to better outcomes, but comes with a degree of financial risk that many developers are not keen to undertake. Adding infrastructure after, if at all, damages community trust and engenders ill will towards future development.

The NIC's Congestion, Capacity, Carbon report promotes infrastructure as an enabler for new housing and new communities in areas where they are needed.¹⁸ It states that infrastructure alone will not solve the UK's housing challenges, but better coordination of infrastructure with new developments is vital if infrastructure is to be deployed effectively.

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Well-designed infrastructure... can play a crucial role in addressing some of the most serious constraints on housing and ensuring that new houses become homes – built in the right place and supporting the long-term needs of local people and businesses.

Sir John Armitt
Chair of the National
Infrastructure Commission¹⁹

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- 15 Baker, M & Hincks, S (2009), Infrastructure delivery and spatial planning: The case of English Local Development Frameworks, in Town Planning Review, 80(2) pp 173–99
- 16 RIBA (2018), Joining the Dots: A New Approach to Tackling the UK's Infrastructure Challenges
- 17 RTPI (2017), The Deliverability and Affordability of Housing in the South West of England
- 18 NIC (2017), Congestion, Capacity, Carbon: Priorities for National Infrastructure
- 19 NIC (2018), Armitt: Success of housing reforms linked to new thinking on infrastructure

Planning for the future

Uncertainty as to where new housing, population and economic activity will be located undermines the capacity to plan infrastructure services for the future. Housing development will always require a balance between local and national objectives, as well as private homes and other types of housing, such as rented accommodation.

A key part of the Local Plan process is ensuring that there is sufficient infrastructure to support the spatial development of an area and to support and contribute to sustainable communities.²⁰ Such infrastructure is either that which is generally paid for through developer contributions and mainstream central or local funding, or that which developers need to provide on new sites, for example connections to utilities such as drainage, sewage, gas, electricity and water. The latter is usually privately financed, with costs being recouped from new customers.

It is not enough just to consider the number of new homes and where they are located when it comes to infrastructure requirements. There are crucial economic, social and environmental challenges, including water provision (most acutely in the south of England); ensuring housing and infrastructure is delivered as close to carbon neutral as possible while preserving and protecting natural habitats; the decarbonisation of transport and heat; flood resilience; and creating communities where people want to live, work and relax.

Integrated and strategic housing and infrastructure planning and delivery can therefore act as the solution to some of the core challenges the UK faces.

Public perceptions of infrastructure and housing

As part of this report, ICE commissioned independent polling to examine public attitudes towards infrastructure and housing. This found that 60% of British adults would support the building of more housing in their local area if any necessary new infrastructure was built at the same time. Previous research from 2018 also found that 48% of adults would be more supportive of new housing in their area if it had accompanying infrastructure.²¹

The National Audit Office, in a review of the planning of new homes, found that concern over a lack of supporting infrastructure is a frequent cause of local communities' opposition to new developments.²² In a 2018 YouGov survey of the public, almost one third of respondents stated that they would oppose future development in their area, with two thirds of that group stating that this stance is due to the strain it will put on infrastructure.²³

An independent survey of attitudes to infrastructure in the UK showed that the public sees housing and infrastructure as interlinked; separating them serves to undermine project benefits.²⁴

Strongly tied to this are key findings from the other public polls that suggest that there is greater support for new housing if it also delivers more employment, transport improvements, schools, health facilities and public spaces. According to a 2018 RIBA/ ComRes poll, 70% of British adults are more likely to support new housing developments in their area if there is a clear plan to improve transport links.²⁵



60% of British adults would support the building of more housing in their local area if any necessary new infrastructure was built at the same time.

Source: Ipsos MORI
Base: 4,283 GB adults 18-75,
16-19 & 23-27 August 2019

20 MHCLG (2019), National Planning Policy Framework

21 YouGov (2018), YouGov/Copper Consultancy Survey Results

22 NAO (2019), Planning for New Homes

23 Burges Salmon (2018), Perspectives on Infrastructure: Housing

24 Copper (2017), Independent Survey of Attitudes to Infrastructure in the United Kingdom

25 RIBA (2018), Joining the Dots: A New Approach to Tackling the UK's Infrastructure Challenges

Section 2: Cross-cutting interventions

Regional infrastructure strategies for England

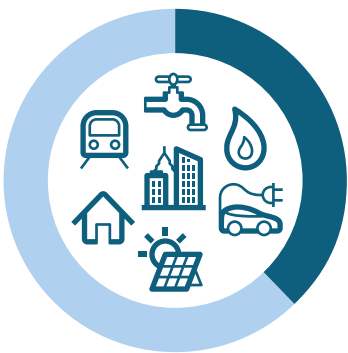
Recommendations:

- The UK government should evolve the role of subnational transport bodies in England to incorporate other economic infrastructure and their interactions with housing to create subnational infrastructure bodies.
- The subnational infrastructure bodies should be tasked with creating integrated regional infrastructure strategies that include housing. These should go beyond individual political cycles, both national and local, be cross-sectoral and evidence-based. Across England, these strategies should feed into the National Infrastructure Strategy to ensure effective integration of infrastructure and housing planning across boundaries and at local, regional and national scales.





32% of British adults believe decisions about what new housing is needed should be taken both nationally and locally.



38% of British adults believe decisions about what new infrastructure is needed should be taken both nationally and locally.

Source: Ipsos MORI
Base: 4,283 GB adults 18–75,
16–19 & 23–27 August 2019

In principle, the devolution of power and funding offers the potential to increase democratic accountability and improve infrastructure provision. The RTPI has argued that social well-being, employment growth and economic competitiveness are put at risk by a failure to fully integrate the provision of housing and infrastructure across local authority boundaries.²⁶ This integration should occur at a range of scales, which could be enhanced by the devolution of powers and responsibilities at a regional level. This is not to say that there is not a role for decision-making at a national level. Strategic infrastructure provision at a national scale can actively enable and shape sustainable housing growth rather than simply respond to existing demand.

Greater alignment of budgets, funding streams and programmes for transport infrastructure, housing, health, education and other local infrastructure, particularly at local authority, combined authority and county levels, would contribute to greater productivity and more efficient use of resources. There is a need to focus on how to support place-shaping, with mechanisms put in place that align investment to a common objective and avoid a siloed approach.

In terms of the public's view on infrastructure improvements and projects in their area, only 6% of British adults felt that these were very well coordinated or part of a strategic plan.²⁷ The same survey highlighted that 32% of respondents would feel more confident about regional infrastructure developments if an infrastructure plan was in place, setting out future projects for the area.

There are inextricable links between housing, energy and water supply, waste services and the provision of transport. Within this, many different public and private sector organisations are responsible for infrastructure delivery. A strategic approach to their delivery can foster a better understanding of overall system need. Setting in place a framework to inform where ultimate decision-making over

the implementation and delivery of a given area of infrastructure policy should be located is imperative. It is as important to establish a system of identifying infrastructure need at multiple political and economic levels.

The distribution of powers to combined authorities like Greater Manchester and Liverpool City Region has primarily focused on policy areas such as transport and skills. In parallel to this, subnational transport bodies such as Transport for the North and Midlands Connect have been established across new economic geographies. This form of devolution means that strategic decisions about infrastructure are made at the right level and are more closely integrated with other policy areas such as health and housing.

