We Can Build a City

A report by the Forest City 1 project detailing solutions to how Britain builds its first new city in 50+ years. In six major topic areas—economics, nature, water, housing, transport, and technology—we demonstrate that it is possible to undertake a vision led project of such ambition and scale.

Forest City 1, April 2026



What Forest City Supporters Say

“It is in the National Interest that we put our faith in people and organisations that believe that the future remains ours to make. All across the country people are listless in the face of inertia. Forest City provides a creative spark, an imaginative leap and a roadmap for a beautiful future with a new way to live. How much better to aim for something that a century from now will have people thankful we were here at this moment, than held transfixed in aspic by an imagined glorious past. We are about to enter a new era where the old ways will be left behind. Embrace the new, with a gentle nod to the past and we will reignite the flame of creativity that once singled us out and can, yet again.”

- **Sir Tim Smit, Founder of the Eden Project**

“Building a new city may seem outrageously audacious but it’s part of what will make national renewal real. And if it’s done with genuine partnership and a focus on people and place, it could transform the opportunities for today’s and tomorrow’s new generations.”

- **Dame Patricia Hewitt, former Labour Secretary of State for Trade & Industry, and Chair of Advisory Board, ACDC**

“The UK desperately needs new housing, new ideas, and catalysts for growth. Forest City is a bold attempt to bring those together in an area of huge economic potential. If we are serious about getting on the right economic track we need to get serious about Forest City, and other innovative projects which will support growth and prosperity."

- **Paul Johnson, former head of the IFS (ACDC advisory board)**

“Forest City 1 is a chance for the UK to reinvent placemaking, land use and the planning system. It can serve as a blueprint for growth, while solving some of the greatest challenges the nation faces such as the housing emergency, nature depletion and the skill crisis. It needs to be taken seriously and we certainly back the proposal...It’s a chance for this government, who has a mission to enable growth and solve the housing crisis, to leave a mark as well loved as the NHS.”

- **Richard Beresford, Chief Executive of the National Federation of Housebuilders**

“We talk about the UK's creative and cultural industries as an incredible national strength, but we will slowly strangle them by failing to build places where creative and dynamic people can actually afford to live. Forest City is an opportunity to design, from scratch, the kind of place that attracts the scientists, creators and entrepreneurs who will shape the 21st and 22nd century. Done right, it could be Britain's most ambitious act in the physical environment in a generation. I spent six years as a DCMS Minister bolstering Britain’s global standing as a place that does extraordinary things. Forest City would be an excellent way to cement that standing.”

- **Lord Edward Vaizey, former Conservative Minister for Culture**

“The UK needs far more houses. They need to be in the right places...The area around Cambridge is such a place. Stanford University has powered the economy of the entire San Francisco Bay area, and to some extent the US as a whole, only because university spin outs could find space for commercial labs, and because workers could find somewhere to live. Forest City will allow Cambridge University to do the same for this area, and make the UK as a whole much better off. And using a Community Land Trust means that build out rates can be rapid - exactly as they were in the UK in the Industrial Revolution. Let’s make this happen.”

- **Professor Tim Leunig, former Chief Economic Advisor to two Prime Ministers (ACDC advisory board)**

“The economy is roundly screwed. Now is not the time to be timid. Never underestimate the major hurdles to be overcome, but...I am throwing caution to the wind and chucking my weight behind this project, these ideas and these people.”

- **Jackie Sadek, UK Innovation Corridor Chair (ACDC advisory board)**

“Cambridge is one of the most important innovation clusters in the world, but it’s being held back by a lack of housing and infrastructure. Forest City is a serious answer to a serious problem. If we want to keep world-class talent building in the UK, we need to give them somewhere to live.”

- **Barney Hussey-Yeo, Founder of Cleo, UK AI fintech unicorn**

“Forest City will be a magnificent template for future settlements at home with nature and technology. It will restate the UK’s pre-eminence in urban planning and placemaking and deliver affordable homes, extraordinary careers and unique leisure landscapes. If this were not enough, it will provide a fundamental building block for new skills in design and construction industries and boost the growth of knowledge and creative economies”

- **Steve McAdam, Architect, Olympics and King’s Cross Masterplanner (ACDC advisory board)**

"World-leading innovation clusters do not grow in isolation - they are supported by places that provide the space to live, experiment and scale. The UK has extraordinary research and entrepreneurial talent, but without the physical capacity for new homes, labs and high-quality workspace, we limit our own ambition. We've seen how Silicon Valley has Stanford backing its innovation and growth; Forest City represents an opportunity to create the conditions for the next century of British innovation by allowing growth in Cambridge. It's a place designed from the outset to support deep tech, life sciences and high-growth companies at a meaningful scale."

- **Stuart Clake, MBE Founder UK Tech Week**

"This level of ambition is the kind of project we need in Europe to turn it around this century. This sounds completely impossible, but only until it's done."

- **Andreas Klinger, Founder, Investor**

"I think it's a bold plan, which would benefit local residents and harness all the potential of Cambridge, which is currently hampered by planning restrictions. The project will create a huge tech employment opportunity. It will also create the kind of growth this government is trying so hard to establish."

- **Henry D'Abo, Landowner, West Wratting**

Foreword by ACDC Advisory Board Chair, Dame Patricia Hewitt

I am part of a lucky generation—the luckiest our country has ever known. Today, in my 70s, I'm horrified by the sense of decline and division in so much of our national conversation, the state of so many left-behind communities and the inequality between the opulent and the rest.

But I'm also inspired by the young innovators, entrepreneurs and activists who are determined to create a better future. I know how hard it is to create lasting social change. And just as I remember the people who supported me as an impatient young feminist and political campaigner, I reckon it's up to those of us who've had our turn and been lucky in our lives to back today's change-makers. That's why I am delighted to be supporting Albion City Development Corporation and its bold vision for Forest City.

I am ambitious for our country. And I'm ambitious for East Anglia, a region where I live and have deep family roots. For decades, governments have wrestled with the challenge of how to capitalise on Cambridge's world-leading brainpower. The Oxford-Cambridge Arc is poised to move from vision to reality with the Government's commitment to new towns and the new East-West rail link. The UK Innovation Corridor joins two of the world's most innovative cities, London and Cambridge, whose economies are predicted to double in the next quarter-century.

Forest City would extend and enlarge both the Ox-Cam Arc and the UK Innovation Corridor, transforming the scale of investment, economic growth, job creation and innovation, generating wealth and taxes for a confident, prosperous, 21st century UK.

It would make financially possible the infrastructure that Cambridge and East Anglia urgently need, including a new reservoir and water infrastructure. It would look East: bringing new railway connections to Haverhill (one of England's largest towns without a railway station), providing investment and transport links for the economies and universities of Norwich and Ipswich and the great port of Felixstowe and supporting the sustainable development strategies that will be drawn up by the new Mayors of Suffolk and Norfolk and of Greater Essex.

And, crucially, it would do all this in harmony with Nature. Creating one of our country's largest natural parks on the historic footprint of ancient woodland and building to the highest environmental standards, with car-free mobility as the default option.

It is less than six months since Forest City's two co-founders, Shiv Malik and Joseph Reeve, launched the project in front of 1,200 people at the O2, Greenwich. Working with the speed of a start-up, they've already mobilised an astonishing level of interest and support. But here, in the reports from Forest City's six working groups, we have the views of over 40 experts who have generously given their time and professional experience to consider how it can be done. On behalf of the Advisory Board, I want to thank them all for their exceptional contribution.

I believe this report makes a compelling case. Faced with a huge ambition, there will always be people who say it can't or shouldn't be done. But whether you are a skeptic, an enthusiast or somewhere in between, I invite you to read this report with an open mind. Share your views. Come and talk to us. And remember, as the great anthropologist Margaret Mead said, "Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has".



Dame Patricia Hewitt

Chair of ACDC Advisory Board

April 2026

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Steve McAdam

An architect by training, Steve has over three decades of experience in urban regeneration. He founded the much respected built environment consultancies Soundings and Fluid and is credited with being a prime mover in codesign, participatory urbanism and effective community engagement. His portfolio includes the Kings Cross redevelopment, the London Olympic and post-Olympic masterplans, and the placemaking strategy for the Royal Docks. Steve also established the City Design Institute research Centre of Excellence and the City Design MA at London Metropolitan University.

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Joe Reeve

Joe is an entrepreneur and technologist. His successful campaigns—from cleaning the tube to championing growth—prove that determined action can move mountains. He is the co-founder of Looking For Growth, the campaign group that's already pushed the Labour government to change planning laws and also works at a major AI company in London.

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People - Advisory Board

Dame Patricia Hewitt (Chair)

Former Secretary of State for Trade and Industry & Health



After helping to found IPPR, one of Britain's most influential think-tanks, Patricia was elected MP for Leicester West in 1997. She went on to serve as Secretary of State for Trade and Industry, Cabinet Minister for Women and Health Secretary; her record in government includes the introduction of the smoke-free legislation, paid paternity leave and community interest companies. After leaving Parliament in 2010, she joined the boards of BT and EuroTunnel, chaired the UK India Business Council and led the NHS Norfolk and Waveney Integrated Care Board.

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Professor Tim Leunig is a prize-winning economist who has taught at the LSE for 25 years, and holds visiting faculty positions in the US and Europe. He worked for the UK government for over 10 years, including serving as economic adviser to two chancellors (Javid, Sunak), three housing secretaries (Clarke, Javid, Gove), and as chief analyst and chief scientific advisor at the Department for Education. During Covid, he created the UK furlough scheme which helped employers keep more than 3 million people employed. He is Director, Public First Consulting, and an Associate Member of Nuffield College, Oxford.

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A former Specialist Adviser to Government on urban regeneration, Jackie Sadek has nearly 40 years experience in the regeneration sector. She has held a number of senior positions in both the public and the private sector, including Head of Regeneration (EMEA) at CBRE and chair of the UK Innovation Corridor, a bottom-up partnership of 15+ local authorities, six universities and hundreds of innovation and science companies in the London-Cambridge region. She also headed up Kent Thameside and the Park Royal Partnership and in 2019, Jackie won planning consent for a 1500 home Garden Community in the South Midlands. She is a Member of the Property Week Hall of Fame and co-author of "Broken Homes".

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Paul Johnson CBE is a British economist who served as director of the Institute for Fiscal Studies from 2011 to 2025, becoming one of the UK's most prominent commentators on public finance, tax, and economic policy. He has held senior roles across government, including chief economist at the Department for Education and Skills and director of public services at HM Treasury, and is the author of the bestselling book Follow the Money. Since 2025, he has served as Provost of The Queen's College, Oxford, and he continues to write as a columnist for The Times.

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Introduction and Executive summary

By Shiv Malik and Joe Reeve

"We shape our buildings. And afterwards our buildings shape us."

- ***Winston Churchill, 1943***

There's so much to fix in modern Britain that one could almost be paralysed by asking, "Where do we start?" For us the answer is simple; by repairing the social contract. Not everywhere, but in a very particular place: Forest City. And not all at once, but over a three decade commitment.

What do we mean by the 'social contract'? This can be distilled by asking a simple question: is it possible to work hard, buy a home, and raise a family? If you cannot do that in a modern 21st century economy, especially when at least two generations prior have been able to achieve just such a thing, then your country is broken. So if we can start to repair that contract, by building Forest City, then it will be worth every effort we can give it.

Joe is known for his saying, "You can just do things". Manifesting 400,000 homes, 8,000 acres of commercial space and 12,000 acres of forest, might be stretching the conceit to breaking point. But having kicked off 'the doing' a mere five months ago we have acted with breathless urgency.

We have held or spoken at eight events from the 02 Centre in London, to the Arts Centre in Haverhill. We formed an advisory board with some of the nation's most respected experts and practitioners. We've clocked dozens of press items, from the Telegraph to Time Out, alongside hours of radio and podcasts. We've conducted countless meetings with politicians, civil servants, builders, investors, longstanding institutions and NGOs. And along the way we've won significant backing. Not just from the more than 1,000 people who signed our pledge to help get this city built, but from academics, businesses, landowners, campaigners, and British innovators like Sir Tim Smit, the founder of the Eden Project and Barney Hussey-Yeo founder of the unicorn AI finance company, Cleo.

This report represents a major milestone in our journey. There are undoubtedly those who will say that the following 300+ pages examining the possibilities of growth, nature, water, transport, housing and technology are simply not enough to begin building a city. And they are right. It is not enough. It is simply the very beginning. But if you don't start somewhere to produce something, you will always end up with nothing.

So what then is this report for, and why are we issuing it? It represents the most preliminary feasibility assessment we could make from a standing start and covers six broad questions, which we believe are existential to our goal of building Britain's first new city in over 50 years.

Summarised, those questions are:

- Will the economic return (or Gross Value Added) be big enough to make this a worthwhile national project?
- How will development be balanced with the needs of nature?
- Will there be enough water?
- How will the city be connected to the region and London?
- Can housing be made affordable enough to fix the social contract?
- How should a city be built when technology is changing so rapidly?

Why are these questions existential? Well, if any one of those questions could not be answered sufficiently, it would spell the end of the project. Without water, without a way for people to move in and out, without economic value, and if you're simply destroying nature, there can be no city.

We are immensely proud of the efforts that at least two score people have put into producing this work and the nearly 100 people who have directly helped in the last five months to aid the Forest City cause. All of it done pro-bono. Every contributor is a skilled area expert. And they all have day jobs. And yet their passion and dedication to seeing this City being built has been unrelenting. It has been deeply humbling to be a part of.

The report's authors have had wide latitude and full independence in coming to the conclusions they believe are correct. Thankfully the results of this effort makes clear that there is a route forward in all cases. Should Forest City be built, it would create:

- Growth on a huge scale—some £53bn in GVA created because we unlock 8,000 acres of new commercial space (e.g. labs, offices and manufacturing).
- England's single largest land-based nature reserve, fostered and funded by the City's urban community.
- A new large reservoir to drive forward nature, society, and the economy in tandem.
- Up to £16bn in new transport connections; a car-light vision for the City itself that cements efficient mobility within its bounds and connects the East of England region via road and rail.
- A community where every four-bed home sold smashes affordability criteria—but aims for even greater price reductions to bring us into line with our stated ambitions.

This would be transformational for post-war Britain in a way that only the establishment of the NHS or the discovery of North Sea Oil could match. We are aiming to build not a new town. Or even a new city. But a new country; economically growing, desirous to make new ventures work, efficient and intelligently designed, eager to bolster the lives of the next generation of families, operating deep at the frontiers of technology. A United Kingdom determined to show the world once more what the future looks like.

These six reports and appendices are very much focussed on their individual areas and questions. So it is worthwhile in this chapter, grounding the whole project in some context and also drawing together the different strands by answering the following questions.

1. What is Forest City?
2. Why ‘here’? (And why not expand Cambridge radially?)
3. What does this do for the East of England?
4. What does Forest City do for the rest of the country?
5. How is the business model expected to work?
6. What are the next steps to delivery?

What is Forest City?

It bears repeating; we’re planning a city not a town. The substantial difference is that a city is where people both work and live. It is not simply a place to commute from. This makes a huge difference in not only how it is planned, but how it is funded, how the transport is arranged, and the possibilities for changing the socio-economic settlement. But first, let’s go on a quick tour.

For Forest City, the housing we envisage will be gently dense, terraced housing in the main. Think Islington and Edinburgh rather than Milton Keynes or many of the detached, ugly, and sprawling developments being erected on the edge of villages and towns today. It needs to be gently dense to give as much space to nature, optimise land use, and create the requisite agglomeration effects. Our extensive transport section (see Report 4) lays out an entire thesis, Symbiotic Mobility, for how this would operate. It is a vision with mass transit, pedestrianisation and cycling at its heart.

The project will take all the lessons of the last 50 years of smart placemaking, urban design, and technological innovation, and start to implement them at scale. Whether it’s a two pipe system for waste water so sewers no longer have to overflow effluence into rivers every time it buckets down, or district heating systems that ensure energy from data centres is a valuable product, not ‘waste’ (see Report 6).

We also need enough space, not only for the prospect of abundant energy but for Nature (see Report 2). As the creator of the Garden City concept, Ebenezer Howard, wrote in his book, Tomorrow, “Human society and the beauty of nature are meant to be enjoyed together”. With all that we’ve learnt about ecology since Letchworth was built 100 years ago, his vision is due an update.

What we propose is, in effect, a huge rewilding project; not a dense managed forest of 12,000 acres, but a return to a mediaeval conception of woodland: oak, birch and willow, situated amongst ponds, marshes and meadow.

Like a budding plant, Forest City’s massive nature reserve wends its way organically through the City, ensuring every part of it is touched by its vitality. And when the children of Forest City ramble, they will spot beavers, storks, bison, otters and voles; animals brought back to inhabit an environment that was once theirs. It’s the same for the trees. Not only will we retain all current ancient and veteran trees, Report 2 demands we restore the historical baseline of the area going back as far as the old maps can enlighten us. It’s a deeply rich, ecologically resilient habitat, which will, yes, need some very hard thinking in terms of how it is planted and fostered. But it will be a great legacy for this urban institution to nurture and protect for the benefit of the entire country.

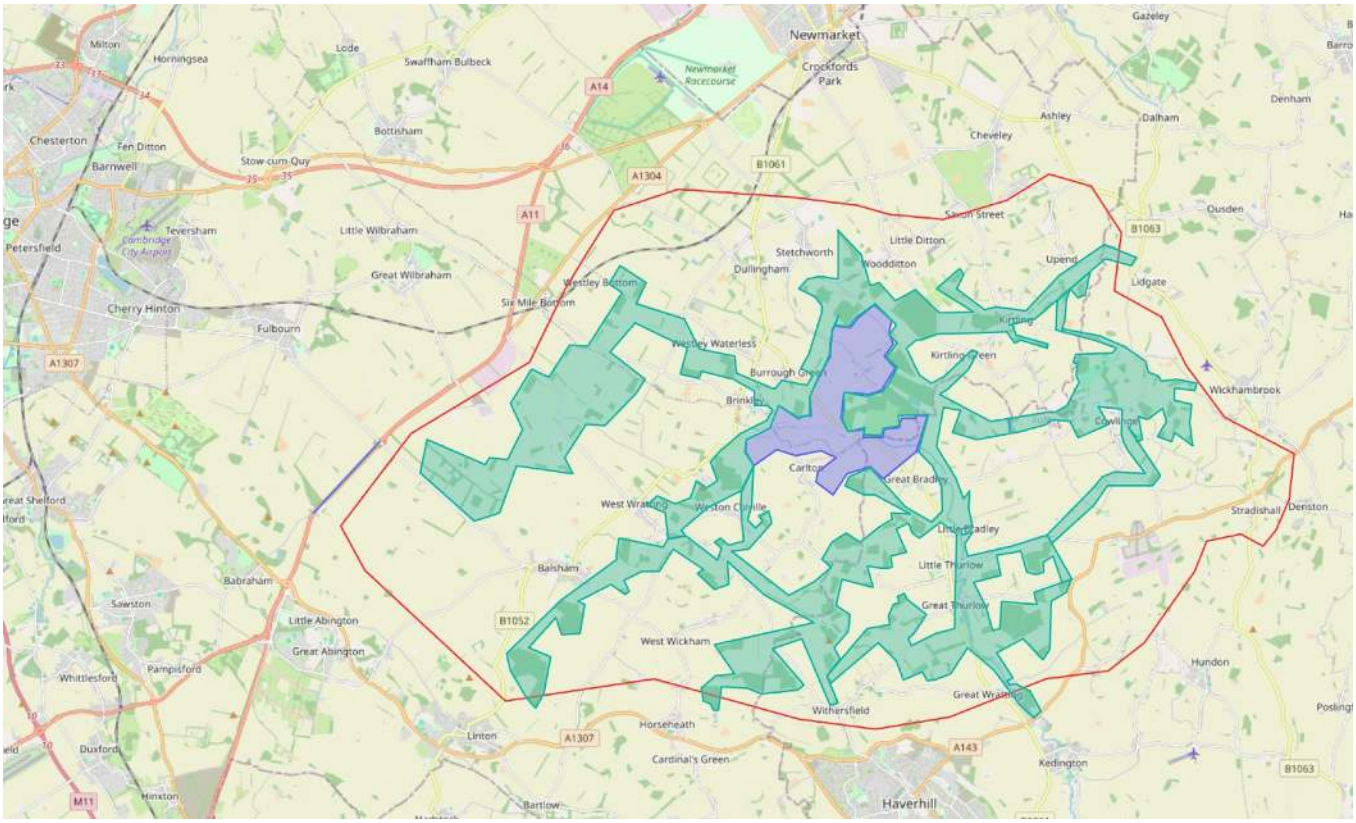


Figure I.0.1 Draft Redline area and initial outline of the forest and reservoir

As we move to the geographical centre of the City, we find a 1,600 acre lake, to swim and boat in and around its edges, another home for nature. This is also the City's reservoir (see Report 3) providing over 50% of its needs.