In England, it has been argued that the abolition of the Regional Development Agencies and Regional Planning Bodies in 2010 resulted in a more limited application of spatial and integrated planning.²⁸ This is not to say that the Regional Planning Bodies and their Regional Spatial Strategies (RSSs) were infallible. While it has been acknowledged that RSSs bridged the gap between planning issues determined at a local level and those set as national priority, the top-down nature of setting targets on housing numbers and perceived bureaucracy they brought to the process played a large part in the reason for their revocation.²⁹ The Scottish and Welsh governments, as well as the Greater London Authority, are current administrations to have spatial strategies that outline long-term housing and infrastructure plans.

Lessons need to be learned from previous and current deficiencies in the system, while building on the success seen recently in combined authorities and subnational transport bodies that have brought together multiple stakeholders in developing a coherent vision with continuous engagement.³⁰

26 RTPI (2013), *Delivering Large Scale Housing: Unlocking Schemes and Sites to Help Meet the UK's Housing Needs*

27 Copper (2015), *Independent Survey of Attitudes to Infrastructure in Great Britain*

28 Barton et al (2015), *Distributing Power. A Transition to a Civic Energy Future. Working Paper*

29 Communities and Local Government Committee (2011), *Abolition of Regional Spatial Strategies: A Planning Vacuum*

30 Grant Thornton, Bond Dickinson (2017), *Combined Authorities: Signs of Success*

Subnational infrastructure bodies

In 2016, ICE argued for the creation of cross-sectoral regional infrastructure forums, bringing together government, regulators, businesses and stakeholder representatives to develop regional infrastructure strategies.³¹ Feedback from the evidence-gathering process for this report shows that support for those forums is still high, and that housing must also be central to this, ensuring any planned infrastructure supports new housebuilding.

Forums for developing regional infrastructure strategies should be convened and managed by sub-national infrastructure bodies – these bodies would be created by extending the current remit of organisations like England's Economic Heartland, Transport for the North and Midlands Connect to include other economic infrastructure sectors, including housing.

It is important to emphasise that adequate infrastructure for housing is not simply a matter of transport connections. It is well known that transport infrastructure acts to support economic expansion and provision of new housing, and hence targeted investment to increase capacity should remain a priority.³² But with a net zero carbon emissions target in place, other infrastructure – such as heat and power networks, digital communications, electric vehicle charging and flood resilience – need to be considered, as well as a focus on sustainable travel options. Strategies at a regional level must consider all this in their development, focusing on how infrastructure and housing can be catalysts for reducing environmental impacts, utilising innovation and new technology to its greatest effect.

Each regional infrastructure strategy will be different and, depending on geography, have a multitude of stakeholders to engage. This would include, but not be limited to, combined authorities, regulators, local businesses, Local Enterprise Partnerships, community groups, national and local delivery bodies and central government departments.

These strategies must go beyond individual political cycles, both at a national and local level. Appropriate governance mechanisms must be created around them, allowing flexibility for principles and needs to evolve over time and in line with policy developments.

The strategies would highlight key infrastructure challenges, economic, environmental and social benefits, and provide potential investors with a degree of certainty around future planning and development within each region. To enable as integrated an approach as possible, the subnational infrastructure bodies should have clear reporting mechanisms coinciding with the NIC's operating cycle and production of its five-yearly National Infrastructure Assessment. This will allow regional infrastructure strategies to complement the National Infrastructure Strategy and ensure effective integration of infrastructure and housing planning across boundaries and at local, regional and national scales.

Case study: Scotland's Regional Spatial Strategies

The Planning (Scotland) Act, which received Royal Assent in June 2019, takes a new approach to strategic planning in Scotland by introducing a statutory duty on local authorities to work together to produce Regional Spatial Strategies (RSSs).³³ This replaces the previous Strategic Development Plans that covered four city-regions of Scotland.

An RSS is to identify:

- the need for strategic development
- the outcomes to which strategic development will contribute
- priorities for the delivery of strategic development, and
- proposed locations for strategic development.

In the context of the Act, 'strategic development' means 'development that is likely to have a significant impact on future development within the area of more than one planning authority'.³⁴

These strategies aim to provide long-term direction to large-scale development and match together local and national planning needs, outcomes and priorities. The change provides greater scope for regional planning to influence national plans.³⁵

31 ICE (2016), State of the Nation 2016: Devolution
32 IPA (2016), National Infrastructure Delivery Plan 2016–21

33 Scottish Government (2019), Communities given more say in planning

34 Planning (Scotland) Act 2019

35 Ibid

Utilities

Siloed planning and delivery of utilities infrastructure and housing means that providing utilities to new housing developments can often be a cause of delay to construction.³⁶ Utilities are a regulated industry and typically wait to provide infrastructure once a developer comes forward to pay for it; there are no incentives or disciplines currently in place to deliver in advance of developments. These can put the burden of cost on housebuilders, triggering a chain reaction where developer contributions then need to be renegotiated with the local authority in order to ensure the development remains viable, meaning other infrastructure or housing provision suffers.

Engagement with utilities is often undertaken by developers only when they are entering a contract with the landowner or at the planning application stage.³⁷ Strategic landowners and master developers will often engage earlier, outlining the longer-term plans for the development and infrastructure requirements. There are, however, opportunities for even earlier engagement and this is to be encouraged, particularly in light of the need for long-term regional infrastructure strategies.

The Letwin Review found that more effective coordination between government departments, agencies and private sector operators was urgently required to improve and accelerate the delivery of utility infrastructure before construction could begin.³⁸ Additionally, draft planning delivery advice by the Scottish government made clear the interdependencies between housing and utilities infrastructure, encouraging regular engagement in the development plan to provide clarity and certainty about necessary infrastructure investment.³⁹

There is therefore a recognised need to engage utilities early on longer-term plans. In most cases, utilities are not being incentivised for any level of engagement with the planning process.

Recommendation:

- Regulators should build greater flexibility into the utilities' regulated asset base model so that appropriate consideration can be given to providing infrastructure for permitted new housing developments outside of price control periods.



36 NIC (2017), Congestion, Capacity, Carbon: Priorities for National Infrastructure

37 Scottish Government (2017), Draft Planning Delivery Advice: Housing and Infrastructure

38 Rt Hon Sir Oliver Letwin MP (2018), Independent Review of Build Out

39 Scottish Government (2017), Draft Planning Delivery Advice: Housing and Infrastructure

Planning for the longer term

Guidance from the Ministry for Housing, Communities and Local Government (MHCLG) for English authorities, updated in July 2019, sets out that growth that requires new water supply should be reflected in companies' long-term water resources management plans to help ensure that the necessary infrastructure is funded through the water industry's price review.⁴⁰ The guidance encourages early discussions between water and sewerage companies and strategic policy-making authorities, a practice that might be formalised via the development of regional infrastructure strategies that outline the strategic need for major utility infrastructure.

The current regulatory asset base model across many of the utilities does not prioritise housing. The utility regulators' role in this must be recognised. The main challenge is that the regulatory framework does not easily allow investment to be planned ahead of need. In particular, as regulators' primary functions are to protect consumers' interests, they are keen to ensure that consumers do not pay for unnecessary expenditure on

infrastructure enhancements. It is therefore difficult for utilities to recover expenditure on enhancements without being able to demonstrate a need for the enhancement.

Flexibility is required by the regulators in how utilities account for housing development in their region, and go beyond asset management periods. Meanwhile, the performance of utility firms in delivering the necessary infrastructure to enable housing development should be monitored by regulators, and best practice highlighted and shared. With the development of regional infrastructure strategies that outline the strategic need for major utility infrastructure, it would be beneficial for regulators to require the utilities to make plans for infrastructure provision that meet the regional planning framework, factoring it into the regulated asset base and including it in their requirements and calculations.

There also needs to be a less siloed approach across multiple utility providers. Different sectors, through early engagement, could deliver and install multiple infrastructure assets through a single corridor, thereby reducing costs and disruption, and allowing for more efficient delivery of housing.

Case study: Greater London Authority's (GLA) Infrastructure and Development Coordination Team

The GLA, with backing and funding from industry, recently established an Infrastructure and Development Coordination Team (IDCT) to support coordination of infrastructure and development planning and delivery in London.⁴¹ The team is undertaking a range of projects, including those related to better delivery of infrastructure for housing.

The London Infrastructure Mapping Application (IMA), an interactive tool that explores current and future developments, supports this work. This includes identifying opportunities for joint infrastructure delivery and giving infrastructure providers insight into future projects.⁴² The IMA helps developers, providers and utilities to work together more effectively to phase projects, improving efficiency and reducing costs. The IMA currently offers two versions – a public one for all users, and a private one with additional datasets which registered users can access. This allows the GLA to respect constraints around releasing sensitive information publicly.

In addition, the IDCT is documenting projects in key growth areas in London where poor and inefficient planning for utilities has created uncertainty, causing development to stall. From these, the IDCT has sought to learn lessons and identify improvements that can be made to processes. This includes designing utilities infrastructure for better outcomes, identifying upfront land requirements, gaining a better understanding of local demand, and developing delivery programmes that incorporate collaboration as a key principle.⁴³



- 40 MHCLG (2019), Water Supply, Wastewater and Water Quality
- 41 Greater London Authority (2018), Infrastructure and Development Coordination Team
- 42 Greater London Authority, London Infrastructure Map
- 43 Infrastructure and Development Coordination Team, Planning for growth

Housing as an economic infrastructure asset

The delivery of infrastructure is often a lengthy and expensive process requiring substantial long-term financial commitments on the part of various key agencies and sectors. The establishment of the National Infrastructure Commission (NIC), the Infrastructure Commission for Scotland (ICfS) and the National Infrastructure Commission for Wales (NICW) has gone some way to outlining the options and direction of travel required, facilitating an evidence-based and informed debate about infrastructure that goes beyond short-term political interest.

There is ongoing debate about the relationship of housing and infrastructure and whether housing should be classified as infrastructure.⁴⁴ Some call for the classification of social housing alone as an infrastructure asset, others view the need to improve energy efficiency of existing homes as an infrastructure priority, while others go wider still and consider housing in its entirety.⁴⁵

Housing differs from the other infrastructure sectors. It is not a network and investments in housing can vary considerably in scale. Housing shares inextricable links with other forms of infrastructure – in particular with transport, energy, water, digital communications, flooding and waste – and should be integrated more closely at national, regional and local policy levels.

It is vital that the spatial implications of national infrastructure investment are understood, and in particular how this relates to locations where major development is proposed, and where resources are located in relation to demand.

The current remits of the NIC and NICW cover the interaction between infrastructure and housing, but not housing itself. This is in contrast to the ICfS, which does directly consider housing and other social infrastructure as part of its remit. The NIC and NICW should therefore include housing as part of their charters alongside economic infrastructure.

Recommendation

- The UK government should amend the charter of the National Infrastructure Commission to include housing alongside economic infrastructure, allowing more joined-up, long-term and evidence-based strategies on housing and infrastructure requirements.



⁴⁴ KPMG (2017), *Insight* magazine, issue 10

⁴⁵ Shelter (2018), *Building for our Future: A Vision for Social Housing*

Large-scale developments through the Planning Act

Nationally significant infrastructure projects do not exist in a vacuum. Rather, infrastructure policy should include the joined-up provision of housing and infrastructure, and in doing so take account of the wider needs of communities.

There are some important disconnects between infrastructure delivery and housing delivery. At a very large scale in England and Wales, the Development Consent Order (DCO) process for infrastructure can deliver only 500 homes maximum as part of any Nationally Significant Infrastructure Projects

(NSIP) application, which itself is dependent on functional need and geographic proximity.⁴⁶ Often, the homes delivered as part of the current NSIP regime include housing for key employees working on large-scale infrastructure schemes, such as at Hinkley Point C. This means the system is not used to deliver large-scale coordinated infrastructure and housing projects or facilitate strategic mixed-use schemes with business or commercial projects.

Recommendation

- The UK government should amend the Development Consent Order (DCO) process to enable large-scale housing developments of 5,000 or more homes to be delivered under it, ensuring greater coordination of housing delivery with nationally significant infrastructure, business and commercial projects.



⁴⁶ DCLG (2015), Housing and Planning Bill briefing note

Given the national urgency of addressing the housing crisis, this means that the infrastructure planning process is constraining the delivery of new communities and other large-scale housing schemes. New settlements are very large-scale projects providing an appropriate mix of uses across employment, services and leisure, including many elements that fall within the DCO regime – any development will require energy generation, water supply, waste treatment, transport links, as well as commercial space, and the DCO process allows them to be considered holistically.

A well-understood process

The success of the DCO process in delivering integrated consents for infrastructure projects of national importance suggests that there is no proper planning reason why it cannot be extended to deliver large-scale coordinated housing developments. A major benefit of the DCO process is that all powers required to deliver a project are wrapped into a single consent, such as environmental permits, highways orders and compulsory acquisition of land. Research has also shown the DCO process delivers high levels of certainty and transparency, helped in part by well-understood processes, a defined timescale and an extensive consultation period, providing confidence to all parties engaged in the process.⁴⁷

One question is whether housing would stand up to scrutiny as an issue of national need in this way, as opposed to a question of local or regional need. However, with a clear requirement to increase housing supply now and in the future and to deliver infrastructure alongside it, DCOs are the vehicle to use to bring into a single title what are often fragmented land ownerships.

On the face of it, it appears that having housing decisions taken at a national level runs counter to ICE's endorsement of regional infrastructure strategies and the government's shift over the last decade to a more localised planning process. However, the two are not mutually exclusive. ICE is not suggesting the DCO process is used to deliver regeneration, urban extensions and residential suburbs that may form part of a Local Plan; rather it would be used for new settlements of a nationally significant scale and form one part of the solution for delivering 300,000 new homes a year with infrastructure consideration at its heart. Indeed, a regional infrastructure strategy could well identify a suitable site for a new community, and be delivered in partnership across local authorities, developers, landowners and existing communities. However, it would be for the UK government to determine which bodies could take forward a DCO in order to prevent abuse of the system and ensure plans are in alignment with regional infrastructure strategies.