Then finally off to the lake's eastern shore, there is a Central Business District. 1,300 acres for offices, with tall, elegant structures and room for monumental architecture, engineered from cutting edge materials, not simply imposing glass and steel. It's enough office space—and across all 8,000 acres, lab space, and light industrial space—to compete with any Chinese or US city. All connected with frequent rail and metro links to some of the most dedicated and intelligent researchers on the planet. As Stanford University is to Silicon Valley, so Cambridge University shall be to Forest City.

The Forest City Plot

- 12,000 acres forest/woodland
- 8,000 acres commercial space (~1,300 for Central Business District)
- ~21,000 acres residential (47 dwellings per hectare, compared to 51dph in Central London, and 75dph in Islington and Kensington)
- 1,600 acres allocated for reservoir
- 2400 acres for other amenities including power.

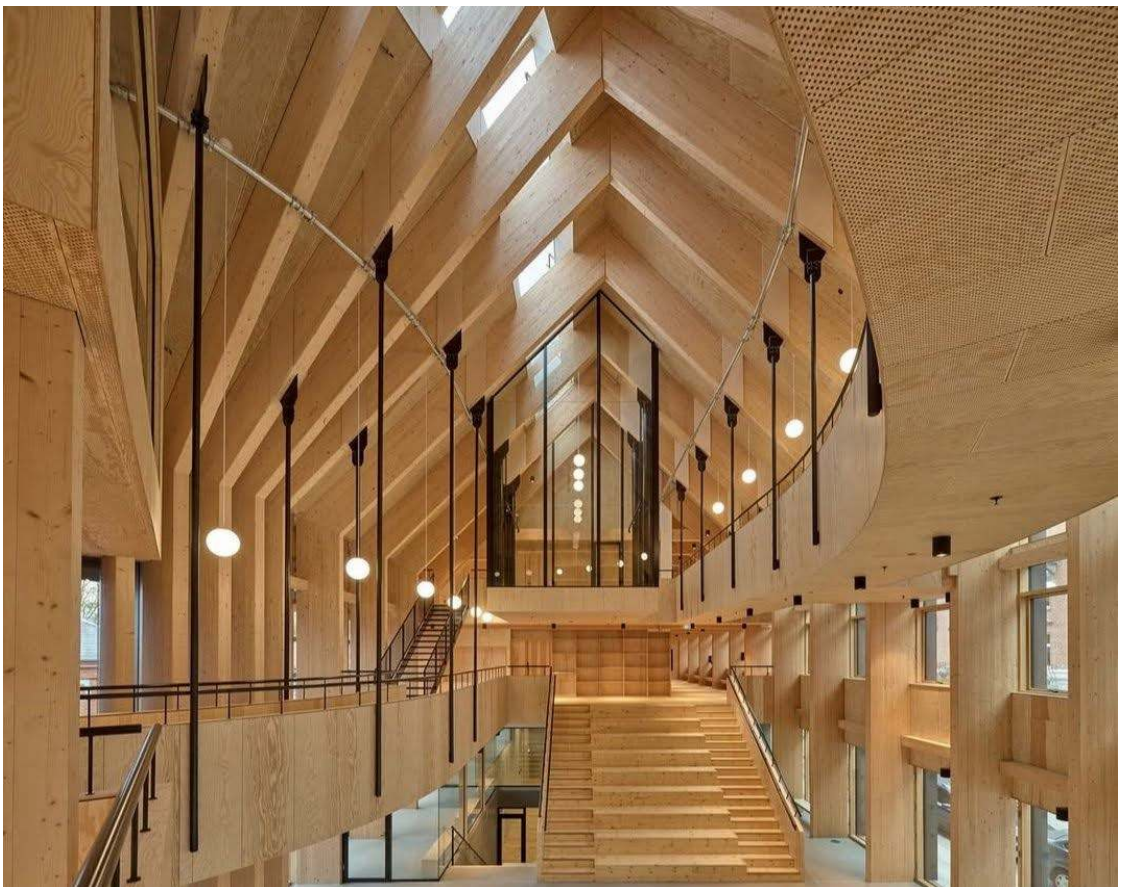


Figure I.0.2 New health centre in Copenhagen built from Cross Laminated Timber

The Invisible Fabric

Underlying this scenic tour are distinct socio-economic elements that make up the invisible fabric of the City. Primarily, it is the way housing is sold or rented; 70% of the housing should be sold via a **Community Land Trust** scheme (see Appendices). The other 30% will be to rent; **cooperatively**. In effect **every house in Forest City must be affordable** (see Report 5). Not just on the technical benchmark of 80% market rates, but instead based on the historic measure of 3.5-5 price to earnings ratio i.e. genuine affordability. (In Cambridge that figure is currently 10.9). With our central aim in mind—repairing the social contract—we're attempting to make housing as non-extractive as possible. Schemes like Bournville (set up by factory owning Quakers) have pointed the way for over a century. Again, we're overdue an update on a very British legacy.

Why a Community Land Trust? The answer is simple; if housing is significantly cheaper in Forest City than in surrounding areas like Cambridge, new Forest City homeowners could flip their home and pocket a massive windfall. A CLT ensures sellers sell the home back to the city—perhaps with a small above inflation price increase—so the discount can be passed on to future generations. We are explicitly not going for a post-war, local authority model, for the simple fact that we don't want the housing to be owned by the government, which has demonstrated that as an institution, it often fails to imbue residents with a true sense of ownership, and has been unable to protect hard won community assets from privatisation. Bournville survives and thrives whilst so much council housing does not. Forest City is a re-run of pre-war norms.

A strand of Liberal municipalism, the sort championed by that pioneering Mayor of Birmingham, Joe Chamberlain, gently runs through some of the other chapters. For example, Report 6, recommends the City owns the ducting of the fibre networks rather than a private corporation. This ensures more competition for the provision of actual services. Smart. But also a profound break with the current status quo. And again, with the reservoir, (though this isn't explicit) once it is built, and therefore completely de-risked, leasing brand new infrastructure to an operator might make more sense than simply selling it wholesale to a company owned by Canadian and Australian pensioners.

Quiet but highly effective municipalism formed the backbone of the economic success of many UK cities from the late-Victorian era. If you take the leasing of commercial land into account, it is also behind the success of Singapore and the City of London. Only building anew, at City scale—where infrastructure, housing, commerce, and nature are rationally planned together—allows us to rework the socio-economic fabric so that the people of a place rather than those on the other side of the world, become beneficiaries of investment and can thereby better unlock their dynamism and productivity via the lower costs of housing and doing business.

Finally, the City will generate a massive uplift to the UK economy as a whole; some £53bn annually (see Report 1). We originally called for the City to be designated as a Special Economic Zone. Though we don't expand on this in any part of our reports, this call is still **central to the project**. Just as the Community Land Trust supports affordable housing and keeps wealth within the community, so a SEZ would support and incentivise entrepreneurship and re-investment. Similar incentives were behind the undoubted success of Canary Wharf. An SEZ will help power a new era of British entrepreneurialism and is a just inducement for companies willing to make the move and expand operations or even relocate from Cambridge, London or abroad.

Why here? Why not expand Cambridge Radially?

People have often asked "Why not build Forest City in Northumberland or Wales?" where they say, there are even fewer people or where the arable land might be less good etc. The answer to that is easy; if you are building a city, the task is already precarious enough. You need to start with a slam dunk case for agglomeration effects; somewhere there would be clear demand from economically productive people for housing and commerce. The top of the list is Cambridge. Two successive governments, Conservative and Labour have made the argument for expansion. We don't need to rehash this case here, which is already detailed and undeniable. The city is a UK powerhouse. More Nobel prizes have come out of Cambridge than the whole of France put together. And yet, no French city approaching Cambridge's stature would ever be left so hobbled by a lack of infrastructure. There's no water, little space for strategic business expansion, eye-wateringly expensive housing, and then there is transport; crumbling roads and no real prospect of first world mass transit.

To quote Report 4:

> *"Greater Cambridge is experiencing a profound disconnect between its economic dynamism and its infrastructural capacity. The region has seen population growth of 17% over the last decade, with projections of a further 28% increase by 2031, accompanied by 44,000 new jobs.*
>
> *This hyper-growth is funnelled into a medieval road network and radial arteries that are physically incapable of expansion. Consequently, traffic congestion has emerged as the paramount crisis, cited by nearly 65% of residents as their single biggest concern. This gridlock is not merely an inconvenience; it acts as a tax on the region's productivity."*

You can not fix these problems by simply adding 150,000 homes around the outskirts. To triple the size of Cambridge and expand it from its historic centre, you need a complete overhaul. You need to dig up Cambridge's streets to install at least a tram. You need to build another massive reservoir… somewhere. You need a comprehensive restructuring of the energy system. Sidestepping these challenges is like trying to say you can erect a 300ft loft extension on top of an existing Tudor house; it can't be done. And then, what of the greenbelt? Will it stay in place?

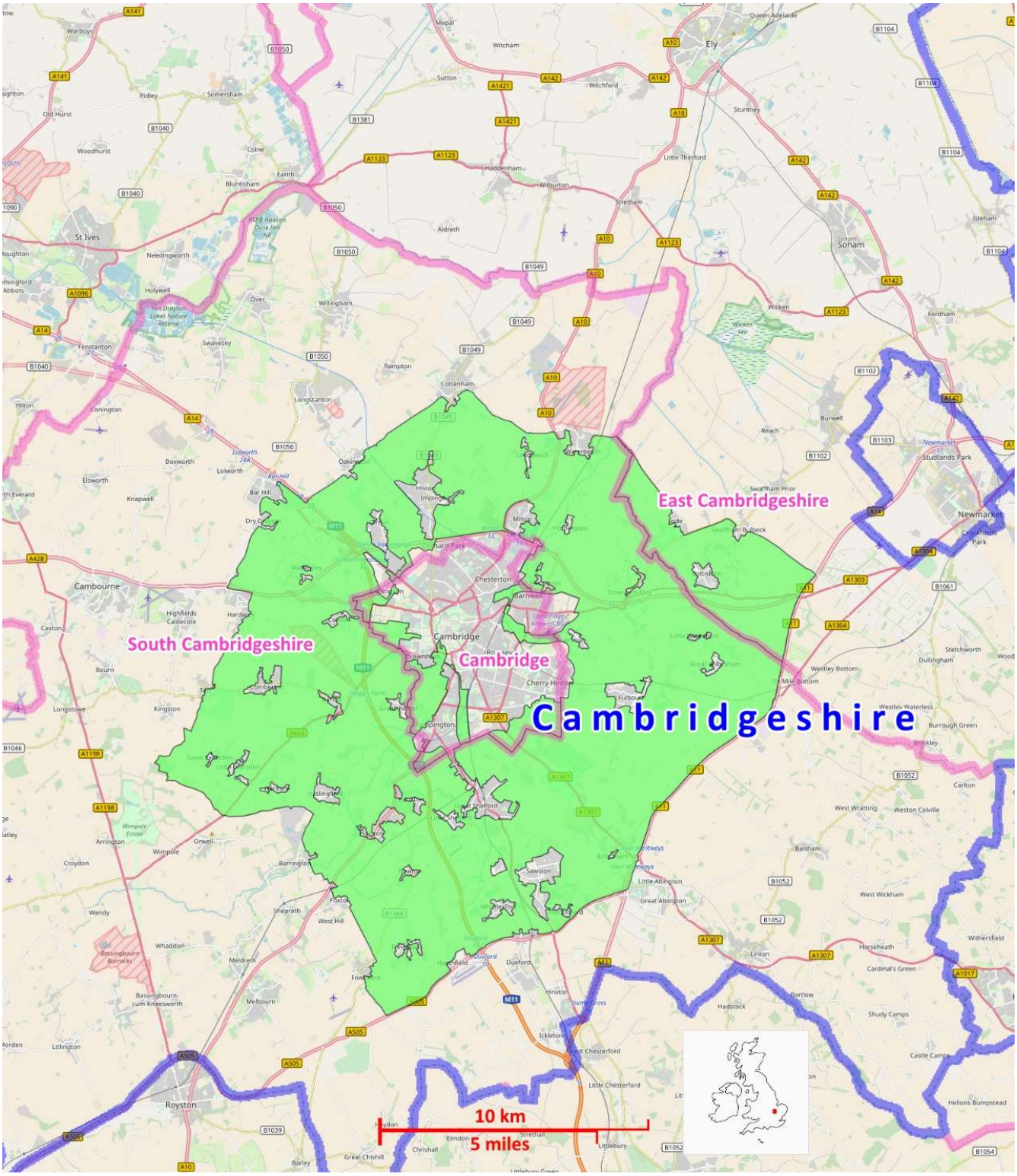


Fig. I.0.3 Cambridge's Green Belt and political boundaries

To command this development, the Government is consulting on a DevCorp whose powers of planning and compulsory purchase will span 362 sq miles and run its writ over 325,000 people. At the time of writing, both Cambridge City Council and South Cambridgeshire District Council have rejected the removal of their authority.

Forest City offers a **potentially complementary,** but otherwise alternative vision for Cambridge's expansion. The plot sits over a much smaller area (70 sq miles) and a population of just 8,000 people. None of it is zoned as greenbelt and the plot has just seven small SSSIs which in our plan become assets not obstacles. Build speeds and efficiencies of scale can be greatly increased due to the largely 'greenfield' nature of the development—it sits on grade 2 arable land—and as the reports demonstrate, water, transport, nature and even energy can be solved holistically rather than in silos.

The plot is also largely agglomerated; four fifths of the 45,000 acres under consideration are owned by 10 landowners. Furthermore, because it doesn't face the land banking and developer interest that every immediate area around Cambridge already faces, there's a very different quantum of land uplift. Currently agricultural land is valued at £9-12k an acre.

The specific geography unlocks further possibilities. **One third of Forest City is located in West Suffolk** (Labour and Independent controlled), the rest is in East and South Cambridgeshire. Compared to a radial expansion of Cambridge, this tilt geographically eastward bolsters the business case for many other East of England projects (see below). Then there is the new line to Stansted and London Liverpool Street station via a new station at Haverhill. In the words of one local councillor, this "would be transformational" for the 30,000 people who live there.

Dropping the model of piecemeal, radial development, and letting Cambridge get on with winning Nobel prizes, whilst nevertheless adding to its capacity quickly, rationally, and efficiently, by moving all significant expansion for the next thirty years to the other side of the greenbelt—an area with just 2.4% of the population—seems the more sensible choice.

	Greater Cambridge DevCorp	Forest City
Area	362 sq miles	70 sq miles
Population within DevCorp	326,000	8,000
Homes Built	150,000 (mainly market?)	400,000 (100% genuinely affordable)
Nature uplift	?	12,000 acres of Forest
Greenbelt affected	?	No
Infrastructure	CSET	New London rail link + S-Bhan/Tram for 1 million, double tracking at Newmarket

Table I.0.1 GCDC/Forest City comparison

	Greater Cambridge DevCorp	Forest City
Placemaking	Unclear/Satellite developments	Rationally planned, deeply integrated infrastructure
Delivery	Post-local plan (2029/30)	Building begins 2029
East West Rail	Yes	Yes
Regional strategy	West facing	East facing

Table I.0.1 GCDC/Forest City comparison

What does Forest City do for the East of England?

Given its scale, size and ambition, Forest City will undoubtedly change the centre of economic gravity of the East of England. Forest City sits at the juncture of two economically strategic areas, the Oxford-Cambridge Arc and the London to Cambridge Innovation Corridor. Each is being promoted and invested in by Government. Our plan goes further by making it possible to extend those growth corridors further east. Not only does Forest City provide a very physical anchor to these two intersections, it builds and bolsters links to Norwich, Ipswich, and Felixstowe. The City would generate jobs, investment and growth to support a wider polity with its growing pensioner population and an acute need for employment prospects.

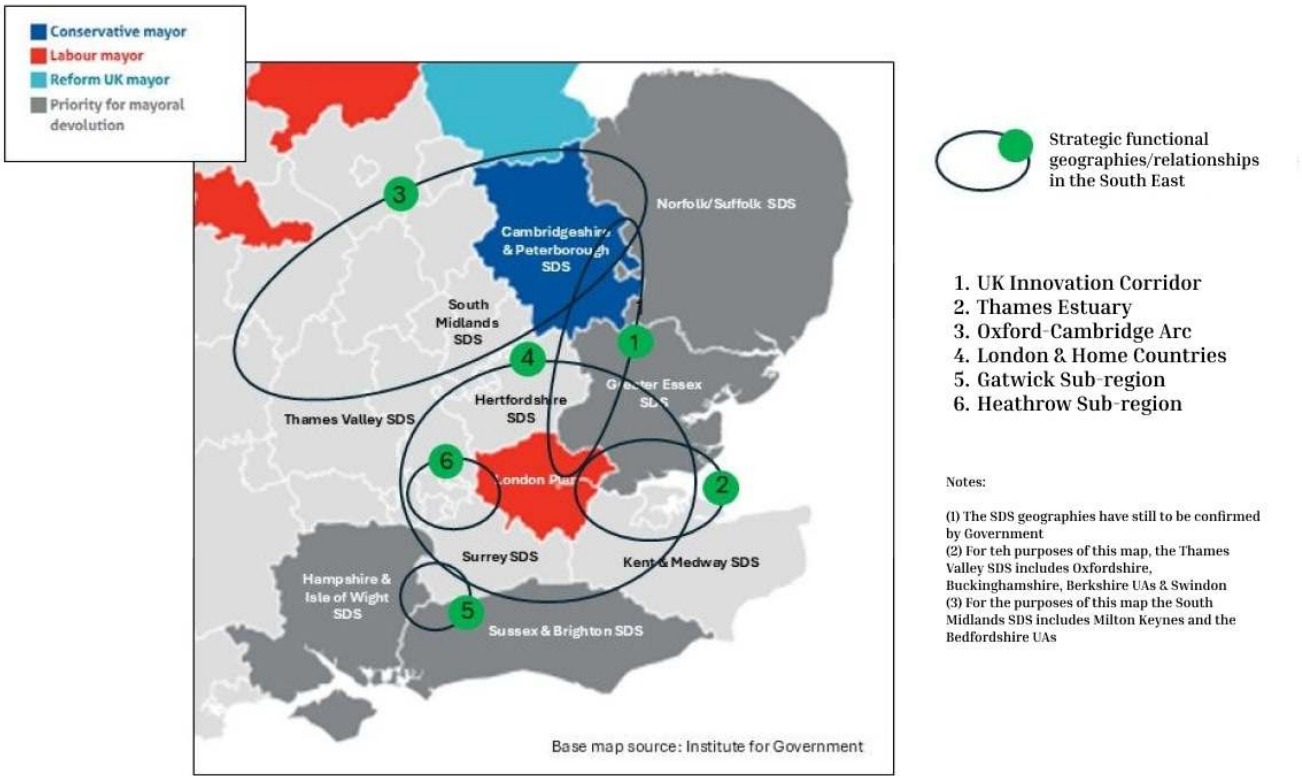


Fig. I.0.4 Emerging Strategic Planning Authorities via Catriona Riddell Associates.

With its sizeable population Forest City would transform the business case for major transport projects such as the upgrade to Ely Junction and further infrastructural support for Britain's biggest port, Felixstowe. This would be on top of leveraging the double-tracking of the Cambridge to Newmarket line to extend East-West Rail drawing those benefits into Suffolk, but also creating another new high-capacity link to London Liverpool Street, via Haverhill and Stansted Airport. Report 4 lays out other major improvements to existing road and rail infrastructure including the A1307.

But it's not just road and rail. The currently planned Fens Reservoir will be barely sufficient for already planned needs. Report 3 bravely shows how a new system of pipelines and water storage can balance water resources across the East of England just as climate change begins to bite. Finally, Forest City, and our aspirational plans for a Small Modular Reactor (SMR) within a more abundant energy paradigm (Report 6) would integrate with the existing energy infrastructure, including the new investment at Sizewell C.

Beyond transport there is the region's innovation and knowledge economy. Forest City would amplify the strengths of regional research clusters outside Cambridge such as those centred around BT's Adastral Park in Suffolk—the UK's leading research centre into network technologies—or the Norwich Research Park one of the world's most concentrated centres for research in genomics, agritech and health science. It would provide a regional base for the rapid deployment of knowledge transfer vehicles enabling the latest advances to move from lab to patent to deployment at vastly improved speed.

It would also help address the critical national skills shortages in manufacturing and construction, environmental standards and clean energy. The act of building a city will necessitate the training of a whole new cohort of skilled labour, turning low wage, low skill industries into high skill, high wage professions. Working in partnership with the further and higher education sector in the region to develop that skills base will be a priority. Rather than a net importer of the know-how needed to drive a modern economy, the East of England will become an international centre of expertise in the development of these techniques and training the workforce to deliver them.

For important regional sectors like arts, culture and tourism, the City will radically expand the potential market base across the board rewarding long term Lottery and Arts Council England (ACE) investments. The vast majority of the visitor economy in Norfolk and Suffolk comes from people living within a relatively small geographic distance. Forest City residents will provide a substantial increase in the population within that geography while also extending transport connections, turning once remote places into accessible leisure destinations. This proposal could indirectly resolve regional issues where repeated government intervention has failed: offering a renewed tourist economy in ACE Priority Places like Great Yarmouth, Fenland and Tendring and

rewarding significant funding for culture and tourism in Norwich (an outlying node in the wider transport network). Furthermore, the possibility for growing regional sectors like fintech and games development would be transformed by Forest City; despite innovation many smaller businesses lack the ability to scale in place due to labour market constraints.