Major long-term housing proposals (approximately 5,000 units or more) should be considered as part of the NSIP planning regime. If approved under this regime, individual housing proposals would have in-principle government support and housing developers could then develop them in detail in partnership with local authorities and other organisations, and in combination with the required on and off-site infrastructure. This could be delivered most successfully through a master developer model or development corporation, as outlined in the Letwin Review.⁴⁸

47 UCL (2016), Infrastructure Delivery: The DCO Process in Context

48 Rt Hon Sir Oliver Letwin MP (2018), Independent Review of Build Out

Section 3: Funding and financing

Infrastructure provision for housing development

Recommendation:

- The UK government's commitment in 2018 to develop a Strategic Infrastructure Tariff that allows local authorities to pool resources to fund specific strategic infrastructure must be carried through by the new administration.

Developer contributions

Developer contributions have an appeal as a means of bringing funding for infrastructure development. They can be applied where individual developments are expected to create a burden on existing infrastructure, or increase the pool of resources which can be drawn on in developing infrastructure across a region.

Evidence from the National Audit Office (NAO) shows that the system to obtain contributions from developers towards the cost of infrastructure is not working effectively.⁴⁹ Local authorities in England and Wales are almost entirely dependent on government funding to meet their infrastructure ambitions. The only tools available to them are the Community Infrastructure Levy (CIL) and Section 106 (S106) contributions. Section 75 and 76 agreements are used in Scotland and Northern Ireland respectively, while the Scottish government is considering its own proposed Infrastructure Levy following on from a report by the Scottish Land Commission.⁵⁰ Planning obligations such as these are frequently renegotiated: 65% of planning authorities renegotiated a planning agreement in 2016/17.⁵¹ Changes to the type or amount of affordable housing agreed is one of the most common reasons for renegotiations recorded.⁵²

49 NAO (2019), Planning for New Homes

50 Scottish Land Commission (2019), Options for Land Value Uplift Capture

51 MHCLG (2018), Supporting Housing Delivery through Developer Contributions

52 Ibid

Social and economic infrastructure is often sacrificed in these renegotiations, increasing community frustration with the system.

CIL is voluntary for local authorities to implement and is most widely used in London and the south east, where land value is highest. The NAO found that both S106 and CIL are complex mechanisms that need to be applied more effectively, rigorously and consistently than at present in order to maximise contributions and enable supporting infrastructure to be in place.⁵³ Figures showed that CILs were yielding between 5% and 20% of the funding required for new infrastructure in an area.⁵⁴ As of January 2019, only 47% of authorities had implemented CIL; the estimate in 2011 was for between 82% and 92% of them to do so.⁵⁵ In some parts of the country, the land value uplift will be insufficient to fund the required infrastructure, irrespective of whether or not there is a CIL mechanism in place. In other words, CIL does not create value, it only captures it where it already exists.

Mechanisms such as developer contributions have a significant role to play in infrastructure delivery, but careful thought needs to be given to alternative ways in which funding for infrastructure can be raised, given the possible limitations of existing mechanisms such as planning obligations. Locally derived mechanisms such as strategic tariffs, used in Milton Keynes, might be one way forward, as well as learning from the indirect benefits of policies such as Nottingham City Council's Workplace Parking Levy. It is clear that developer contributions alone do not have the capacity to provide the necessary funding and investment to deliver all planned infrastructure requirements in a region, only those necessary to enable their development. However, there are improvements that can be made to existing policies in order to make better use of those contributions.

In 2018, the government decided to take forward a modified proposal to enable combined authorities with strategic planning

powers to adopt a Strategic Infrastructure Tariff, similar to the Mayoral CIL currently operating in London that was used to good effect with Crossrail.⁶² This will allow groups of charging authorities to use existing powers more effectively and support the delivery of strategic infrastructure, often cross-boundary, through the pooling of their local CIL receipts that can capture uplifts in land value.

Until recently, local planning authorities were unable to pool more than five S106 contributions towards a single infrastructure project or type.⁶³ The government has recognised that this restriction slowed down and prevented the delivery of infrastructure, and ICE supports the removal of pooling restrictions. The work done to develop a Strategic Infrastructure Tariff for combined authorities must be taken forward by the government.

A coordinated, proactive approach to infrastructure and housing is vital. There is a recognition that planning and investment in infrastructure creates an uplift in land value, which can encourage developers to invest and accelerate delivery on sites which may already have planning permission.⁶⁴

If captured by a public body or strategic landowner, this value can deliver further social and economic benefits.⁶⁵ But this can only happen consistently if housing and infrastructure delivery are coordinated, or if a body in question has the power to capture the uplift. Frequently, new infrastructure is provided without such mechanisms in place. In 2018, KPMG and Savills calculated that eight prospective TfL projects (including Crossrail 2, the Bakerloo line extension and the DLR extension to Thamesmead) cost £36 billion, but could produce land value uplifts of £63 billion on existing stock, and £24 billion on new development.⁶⁶ The problem is particularly immediate in the delivery of new sites.

As outlined in ICE's 2018 State of the Nation report into infrastructure investment, ICE supports efforts to realise value uplift outlined in the National Infrastructure Assessment.⁶⁷ This includes investigation of zonal precepts where property value uplifts are realised and removal of ballot requirements to raise business rate supplements. The government should also consider new primary legislation to enable projects to include land value uplift as part of the funding package for infrastructure development.

Case study: Meridian Water, Enfield Council

Meridian Water is located in the south east of the London Borough of Enfield, benefiting from its proximity to the River Lee, Lee Valley Park, the A406 and a train line into central London.

The ambition for the project is to create an exemplary new piece of the city that delivers 10,000 new homes, 6,000 jobs and new schools, health facilities, parks and local amenities over a 25-year period.⁵⁶

Enfield Council itself has assumed the role of master developer to de-risk the project, a pioneering approach for a local authority that sees the council lead responsibility for setting strategies, working up the masterplan and selecting development partners to bring forward phases incrementally.

The new Meridian Water train station opened in June 2019, part of Enfield Council's aim to strategically frontload the infrastructure in order to unlock further development. The station will

eventually serve an estimated 4 million passengers a year.⁵⁷ In terms of energy infrastructure, the council-owned district heating network, Energetik, plans to provide heat to the homes and businesses in the area.⁵⁸ The project was awarded £156 million of Housing Infrastructure Fund funding in August 2019 to deliver further rail works, road infrastructure, land remediation, flood alleviation and utilities.⁵⁹

Enfield Council has been assembling the site for over four years, completing multiple site acquisitions totalling 38 hectares at a cost of £160 million.⁶⁰ This has allowed the scheme to be delivered faster than relying on compulsory purchase orders, while enabling the council to maximise returns ahead of selling the land to developers on a phased basis. On parts of the site that are not due to be developed for a number of years, the council has provided space for small businesses, music and cultural venues.⁶¹

53 NAO (2019), Planning for New Homes
54 DCLG (2017), The Value, Impact and Delivery of the Community Infrastructure Levy
55 NAO (2019), Planning for New Homes
56 Meridian Water (2019), A new part of London at Meridian Water
57 Meridian Water (2019), London's newest station
58 Ibid
59 HM Government (2019), £600 million boost for housing
60 Meridian Water (2019), A new part of London at Meridian Water
61 Ibid