Whilst Report 2 seeks to extend environmental investment to the wider Suffolk region, farming is also acknowledged in our appendices. The loss of good quality arable land is no meagre thing. But there are substantial mitigations we can begin to plan for. For example, the NFU confirms that one of the most pressing needs to improve productivity is water. Facing further extraction restrictions in the face of climate change, Forest City could readily provide vegetable farmers with a dependable source of pre-extracted, nutrient free but non-potable water to boost output. Combine that with greater possibilities around the applied research ecosystem in agritech and a bit of creativity, and trade-offs needn't always be so starkly zero-sum.

Politically, there are also trade-offs. A number of local politicians have asked if accepting a major development in one place can mean being free of central government targets elsewhere in the region. Given how ugly and expensive these developments often are—and how difficult it has been to get the required infrastructure in place for them—this would be an appealing way to bridge the often intractable NIMBY divide. It doesn't mean blocking homes from being built close to where people live, it means development isn't forced on locals from Westminster. It's a new deal.

Instead of piecemeal, private developer controlled local plans, which leave broader infrastructure execution spread across a multitude of stakeholders, none of whom appear to want to work cooperatively let alone quickly, Forest City represents the return of regional spatial planning; the same policy the government is already pushing ahead to reintroduce.

What does it do for the rest of the country?

Years of consultation, a thicket of competing interests, legal challenges, revised plans, further consultation, and then, more often than not, a watered-down version of the original idea, delivered late and over budget. Whether it is pylons or pub extensions, this is the British experience of building. We have become, as a nation, extraordinarily good at stopping things. Forget not building a city in over fifty years. We haven't even built a major reservoir in over thirty. And as we write, building new homes in our capital, the most productive place in the UK, has ground to a halt. Rightly, the government has put its full weight behind changing this. A target of 1.5 million new homes. Fresh infrastructure legislation with a revision of compulsory purchase powers on the horizon. £21bn in funding from the National Housing Delivery Fund and National Housing Bank. And now seven New Towns. But the logic behind much of this action is still premised on dispersal.

From its inception Forest City was intended to be a challenge to that. Instead of forcing

infrastructure, nature, homes, energy and commercial projects to fight countless individual battles, we believe it makes more sense to concentrate as much of it as possible into one place. One project. One set of political trade-offs. One decision. And then move with speed. For example, on housing alone, even if they all hit their maximum 40,000 home target, Forest City's 400,000 fully affordable homes would be much bigger than all seven New Towns projects combined.

As made clear in Reports 4-6, the benefits of rational spatial planning at city-scale are not merely political or administrative. When homes, commerce, nature and infrastructure are designed together from the ground up, each makes the others cheaper and faster to deliver. The tram is easier to build when the streets are planned around it. Advanced construction skills honed on a hundred homes are redeployed to twenty thousand more on the same site. The commercial district fills quicker because the nearby housing is affordable and the transport is readily available.

There are also tangible knock-on effects. From our own conversations with major housing developers, a project of this scale and duration—offering consistent baseline demand over decades—would be genuinely transformative. Even if it comes in the form of less profitable contractor relationships, stability and scale help de-risk their wider business. These are real effects that our European neighbours enjoy and we do not.

Then there is the question of what Britain needs to compete in the century ahead. The technological and national security challenges of the 21st century require **abundant power, deep research and advanced manufacturing to be co-located**. Nowhere in the UK currently provides that combination. When we speak to regional quantum computing startups and advanced manufacturers, they complain not about capital or talent constraints, but an inability to get staff to the office without sitting in traffic, or about finding the warehouse and lab space to innovate at scale. This is the very real sharp end of our productivity crisis. The unlock is cheap. The reward substantial. And yet we prevaricate.

With excellent fibre infrastructure already located in the area, (Report 6) proximity to Sizewell and North Sea wind farms, and Cambridge University on its doorstep, Forest City is as close to a ready-made answer to that problem as the country is likely to find.

Forest City would also address the national crisis of migration and birth rates. We know too many of the best and the brightest of our generation are leaving the UK. Or they are forced to live far from economic opportunity—priced out and pushed to the margins in the prime of their working lives. Worse yet, our generation has stopped having enough children altogether. The causes are becoming clearer by the year. As the Resolution Foundation states, “childlessness rates are highest among those without independent housing”. Given how long demographic corrections take, this is an undoubted national emergency.

Forest City is not then simply about housing, or even employment opportunities, but about signalling that Britain will always be a home to its most ambitious and a place to raise the next generation.

The most profound opportunity that Forest City offers to the UK might be harder to quantify; our reputation and our belief in ourselves. In the wider world, there is still great respect for Britain and its institutions, which are often more glorified by foreigners than ourselves. But try to sell them on investing in development and they demur or worse, mock. Just a few weeks ago, international investors from Malaysia told us that with one scheme they'd invested in, it had taken nine years to build nine bungalows. They were flabbergasted at how slow it all is. Why would they invest again? Worse still, however well equipped with legal powers or finance the Labour government might be, few of the global investors we have spoken to believe this government has the stomach or ambition to get really big things done.

It's bad that our international friends doubt us. It's far worse that we doubt ourselves. In recent memory, there have been two defining national projects. One was the 2012 Olympics; delivered on time and received with a pride that surprised even those who built it. Stratford was transformed and the opening ceremony was a wonder to behold. Then came HS2. Same country, same decade. But it is a project that has become a byword for everything we fear about modern Britain; intractable, ruinously expensive, politically humiliating. The contrast is not just embarrassing, it is a question about our national identity. "How can we build a city when we can't even build a railway line?" is probably the most common retort we hear to our plans. (The next is about fixing the potholes before anything else). When we remind people this was the country that built Bath, Belgravia, Edinburgh New Town, Glasgow's West End, and Canary Wharf they laugh and say, "We'll never do that again".

We are the nation that gave the world the metro, the urban park, the garden city, the council house, the iron bridge, and the metal-framed building that made the skyscraper possible. We also created the first civil nuclear power plant, and invented the steam engine, the jet engine, stainless steel, penicillin, the MRI, in-vitro fertilisation, the World Wide Web, and arguably with Deepmind, the entire AI revolution. We invent, discover and build astounding things. Forest City is a direct continuation of that legacy and a direct answer to that despair.

We have not yet had the resources to put together a full business or building phasing plan. With high confidence, our analysis tells us that £53bn in Gross Value Added will be generated by Forest City once it is fully built out and populated; the **equivalent output of Oxford, Cambridge and Leeds combined.** Once completed, the government's tax take will be considerable.

The pressing questions from the government's perspective are then:

- What are the other socio-economic benefits?
- How much is the infrastructure bill?
- How fast will that money be recouped to make sense for Net Present Value calculations?

Our analysis suggests the hard (trains, electricity, fibre, roads) and soft (police stations, hospitals, parks) infrastructure will cost between £28-£43bn. This figure so far does not account for a Small Modular Reactor (£3bn) but is otherwise a reasonably comprehensive list for a cursory analysis. We need much more work to deliver costings for a serviceable plot.

At the very highest level, a Development Corporation (DevCorp) for Forest City, or any Joint Venture (JV) arrangement that sits underneath it, can rely on two major revenue streams: housing and commercial land. Since housing is expected to simply 'wash its face' and be sold as affordably as possible, only recouping the cost of the land, residential groundworks and some infrastructure costs, it is the leasing of 8,000 acres of commercial land which will need to pay back the bulk of the infrastructure spend. This has been independently valued at more than £60bn trended. While the uplift from agricultural (£9-12k an acre) to zoned commercial land is undeniable, the question is still open as to what this will ultimately be worth.

How much would commercially leased land fetch in a gently dense City with one of the most prestigious universities on its doorstep, world class infrastructure fit for the 22nd century, set within a lake and 12,000 acres of woodland? Add in tax incentives, existing demand drivers around housing, and the UK's enviable global property investment status, and one might reasonably expect the centre of Forest City to be equivalent to Denver, Frankfurt or Boston. Or it might be worth no more than Milton Keynes or Croydon? (Of course, we are aiming for Tier 1 status). Multiple experts we have commissioned have modelled several scenarios. There is little hard data to base it on, given that practically no cities have been built in Europe and North America for half a century.

Another major factor is speed and efficiency of delivery. There are some unique advantages, which will allow Forest City to keep costs low. Multiple projects worked together allows for efficiencies from a building perspective. E.g. one cement works or digital site map for the entire site rather than many multiple. A greenfield site also means you are not spending extra billions to work around existing structures. Finally a single DevCorp with planning powers for 25+ years also gives you speed and certainty; a crucial element to reducing costs for contractor relationships.

Housing absorption is another major advantage. The single biggest blocker to building rates is being unable to sell what you build. Unlike every other private developer, who looks to reserve costs on infrastructure and squeeze as much profit out of each home, housing for Forest City is an effective 'loss leader'. The better we make it, both in terms of quality and price, the faster it will shift and the faster commercial anchor tenants can relocate—especially since their

employees will get reservations on the list. These plans need far more development to be reliable. And to address the issue head on, as laid out in Report 5, the cost of house building is still a substantial problem we need to resolve. Finally, it is worth remarking that there is financial flexibility. As master developer, the DevCorp could increase house prices marginally and raise many more billions, without significantly affecting the affordability measure. (Crudely, £10k per home would raise £4bn over the scheme). Furthermore a provisional examination of the overall scheme will reveal other sources of income: rents from housing, ground rents from commercial properties, leasehold arrangements on hard and soft infrastructure, and the slow release of uplift value from when houses are re-sold to a second and third generation of residents.

How does it get delivered?

At this stage ACDC is **now seeking an expression of interest from the Secretary of State**; a sign that this is a project the government wants to progress. As the master planner, ACDC will then raise the funds to option land and carry out a very long list of tasks for the masterplanning process.

For smaller projects, of say a few thousand homes, a developer would be expected to come with full plans and to prove scheme viability and control of the land. For much larger projects, there would be an official commission from a Development Corporation. We have opted for a third route; letting the private sector (ACDC) absorb the masterplanning and land agglomeration risk, a cost we expect to run to £280m.

This is not a small risk; nearly £180m in public funds have just been wasted on planning the Stonehenge Tunnel. Our masterplanning process will take **two years**. This will include delivering recommendations around possible JV arrangements and suitable governance models. Then on our delivery timetable, we leave a very tight 10-12 months for the government to assess those plans and pass the requisite legislation. In reality these elements will need to run in tandem, but the goal is to get a ceremonial spade in the ground by the end of this parliament.

This timetable is incredibly ambitious. But we are treating this as at least equivalent to the urgency we pursued establishing the Olympics. If the legislation and masterplanning for a global sporting pageant can be completed in two years, we can surely press ahead with the same, if not more, urgency to fix the economy and ameliorate the housing and growth crises for an entire generation.

How does ACDC recoup its investment? Replicating the Canary Wharf model, ACDC will retain as freehold, 160 acres of land (¼ of a square mile or 0.36% of the entire plot) at the heart of the City; land which ACDC expects to effectively hold rights over in any case. This has moved up

from our initial estimate of 80 acres and is based on a full rigorous land value assessment and detailed conversations with potential investors and the risk multiples the investment market would likely bear. Any expression of interest would have to accept these basic terms to make investment viable.

There are some who have already protested this set up i.e. private sector involvement in such a nationally strategic project. We are sure they would also complain about public funds being used in this way. 'Do nothing' would be the only way to satisfy those complainants, and that simply isn't an option.

We recommend this model because it:

- Outsources planning risk whilst preserving government optionality
- Introduces private sector speed and flexibility for negotiating with landowners and residents
- Harmonises incentives between masterplanning and build phases (the land is worth very little if the project fails)
- Is a replicable model for future city-scale building projects

Conclusion

Before you embark on reading the rest of these reports, be warned once more that there is much that is missing. There is nothing about culture, or how our governance structures (for the forest, Community Land Trust, or DevCorp) will work. There's nothing about future anchor tenants, or how housing lists are sorted. Nor is there much about skills or anything on how we phase the project. And though we have spoken to dozens of stakeholders, there are many bodies which would be directly affected by our proposals—especially on water and transport— who have not yet been consulted with. That's another shortcoming; as we say at the top, there is a lot that isn't here.

The mistake is to treat this as a planning application. It is not. It is a proposal which ultimately concludes that it is possible to build a city. How we build a city, and whether ultimately it makes sense to do so, comes next. But before ACDC raises hundreds of millions to option land and carry out the masterplanning, we need to know that this is something the ultimate decision maker, the government, wants. We already have builders, architects, master planners, economists, investors, environmentalists and even ex-ministers from both parties who support this. Our Secretary of State will now need to signal where they stand.

As we've already touched upon, there are tradeoffs. Some of them will come at political cost. The

loss of farmland can be somewhat mitigated against, but not nearly in full. For those who think food security a primary issue, building on grade 2 arable land will be unforgivable.

Then there is the irrevocable effect this will have on the lives of the 8,000 people who live in the 24 villages directly within the Forest City boundary. Not everyone is opposed. The villages are losing their own children to the housing crisis as well. Even the cheapest two-bed house in the most deprived area costs £200k. Those kids simply move away, becoming migrants who no longer have a voice in the parish of their birth. But, should Forest City be built, the quiet, cherished rural life that nearly everyone in this area has deliberately sought out, will no longer be the same. There is no getting around that. And worse than that, no one should wish that they live in a construction zone for years on end. For those that are retired (35.6%), this is something we have a duty to mitigate and find a set of solutions to urgently. We have already appointed an independent group to act as a voice and interlocutor for the residents of the villages and that programme will begin in June.

When we started this journey, we asked one of the most senior infrastructure mandarins in the country what he thought of our idea. He was impressed with the ambition but replied that this was “Not the sort of project that could be undertaken in 21st Century Britain”. Not because Britain didn’t have the riches or skills. Or the gumption. But simply because we were no longer organised like we once were to deliver such scale. We’ve become a developed nation who no longer knows how to develop.

We are aged 45 and 28. This is our country and we are not leaving. So we can no longer settle for managed decline. Instead, we are taking up Sarah Housley’s challenge, set out in her book Designing Hope, and asking ourselves, “What will 22nd century Britain look like”? And so if you step back, you realise what we are doing is not about delivering more housing units, or building out commercial space or increasing Biodiversity Net Gain. We are trying to reinvent the way we live our lives for the next century.

The journey we travel on our morning commute. The sounds of a musician on the square. The view from the office. The team mates we call for an evening kickabout. The birdsong we hear as we ramble home, lost in thought. The strangers we meet at the pub. The table where friends eat together. The corner where we kiss and fall in love. The meandering route we take as we guide a child to the park. The roof under which our family sleeps.

Whatever life is like 100 years from now, a life well lived will still be made of these moments. But how those moments are enriched and given meaning is down to the place in which they occur. We shape our places. And afterwards those places shape us. So this is what we are building: not just homes, not just a city, but a foundation for the life well lived, for generations to come.

Endnotes

[1] https://www.gov.uk/government/consultations/establishing-a-development-corporation-in-greater-cambridge/establishing-a-development-corporation-in-greater-cambridge

[2] Wellcome's flagship genetic campus seeks missing transport link

[3] Labour Party Manifesto, commitment to 1.5 million homes over the parliament, framed as 300,000 homes per year

Delivery Overview

The goal for the Albion City Development Corporation is to convince the government of the day to establish a Development Corporation, which will have the powers to create a new City in accordance with our vision.

First 10 months

Phase 1

Foundation and feasibility: engaging stakeholders and assessing feasibility.

Months 20-20

Phase 2

Detailed Planning and Coalition Building

Years 2-4

Phase 3

Political Approval and Final Preparations

Years 4+

Phase 4

Implementation and Delivery



ACDC's Purpose

The scale of Forest City requires a Development Corporation (DevCorp). It is too big for a single, democratically unaccountable, private developer to build. In this instance only the Secretary of State has the authority to create a DevCorp.

ACDC will not be hiring diggers, tunnelling under the earth or building roads. That job will be for the DevCorp and any further JV arrangements. Our role therefore is to lobby for, and aid the creation of the DevCorp, and also provide it with masterplans, site and environmental surveys, business plans, and land assembly when it is established. In short, our job for the foreseeable future is to make this possible, but not execute the build.

Before we can get spades in the ground, we must therefore do the following:

Phase 1: Foundation and Feasibility (Months 1-10)

- Bring together major stakeholders
- Initial knowledge base and feasibility overview

Phase 2: Detailed Planning (Years 2+3)

- A detailed business case
- Master planning
- Detailed site surveys
- Transport, Energy, Water etc planning studies and proposals
- Securing land options
- Feasibility studies

Phase 3: Political Approval and Final Legislative Preparations (Year 4)

- Final redlining of site
- Preparation of legislation
- Securing Parliamentary backing
- Securing financial backing for build phase

Phase 4: Implementation and Delivery (Years 4+)



Where We Are Now: Phase 1

We're in Phase 1 - Foundation and Feasibility. (Months 1-10). This involves:

1. **Building credibility:**

- Company set up & assembling the board and expert committees
- Issuing reports on the economic feasibility; financing, construction viability, economic impact modelling, and SEZ set up.
- Issuing reports on the social-economic / housing case - feasibility of CLTs at scale
- Supplementary reports on energy, inter-city transport links, resident selection criteria, water management, modular house delivery capacity feasibility, skills feasibility.

2. **Coalition building:**

- **Landowners/Current residents:** can we get land purchase options and how much can we win over current residents (including those in wider West Suffolk, Newmarket, Haverhill and Cambridge) to this vision?
- **Local government and relevant authorities:** do we have expressions of interest and buy-in from West Suffolk Council, Cambridgeshire, Local MPs, and other relevant QANGOs and industry bodies?
- **Prospective residents:** can we show enough people want this and would move to this city?
- **Anchor tenants:** do companies want to move here? Are the tax incentives of an SEZ, cheap housing for employees and new infrastructure enough to get companies over the line? Can we prove this with LOIs?
- **Construction industry:** can we bring the most credible players in the industry onside?

The end-goal of Phase 1 is to receive tacit or, ideally, explicit support from the Secretary of State on the following:

1. That they agree with the vision of a city for a million people near Cambridge
2. That ACDC can retain the freehold on 160 acres at the centre of the commercial district

This will mark Phase 1 complete and allow us to progress to Phase 2, where we will assemble a detailed masterplan and a funding plan for raising the £250m required.

The Next Phases

Phase 2: Detailed Planning and Coalition Building (Months 10-24)

This intensive phase develops the complete project blueprint. The detailed working plan must include:

- Financial modelling with multiple funding scenarios,
- Comprehensive business cases, including 20-year fiscal projections,
- A ‘go-to-market’ strategy for recruiting residents, and
- City planning blueprints with architectural renders.

Legal work includes:

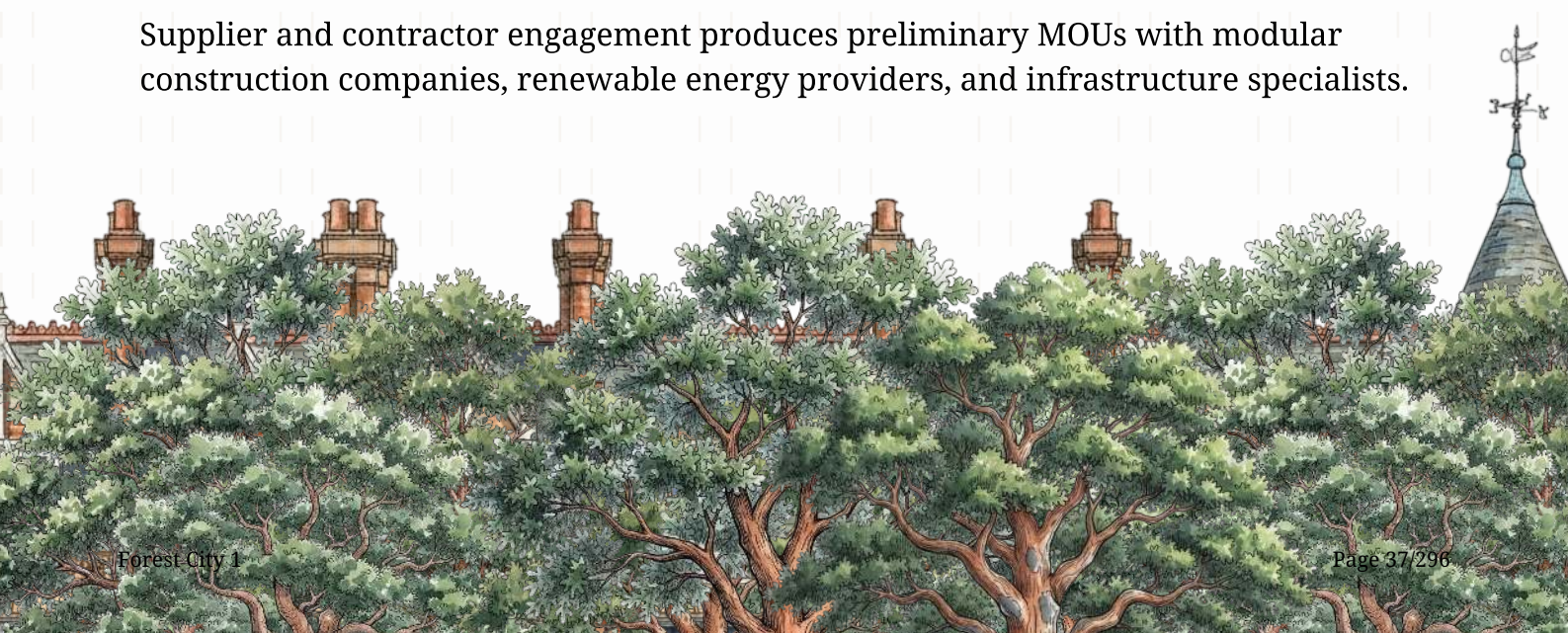
- Drafting the Parliamentary bill,
- Conducting detailed land requisition studies,
- Structuring Community Land Trust arrangements,
- Environmental impact assessments to ensure regulatory compliance,

The trams and railway extensions will require feasibility studies and designs, which should also be done at this stage.