62 MHCLG (2019), Government Response to Supporting Housing Delivery through Developer Contributions
63 MHCLG (2018), Reforming Developer Contributions
64 Housing, Communities and Local Government Committee (2018), Land Value Capture
65 Savills (2018), Infrastructure investment and land value uplift
66 TfL (2017), Land Value Capture
67 ICE (2018), State of the Nation 2018: Infrastructure Investment

Case study: Milton Keynes Tariff

The Milton Keynes Tariff was introduced in 2004 to fund economic and social infrastructure in strategic expansion areas. Unlike Section 106 agreements, Milton Keynes was able to borrow money from the then Homes and Communities Agency to forward-fund infrastructure against expected tariff receipts. Under the tariff model, the developer pays 75% of the charge on completion rather than upfront, reducing the need for borrowing and allowing for greater certainty for both partners. Some payments were delivered 'in kind' if developers provided specified infrastructure or public space. Despite its effectiveness, this model was replaced by the CIL as it offered similar powers.⁶⁸

The model brought landowners into a partnership with developers so that funding agreements could be put in place at the outset. A model such as this allows the local authority to borrow more, while the certainty of infrastructure encourages developers to commit.⁶⁹ There are risks with this approach, however. Homes may follow late or not at all, and may be unable to generate sufficient value to repay the upfront investment.

Case study: Nottingham City Council's Workplace Parking Levy

Nottingham City Council introduced a Workplace Parking Levy (WPL) in 2012 in a bid to tackle the region's traffic congestion.⁷⁰ The levy works as a demand-management tool focusing on commuter parking and acts as an incentive for employers to manage their workplace parking provision. The money raised goes towards the council's plans to extend the existing tram system, redevelop Nottingham train station and provide support to the local bus network. In 2019–20, the levy is set at an annual charge of £415 per parking place for employers with 11 or more spaces.⁷¹

A total of £44 million was raised through the initiative in its first five years, which also saw a 33% fall in carbon dioxide emissions and public transport use increase to over 40% – one of the highest usage rates of any city in the UK.⁷² As an indirect benefit to housing, employers in the city, such as the University of Nottingham, converted land previously preserved for car parking into residential and commercial use as a result of the policy.⁷³

68 Centre for Cities (2014), Milton Keynes Tariff: funding infrastructure upfront

69 Ibid

70 Nottingham City Council, Workplace Parking Levy

71 Ibid

72 Centre for Cities (2017), Funding and financing inclusive growth in cities

73 Ibid

Housing Infrastructure Fund

Where land value capture is insufficient to fund supporting infrastructure for housing, direct investment is often required.

As part of the evidence-gathering process for this report, ICE received generally positive feedback from stakeholders in all areas of the housing and infrastructure sphere on the impact of the Housing Infrastructure Fund (HIF) in England.

HIF is a £5.5-billion pot of central government funding split into two sections: marginal viability and forward funding. The majority of funding is in the latter section, with £900 million allocated for marginal viability. Individual bids for marginal viability are capped at £10 million, as the government's aim is for local authorities to use it for 'the final, or missing, piece of infrastructure funding to get additional sites... unblocked quickly'.⁷⁴

ICE heard no calls to remove HIF as a mechanism, and indeed there was enthusiastic support to extend it further, but there were concerns over the bidding process.⁷⁵ Within the current permitted timeframe for bidding applications, it may be difficult to accurately identify the mix of potential development at a strategic level. ICE also heard evidence of poor-quality bids being submitted within the deadline period that do not meet the HIF criteria for demonstrating an overarching vision that integrates existing proposals and initiatives.⁷⁶ In addition to extending HIF further into the future to continue its momentum and impact, it should move from a series of defined bidding rounds to a continuous programme of funding, thereby ensuring that a more strategic approach to infrastructure provision can be delivered by authorities.

The government makes a calculation when comparing HIF bids to judge which ones will deliver the greatest benefits. As HIF is seeking the highest return from least investment, this often has a bias towards areas of higher land value and house prices, such as London, the south east, south west and east of England. Analysis in May 2019 showed that 66% of provisionally accepted HIF bids were for those four areas.⁷⁷ While there is no doubt that areas of highest housing and infrastructure demand should be prioritised, the government should explore the option of allocating a separate portion of HIF for areas of lower land value, ensuring that strategic sites nationwide are unlocked for housing development that will provide additional community benefits. This should be subject to a robust process and show clear evidence of demand, with a coherent place-based offering.

Scotland has its own HIF equivalent which works differently from that in England. It prioritises developments which deliver affordable and private rented housing, and provides loans to non-public sector organisations and grants to local authorities and Registered Social Landlords to unlock sites for housing development with infrastructure.⁷⁸ So far, almost £18 million has been approved in grants and £14 million in loans.⁷⁹

The HIF in Scotland must continue beyond its current period of 2021 in order to keep up the momentum generated by the More Homes Scotland programme, alongside the £25-million Rural Housing Fund and £5-million Islands Housing Fund. Wales lacks a HIF equivalent and the Welsh government should explore creating one, basing its principles on the Well-being of Future Generations Act.

Recommendations:

- The Housing Infrastructure Fund in England should be extended beyond 2023–24 and moved to a continuous programme of funding, as opposed to defined bidding rounds. Consideration should also be given to ring-fencing a specific amount of funding for areas of lower land value to ensure more strategic sites nationwide are unlocked for housing development.
- The Scottish Housing Infrastructure Fund, Rural Housing Fund and Islands Housing Fund should be continued beyond 2021 in order to sustain the momentum generated by the More Homes Scotland programme.
- The Welsh government should consider establishing its own version of a Housing Infrastructure Fund in order to unlock strategic sites for development, drawing on the principles of the Well-being of Future Generations Act.

74 HM Government (2019), Housing Infrastructure Fund

75 Evidence from ICE regional evidence-gathering sessions

76 Evidence from ICE regional evidence-gathering sessions

77 Lichfields (2019), Housing Infrastructure Fund: The story so far

78 Scottish Government (2019), Housing Infrastructure Fund

79 Scottish Government (2019), HIF breakdown and details: FOI release

Section 4: Planning for the future

Recommendation:

- The next National Infrastructure Assessment should identify options for future-proofing new housing developments and strengthening existing communities, ensuring that decisions are strongly linked to the transformation in transport, water, energy and digital infrastructure that technology will enable and climate change will demand. This should feed into developing and iterating the Future Homes Standard in England.