Simultaneously, we continue to build political support through systematic engagement with MPs, local residents, and relevant ministers. Anchor tenant outreach secures agreements in principle from:

- Major technology companies,
- Research institutions, and
- Public service providers willing to establish operations.

Supplier and contractor engagement produces preliminary MOUs with modular construction companies, renewable energy providers, and infrastructure specialists.



Phase 3: Political Approval and Final Preparations (Years 2-4)

The lobbying phase focuses intensively on passing enabling legislation through Parliament. This involves coordinated campaigns targeting key committees, continued opposition engagement to build cross-party support, and public consultation processes to demonstrate community backing. Plan revisions incorporate feedback from political negotiations and regulatory requirements while maintaining core vision integrity.

Financial closure occurs through final investment agreements, government backing arrangements, and potential off-plan sales to early residents. Contractor and supplier relationships move from MOUs to binding preliminary agreements, with detailed delivery schedules and penalty clauses. Marketing campaigns launch to finalise resident waitlists and establish the City's brand nationally and internationally.

Phase 4: Implementation and Delivery (Years 4+)

Implementation begins with comprehensive marketing, including off-plan sales to qualified residents. Land acquisition proceeds through negotiated purchases or compulsory purchase orders as authorised by Parliament.

The city breaks ground, with modular manufacturing beginning in parallel with site preparation. The phased construction approach delivers infrastructure first - utilities, transport links, and community facilities - followed by residential areas.



Report 1. Initial Economic Assessment

By Priti Billimoria

1. Executive Summary

Forest City represents a generational opportunity to address the UK's housing crisis whilst delivering transformational economic growth. This initial assessment establishes the economic foundation for a new planned city of 400,000 dwellings housing approximately one million people in the Cambridge-Oxford corridor.

The Opportunity

- **Scale:** 400,000 dwellings, ~one million population at full build-out
- **Location**: Oxford-Cambridge corridor, strategically positioned for East West Rail connectivity
- **Timeline:** 25-40 years depending on governance model and policy enablers
- **Principles:** Sustainable development, community-led governance (Community Land Trust model), integrated planning from inception

Headline Economic Impact

- **Gross Value Added (GVA):** £53bn annually at full build-out
- **Employment:** Over 600,000 jobs at baseline productivity assumptions
- Equivalent to adding a city larger than Leeds, Oxford and Cambridge combined to the UK economy



Strategic Rationale

Forest City directly addresses market failure in UK housing supply that currently constrains national economic growth. The government's target of 300,000 homes per year consistently exceeds delivery of approximately 225,000, creating an annual shortfall of 75,000 homes. In high-productivity regions, this constraint is particularly acute: Cambridge and Oxford show house price-to-earnings ratios of over 10, compared to a national average of 8.2.

Recent analysis by Public First demonstrates that the Oxford-Cambridge Arc requires over 370,000 additional homes by 2050 under a growth scenario designed to unlock the area's potential. Forest City's 400,000 dwellings would address this requirement whilst enabling high-productivity employment that is currently suppressed by housing shortage.

Key Differentiators

- **Scale delivers national impact:** At one million population, Forest City achieves the critical mass for genuine agglomeration benefits and meaningful contribution to UK GDP
- **Community ownership:** Community Land Trust model enables land value capture for public benefit and for future generations to continue to access affordable housing
- **Sustainability leadership:** Forest City model integrates nature-based infrastructure from inception, demonstrating climate-compatible urban development at scale
- **Lower displacement:** 45% displacement versus 70%+ typical regeneration, because greenfield development relieves supply constraint rather than replacing existing activity

Next Steps

This initial assessment establishes the economic foundation for Forest City. Further work is required on refined delivery phasing, market analysis, Environmental Impact Assessment, and a fully comprehensive business case with full cost-benefit analysis.

2. Context and Opportunity

The Housing Challenge

National Context

There is widespread acceptance that the UK's economic prospects are constrained by the housing affordability crisis [4] . The New Towns Taskforce Report (2025) identifies housing supply as a critical bottleneck for national growth, with new towns positioned as a key mechanism to address this constraint [5].

Current government targets call for 300,000 [6] new homes annually, yet delivery has consistently fallen short at approximately 225,000 [7] homes per year, creating an annual shortfall of 75,000 homes. This adds to a cumulative undersupply estimated at between 4.3 and 6.5 million homes [8], has significantly constrained household formation and labour mobility, particularly affecting younger generations seeking to access homeownership and high-productivity employment.

Housing affordability in the UK compares poorly to other European countries [9]. This is particularly acute in the South East of England, where the concentration of high-productivity sectors creates intense competition for limited housing stock. The result is a spatial mismatch where workers cannot afford to live near employment centres, suppressing economic activity that would otherwise occur.

Regional Pressures: Oxford-Cambridge Arc

The Oxford-Cambridge Arc exemplifies how housing constraints suppress regional economic potential. Recent analysis by Public First demonstrates the scale of the challenge [10]:

- **House price-to-earnings ratios:** Cambridge (10.94), Oxford (11.19), versus national average (8.2) [11]
- **Housing requirement:** 370,808 homes needed by 2050 under Growth scenario
- **Graduate retention:** 83% of graduates leave region due to unaffordability
- **Lab space shortage:** 850,000 ft² shortfall in Cambridge alone
- **Infrastructure investment:** £243 billion required over 25 years to enable growth

The Cambridge and Peterborough Combined Authority local plan similarly identifies substantial housing need that current delivery mechanisms cannot address [12]. Comparing these requirements to current housing delivery numbers reveals a significant and growing gap.

Intergenerational Inequity

The housing crisis disproportionately affects younger generations. Data on household formation rates for those under-30 shows significant suppression compared to previous generations, with delayed marriage, reduced fertility, and prolonged residence in parental homes all linked to housing unaffordability [13]. This represents not only an economic efficiency loss but also a fundamental question of intergenerational fairness.

Summary

There is an urgent need to address the housing crisis to boost UK productivity and address social concerns. Forest City offers a solution proportionate to the scale of the challenge.

Forest City Vision

Location and Scale

Forest City is proposed for development in the Oxford-Cambridge corridor, strategically positioned to benefit from East West Rail connectivity whilst addressing the acute housing shortage in this high-productivity region.

- **Scale:** 400,000 dwellings
- **Population:** ~one million at full build-out
- **Geographic footprint:** To be determined through site analysis
- **Connectivity:** Proposed integration with East West Rail, enabling labour market participation across the Arc

Guiding Principles

- **Sustainable development:** Forest City model integrates nature-based infrastructure, prioritises active travel and achieves net zero carbon from inception
- **Community-led governance:** Community Land Trust (CLT) model enables resident participation in decision-making and captures land value uplift for public benefit
- **Integrated planning:** employment, housing, infrastructure and amenities planned holistically from inception, avoiding the retrofitting challenges of organic urban growth
- **Intergenerational equity:** mixed tenure with significant affordable housing provision, enabling access for younger generations currently excluded from homeownership

Policy Alignment

Forest City aligns with current government priorities

- **Growth mission:** Removes housing constraint that suppresses productivity and labour mobility
    - **New Towns Taskforce recommendations:** Demonstrates state capacity to deliver housing at scale through strategic planning
    - **Net zero commitments:** Opportunity to build sustainability into urban form from inception rather than retrofitting
    - **Regional development:** Enables Oxford-Cambridge Arc to reach its economic potential

3. Steady State Economic Value

Approach & Assumptions

Methodological Note

This analysis uses simple productivity benchmarks to calculate potential economic value creation at Forest City's full build-out (steady state). This is not a full programme appraisal. A comprehensive business case following HM Treasury Green Book methodology would require detailed phasing analysis, discounted cash flows, sensitivity analysis, risk quantification, and assessment of wider economic benefits.

Rather, this initial assessment establishes an order-of-magnitude estimate of Forest City's potential economic contribution to inform strategic decision-making and guide further detailed analysis [14].

Dwellings	400,000
Occupancy	2.4 persons per dwelling × 99.3% occupancy rate [15]
Population	953,280 (400,000 × 2.4 × 0.993)
Productivity benchmarks	Milton Keynes, Cambridge, Oxford,
Employment rates	Based on benchmark city employment-to-population ratios
Values	Current prices (2023-2024 data), not discounted

Table 1.0.1 - Core Assumptions

Gross Economic Impact

Three productivity scenarios are modelled based on different benchmark city combinations.

Base Case: Milton Keynes Benchmark

Milton Keynes provides the most direct UK precedent as a successful new town with demonstrated high productivity. While Milton Keynes has some natural economic advantages, primarily from its location along key national transport infrastructure (namely West Coast Mainline and M1, providing fast transport into London and northwards), Forest City offers reasons for optimism. The proximity to world class centres of innovation around the University, as well as the proximity to London Stansted airport give the city international appeal and growth potential.

This forms the conservative base case.

- **GVA per worker:** £88,064 [16]
- **Employment rate:** 63.8% [17]
- **Employed population:** 608,383

Gross GVA: £53.6 billion annually

This would add an economic value greater than Leeds GVA (£36 billion), and would be equivalent to adding approximately 2.2% of current UK GVA (£2.453 trillion) to the economy, as well as approximately 2.3% of England employment (28.4 million).

Sensitivity Analysis

Milton Keynes provides the most direct precedent for Forest City as a successful planned new town. However, Forest City's location in the Oxford-Cambridge corridor, with direct proximity to world-class universities and integration with the Arc's knowledge economy, creates potential for different productivity outcomes.

We test sensitivity using Oxford and Cambridge as alternative benchmarks, recognising these cities represent different economic models:

	Milton Keynes	**Oxford**	**Cambridge**
GVA per Worker[18]	£88,064	£68,078	£73,505
% Employment rate [19]	63.8%	76.48%	80.74%
Gross GVA Forest City	**£53,576,722,831**	**£49,630,494,052**	**£56,575,142,416**

Table 1.0.2 - Oxford Cambridge Comparisons

Key insights:

1. Oxford and Cambridge show lower GVA per worker than Milton Keynes, reflecting their sectoral composition. University cities have large student populations and academic employment with different productivity profiles than commercial centres.
2. Employment rates vary significantly: Cambridge achieves 80.7% employment versus Milton Keynes' 63.8%. This 16.9 percentage point difference translates to an additional 160,000+ jobs at Forest City's scale - highlighting employment creation as equally important as productivity per worker.
3. The Cambridge scenario (£56.6bn) exceeds the Milton Keynes base case (£53.6bn) despite lower productivity per worker, entirely due to higher labour market participation.

Implications: Forest City could realistically achieve outcomes across this £49.6bn-£56.6bn range depending on: (a) sectoral mix attracted, (b) success in creating employment dense clusters, and (c) effectiveness of active labour market policies. The Milton Keynes benchmark at £53.6bn represents a credible central estimate rather than a floor.

Net Economic Impact

The gross GVA figure represents total economic output but does not account for what would have happened anyway (deadweight), activity displaced from elsewhere (displacement), benefits leaking outside the UK (leakage), or multiplier effects. While the English Partnerships Additionality Guide (2008) provides the framework for these adjustments [19], for an intervention of Forest City's scale and ambition, traditional additionality adjustments require recalibration. This level of analysis is beyond the initial scope of this report.

Delivery Scenarios

Economic impact trajectory and total value differ significantly depending on delivery timeline, which in turn depends on governance model and policy enablers. Three scenarios illustrate this:

Scenario A: Development Corporation with Full Special Economic Zone (SEZ) Status

- **Build-out timeline:** 25 years to 80% capacity
- **Average delivery rate:** ~16,000 homes per year
- **Economic impact:** Faster trajectory to full £53bn annual contribution; higher NPV over appraisal period

Scenario B: Development Corporation

- **Build-out timeline:** 40-50 years to 80% capacity
- **Average delivery rate:** ~8,000-10,000 homes per year
- **Economic impact:** Slower trajectory to full contribution: lower NPV but more manageable risk profile

Scenario C: Investment Zone

- **Build-out timeline:** 40-50 years to 80% capacity
- **Average delivery rate:** ~8,000-10,000 homes per year
- **Economic impact:** Slower trajectory to full contribution; lower NPV but more manageable risk profile

The economic case is strongest under accelerated delivery scenarios (Scenario A), which maximise present value of benefits and demonstrate UK government commitment to strategic growth. However, all scenarios deliver substantial economic value; the question is primarily one of timing and risk appetite.

4. Wider Economic Benefits

The steady-state economic contribution of £53bn annual GVA is one measure of Forest City's economic impact. A comprehensive business case following Green Book guidelines would assess numerous additional economic effects, though these require further detailed analysis beyond the scope of this initial assessment.

Regional Housing Affordability Impacts

By adding 400,000 homes to a severely supply-constrained region, Forest City would be expected to reduce house prices in surrounding areas, improving affordability and increasing disposable income for existing residents. This generates:

- Reduced housing costs for existing residents in Cambridge and surrounding areas
- Increased discretionary spending as housing cost burden decreases
- Improved labour mobility as workers can afford to relocate for high-productivity employment
- Reduced wage pressure on employers competing for talent in constrained housing markets

Quantification would require modelling house price elasticity with respect to supply changes and distributional analysis of who benefits from improved affordability.

Agglomeration Benefits

The central £53bn estimate does not account for potential long-term agglomeration effects. Given the scale of Forest City, these impacts are potentially significant. Research indicates cities generate productivity premiums of 3-8% through [16]:

- Labour market pooling: deeper pools of specialised workers reduce matching friction
- Knowledge spillovers: face-to-face interaction facilitates innovation and learning
- Input sharing: specialised supplier networks emerge at scale, reducing transaction costs
- Network effects: connections between Forest City and existing Oxford-Cambridge Arc activity hubs

Public First's analysis of the Oxford-Cambridge Arc quantifies agglomeration effects at £4.6bn annually in their growth scenario. Detailed modelling would be required to estimate Forest City's specific contribution to these regional agglomeration dynamics.

Social Housing Benefits

With co-operative rental at the heart of the vision for Forest City, there is the potential for up to 30% of the homes to be delivered via registered social landlords. Research suggest that social housing can generate significant GVA multiplier effects through:

- Reduced homelessness and temporary accommodation costs
- Improved health and educational outcomes for low-income households in stable, quality housing
- Reduced public expenditure on housing benefit as supply increases
- Workforce participation improvements as housing stability reduces barriers to employment

Methodologies for quantifying these benefits already exist [17], though detailed application to Forest City would require further analysis.

Construction Phase Effects

During the 25-40 year build-out, Forest City would generate substantial construction sector activity. Lichfields' research (September 2022) provides methodologies for estimating these effects, typically showing :

- Direct construction employment (on-site workers)
- Indirect employment in construction supply chains (materials, equipment, professional services)
- Induced employment from construction worker spending
- Training and apprenticeship opportunities, building UK construction sector capacity, which are potentially significant given the scale and duration of the build out phase

These indirect effects and implications will require further assessment.

Infrastructure Costs and Benefits

Public First's analysis estimates £243bn infrastructure investment required over 25 years for the Oxford-Cambridge Arc growth scenario. This includes transport, utilities (notably £2.6bn for water infrastructure), social infrastructure, and digital connectivity.

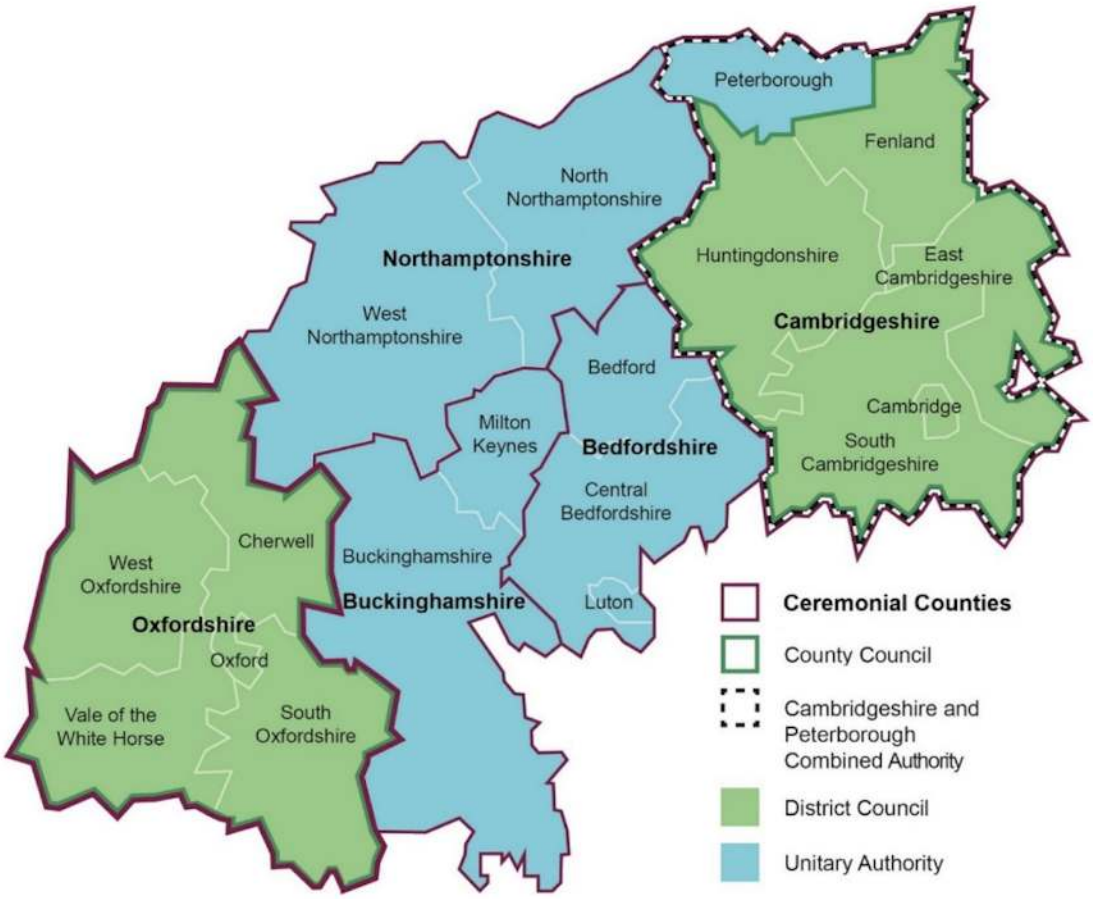


Fig. 1.0.1 The Oxford-Cambridge Growth Corridor

A full cost-benefit analysis would assess:

- **Infrastructure costs:** capital expenditure, maintenance, operating costs
- **Transport benefits:** time savings, decongestion, accessibility improvements
- **Utilities resilience:** water security, energy system benefits
- **Enabling value:** infrastructure as prerequisite for wider economic benefits

Forest City's full infrastructure requirement would be determined based on final site selection and masterplan development.

Environmental Impacts

A comprehensive Environmental Impact Assessment would quantify both costs and benefits:

Costs (primarily short-term):

- Construction phase disruption to ecosystems
- Embodied carbon in construction materials

Benefits (primarily long-term):

- Forest City model: large-scale reforestation, urban greening, biodiversity net gain
- Net zero from inception: avoids carbon lock-in of conventional development
- Natural capital: carbon sequestration, flood mitigation
- Climate resilience: nature-based adaptation to climate change

Valuation methodologies exist for these impacts (e.g., Social Value of Carbon, natural capital accounting) and should be incorporated into a full business case.

Discount Rate Considerations

This initial assessment presents steady-state impacts without discounting. A full Green Book appraisal would discount future benefits and costs at 3.5% per annum (HM Treasury standard rate). However, for very long-term projects like Forest City, declining discount rates may be appropriate for intergenerational impacts, as recommended in the Green Book.

The choice of discount rate significantly affects Net Present Value calculations, particularly for projects with long build-out periods and permanent benefits. This merits careful consideration in detailed business case development especially with respect to social housing elements.