Projections indicate that the UK population will grow to 77 million by 2050.⁸⁰ This will inevitably impact across a whole range of housing and infrastructure needs. In general, people are likely to live longer (the proportion of those aged 85 and over is projected to double within 25 years), migrate more and concentrate in denser urban environments. At the same time, households are getting smaller, creating changing needs for housing, communities and infrastructure.⁸¹

In parallel, there is a need for future-proofed housing that addresses 21st-century issues – in particular new homes and supporting infrastructure that are planned and delivered to take best advantage of technological advances while playing their part in addressing the net zero carbon target. There are pockets of best practice emerging across both fronts, often led by strategic landowners who have a long-term interest in the formation of strong communities. Unfortunately, there are still many examples of housing that is simply in the wrong place imposing, for example, outdated transport solutions at costs that are unsustainable and unaffordable to future residents, with consequent social impacts.⁸²

⁸⁰ Eurostat, ONS (2017), Overview of the UK population: March 2017

⁸¹ ONS (2017), Families and households

⁸² Transport for New Homes (2018), Project Summary and Recommendations

The choice of location for housing determines a wide range of subsequent long-term infrastructure requirements. For example, a location that does not permit active travel options such as walking or cycling, or support high-frequency public transport tends to necessitate the allocation of more land for car parking.⁸³ At present, too many housing developments are being built with insufficient regard to the sustainability of the location.⁸⁴ In particular, despite growing awareness of sustainability concerns, large greenfield developments continue to be built without quality access to dense, diverse public transport networks, and in locations where there are few practical alternatives to car ownership and use.⁸⁵ This tends to create a legacy of low-density, car-dependent housing, which will have long-term consequences for energy use, carbon emissions and air quality.

In a survey of over 2,000 British adults conducted as part of this report, 53% believe the highest priority should be given to public transport infrastructure, such as rail and

buses, when planning the building of new homes in their area. Across those who support the development of more housing in their area, this increases to 62%.

Where housing is located can also lead to other, less obvious, consequences. The area required for car parking and roads determines the volume of run-off, impacting on the design of the drainage system, the potential to introduce sustainable urban drainage systems (SuDS), and the amount of land left over for publicly accessible open space.

The challenge here is that a one-size-fits-all approach may not be suitable. Solutions that take advantage of new and emerging technological potential whilst addressing the urgent need to achieve net zero carbon outcomes are not singular but plural, not static but dynamic and subject to change over time. The range of tools available across the spectrum of new and existing homes and their supporting infrastructure is large and diverse, and the benefits gained from each will vary according to local circumstances.

There are, however, common themes emerging around which a national policy direction would help to kick-start and embed appropriate action. At the moment, for example, there is no national policy direction to address electric vehicles, connected and autonomous vehicles (CAVs), air pollution, the need for adaptable homes, or the core consideration of how to reach the net zero carbon commitments by 2050, or 2045 in the case of Scotland.

The upcoming Future Homes Standard presents an enormous opportunity to deliver high-quality housing and placemaking to ensure that policies on net zero carbon can be set and achieved, while giving certainty to developers about the common set of standards that must be applied.

Together with ICE's call for the National Infrastructure Commission and National Infrastructure Commission for Wales to include housing within their respective remits, this presents the next National Infrastructure Assessment in 2023 with the opportunity to identify how to deliver housing and infrastructure in an integrated and holistic way. The UK, Northern Irish, Scottish and Welsh governments should develop stable, joined-up policy frameworks and direction of travel across a number of areas associated with housing, most prominently those related to reaching the net zero carbon target and mitigating climate change impacts while taking advantage of technological advancement. Immediate agenda items would include electric vehicle charging provision, the decarbonisation of heat, low carbon public transport alternatives, and improved flood resilience. There are strong links here to long-term regional infrastructure strategies that join up housing and infrastructure delivery.

The ideal outcome of this approach is one where landowners, developers, local authorities and others deliver future-proofed housing that is able to meet these challenges head-on. There needs to be a paradigm shift in which only housing that facilitates low carbon living is acceptable by the public, with quality development becoming 'business as usual' across the industry.

Figure 2: Which, if any, of the following types of new infrastructure should be given highest priority when planning the building of new housing in your local area in the future?



Source: Ipsos MORI
Base: 2,148 GB adults 18–75,
23–27 August 2019

83 Transport for New Homes (2018), Project Summary and Recommendations

84 RTPI (2016), The Location of Development

85 Urban Transport Group (2019), The Place to Be

Decarbonising energy for homes

The pressure of climate change is adding urgency to the need to deliver more energy efficient new homes and to retrofit existing housing stock. Energy use in UK homes generated 14% of national total carbon emissions in 2018, a figure that increased by 1% relative to the year before.⁸⁶ The existing housing stock is largely dependent on gas; according to the 2017–18 English Housing Survey, 86% of dwellings in England are connected to the mains gas supply.⁸⁷

If the UK is to meet its legally binding climate commitments, direct emissions from the UK's stock of existing and future housing must be reduced to almost zero by mid-century.⁸⁸ Making homes more energy efficient can prevent expensive investments in generation, transmission and distribution infrastructure and reduce reliance on fuel imports, potentially saving an estimated £4.3 billion in electricity network investment.⁸⁹

The Committee on Climate Change (CCC) have called for no new connections to the gas grid from 2025; instead homes must be heated via heat pumps or other sources, such as hydrogen or biomethane, and use induction hobs or other future non-gas dependent technologies for cooking. In the 2019 Spring Statement, the then-Chancellor confirmed that a Future Homes Standard will be introduced by 2025 so that new-build homes are future-proofed with low carbon heating and high levels of energy efficiency. This includes implementing the CCC's recommendation for no new homes to be built with fossil fuel heating from 2025.⁹⁰

Housing locations influence the effectiveness of different energy sources, as the choice of technology will depend on the population density and types of properties in the area served.⁹¹ In places off the gas grid or with low population density, electric heat pumps are likely to be the most suitable solution. However, in densely populated urban and suburban areas, repurposing of the existing gas grid for hydrogen may offer a better opportunity as it avoids disruption to households and would permit the use of existing gas storage assets for inter-seasonal demand management.

A housing growth programme also offers an opportunity to accelerate the deployment of decentralised energy systems in new developments, most notably in areas of high density.

Case study: Rugeley Power Station, ENGIE

ENGIE is taking a strategic and infrastructure-led approach to designing, delivering and operating its low carbon 350-acre development at the former Rugeley Power Station in Staffordshire.⁹²

The proposed development will deliver up to:

- 2,300 mixed tenure homes
- 5 hectares of employment land
- 3.2 hectares of ground mounted solar panels,
- 1.2 hectares of mixed-use development comprising community facilities, neighbourhood amenity and a 2-form school
- a new 'country park', town centre and transport links

As master developer this is the first time that a major UK energy company has directly repurposed one of its own sites. ENGIE is seeking to establish a 'market shifting' model to meet current housing needs and clean growth targets through ensuring connectivity, sustainable infrastructure and community activation.⁹³

ENGIE has invested heavily in exploring how infrastructure can drive greater value and more sustainable outcomes together with improvements in building specifications, performance criteria and digitally enabled homes. An integrated

view that encompasses renewable generation, mobility, transport, domestic energy use and smart energy systems has provided a long-term model of how housing-led redevelopment can begin move away from relying on short-term revenue streams to securing longer-term investment.⁹⁴

Scheme initiatives include autonomous vehicle trials together with community energy systems which generate renewable energy and optimise consumption through centrally controlled systems, such as solar and battery microgrid solutions. The systems are planned to be capable of extension and modification to include infrastructure for electric vehicles, hydrogen storage and grid flexibility services.

ENGIE's aspirations go wider and the company is exploring the potential to develop the town of Rugeley as an 'Energy Innovation Zone' that connects new development with existing infrastructure to optimise energy usage at a town scale.

By ensuring that infrastructure is planned at the outset to add long-term value to its place-shaping activities, ENGIE is hoping to ensure a delivery mechanism that encourages and aligns investor objectives and complements the existing market to become genuinely scalable.