5. Summary

Summary of Findings

Economic Impact

- **£53 billion GVA annually** at full build-out (conservative estimate)
- **Over 600,000 jobs** at Milton Keynes productivity benchmarks
- **Equivalent to adding a city larger than Leeds, Oxford and Cambridge combined** to the UK economy

- **Conservative assumptions:** Excludes long-term agglomeration premiums, innovation spillovers, construction multipliers, social & environmental benefits

Strategic Rationale

- **Addresses critical market failure**: Housing constraint suppresses national economic growth
- **Scale matters:** 1 million population achieves critical mass for agglomeration and meaningful national impact
- **Regional alignment:** Addresses majority of Oxford-Cambridge Arc housing requirement
- **Public value:** Intergenerational fairness, democratic legitimacy, environmental leadership

Delivery Considerations

- **Timeline:** 25-60 years depending on governance model
- **Infrastructure requirement:** Substantial but proportionate to potential economic benefits generated
- **Risk profile:** Manageable through phased delivery and adaptive planning

Further Work Required

To develop this initial assessment into a comprehensive business case, further work is required:

- **Site analysis:** Detailed constraints study, ground investigations, environmental baseline
- **Masterplanning:** Urban design framework, land use strategy, phasing plan
- **Economic modelling:** Refined GVA forecasts with delivery phasing, discounted cash flows, sensitivity analysis, quantification of wider economic benefits
- **Infrastructure assessment:** Detailed costing for transport, utilities, social infrastructure; funding strategy
- **Environmental Impact Assessment:** Full EIA process, biodiversity net gain strategy, carbon assessment
- **Market analysis:** Residential and commercial demand studies, absorption rates, pricing strategy

6. Context Data for Benchmarks

Productivity Data

	GDP (£m, 2023)	Total Resident Population (2023)	GDP per Capita (2023)	Employed (2024)	Employment Rate (calc)	Balanced GVA (2023)	GVA per Worker (calc)
Milton Keynes	16,763	298,270	£59,940	190,350	63.82%	£16,763	£88,064
Cambridge	8,900	149,963	£62,848	121,080	80.74%	£8,900	£73,505
Oxford	8,600	165,184	£55,374	126,325	76.48%	£8,600	£68,078

Table 1.0.3 - Productivity Data

House Price Data

	Average Price	Detached Price	Semi Detached Price	Terraced Price	Flat Price	First Time Buyer Price
Milton Keynes	325,163	549,376	328,009	267,470	171,235	273,328
Cambridge	514,897	1,027,065	640,526	526,849	339,359	434,898
Oxford	434,898	940,603	577,245	460,113	301,732	409,254

Table 1.0.4 - House Price Data (Dec 2024)

Affordability Data

	Ratio of median house price to gross median annual residence-based earnings	**Ratio of lower quartile house price to lower quartile gross annual residence-based earnings**
Milton Keynes	8.47	8.82
Cambridge	10.94	11.68
Oxford	11.19	11.8

Table 1.0.5 - Affordability Data (2024)

Endnotes

[4] Homes England (2025) Measuring Social Value Paper 7: Housing Affordability and Productivity
[5] UK Government (2024) New Towns Taskforce 'Report and Recommendations'
[6] Labour Party Manifesto, commitment to 1.5 million homes over the parliament, framed as 300,000 homes per year
[7] MHCLG (2025) Live Tables, Net Additional Dwellings, Table 118, 5 year average
[8] Centre for Cities (2023) The housebuilding crisis, Centre for Policy Studies (2025) How Many Homes Does the UK Need?
[9] Deloitte (2025) Property Index, Overview of European Residential Market
[10] Public First (2024), Oxford-Cambridge Supercluster: Scenario Modelling
[11] Office for National Statistics (2024), House Price Statistics for Small Areas (HPSSAs), Table 5c: Ratio of median house price to gross median annual residence-based earnings
[12] CPCA (2025) Get Cambridgeshire and Peterborough Growing, A Local Growth Plan with National Reach and Global Impact, Estimated 214,760 new homes by 2050
[13] Resolution Foundation (2017, 2024), Home Affront: housing across the generations and Housing Hurdles
[14] An alternative approach using HCA (2015) Employment Densities Guide was considered, but would require an additional level of detail on planned commercial space than is currently available.
[15] Census data (2021) average household size, current estimated long term vacancy rate in SE
[16] Nomis (2024) Business Register and Employment Survey, ONS (2023) Nominal & Real Regional Gross Value Added
[17] ONS (2023) Regional gross domestic product: local authorities, Nomis (2024) Business Register and Employment Survey
[18] English Partnerships (2008), Additionality Guide: A Standard Approach to Assessing the Additional Impact of Interventions
[19] Rosenthal, S. and Strange, W. (2004), 'Evidence on the nature and sources of agglomeration economies', in Henderson, J.V. and Thisse, J.F. (eds), Handbook of Regional and Urban Economics, Vol. 4, pp. 2119-2171.
[20] NEF Policy briefing (2024) The economic and social value of investing in a new generation of social housing, Cebr report for Shelter and the National Housing Federation (2024), The Economic Impact of Building Social Housing.
[21] Lichfields (2022) The Economic Footprint of Home Building in England and Wales

Report 2. Natural Infrastructure: Forest

By Paul Powesland

Introduction

Almost all modern development gets the Nature element the wrong way round. It decides the layout of the development first and then seeks to compensate for the Nature destroyed or damaged (and add any biodiversity net gain) by tacking on Nature creation at the end. This approach is expensive and usually does not work well, given that many parts of Nature will either take decades to mature or are, essentially, irreplaceable.

This report has sought to work the other way round and determine what parts of Nature are important and irreplaceable (e.g. rivers, woodlands and SSSI sites), incorporate these into what would become England's biggest, contiguous, land based nature reserve and then build the city around this.

In determining what is best for Nature in building Forest City, we are aware of the need to avoid a 'nature doughnut'. This is where the forest/Nature Reserve part of the City is ecologically rich but is simply a circumference around a concretised, nature deprived urban core, set amongst a wider landscape that is also poor for Nature. To avoid such a scenario, this report recommends five different zones for Nature:

1. Nature Reserve
2. The City
3. Surrounding Area
4. Wider Landscape Recovery
5. Impact On The Country As A Whole



Nature Reserve City

Introduction

> *"To make space for nature we need more, bigger, better and joined up sites to create a sustainable, resilient and more effective ecological network for England."*
>
> *- **Sir John Lawton, Making Space for Nature: A review of England's Wildlife Sites & Ecological Network, (2010)***

The founding idea of Forest City is to help solve the housing crisis for humans, and the crisis of the environment at the same time. The most important part of this is the 12,000 acres of Nature Reserve that is to be set aside principally for Nature and managed in its best interests. This would be one of the largest Nature Reserves in England and the largest urban adjacent Nature reserve in the UK.

The outline of the Nature Reserve can be seen on the image below:

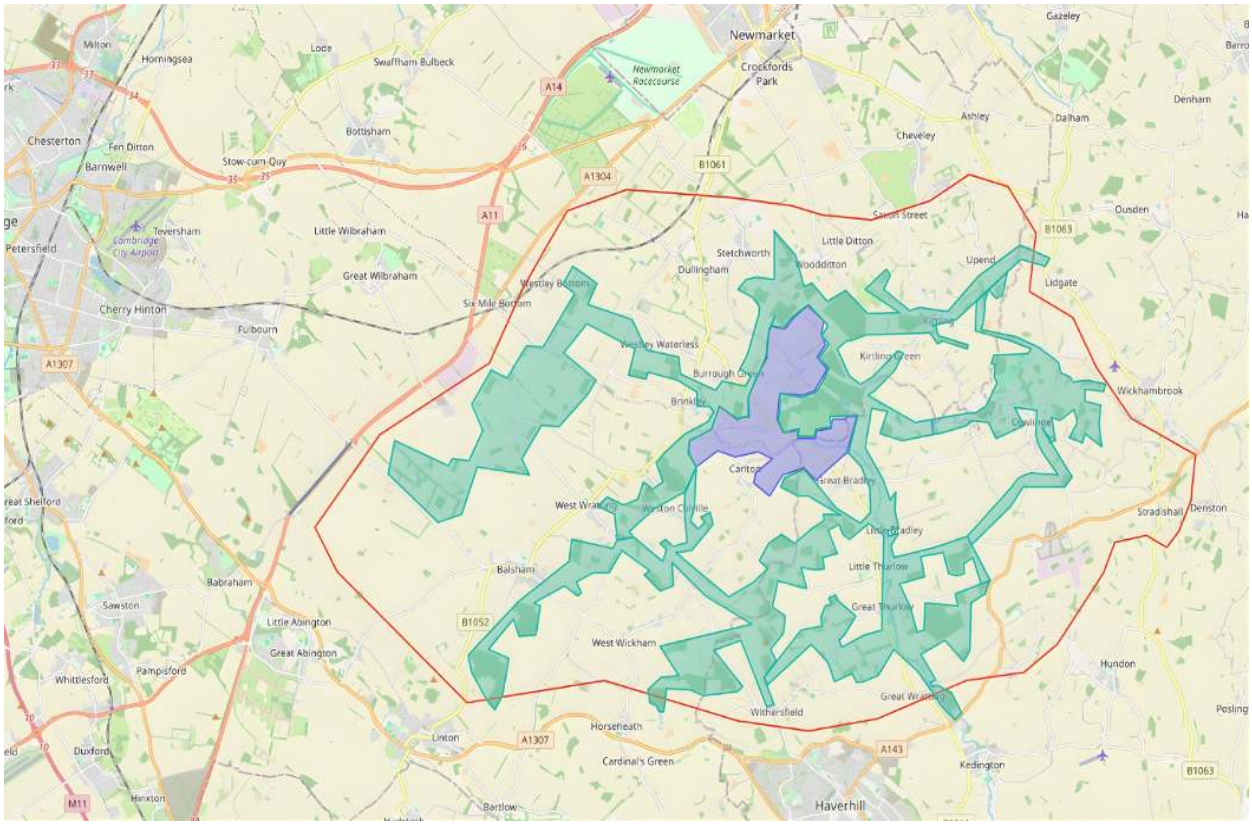


Fig. 2.0.1 Forest City early draft forest and reservoir outline

The Nature Reserve is situated more heavily in the West of the proposed area of Forest City, as this is where the greatest concentration of existing irreplaceable habitats can be found. The way that the Nature Reserve creates enclaves surrounded by forest makes this area most suitable for individual residential neighbourhoods. From Nature's perspective, the commercial centre of the city, which would require more open land to build on, would be best placed to the east of Great Bradley, beyond the Nature Reserve that follows the Stour Corridor.

This report can only set out the general principles and is not intended to be definitive as to which areas are included within the Nature Reserve. Following the comprehensive surveying that will take place at the next stage of the project, further irreplaceable habitats and protected species are likely to be identified. The boundaries of the Nature Reserve will then need to be amended to include such sites.

Standards & Principles

> *"Future woodlands need to be much more open and complex, closer to the ancient 'forests' of the past: shifting mosaics of open grown trees, groves of trees, thorny scrub and understorey, grazing lawns, heath and wetland vegetation, with large herbivores (or a proxy for them) keeping systems dynamic and resilient."*
>
> - ***Isabella Tree, Book of Wilding, (2018)***



Fig. 2.0.2 Centenary Walk, Epping Forest, London

To ensure that the Nature Reserve element of the project is developed and managed in the best way possible, we recommend that the reserve be subject to specific standards of natural abundance and diversity to be achieved by different dates. These standards would be legally enforceable and contained either in any legislation that gives planning permission to Forest City, or in Nature Covenants. The exact standards are to be set in negotiation with Natural England, government and Nature Guardians, but as an example, could be:

- Within 5 years, to have achieved the level of Local Nature Reserve
- Within 10 years, the level of National Nature Reserve
- Within 25 years, the level of SSSI

Much development in Britain adopts a ‘tabula rasa’ approach of destroying the Nature on a site, building the houses or infrastructure on a blank slate and then ‘restoring’ Nature around it (e.g. by planting trees). Forest City emphatically rejects this approach and instead has a foundational principle of working with the Nature that is already there. For the Nature Reserve, this means:

- Keeping **all** existing woodland and forest.
- Existing areas of woodland and forest to be protected but not counted towards the 12,000 acres allocated towards the Nature Reserve.
- Retaining all existing trees and hedges within the bounds of the Nature Reserve and letting them form the structure of the reserve. Exceptions to this rule would apply for non-native species and for coppicing and pollarding to increase biodiversity.
- Keeping all existing ponds and wetlands.
- Incorporating the entire River Stour within the reserve and creating a buffer zone of 100 metres either side where possible.
- Incorporating smaller streams, brooks, water courses and wetlands within the reserve wherever possible.

The existing trees and woodlands will give much needed structure, maturity and variety in the habitats and ecology within the Nature Reserve. It is not possible to create or plant this and so it is vital to incorporate and not destroy all of the existing woodlands and as much of the hedges, trees and other habitats and ecologies as possible.

Current work on establishing the existing natural habitats and ecological richness of the area has been at a very high level (particularly maps, with some site visits). Much more detailed ecological surveying will be needed. Where these reveal areas of ecological importance or existing ecological richness, the boundaries of the Nature Reserve will be adjusted to incorporate them.

In setting the area, there are trade-offs between connectivity and mass. Whilst connectivity and corridors are good, if the acres of the Nature Reserve become too ‘strung out’, there will be fewer areas with a solid mass of land allocated to Nature and the ‘edge effect’ is increased. For this reason, we have decided against allocating the 12,000 acres of Nature Reserve to a narrow belt around the entire city.

Counteracting the ‘edge effect’:

- The edges of woodlands and nature reserves are the most vulnerable. Such vulnerabilities include wind, invasive species and predators, fertiliser, pesticide and herbicide contamination, light pollution etc.
- In particular, hard edges that abut Nature-poor urban areas are bad for Nature and biodiversity.
- This can be reduced via proper planning, ecological design and ecological covenants in the parts of the city adjoining the Nature Reserve. This is dealt with further below under Nature within the city itself.

Connectivity is important; wherever the reserve crosses human infrastructure (e.g. roads or railways), connectivity must be maintained. This could either be through the human infrastructure going through tunnels, or through green bridges and tunnels taking nature under or over the location in question.

When preserving what is already there and restoring what has been lost, we recommend categorising locations in the following ways:

A) Preserving what is there and is irreplaceable and immoveable (e.g. ancient trees & ancient woodland soil).
B) Preserving what is there but potentially could be relocated or recreated (e.g. ponds, grasslands).
C) Restoring what was lost and where there is a physical advantage to doing it on the original site (e.g. Plantation on Ancient Woodland (PAWs), ancient ponds with water sources and seeds, grasslands).
D) Restoring what was lost where there is no physical advantage, but there is one of historical/cultural memory (e.g. recreating old woodland/ponds/river channel.

In determining what is incorporated into the Nature Reserve and what is protected within the City element, greater stringency is to be given to those at the top of the list than the bottom. For example, all ancient woodland is to be preserved, given it is irreplaceable, recreating a completely lost ancient woodland or pond for the purposes of historical memory will be done

where it is possible within either the Nature Reserve or City, but not if it would be in the middle of the commercial centre of the City.

Consideration should be given to not just preserving the ecology of existing Nature within the Forest City site, but also keeping cultural and historical memory wherever possible. For example where woodlands are subsumed into the new Nature Reserve, their historical boundaries could be marked by surrounding them with a ditch and bank (on 1880 boundaries) and ensuring that each is signed with its historic name (where known).

Human Access

As the 12,000-acre Nature Reserve is to be managed for the benefit of Nature, access to humans will be on the basis that it does not damage or significantly negatively impact Nature. The following principles will apply:

- Allowing human access to as much of the Reserve as possible, to the extent there are no deleterious consequences for Nature.
- Where it is necessary to exclude, control or manage human access, this should be through natural interventions rather than human barriers such as fencing, walls or wire. Examples could include the use of ditches and moats or the creation of thorny scrub to give natural habitat and make some areas more difficult to access.
- Some areas should be set aside where no human access is allowed, to permit Nature and natural processes free reign.
- For the benefit of Nature, sensitive areas of the Nature Reserve should have restrictions on permitted human activities (zones that require dogs on leads, but also specific areas designated for camping and other leisure activities).
- Some areas of the reserve may need seasonal access restriction (e.g. around nesting time).

Governance

The Nature Reserve should take a Rights of Nature/ Nature Guardianship approach to governance. If possible, this should include self-ownership and legal personality for the Nature Reserve and the Nature and wildlife that inhabits it.

Whatever the legal governance, the practical effect must be that these 12,000 acres are managed primarily in the interests of Nature itself.

We would recommend moving away from a contractor model of caring for public land and towards one of Guardianship:

- Attempt to re-animate the indigenous model of caring for Nature.
- Wherever possible, any housing or buildings that end up within the boundaries of the Nature Reserve are to be used in service of Nature itself and the reserve. In particular, to house those caring for Nature and the reserve. This will help to break the current 'contractor' mentality of caring for Nature, where those working on Nature are removed from it physically. Geographically anchoring those caring for Nature in the reserve itself will give them a wholly different (and better) relationship with the environment they are caring for.



Fig. 2.0.3 Gunton Woods, Lowestoft, Suffolk

Forest Creation

"The easiest way to create a wood is to do nothing"

- ***Oliver Rackham***

In regards to the creation of the Forest, ecological and forestry experts should decide which options are best for each site based on its specific characteristics. For example, from the options below, a site next to existing woodland might suit option 1 best, but a site far from any existing seedstock and where seed planting might not be efficacious, might better suit option 3:

1. Wherever possible, forest creation is to be by natural planting and succession. This will be assisted by creating new woodland in the vicinity of existing woodland and hedges. This will help to avoid failures of planting using nursery stock (e.g. the nearby A14 tree planting, where thousands of saplings died).

2. Where existing seed stock in the vicinity is low, it may be necessary to collect seeds elsewhere and get volunteers to sow/plant them in the forest creation area. This can be combined with fencing to keep out deer where necessary.
3. If planting is necessary, it should be from local stock, planted as early as possible (saplings should be no more than 2-3 years old). The project should set up a community nursery to grow saplings from local native seed stock.

All trees planted are to be native, except where trees are brought in to aid with climate resilience and are also good for native biodiversity (e.g. Oak, Quercus Robur, stock from Southern France that is better able to cope with drier and hotter summers). Exact planting will be determined by the soil type, ecological needs and historical evidence for each site.

The next stage of the project is to include a full research project to determine which tree species are endemic to the Forest City area (both currently and historically) and will provide the most biodiversity benefits. In general, priority should be given to the following species, due to their historical connection to the area and ecological benefit:

- Oak (quercus robur)
- Ash (subject to a breeding programme to produce ash dieback resistant saplings)
- Elm (subject to a breeding programme to produce Dutch Elm Disease resistant saplings)
- Birch
- Willow (all sub-species, but particularly goat (Salix Capra) and white (Salix alba)
- Black poplar
- Hawthorn
- Hazel
- Small-leafed lime

For the next stage of planning, here are further important points on woodland creation to consider:

- Non-native trees and plants from the Nature Reserve area should be removed except where it is shown that they are beneficial to native biodiversity.
- Some areas may need to be fenced in order to allow trees and scrub to regenerate. However, given the size of the area, and the fact the ecological restoration will be embedded in the wider landscape, culling of deer and the reintroduction of natural predators should play a significant role in reducing browsing pressure.
- The creation of new deadwood (both standing and fallen) will be important. This can hopefully be achieved through felling and ring-barking non-native trees as part of the ecological restoration process.

- The full restoration of all PAWS across the city and particularly in the Nature Reserve area.
- The regeneration of poorly managed existing woodland through coppicing, the removal of non-native species and any pine plantations.
- The need to introduce large herbivores in some areas, and a coppicing regime in others, to keep the Nature Reserve at its maximum ecological richness and vitality.
- The intensity of human intervention varies depending on the size of the area to be rewilded. As a mid-size project, the Nature Reserve will need a bit of both; being left alone and active management.

Other Habitats & Ecosystems

Ponds

Increasing ponds across the Nature Reserve area is of real importance especially since they can be utilised to mediate water run-off and thus reduce both flooding and drought and potentially contribute to water storage and supply. On that basis, the following is proposed:

- A target of 50 ponds per square mile should be set following a further feasibility study.
- Restore all historic ponds (to 1880 baseline).
- Water sources may be an issue. However, it is good for Nature to have a variety of different types of ponds, including seasonal ponds that dry up in summer.
- Ecological planners will need to ensure that ponds have large ‘draw down’ zones and are connected to other wetlands wherever possible. A good example of this is Pinkhill Meadows in Oxford.



Fig. 2.0.4 Pond in West Suffolk

Marshes & Wetlands

Wetland areas are particularly rich for Nature. However, as a result of intensive agriculture in the area proposed for Forest City, many of these have been lost. Slowing the flow of water through the site of Forest City and creating as many wetlands as possible, using every drop of water landing in and flowing through the Nature Reserve, will therefore help to create as much life as possible. Where possible Forest City should rely on natural methods to create new wetlands (e.g. via the reintroduction of beavers) and digging scrapes and marshes rather than any concrete or heavy infrastructure. Of particular importance is the creation of areas of carr and wet woodland throughout the Nature Reserve

Caves

Where possible, use existing structures within the Nature Reserve area to create cavern-like and enclosed but open to Nature structures for bat and bird roosting.

Grassland & wildflower meadows

All non-improved grasslands and wildflower meadows on the Forest City site should be included in the Nature Reserve, preserved and restored wherever possible. New grassland and wildflower meadow should be created as part of the mosaic of habitats within the Nature Reserve area; these can be especially concentrated on the Stour Corridor and in the floodplains of other watercourses within the area of Forest City.

Introduction to missing species



Fig. 2.0.5 Beavers have recently been re-introduced to Suffolk after 400 years

Animal species play a critical role in shaping and maintaining the vitality of habitats, without the need for humans. The recommendation is to re-introduce missing native species within the Forest City Nature Reserve, particularly keystone species. Some of the species which could be successfully introduced include:

- Beavers (e.g. successfully reintroduced into a peri-urban area at the Ealing Beaver Project)
- Storks (e.g. due to be re-introduced into a peri-urban area in Barking & Dagenham)
- Lynx
- Vole (this sits nicely with the recent eradication of mink in East Anglia).
- Large herbivores
- Bison (e.g. as introduced in the Kraansvlak, Netherlands or Blean Woods, near Herne Bay in Kent)
- Auroch equivalents
- Wild boar
- Water buffalo



Fig. 2.0.6 Bison in Blean Woods, Kent

2. The City

Introduction

The Nature Reserve element of the city is a radical proposal that would be the first of its kind and the largest urban-adjacent Nature Reserve in the UK. However, it would be bad for both humans and for Nature if all of the Nature protection, restoration and connection were merely contained in the Nature Reserve element of the City. To live up to the full potential of a Forest City, it is necessary to weave Nature and forest into the city itself to further demonstrate that it is possible for human society and Nature to co-exist.

At this stage, we can set up general standards and principles, but in the next stage of the project these will need to evolve into detailed guidance, design code and spatial planning. The application of all these on the ground will then need detailed ecological surveying on a site-by-site basis.

Standards & Principles

Tree cover in the city to be 30%: double the national average for urban areas (15%). In terms of Biodiversity Net Gain (BNG), the city should be aiming to exceed the current national standard of baseline BNG + 10% **without taking into account** the Nature Reserve element of the city. The exact percentage the City element will exceed this by, is to be determined with Natural England, government and Nature Guardians at the next stage.

Wherever possible, the building of the city must be designed to retain existing trees and hedgerows, particularly those that are ancient and irreplaceable. Retention of existing trees and hedges:

- All ancient and veteran trees to be retained
- 80% of remaining trees (over 25 years old) to be retained
- All ancient hedgerows to be retained
- Remaining hedgerows to be retained wherever practically possible

Any trees or hedgerows that have to be removed must be replaced with plantings that will provide the same carbon, ecological and ecosystem benefits within 10 years.

Retention of existing ponds wherever possible. Creation of new ponds and moats to bring the city-wide level of ponds (excluding the Nature Reserve area) up to 20 ponds and moats per square mile.

Recommended City-wide policies:

- All lighting to be nature friendly, with particular emphasis on the areas adjacent to nature reserves.
- All native tree and plant species (except in specific circumstances where non-natives planting is needed and the species chosen have equivalent ecological benefits to native species).

- Even for natives, significant weight should be given to the native trees with higher biodiversity values.
- The City should be a herbicide and pesticide free zone.
- All non-native trees and plants within the area of the City, should be removed via a prohibition on planting non-natives within the City and a (funded) policy of removal for any non-natives that later establish themselves within the City.
- Use of natural features (e.g. moats, hedges, ditches, thorny scrub) to demarcate boundaries and provide security wherever possible.
- This area has one of the highest concentrations of moated buildings in the UK. Using such moats as a design motif throughout the city would not only add to aesthetic value, but also serve to recognise the history of the area and add huge uplift for Nature at the same time.
- The City should seek to establish neighbourhood micro-forests (potentially using Miyawaki method) throughout the City.



Fig. 2.0.7 Gardens by the Bay in Singapore, an example of inner urban nature

In designing all elements of the City, consideration is to be given to ensuring the best possible outcome for Nature that can be achieved whilst also providing for human use. This must be a detailed exercise covering every aspect of how the City is designed, built and used, but some examples would include:

- Ensuring that the reservoir by Great Bradley is of maximum use for Nature.
- Building wildlife corridors along transport corridors.
- Ensuring that parks and green spaces are useful for Nature and wildlife as well as people.
- Incorporating Nature into social infrastructure, such as schools and hospitals.
- Bringing Nature into streets, public squares and spaces.

Use of local byelaws, conservation covenants or the Act of Parliament establishing the development corporation, to incorporate a Rights of Nature framework and governance for the City:

- All trees & hedges above a certain size/age to be automatically protected, with a simple to use & inexpensive set of substantive criteria and procedure to determine applications to fell.

All buildings and developments must contribute to the increased biodiversity of the city as a whole. The best way to achieve this would be to allocate a biodiversity value that each site must achieve and offer different 'pathways' to obtaining this. Examples of pathways:

- Genuine nature, greenery and blue space at ground level.
- Use of native vertical forests and gardens (e.g. Milan Bosco Verticale or Eden in Salford).
- Genuine wildlife sites on rooftops: Proper wetlands, scrub and woodland, not just roof gardens (e.g. the Utrecht 'no roofs unused' policy).

Use of conservation covenants to embed ecological principles into the operation of the City, rather than just its building:

- Consideration of measures to protect birds from domestic pets e.g. cats (either city-wide, or in certain proximities to the Nature Reserve areas).
- Regulations on Nature-friendly lighting.

3. Surrounding Area

Nature does not respect humanity's neat administrative boundaries. Whilst it is good that profits from the development of the City will be split with Nature, by being used to restore it, there is a law of diminishing returns. This means that, at some point, a pound spent on restoring Nature would be better spent on greening and ecologically restoring Nature in Newmarket or Haverhill, than in the equivalent of buying yet more fancy Nature 'bling' within the City itself.

Allocating money from the Nature restoration budget to the greening and ecological restoration of nearby towns and farmland would also help to demonstrate the benefit of the new city to residents in nearby towns and villages.

Principles & Policies

The exact area for the application of this policy is yet to be determined:

- A radius of 10 miles from the centre of the new City, would encompass Newmarket and Haverhill.
- A radius of 15 miles would encompass Haverhill, Newmarket, Soham, Bury St Edmunds, Mildenhall, Saffron Walden, Sudbury and the Eastern side of Cambridge.

What could be achieved within this policy.

- Creating new habitats: e.g. ponds, woodlands, meadows.
- Creating natural buffers around the most important sites for Nature (e.g. ancient woodlands, rivers and streams, SSSI's etc).
- Urban tree planting and Nature restoration in towns around Forest City.
- The creation of new nature reserves in towns and villages around Forest City.
- Restoration of existing habitats (e.g. re-meandering rivers, ecological management of woodlands).
- Any reservoirs or water storage areas are to be designed to create maximum biodiversity at the same time.
- Wherever possible, water transport mechanisms should be as good for nature as possible. This ideally means being above ground (like the New River), rather than underground in pipes.
- Transport corridors constructed for Forest city must also serve as Nature and biodiversity corridors.



Fig. 2.0.8 Hampstead Heath; 790 acres claimed for the public via the Hampstead Heath Act of 1871

- Other infrastructure corridors to be designed for Nature, e.g. infrastructure for electricity cables (over or underground) which cannot be built on otherwise, should be utilised as wildlife and ecological corridors.

4. Wider Landscape Recovery

There is a need to embed the City itself within a wider, landscape recovery project. Using funding from the city to help create landscape scale recovery will give bigger benefits than using the funding purely on the land of the city itself.

The exact project is to be determined. However, an example could be a ‘Fen to Sea’ landscape recovery project covering the southeastern edge of Fens, through the Forest City site and down the Stour Valley to the sea at Harwich. This would allow funding from Forest City to create fenland restoration projects and Nature buffer zones and river restoration on the Stour and its tributaries as well as the Cam and Ouse tributaries to the north and west of Forest City.



Fig. 2.0.9 Wheat farming in West Suffolk

5. Impact On The Country

A less immediately obvious potential impact of Forest City on Nature is outside the immediate geographic area of the City. Through the materials used and the processes and practical case studies provided, Forest City could positively impact Nature on a national level. In this regard, Forest City could relieve the need for environmentally destructive greenfield housing elsewhere in the East of England region, as well as showing what is possible with imagination and providing useful case studies for nature-positive development.

There are opportunities in materials usage too. Thousands of acres of Plantation on Ancient Woodland (PAWS) exist across the UK, but restoring these to broad-leaved ancient woodlands is hampered by a lack of market demand for the pine they are currently planted with. By creating buildings from this pine, it will help to create the technology, processing facilities and case studies needed to use up this pine. This could potentially unlock the restoration of thousands of acres of PAWS across the UK.

Where earth, stone and aggregate are needed to build Forest City, those holes are to be turned into ponds, lakes and wetlands rather than landfill dumps.

6. Conclusion

Time and again we are told that the UK is one of the most nature deprived countries on the planet. Each day there are armies of ecologists, environmentalists, researchers and conservators who work tirelessly to change this. But with Forest City we have the chance to create something profound with real scale; the largest single land-based nature reserve in England

This is not about defensively protecting nature, but instead getting on the front foot to replenish ancient natural systems, and build new human institutions to substantially reverse centuries of historical damage.

And by creating this Nature Reserve, with all the attendant benefits to the East of England's environment and biodiversity, we will also be able to show how urban living in the digital age can be deliberately reshaped to exist with, and even for, Nature.

Looking back at Britain's past, this is not an unusual undertaking. From the creation of the first publicly funded urban park in Birkenhead, Liverpool, to Letchworth Garden City and the establishment of Green Belts, Britain has long been a leader in demonstrating to the world how the urban and the natural can co-exist in new ways. If we ever needed to reforge that radical spirit, it is now.

Examples & Case Studies

English National Nature Reserves (NNR's):

- Wyre Forest: the UK's largest woodland National Nature Reserve (NNR) is 3,595 acres
- Somerset Wetlands NNR is UK's third largest at 15,172 acres and has recently been declared a 'Super NNR'
- Wealden Heath's 'Super' NNR is 6,832 acres
- Purbeck Heath's NNR is 8,321 acres

UK Rewilding Projects:

- Strawberry Hill, Bedfordshire: 377 acres
- Knepp in Sussex: 3,500 acres
- Wild Ken Hill: 1976 acres
- Wild Ennerdale: 11,861 acres

Rewilding examples from other countries:

- Oostvaardersplassen Reserve: 13,714 acres
- Kraansvlak: 790 acres

Other notable forests in England:

- Epping (biggest forest in London): 6,000 acres
- Thetford Forest (mainly pine): 47,000 acres
- New 'Western Forest' proposal: 6,177 acres

Report 3. Natural Infrastructure: Water

This report goes through the plan for supplying water to Forest City. It first comes up with reasonable assumptions related to the amount of wholesome water that is used per person per day at the household level, as well as the amount of non-household water that will be used by a likely business population.

These assumptions are based on best-practice efficiency examples and the use of high quality sustainable drainage systems (SuDS). It assumes maximal water reuse and advanced water treatment is in place as well as nature-based drainage solutions in each housing development.

It subsequently outlines an infrastructure-led plan for supplying water to the population of Forest City by 2050, as well as a working estimate of 200,000 person population living in Forest City in 2040. The combined options list is outlined below and explained in detail in this report:

- Plug into Anglian Water's strategic pipeline, building a pipeline extension from the Cambridge to Rede pipeline into Forest City.
- Extend the Thames to Affinity Pipeline from the Affinity Water Region to Forest City.
- Build A storage reservoir of 75 Ml.
- Build and fill a large-scale reservoir (1,600 acres) near Great Bradley of 50-52Mm^3. An approximately 6.5km2 hydrologically appropriate site, to be filled in high-flow scenarios over 3-4 years.
- Build an advanced treatment centre and water treatment works.





Fig. 3.0.1 Lake Zurich, Switzerland

How Much Water Will Forest City Use?

First we estimated the amount of water Forest City will use. We assume that the wholesome water use per person per day is 60-80L. This per capita use is based on successful pilot schemes carried out in Cambridge [22]. Clay Farm is a development in Cambridge with 208 homes, made up of nine quads consisting of 23 homes ranging from one to three-bedroom apartments and family houses. In the heart of each quad is a moat that can store and attenuate rainwater.

Clay Farm uses extensive rainwater harvesting which is treated on-site using reed-beds, reed-beds remove pollutants before water is stored locally before use. If this standard of water efficiency is adopted across Forest City, planners can make a series of assumptions about average household consumption per day.

We have assumed a standard occupancy rate of 2.42 people per household—this translates therefore to 145-193 litres per household per day (l/h/d). To factor in leakage and above average rates of working from home, we have added 16/l/h/d. This leads to a total of 160-200 l/h/d in Forest City. Given a working assumption of a population of 1m people in c.400,000 homes this leads to an assumption of 64-80 ML/D.

It is worth noting that this is a Very High Efficiency Scenario. New homes would adopt state of the art rainwater harvesting and treatment technologies, dual pipe drainage systems etc. We assume 100% smart metering technology in new housing.

This efficiency scenario assumption has been made elsewhere in the planning system, for example in Milton Keynes Council's planning assumptions [23] from 2018. These assumptions align with those made in the New Towns resourcing strategy.

We have assumed non-household water use to be 75 megalitres per day (m/l/d) by 2050. This includes 100% metering, state-of-the-art leakage detection, financial incentives for leakage reduction, and retailer water audits. This assumption is calculated using a similarly high efficiency scenario (and employment of water-efficient technologies of rainwater reuse, non-potable reuse and sustainable drainage systems) applied to the business sector; of a typical non-household population for a UK city of Forest City's predicted size.

Total Megalitres Per Day

Taken together, this generates a forecast water use of (65-80 Ml/d + 75 Ml/d) 140-155 ML/D total demand.

Additionally the Environment Agency's 'Environmental Destination' targets for Forest City (i.e. the reduction in abstraction licenses for the area by 2050) equate to 26 Ml/d [24]. Taken together therefore, the total demand for additional water supply for Forest City equates to 160-175 Ml/d. This 160-175 ML/d demand is not entirely for potable water. Much of the non-household use will only require greywater.

A substantial share of non-household demand, particularly cooling systems, toilet flushing, irrigation and certain industrial processes, can be supplied using non-potable or recycled water. In dual-network urban systems 50% of commercial water demand can be met with non-potable supply. Applying a conservative assumption of 40% of non-household demand, approximately 30 ML/d of the projected 75 ML/d commercial demand could be supplied by recycled water, with the remainder requiring potable supply.

To put this into context, at full capacity, Forest City, with a population of one million people, will have the water needs of a city roughly equivalent to half its population size (e.g. Bristol).

The next section outlines the variety of options available for meeting this shortfall in as sustainable and nature-friendly a way as possible. All of the options will need to be employed in order to meet the required water needs of the area.

1. Great Bradley Reservoir

50-52 Mm^3 - 54% of total supply

A 52Mm^3 reservoir would likely require NSIP designation and a DCO with up-to-date survey, land and stakeholder requirements. It would be approximately equal in size to the Fens Reservoir, currently under construction, supplying around 87 Ml/d, with abstractions from River Great Ouse. This amount of deployable storage is equal to the Fens reservoir's deployable daily output [25].

The reservoir would be based in the Stour catchment and would abstract only during high winter flows from the River Great Ouse, operate under strict hands-off flow rules, and be drawn down during dry periods. This would meet Environmental Destination requirements over long-term 2050 timelines.



Fig. 3.0.2 Planned Fens Reservoir Rendering

A plausible abstraction point would be a winter high-flow abstraction from the River Great Ouse system upstream of Huntingdon (for example near Offord), where excess-flow abstraction is already used to supply Grafham Water. The precise abstraction point would require hydrological modelling and licensing. A second plausible abstraction point could be downstream in the Fenland system, for example near Denver Sluice, where flows from multiple tributaries (including the Little Ouse, Wissey and Lark) converge and winter flows are typically highest. Large catchments like the Great Ouse regularly experience winter surplus flows that cannot currently be stored.

Water quality in any final source river would need to be confirmed through monitoring and treatability assessment. In particular, nutrient and nitrate pressures in the Great Ouse system mean the scheme should assume the need for a robust Water Treatment Works specification, and potentially blending or nitrate-removal treatment, rather than assuming the source is untreated or lightly treated raw water.

In order to comply with Environmental Destination, the reservoir would fill via off-river abstraction, only in high-flow scenarios. This would mean there is no routine abstraction during spring, summer, or drought period given the region's water scarcity. This complies with the Environment Agency's hands-off flow regime, and complies with the Water Framework Directive's no-deterioration requirements.

The Great Bradley Reservoir would be approximately 7-8m in average depth and c.1,600 acres which equates to 52M cubic metres. It would supply on average 87 Ml/d meaning it supplies over half of Forest City's water needs. It would be situated in Ruthamford South water resource zone (WRZ), which models have as 'in balance', i.e. with no additional surplus supply [26] .

This would take **approximately 3–4 winters to reach usable storage.** Tiered abstraction rates at very high flows; tiered for winter and wet spells. The surrounding area of the reservoir would be marshland which would add extra storage capacity (in the same way that SuDS allows for housing development-level storage). The natural wetlands features would enable the reservoir to be a site for nature restoration and recreation. This would also ensure the chalk streams are protected and chalk aquifers can be replenished.

Given the similarity in size, scale and geographical region to the Fens Reservoir, we have taken our assumptions on construction and cost from the project. Like Fens, construction would be expected to last around 5-6 years [27], employing around 2,000 workers with a wide variety of opportunities for local businesses. Planning is highly uncertain but in addition to construction and fill time, a low-friction scenario (the reservoir would be within the red line of the Forest City Development Corporation) implies the reservoir could be operational by 2040-2045. This would require:

- Strategic need established early, ahead of 2029 Water Resource Management Plans (WRMPs) and Asset Management Period 8 (AMP 8)
- NSIP process established
- Early environmental assessments run in parallel, and abstraction licensing is aligned with WRMP need.

Cost

The Great Bradley Reservoir would represent a major strategic infrastructure investment comparable in scale to the Fens Reservoir and other recent UK off-river storage schemes. Based on comparable UK reservoir projects, the capital cost of a 52 Mm^3 off-river reservoir is estimated at £1.7–£2.1 billion. This is based on recent examples below:

- Fens Reservoir (≈50 Mm^3): ~£2bn (originally expected to cost £1.5bn)[28]
- SESRO (150 Mm^3): £2.8–£3.2bn

This estimate includes:

- Earthworks and embankment construction
- Inlet / outlet structures and control infrastructure
- Off-river abstraction infrastructure from the Upper River Stour
- Environmental mitigation, habitat creation, and biodiversity net gain
- Grid power connection and control systems

Given Great Bradley's smaller scale than South East Strategic Reservoir Option (SESRO) but similar regulatory and environmental complexity, a midpoint estimate of £1.9bn is reasonable. Importantly, the reservoir provides long-term resilience, supports biodiversity, and chalk stream protection by reducing summer abstractions, and creates a multi-decade asset with a design life exceeding 100 years.

2. Rede Pipeline Extension into Forest City (13%)

This option involves extending the existing Cambridge-Rede strategic transfer pipeline into Forest City, enabling imported water from the wider Anglian system and indirect access to regional storage assets. This extension is not the primary supply source; the Rede extension acts as a balancing and resilience link in the regional water grid.

The pipeline scheme represents a way to enable balancing between water resource zones (WRZ). The pipeline is assumed to deliver 20-30 Ml/d reliably into Forest City, subject to upstream system availability. While the pipeline does not create new supply, it plugs into the water grid and builds regional resilience, allows balancing across WRZs, and provides options for future interconnections (including further extension westwards), and future balancing from Forest City's own GB Reservoir. It is unclear what the diameter of the existing pipeline is but assuming it is approximately 500mm, it would be in line with the desired supply needs from this extension.

Operationally, the pipeline would run under defined system-balancing rules rather than continuous base-load supply. In normal hydrological conditions, flows would be modest or intermittent, increasing during dry periods when local abstractions are constrained. This operating model is consistent with Environmental Destination requirements and avoids increasing pressure on sensitive chalk stream catchments.

There is already a suggested route for the pipeline which runs through Forest City and indeed Great Bradley [29].



Fig. 3.0.3 Planned Route, Cambridge to Rede Pipeline

Ultimately, where it ends up will depend on the topography, constraints and boundaries, but a very small extension would likely be required of 1-2km at 500mm diameter. The subsequent infrastructure and pumping costs would be in the region of £100m.

Where Does The Pipeline Go?

The Cambridge to Rede pipeline transports raw, untreated water. This water requires treatment at a treatment centre. Forest City will need to build a water treatment centre, and an advanced treatment centre to treat non-potable water and large amounts of raw water being transported into Forest City.