86 Committee on Climate Change (2019), UK Housing: Fit for the Future?
87 MHCLG (2019), English Housing Survey Energy Report 2017–18
88 Committee on Climate Change (2019), UK Housing: Fit for the Future?
89 Committee on Climate Change (2017), Energy Prices and Bills – Impacts of Meeting Carbon Budgets
90 HMT (2019), 2019 Spring Statement
91 ICE (2016), National Needs Assessment

92 Cannock Chase District Council (2019), Rugeley Power Station Site Re-Development
93 ENGIE (2018), ENGIE begins consultation for landmark Rugeley redevelopment
94 Ibid

Electric vehicles, connectivity and automation

While a lack of adequate transport infrastructure may present an obstacle to housing delivery in certain locations, where housing is delivered despite inadequate transport infrastructure the result is an increase in congestion, carbon emissions and air pollution.

A 2018 ICE paper on delivering electric vehicle (EV) charging infrastructure found that there is a lack of drive in the National Planning Policy Framework to enable delivery and a failure to use existing powers to compel EV charging infrastructure in new developments.⁹⁵

The UK is witnessing a doubling in its electric vehicle stock every year, albeit from a low base.⁹⁶ Central and devolved governments are proposing and implementing legislation to support EV adoption, though there are a number of issues around capacity of the grid and the need to upscale charging infrastructure. The government estimates that the cost of installing EV charge points upfront in new developments is significantly lower than retrofitting them once a home has been built; approximately £976 for upfront installation in an average home compared to £2,040 for a retrofitted chargepoint.⁹⁷ It is clear, then, that there are extensive cost

savings for society if the infrastructure is installed upfront, alongside the point-of-use environmental benefits that EVs offer.

While it is encouraging to see the UK government begin to consult on measures to install EV charging infrastructure in residential and non-residential buildings, greater consideration should be given to providing rapid charge points at a community hub level in new developments, particularly in areas of high urban density. This has a number of benefits, including delivery of and access to the infrastructure in a single place, which will allow the network operator to better monitor and manage the impact on the local grid as well as install potential technological upgrades in the future.

With the EV transition and onward shift towards increasingly connected and automated vehicles (CAVs) comes a far greater strategic opportunity to rethink private car use. By only replacing today's privately-owned cars with smarter future equivalents, this misses the opportunity to create a healthier transport system that can support future communities and is accessible to all. The introduction of shared fleets at place or community level would bring significant new potential to reduce and manage EV-related peak charging demand, maximise congestion reduction and offer new prospects to make productive use of land that would otherwise have been used for parked vehicles.

Water

Housing delivery in locations at risk of flooding or water shortage results in a need for greater capacity and investment in these sectors. Demand for flood defence and management infrastructure can be mitigated by ensuring that new development occurs in areas at low risk from flooding and unlikely to produce downstream flooding impacts. ICE's National Needs Assessment identified the need for better alignment and closer working between the Environment Agency (for England) and the Scottish Environment Protection Agency to harmonise planning and environmental guidance on flood scheme appraisal.⁹⁸ Flood risk – as well as demand for water and wastewater infrastructure – can be further managed with the installation of SuDS, green infrastructure, dual wastewater and storm water networks, grey water reuse and rainwater harvesting in new developments.

England and Wales have different regulatory frameworks around SuDS, with Wales having introduced new legislation in January 2019 that makes SuDS a mandatory requirement for all new developments of more than one house or where the construction area is 100m² or more. Some 60% of SuDS professionals in England have experienced planning applications being delayed or blocked because of refusal on the grounds of the SuDS design. This compares with only 30% of SuDS professionals in Wales experiencing the same issue.⁹⁹ Lessons should be learned from Wales' application of the SuDS framework and be applied where appropriate in order to smooth the planning process further.



⁹⁵ ICE (2018), Delivering Electric Vehicle Charging Infrastructure

⁹⁶ PwC (2018), Charging Ahead

⁹⁷ HM Government (2019), Electric Vehicle Charging in Residential and Non-Residential Buildings

⁹⁸ ICE (2016), National Needs Assessment

⁹⁹ Wavin/ICE (2019), SuDS – Perception and Progress: A Comparison of England and Wales

Annex 1:

International examples of housing and infrastructure planning and delivery

These examples provide an overview of how other advanced economy nations develop different approaches to paying for, planning and delivering the infrastructure needed to support new housing development. They also outline who pays for infrastructure provision, what compensation and incentive policies are in place, whether there is a national or regional spatial plan, and whether any land value capture mechanisms are employed.

Australia – Nicole Gurran, University of Sydney

There has been growing concern in Australia that infrastructure has failed to keep pace with growth – which over the past 30 years has focused increasingly on the major cities; and parallel criticism that infrastructure to support growth in regional areas has been neglected, due to continued cutbacks in capital expenditure by governments.

Australia has a three-tiered system of government defined by a national level ('Commonwealth'), six states and two self-governing territories, as well as local government. The States and Territories have primary responsibility for land-use planning, although local governments play an important role in making local plans and assessing development proposals. Responsibility for infrastructure funding and delivery straddles all three levels, with the Commonwealth funding and delivering major interstate highways and communications, the States responsible for transport, social housing and the environment, while local government manages local roads and waste. Water and energy utilities are provided by regional or local corporations, regulated by the States/Territories.

Public private partnerships are often used to fund major infrastructure projects in Australia, particularly in relation to roads and transport, with user charges (tolls and fares) used for partial recoupment of upfront costs.

The Commonwealth is developing an infrastructure planning and funding capacity and has recently established the National Housing Infrastructure Facility, to help finance infrastructure to

support housing development, such as energy, transport, water, sewerage or communications.¹⁰⁰

Contributions are also sought from developers to pay for the shared or public infrastructure requirements associated with their development. Initially, these development contributions were limited to costs of basic services essential to housing development – like roads, drains, sewerage and water, and sometimes open space, with contributions levied by local government but within the parameters set by the States and Territories. Different approaches to these local development contributions were enabled by the States/Territories – ranging from a comprehensive range of items which can be levied for (NSW, Victoria, Queensland) to more limited requirements around car parking and open space (South Australia).¹⁰¹

The states have also established strong parameters within which local contributions for infrastructure can be collected, seeking to balance the need to secure or recoup funding for the basic services needed to support new housing and urban development against the risk that overly onerous requirements will discourage growth. There has also been a new trend over the past decade for states to add their own contribution requirements to those imposed by local government. In greenfield areas, a variety of arrangements exist, depending on land ownership. Under the 'precinct acceleration protocol', developers may install infrastructure upfront to service their own projects, being recouped for excess contributions subsequently as new development takes place.

Canada – Professor Pierre Filion, University of Waterloo

In Canada, legislation pertaining to municipalities and land-use planning is a provincial and territorial jurisdiction. Accordingly, there are 13 different legal and regulatory contexts governing the relation between housing development and the provision of infrastructure. In reality, however, these contexts tend to be quite similar. This example considers the most populous province, Ontario, which is briefly contrasted with Quebec, whose approach to residential infrastructure funding has, until recently, most contrasted with the nationwide norm.