There are three options:

1. **Pipeline → Water Treatment Works → Storage Reservoir or distribution** (primary feed)
2. **Pipeline → Great Bradley Reservoir** (winter)
3. **Off-river reservoir → Water Treatment Works Storage Reservoir or distribution** (backup + drought/low-flow support)

In normal times water from the pipeline extension will be moved to the Water Treatment Works, either via the storage reservoir or direct. This allows for maximum flexibility depending on the supply and demand balance. Broadly there are three operating modes:

1. **Normal mode:** pipeline feeds the works directly; reservoir only 'trickle tops up' or stays in reserve
2. **Winter storage mode**: pipeline runs harder (when available) and surplus is diverted into Great Bradley Reservoir.
3. **Resilience/drought mode:** reservoir feeds the works when pipeline flow is reduced/ interruptible, or when you want to cap pipeline draw.

Cost

Based on recent UK large-diameter strategic water transfer schemes, the capital cost of a pipeline extension of this nature is estimated at £100 million, depending on final route length, diameter, and pumping requirements. The cost reflects the additional elements required to link Forest City into the pipeline system (outside of the actual pipeline extension itself), i.e. pumping and other infrastructure.

3. Extend the Thames to Affinity Pipeline from the Affinity Water Region to Forest City (13%)

This option assumes Forest City gains access to water from SESRO (now the White Horse Reservoir) via a long-distance strategic transfer pipeline extension. SESRO is designed to support London and the wider South East, but surplus volumes during non-peak periods are being transferred to the Affinity Water region (it is unclear exactly where in the region the transfer is due to be made). The pipeline is not due to be operational until 2040, meaning there would be no access to additional supply from this option until 2040.

The indicative design capacity of the transfer into the Forest City region is **20-30 Ml/d**, reflecting a deliberately capped throughput consistent with its resilience role. This supply would be sufficient to materially reduce pressure on local abstractions during dry periods, but not so large as to create structural dependence on imported water.

The principle of this pipeline scheme would be the same as with the Grafham pipeline. However Thames to Affinity Transfer (T2AT) has two stages. The first stage is the transfer of raw, untreated water to a water treatment works. The second stage is a transfer of potable water into the region. This option would involve building an extended pipeline transfer into Forest City, before the water is treated, i.e. it would carry raw, untreated water into Forest City's water treatment works.

Cost

Extending the pipeline pre-treatment would involve a pipeline extension of in the range of 100-150km, depending on where the T2AT stage one finished [30]. If the first stage finishes in the Harefield region [31] as discussed, the capital cost of a dedicated transfer pipeline is estimated at £800 million based on an assumption of £6m per km of pipeline [32]. The deliverable supply is estimated at 20–30 Ml/d, depending on SESRO operational rules and wider regional demand.

4. Enabling Infrastructure: Indoor Storage Reservoir

To facilitate Options 1, 2 and 3, an indoor / covered service reservoir would be required within or adjacent to Forest City to buffer peak demand, manage pressure, and enable operational flexibility. This would be a covered concrete service reservoir akin to the Rede storage reservoir [33] though five times larger.

This includes:

- Covered concrete storage structures
- Chlorination and blending facilities
- Pumping and pressure management
- Land and access infrastructure

While not a supply source itself, this infrastructure is essential to system resilience and enables high utilisation of imported water during peak demand periods. Depending on the system needs and resilience of supply, additional storage reservoirs could be constructed to meet supply needs over time.



Fig. 3.0.4 Rede indoor water storage

5. Advanced Treatment Centre & Water Treatment Works (WTW) (25%)

This option involves constructing a standard WTW and an adjoining Advanced Water treatment centre, enabling large-scale non-potable and indirect potable reuse within Forest City. The advanced treatment and water treatment works are two separate plants necessary for

facilitating the treatment of non-potable water into safe, clean drinking water for Forest City

a) Water Treatment Works (WTW)

A large WTW would need to be built to make water safe for consumption across Forest City. It would treat river/transfer/raw sources to produce drinking water at scale. This is the primary potable supply. The scale required would be that of a typical large treatment centre found in cities of roughly half Forest City's size. A large city works can typically treat 140 Ml/d which, coupled with Forest City's stored capacity, safely exceeds that of maximum demand in a 2050 scenario. This gives headroom of 45-60 Ml/d (c.40% of daily supply) in peak demand phases before non-essential use bans need implementing.

b) Advanced Treatment Centre

This option is critical for long-term sustainability, reducing reliance on abstraction. The ATC would treat municipal and industrial wastewater to produce high-quality water that can be:

- **Directly reused** for non-potable uses (industrial, irrigation), or
- **Polished to potable standard** and blended with WTW output or provided as a parallel potable feed.

A typical Advanced Treatment Centre can supply an additional 40 Ml/d. We assume the Advanced Treatment Centre would supply an additional 40 Ml/d on top of the 140 Ml/d the WTW is supplying to Forest City daily. Much of this will be for industrial use and therefore non-potable. Taken together the WTW supplies the majority of potable demand at 140 ML/d while the Advanced Treatment Centre contributes an additional c.40 Ml/d of reuse water, primarily offsetting non-potable demand.

Cost

An advanced treatment centre and WTW of combined 180 Ml/d would, at typical size and capital costs, be estimated at £800-900 million(for the entire treatment centre) based on recent UK schemes[31] .

Cost Summary

Taken together, all schemes cost an estimated £4-4.5bn in capital costs. The table below shows all supply options.

Supply Option	Description	Approx. Supply (Ml/d)	Capital Cost (£bn)	Date Live (indicative)	Notes
Great Bradley Reservoir	Off-river strategic storage reservoir (≈52 Mm^3), filled during high winter flows	~90	1.7 – 2.1	2038–2040	Primary new water source; NSIP/DCO required; long asset life; major resilience benefits
Rede Pipeline Extension	Extension of Cambridge–Rede strategic transfer into Forest City	20	0.1	2035	Regional balancing only; constrained by upstream availability
SESRO Pipeline Extension	2,000Long-distance transfer extension from Harefield region	20	0.8-1	2024-2042	Strategic drought resilience; capped throughput; supplementary role

Commercial Land Forest City Calc (IR).xlsx

Supply Option	Description	Approx. Supply (Ml/d)	Capital Cost (£bn)	Date Live (indicative)	Notes
Indoor / Covered Storage Reservoir	1 day of treated water storage (buffering & pressure control)	Enabling + buffer only	0.05-0.1	2035	Required to operationalise transfer options; not a net new supply
WTW (including Advanced Treatment Centre)	The WTW would treat the above supply options into potable water The ATC would add to it.	£6,646,361	£53,170,884,335	2035	WTC would supply 140 Ml/d with additional supply from recycled water of 40 Ml/d (180 Ml/d total)
Total		170 Ml/d of 160-175 Ml/d need	£3.4-4.3bn		

Commercial Land Forest City Calc (IR).xlsx

Endnotes

[22] *Case study: Clay Farm water reuse scheme - EWSC*

[23] *Milton Keynes Water Cycle Study 2017 MKFL0002.pdf*

[24] *Environmental Destination technical report: understanding environmental water needs*

[25] *fr-gate-2-submission-report.pdf*

[26] *WRMP24 Technical Document Ruthamford South Water Resource Zone Summary*

[27] *Fens Reservoir 15th October Update*

[28] *Fens Reservoir Cost Saving Design Update 20th October 2025*

[29] Cambridge to Rede Stakeholder Map

[30] Water Transfer from Thames Water to Affinity Water

[31] OXFORDSHIRE COUNTY COUNCIL RESPONSE ON CONSULTATION DRAFT WATER RESOURCES MANAGEMENT PLAN FOR AFFINITY WATER Consultation closing date: 20th February 2023

[32] AFW139 Assurance of Enhancement costs and 3rd party benchmarking

[33] Steve Reed visits new Suffolk storage reservoir - BBC News

[34] Final-G2-report---LWR.pdf

Report 4. Transport

By James Gleave

1. Executive Summary

This document's intention is to articulate a vision for what a transport network serving a Forest City could be. Much of its content is concepts with some supporting analysis. Its ideas and anticipated costs are subject to change as the Forest City concept moves from idea into feasibility, and ultimately into construction. Furthermore, this work is naturally constricted by the available time of the Transport Expert Group, who undertook this work in a voluntary capacity.

Introduction

This report sets out a radical yet necessary vision for the transport network of Forest City, a proposed new city of one million people to the east of Cambridge. The premise of our findings is simple but stark: "business as usual" is not an option. If we were to apply traditional car-centric planning models to a development of this scale, the result would be gridlock and ecological damage. The existing A14 and M11 corridors are already at capacity, and simply building more roads will only induce more traffic.

Instead, this report presents a blueprint for Symbiotic Mobility. This is a system where transport infrastructure doesn't just mitigate its damage to the environment but actively contributes to nature recovery and human happiness. We are proposing a city where 80% of journeys are made by sustainable means, not because people are forced to, but because it is the easiest and most pleasant way to move.



This summary details the core concept of Symbiotic Mobility, the strategic connections required to make the city viable, the operational realities of how the city will function, and the estimated costs involved.

The Vision: Symbiotic Mobility

The core philosophy driving this report is **Symbiotic Mobility.** Historically, transport and the environment have been viewed as opponents—to build a railway or road, you had to destroy a habitat or several of them. We argue that this binary is outdated. Forest City's transport network is designed to be better for people and for nature, allowing both to thrive.

To measure our success, we have established three Core Indicators that guide every technical decision in this report:

- **80% of trips by sustainable modes**: We are reframing this from an environmental nice-to-have to an economic necessity. Congestion is a productivity drain; moving a million people requires the spatial efficiency of mass transit and active travel.
- **30% Biodiversity Net Gain**: Transport corridors must double as wildlife corridors. We propose land bridges over roads and cut and collect verge management to turn grey infrastructure green, among other measures
- **No more than 10% of people at risk of Transport-Related Social Exclusion (TRSE):** The system must work for everyone. If you can't get to a hospital or a job interview without a car, the city has failed.

Guiding Principles

To deliver the Symbiotic Mobility vision, we have established eight core principles that dictate every design decision in Forest City:

Modal hierarchy

We are strictly applying a Link and Place approach to street design, which establishes a clear hierarchy: Pedestrians first, followed by Wheelers/Cyclists, then Public Transport, and finally Private Vehicles.

Infrastructure as a platform

We view the transport network as a digital hardware system upon which mobility services run. By adopting open standards, we ensure that our infrastructure can talk to vehicles and users (Vehicle-to-Everything or V2X communication).

The whole journey

A transport system fails if it only works for the able-bodied, well-off traveller. This principle focuses on eradicating Transport-Related Social Exclusion (TRSE) by ensuring the network supports the "whole journey," including the first and last mile. We advocate for a single unified ticketing system covering a journey across an e-bike, train, and bus, removing the financial penalty of swapping modes.

Give nature space

Forest City’s infrastructure must actively heal the environment, not just minimise damage. This principle mandates that we plan transport routes around natural habitats rather than bulldozing through them. We propose constructing Land Bridges over major arteries to reconnect fragmented wildlife corridors and implementing a Cut and Collect management strategy for verges to encourage wildflower growth.

Building for 150 years

We are designing for the long haul, specifically a 150-year design life for core civil engineering assets. This requires us to future-proof the city against climate change and technological shifts.

Reduce whole life carbon

Net Zero isn't just about electric vehicles; it’s about the concrete and steel used to build the roads they drive on. We recommend a "Shadow Carbon Price" during project appraisal to make high-carbon construction options financially unattractive.

Freight as an economic engine

Logistics is the metabolism of the city, and we cannot leave it solely to market forces. To prevent ‘logistics sprawl’, where depots are pushed to the edges, increasing van mileage, we are integrating industrial space into the urban fabric.

Healthy and happy lives

The transport system should ultimately make people of the city healthier and happier. Other principles may increase physical activity and improve the journey experience, but our transport system should result in a wider measurable ‘health net gain’.

Strategic Connections

Forest City cannot exist in isolation. It will be a major economic node for the East of England. Our modelling suggests a massive flow of around 23,000 peak-hour trips between Forest City and Cambridge alone. To handle this without bringing the region to a standstill, we propose a Rail First strategy, supported by a strictly managed road network.

Heavy Rail: The Backbone

The railway is the only mode capable of moving the volume of people required. We propose two major interventions:

1. **Double-Tracking the Cambridge to Newmarket Line**: This is currently a single-track bottleneck. We must upgrade this to a two-track railway to allow a ‘turn-up-and-go’ frequency of at least four trains per hour. This is also critical for freight moving from Felixstowe to the Midlands, taking HGVs off the A14.
2. **The "Eastern Orbital" (Dullingham - Haverhill - Stansted)**: We recommend a bold new rail link connecting the Newmarket line southwards to Stansted Airport via Haverhill. This creates a powerful eastern arc, allowing residents to access the airport and London without clogging up the Cambridge central station bottleneck. It essentially creates a Stansted Regional service that runs: Cambridge – Forest City – Haverhill – Stansted – London.

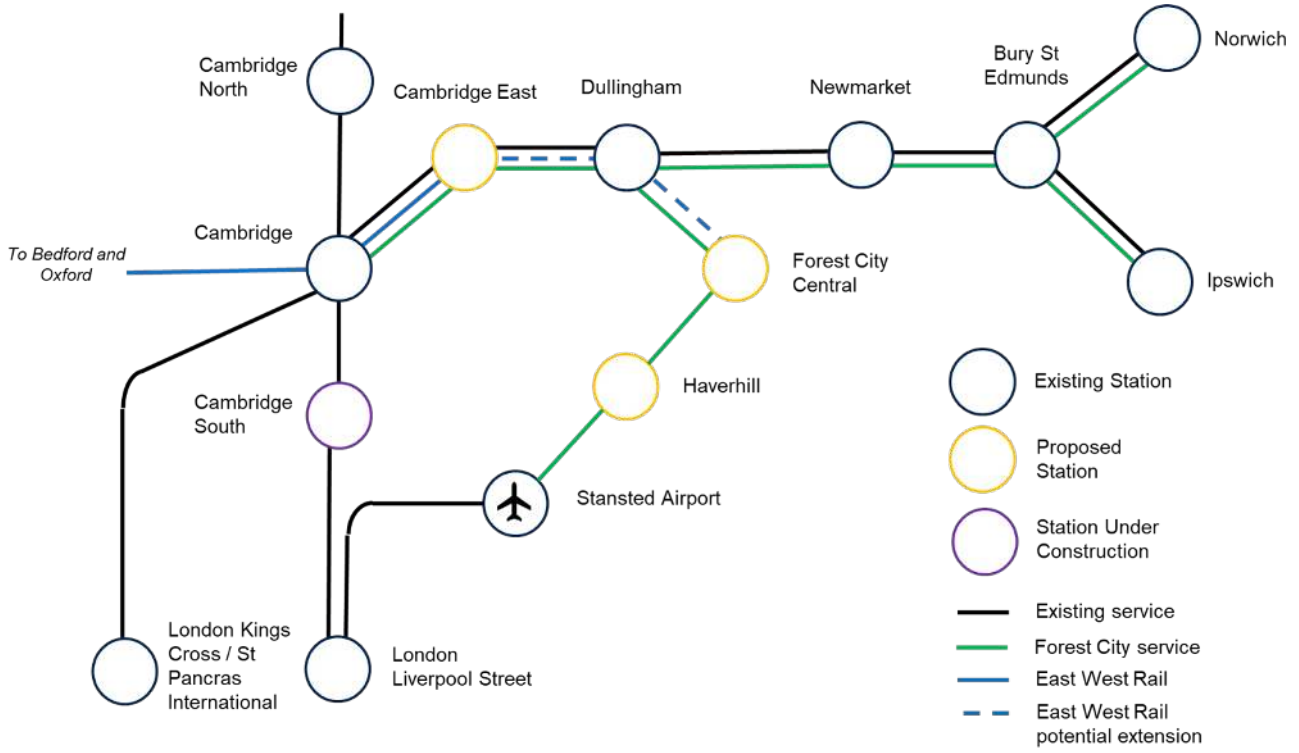


Fig. 4.0.1 Outline of recommended rail service options for Forest City

Mass Transit to Southern Cambridge

For connections to the Biomedical Campus and South Cambridge, we cannot rely on buses stuck in traffic. We recommend a high-capacity **Mass Transit link (Line 1)**. This could be an S-Bahn (carrying 60,000+ passengers/hour) or a rapid tram system. This link is vital for the "short-hop" trips that define the southern economic cluster.

Strategic Interceptors (Park & Rides)

To protect the city from external car traffic, we propose a cordon strategy using four major "Strategic Interceptors" or Park & Ride sites:

- **Dullingham (2,000 spaces)**: Intercepts A14/A11 traffic from the east.
- **A11/A1307 Hub (1,000 spaces)**: Catches traffic from the M11 and west.
- **Haverhill (2,000 spaces):** Captures rural traffic from the south.
- **Eastern Edge (3,000 spaces):** The primary filter for traffic approaching the city centre.

Highway Infrastructure: The Contingency Principle

We recognise that the A14 and A11 are critical arteries. However, we strictly adhere to the principle that **road capacity is for flow management**, **not volume growth**. We recommend upgrading the A14 so that technology assists in smoothing the flow rather than simply widening it, which just invites more cars. Crucially, we propose a **'Contingency Principle'**: funding for road upgrades should only be released once the rail upgrades are contractually committed. This prevents the 'road-first' dynamic that locks in car dependency.

Operation of the City

How will Forest City function day-to-day? Given that the development of natural areas and nature corridors will significantly influence the urban form, we consider that a **polycentric city** structure is more likely. As compared to traditional British cities which are often defined by a single city centre. We have assumed that the city will have three main urban centres: the Central Business District (CBD), a Northern Centre, and a South-Western Centre. This distributes travel demand and prevents the crushing peak-hour pressure seen in traditional city centres.

It should be noted that, more than the transport services provided, the urban form will be the most critical determinant of transport infrastructure and services within the city.

The on-the-ground look and feel of the system is likely to be somewhat different if Forest City is structured around a single city centre. Such matters must be considered as masterplanning of the site continues.

Internal Transport Hierarchy

Connecting these centres will be a **High-Frequency Public Transport Spine.**

- **Core Spine:** Depending on budget, this will be either an S-Bahn or a Tram network. Line 1 (Forest City to Cambridge) and the Heavy Rail Link through the site to Cambridge and Stansted Airport should be the priority.
- **Feeder Services:** Connecting neighbourhoods to the spine will be a mix of Trams, Very Light Rail (VLR), and buses. VLR may offer a lower-cost alternative to trams with similar permanence, though with a lower capacity than a tram system.

The 'Superblock' and Street Design

At the neighbourhood level, we recommend adopting the **Superblock** model (made famous in Barcelona). Built up areas of the city are laid out in 1x1 mile blocks. Inside these blocks, pedestrians and cyclists have absolute priority enabled through street design and speed limits, and through-traffic is physically blocked. Cars can access properties and exit the block, but not

easily cross between blocks. This makes walking and cycling the most direct route for local trips.

We also propose a **Link and Place** matrix for street design. This means evaluating a street not just on how many cars it can move (Link), but on its value as a social destination (Place). We must mandate a **Street Design Guide** that enforces inclusive standards.