The majority of housing developments requiring the construction of new infrastructures happen in suburban subdivisions. In Ontario, a developer must submit a subdivision plan to the municipal planning department. The plan, generally expected to reflect prevailing zoning by-laws, portrays the layout of the proposed development, including streets, parks and schools. The subdivision plan agreement issued by the municipality specifies the responsibilities of the developer, which typically involve the construction of the local infrastructure (roads, water and sewage pipes, landscaping of the public realm, etc.). The construction of these infrastructures must meet standards set by the municipality, which takes over their ownership and maintenance once they are completed. Their construction cost is passed on to the purchasers of the buildings within the subdivision. Other infrastructures, such as arterials, public transit, schools, libraries, water treatment and sewage capacity, are funded by development charges levied on new residential and commercial structures. Their amount is set according to types of residential units and amount of commercial space.

100 National Housing Infrastructure Facility (NHIF) Finance

101 Gurran, N (2011), Australian Urban Land Use Planning: Principles, Systems and Practice

While this funding system assures the funding of the local infrastructures required for new residential development without affecting the tax burden or debt load of a municipality, it fails to address broader geographical and temporal impacts of such developments. Major transportation investments, such as rail public transit and strategic roads, are not funded through this system. They rely in large part on contributions from the provincial and federal governments, whose willingness to pay for such infrastructures varies according to their respective financial situation and political priorities. In large urban regions, the consequence is a transportation infrastructure deficit at the metropolitan scale, a source of congestion and public resentment. If the involvement of developers in the provision of local infrastructures and reliance on development charges secure the financial health of growing suburban municipalities, this situation is reversed when they mature and reach their built-out stage. They must then rely on tax revenues to fix and upgrade infrastructures, causing their tax rate to increase and thus making it difficult to compete with developing municipalities for new investment.

Until recently, in the Province of Quebec most local infrastructures have been built by municipalities, relying on debt to be serviced by tax revenues generated by new developments. Because they do not need to shoulder the responsibility for the construction of infrastructure, there are more small developers in Quebec, which makes for a more competitive residential building scene and lower housing prices. However, responding to concerns about the municipal financial burden, provincial legislation now permits reliance on development charges for the funding of infrastructures.

Germany – Friedhelm Karl Fischer, University of Kassel

In Germany, land use planning and the provision of infrastructure is a public responsibility, in which the three levels of government play different roles. The rules structuring the connections between housing and infrastructure are enshrined in the Basic Law (constitution) of the Federal Republic and specified in the Federal Building Code.

Their application and translation into built reality is shaped by the complex patterns of municipalities and regions. The particular complexity of the German system is a consequence of the polycentric character of the German urban system and the degree of autonomy of municipalities and regions.

Against this background, the overall rules of the framework are set at the federal level, to be carried out at the levels of the 16 Laender (states/regional governments), the 633 groups of local municipal communities and the 7,240 local/municipal communities. These principles are translated into a sequence of plans cascading down from the federal, the regional, and the sub-regional to the local level. The level of autonomy and discretion at these lower levels of government make for flexible but also overall complex patterns of rule-making.

Complex patterns of recovering the cost of infrastructure development have been devised over time. They include grants from the state, charges on developers, various forms of planning agreements and forms of recouping betterment, all of which are currently objects of intense debate and reform. In addition, other forms of public activity in the development process, for example through the acquisition and sale of land, the inclusion of strategies for social housing, co-operatives and self-help structures, can vary the way in which infrastructure costs are met.

Commonly, the process of paying for infrastructure development begins with development charges levied on owners through mechanisms such as the Communal Levies Act. As a rule, landowners pay a maximum of 90% (for instance if the site is to be developed for the first time) and the local authority pays a minimum of 10%. However, a range of special local and state laws are used by local authorities to vary the level of charges for landowners. They include state legislation which requires owners and developers to share the cost of land improvement for initial provision, particularly of vehicular and pedestrian infrastructure such as roads and utilities and also allow the municipality to contract out land improvement to third parties.

A wide range of planning instruments have been introduced to deal specifically with the provision of infrastructure, such as contracts linked to project and infrastructure plans. Combining the aims of paying for infrastructure cost and involving private actors in the development process, the planning agreements that have been most important and successful are the urban development contract (Städtebaulicher Vertrag) and the urban development procedure (Städtebauliche Entwicklungsmaßnahme). Another example is the project-based binding land use plan. Such plans permit the municipality to grant permission for projects where, on the basis of an agreed project and infrastructure plan, the project developer undertakes to complete the plan within a certain delay and fully or partly assumes planning and land improvement costs.

Different mechanisms for the capture of planning gain have been developed in various cities and have had a degree of success in prospering cities such as Munich and Stuttgart, but are difficult to transfer to other, less prosperous cities.

Netherlands – Dominic Stead, Delft University of Technology

Dutch municipalities have long been involved in active land development for new residential and commercial areas. Up to the 1990s, the most widely used approach to land development involved a municipality (or a municipal land company) acquiring land from its owners, subdividing it for different purposes, servicing the land and providing infrastructure. Serviced land would then be sold to developers, housing associations (for social housing), owner-occupiers or others (e.g. schools). The price at which land was sold to housing associations was determined by government regulation.

Since the mid-1990s, three broad approaches for active land development, often combined within a single development area, are used to pursue active land policies: (i) the building claims model; (ii) joint ventures; and (iii) the concession model.¹⁰²

The building claims model involves property developers voluntarily selling land to the municipality. In return, the municipality commits to selling a specified amount of serviced land to the developer later in the process.¹⁰³ The municipality then services the land and installs infrastructure for the whole development area. Developers subsequently buy land from the municipality at a set price and can choose when to build.¹⁰⁴

Joint ventures involve establishing a company to undertake land development, with the shares divided between developers and the municipality. The company acquires land and services it, then sells the serviced land for development. The shareholders agree among themselves as to whom the land will be sold and at what price. The profits on land development are divided proportionately among the shareholders.

The concession model comes closest to the commercial development model used for large projects in many countries. The land is acquired, serviced and developed by one or more developers. Negotiations take place between the municipality and the developers regarding the arrangements for land servicing and how this is financed and on the content of the plan.

From 2008, municipalities were given enhanced powers to recover the costs of betterment (the increased value of property due to the implementation of a plan), even in situations where they do not own the land. The legislation also gave municipalities the authority to require private developers to include a certain amount of affordable housing in developments. While these changes have given municipalities greater ability to achieve their objectives in situations where they do not own land, most municipalities continue to use a public land development strategy in order to keep tight control over developments.¹⁰⁵

Where a land-use plan has been adopted, compulsory purchase powers can be used if they are needed to implement development set out in a plan. For example, compulsory purchase powers can be used if a landowner is unwilling to develop their land in accordance with the plan or to sell to the municipality. Procedures exist to establish the appropriate level of financial compensation for the landowner. These compulsory purchase powers mean that landowners generally tend to cooperate in implementing a land-use plan.

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Annex 2:

Acknowledgements

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- Manchester City Council
- Markides Associates
- Milton Keynes Council
- Mott MacDonald
- National Federation of Builders
- National Housing Federation
- NIE Networks
- North East Local Enterprise Partnership
- Northern Ireland Department for Infrastructure
- Northern Ireland Department of Finance
- Northern Ireland Housing Executive
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