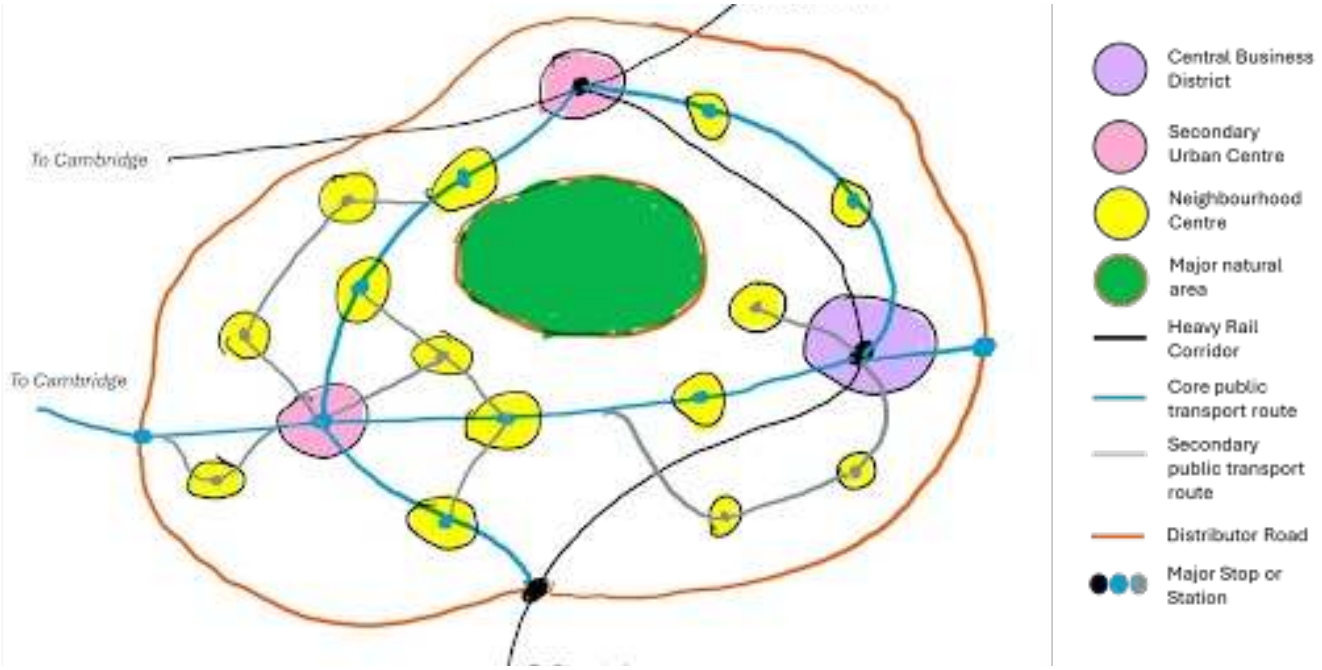


Fig. 4.0.2 Concept Design of an Internal Public Transport Network for Forest City

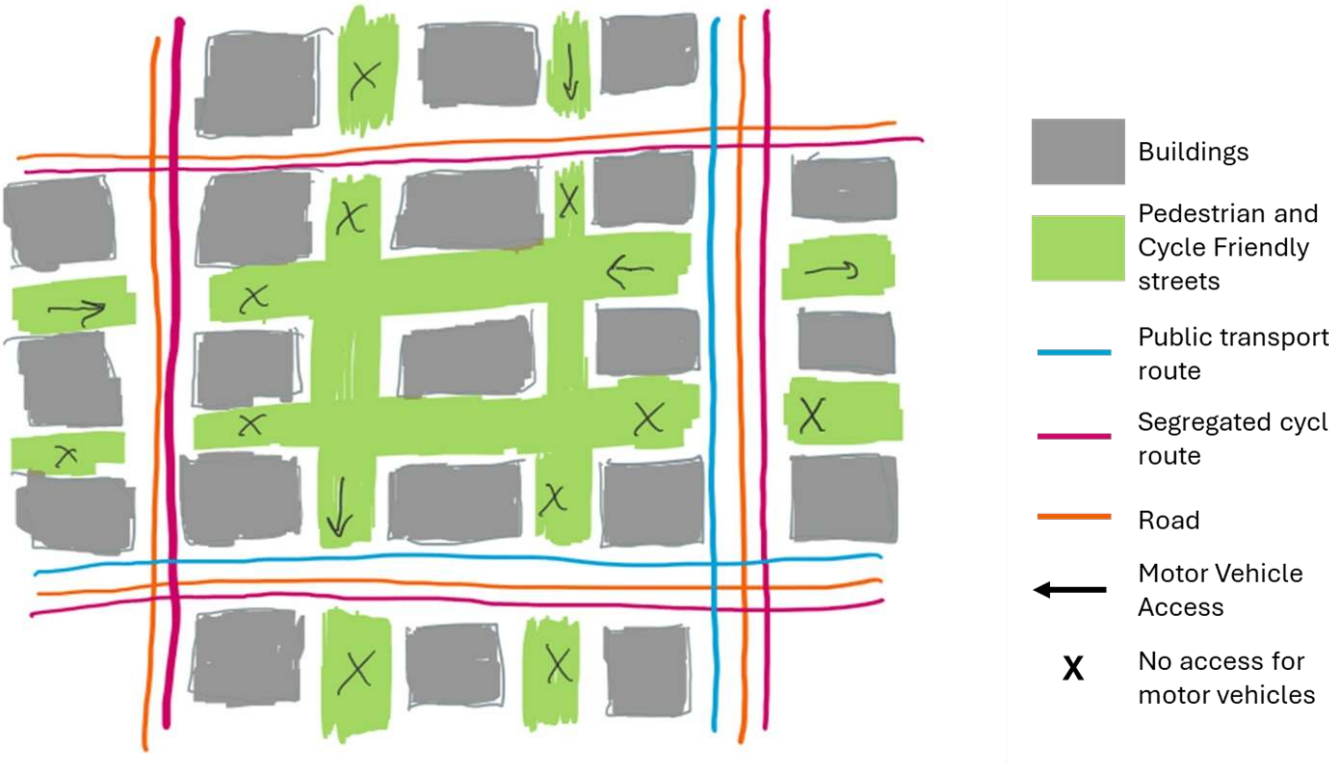


Fig. 4.0.3 Concept design of a Superblock

Freight and Logistics

A city of this size will generate a significant demand for freight. Freight is often treated as an afterthought in city planning. Forest City cannot repeat this mistake. Our approach will require extensive engagement with the freight and logistics sectors39. As a starting point we propose a tiered consolidation system:

1. **Strategic Gateways:** Goods coming into the city do so in a series of large hubs on the outer ring. There, they are sorted and transferred to a series of consolidation centres within the city. One such Strategic Gateway could also host a rail freight terminal.
2. **Urban Consolidation Centres:** Mid-sized hubs where goods are transferred to local delivery by electric van or cargo bike. This can be delivery to specific addresses or to micro-hubs
3. **Micro-Hubs:** These are neighbourhood points where some deliveries - notably parcels - can be picked up by residents. This may be in the form of, for example, a Parcel Locker.

Digital and Future-Proofing

As also discussed in Report 6., we recommend a **Digital Twin** of the transport network. This allows us to simulate scenarios (e.g. what if we close this road?) and allows for **Digital Personalisation** of journeys. A neurodivergent user, for instance, could select a low sensory route via an app. Infrastructure should be built to a **150-Year Design Life,** with modular components that can be swapped out as technology evolves.

Integration with Existing Communities

Within the proposed area of Forest City there are a number of existing communities. These small villages and towns have established communities, social connections, and well-worn travel habits. They will rightly be concerned that any development will affect how they get about. There are means by which the functional transport form of existing communities can be integrated into the Forest City urban area. We would recommend integrating these existing street forms and functions within the urban fabric of the city, so that their sense of intimate village life and historic significance are maintained. We also recommend that communities play a key role in defining the structure and layout of the transport system.

The Costs

Estimating costs for a project of this magnitude at this early stage is inherently uncertain. To provide a realistic picture, we used a **Reference Class Forecast.** This involves looking at the actual outturn costs of similar projects globally and applying an 'uplift factor' to account for the optimism bias that typically plagues infrastructure projects (where costs are often underestimated).

Our analysis suggests the core transport infrastructure for Forest City will cost between **£8.6 billion and £16 billion.**

Cost category	Variations	Estimated Cost	Confidence
Heavy Rail Link (including stations)	Low (Dullingham to Forest City Central)	£1.3 billion	Medium
	High (Dullingham to Stansted Airport)	£4.2 billion	
Double-tracking Cambridge to Newmarket	Low	£414 million	Medium
	High	£823 million	
Cambridge Station Upgrade	Low	£54 million	Medium
	High	£96 million	
Haughley Junction Upgrade	Low	£95 million	Medium
	High	£187 million	
Mass Transit Lines (core network)	Low (tram)	£4 billion	Medium / Low
	High	£5 billion	
Park and Ride Sites (x3)	Low	£30 million	High
	High	£78 million	

Table 4.0.1 Estimated costs of core transport infrastructure

Cost category	Variations	Estimated Cost	Confidence
Greenway Network	Low	£300 million	High
	High	£333 million	
Highway Network (est. 2500 km)	Low	£77 million	Medium / High
	High	£143 million	
Distributor Road (est. 50km)	Low	£1.5 billion	Medium
	High	£2.8 billion	
A14 Upgrade (A10 to M11)	Low (Smart Motorway)	£379 million	Low
	High (Extra Lane + Smart Motorway)	£2 billion	
Junction Upgrades (A14 / A11, M11 / A11, A14 / A10)	Low	£474 million	Medium
	High	£588 million	
Freight Consolidation Centres (x3)	Low	£92 million	Medium / High
	High	£171 million	
Traffic Management System	Low	£16 million	High
	High	£18 million	
Total	Low	£8.61 billion	Medium
	High	£16 billion	

Table 4.0.1 Estimated costs of core transport infrastructure

Conclusion & Next Steps

Forest City represents a once-in-a-century opportunity to prove that a high-density city can be symbiotic with nature. But a vision is only as good as its delivery.

We recommend immediate action on three fronts:

1. **Governance:** Establish a three-tier structure (Sponsoring Board, Programme Board, Technical Steering Group) to separate political strategy from technical delivery.
2. **Co-creation:** Launch a Citizen Assembly. We must move beyond consultation to true co-design, giving the community a mandate to help resolve the difficult trade-offs between space, speed, and nature.
3. **Technical Evidence:** Commission a ‘Data Gap Analysis’ and procure Mobile Network Data (MND) to understand real travel patterns, moving away from outdated roadside surveys.

By adhering to the principles of Symbiotic Mobility, Forest City can become a global exemplar of the 21st-century city.

Introduction

The Forest City Transport Working Group was established with a remit to provide expert input into how to plan for a new city. The working group’s expertise in public transport planning and land use has helped to shape the ideas contained in this report. This is alongside data collection and analysis that was feasible to support this report

This report should therefore be seen for what it is: a considered expert view and initial framework for developing the transport system of the city. And a starting point for how the transport system of a city, quite radically different to those traditionally developed, should function.

Our findings **establish a vision for transport in Forest City**, including how internal transport and transport to and from nearby areas should be planned, and what changes are likely to be required in order to make this happen. It covers infrastructure, services, management of the transport network, and means to influence travel demand in a manner consistent with the vision of Forest City. While a simple purpose, in reality it is wracked with complexity.

However a key element of vision-led Transport Planning is close community engagement. While this report represents a considered expert view, it is essential that the perspectives of local communities and a wider group of stakeholders influence the masterplan and the vision for the city, of which transport is a part.

Escaping Car-Centricity

Forest City represents an opportunity to fundamentally rethink how a city is planned from a transport perspective. For the majority of the UK, transport planning can only be described as car centric. Such an idea dominated the development of New Towns. While the first generation of New Towns sought, but ultimately failed, to design New Towns in a manner so the “vehicle is the servant, not the master” (Cumbernauld Development Corporation, 1963), car-centric planning began to dominate town planning and transport practice in the 1960s.

The intellectual pivot point came in 1963, with the publication of Traffic in Towns, more commonly known as the Buchanan Report. In this report, Colin Buchanan and his team presented a stark ultimatum. The UK could either rebuild its cities to accommodate the car at vast financial and aesthetic cost, or strictly limit vehicle usage. Buchanan favoured the former—engineering “civilised” accommodation of the car through multi-level segregation. The report offered terrifying statistics for the time: it predicted that the number of vehicles on British roads would quadruple from approximately 10.5 million in 1963 to 40 million by 2010 (Buchanan, 1963).

As it so happened, at the end of 2010, there were 28.3 million vehicles on UK roads (Department for Transport, 2026). But the impact of Buchanan’s recommendations have been felt ever since. The most notable is Milton Keynes, the definitive Mark III New Town designated in 1967.

Unlike the distinct neighbourhoods of the 1940s, Milton Keynes was designed as a dispersed city built explicitly for the private car. The Plan for Milton Keynes (1970) abandoned the idea of a focused center in favor of a 1km-square grid system, driven by the goal of easy movement and access, and good communications. The planners, Llewelyn-Davies Weeks, believed that no fixed limit should be put on the use of the private car, creating a low-density urban form that made public transport difficult to sustain. The grid roads were designed with landscaped berms to hide the cars, creating an illusion of a "City in a Forest" while facilitating high-speed travel across the network.

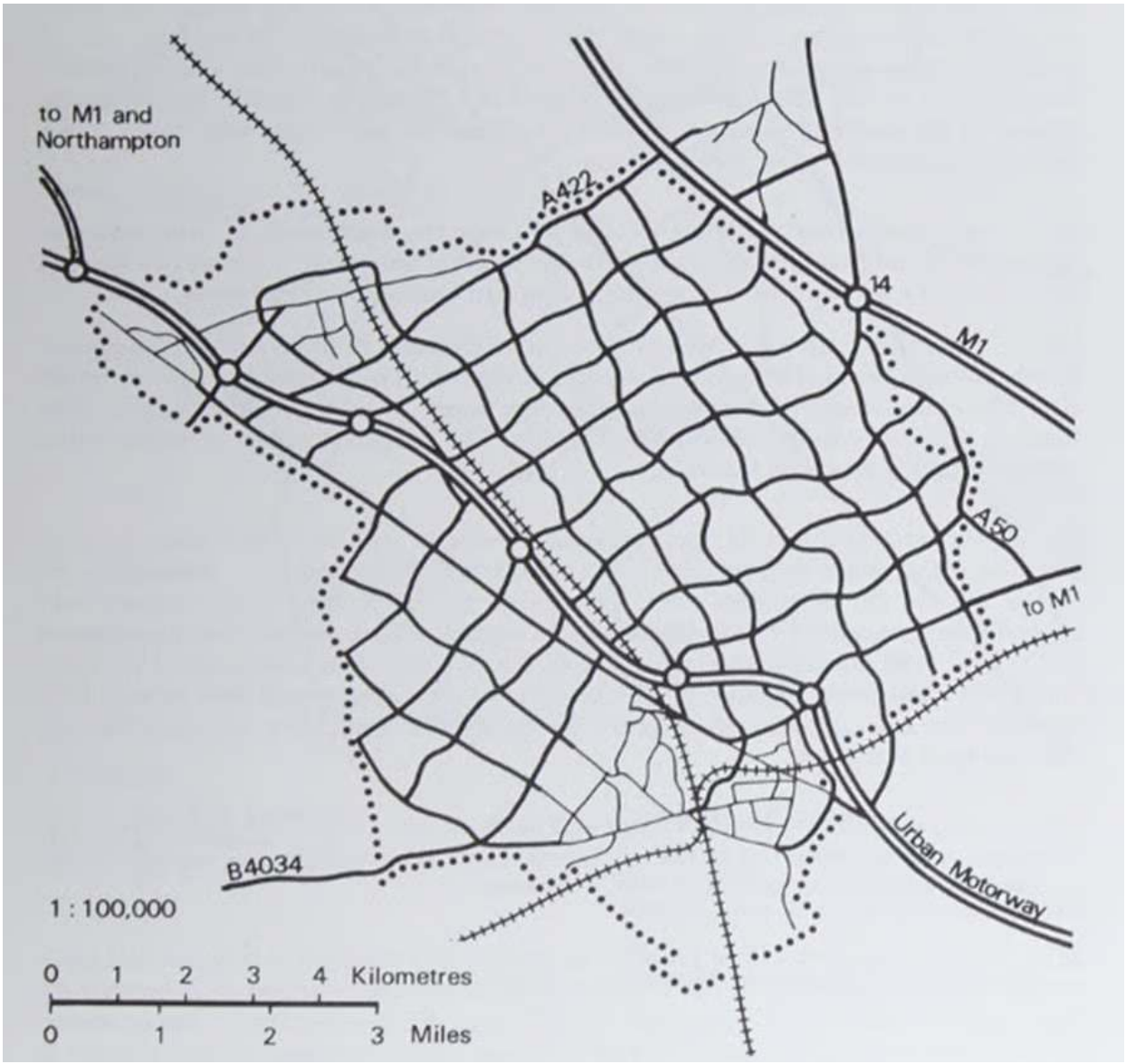


Fig. 4.0.4 The Grid Road System of Milton Keynes as set out in The Plan for Milton Keynes Volume One from 1970 (Source: Milton Keynes City Discovery Centre, 2025)

The legacy of this planning philosophy is a landscape of car dependence that persists today. The social cost of such car dependence was higher than anticipated. New Towns often exhibit higher car ownership rates and lower public transport usage than older settlements. For instance, the Trapped Behind the Wheel report (2024) notes that new builds in these areas have steadily become more and more car-dependent relative to existing homes (New Economics Foundation, 2024).

The segregation intended to keep pedestrians safe, ultimately isolated them as the pedestrian underpasses and walkways—once symbols of modernity—became perceived as unsafe, further entrenching the car as the primary, and often only, viable mode of transport.

But to take the learning of Buchanan's work as just about encouraging car dependency is to ignore another fundamental lesson: **car-centricity is not the only choice.** The UK could have chosen another path of investing heavily in public transport, developing cycle and pedestrian networks, and charging for the use of private cars in a manner that reflects the cost of their negative externalities, thereby giving people a meaningful choice between using a car and other modes.

The use of the car is, as an act in itself, not a bad thing. Owning a car allows families to travel long distances to see each other, allows people to get to work, or parents to take their children to new and exciting places. Owning a car should not be a negative character judgement; many people own cars for very good reasons.

But car centricity is a problem. When people become entirely dependent on owning a car to live their life, it starts a cycle. As people choose the car as the obvious choice for journeys, fewer people use alternatives like public transport, which then get cut back through lack of use. Thus entrenching car use even further. This is all well and good, until—whether through physical impairment, financial insecurity or other means—people are unable to use a car any more. Then they have no choice but to rely on others or stop travelling.

Building in such car centricity is not an inevitability. In the 1950s and 1960s, Britain's towns and cities were not car-centric, and only a conscious choice to make them that way made it happen. We can avoid the mistakes of the past. Not only is doing something radically different possible, but as we argue in this report, it is necessary, and this report provides the intellectual and policy foundations for creating something radically different.

Existing communities

Whilst not within the realms of only transport, we need to be conscious that there are many existing communities in the area including, but not limited to, Haverhill, Linton, Balsham, West Wratting, Stetchworth, Great Bradley and the Thurlows. These are places with an established way of life and community, of which transport plays a role and impacts upon[35] . Our own experience from transport projects is that these communities are likely to have transport as their number one concern. What roads will need building? How long will the disruption last? How will traffic be managed? Will my local bus service be cut?

It is important to be sincere and open in communication, and have empathy for these concerns. Part of the process of developing plans for a city such as this is working closely with communities to identify such issues, explore them, understand them, and work solutions out. This involves mutual learning on both sides, and acceptance that in many instances trade-offs are necessary.

We are also aware that there are many ideas for improvements to local transport put forward by communities. A notable example being the reinstatement of a rail link between Haverhill and Cambridge that was closed in 1967, which the Town Council and Railfuture have been campaigning for years to happen and was planned as part of the Cambridge Autonomous Metro project. We know from our research that we are barely touching the surface of these ideas.

This ties into our own experience delivering projects. In refining the vision and developing it into something real, communities must be part of the conversation in a meaningful way, and help to shape decisions. And they must feel that engagement even when there are disagreements and trade-offs.

To members of the community reading this report, we would like to state that the ideas in this report are based upon established best practice and our professional knowledge and experience. Whilst we have confidence in them, it doesn't answer every detailed issue such as what roads will be closed or which particular village bus services will be affected. That detail will be looked at as the Forest City plans progress. This is a starting point to tackle broader issues and work together to build something unique.

3. The Vision: Symbiotic Mobility

Introduction

This section articulates the key elements of the transport vision for Forest City, identifying how success will ultimately be judged, and providing a description of transport in a fully-realised Forest City. It does not go into specific detail into individual aspects of how the city and its transport connections will work. For now, it paints a picture of what transport in the city could look like.

Making Vision-Led Transport Planning a Reality

Historically, transport planning followed a **Predict and Provide** model. Planners forecasted future traffic demand based on past trends and built infrastructure (usually roads) to accommodate it. This often induced more demand (i.e. more than what was forecast), creating a cycle of congestion and construction.

Vision-led Transport Planning inverts this. Instead of forecasting traffic, planners:

1. **Decide** on a preferred future (e.g. a net-zero, nature-rich city with high active travel).
2. **Provide** the infrastructure that actively steers behavior toward that vision.
3. **Monitor** and adjust interventions to stay on track.

This concept is fast gaining traction in policy making circles. A notable example is the draft National Planning Policy Framework (NPPF)—out for consultation at the time of writing this report—that signals a definitive move away from car-centric planning. Paragraph 1 of Chapter 15: Promoting Sustainable Transport, states:

> *"Sustainable transport should be considered from the earliest stages of plan-making, so that it is reflected in the vision for the plan area and its specific proposals, and forms an integral part of a plan's strategy for creating well-designed, sustainable, inclusive and popular places." (Ministry of Housing, Communities and Local Government, 2025)*

The consultation explicitly supports approaches that limit road capacity where it undermines sustainable transport goals. It moves the burden of proof from 'why shouldn't we build this road?' to 'how does this road support our vision?'.

Such a shift is not confined to the national government either. The TRICS Consortium who run the TRICS Database—the UK's standard for estimating trip generation from new development—has released guidance calling for the use of "Decide and Provide" (TRICS Consortium, 2021). It allows planners to use lower trip rates for developments if they can prove robust sustainable transport infrastructure will be in place, rather than forcing them to model for worst-case car usage. Oxfordshire County Council have also released guidance for new developments requiring developers to visualise a low-carbon future and prove how their site contributes to it, rather than simply mitigating traffic impact (Oxfordshire County Council, 2022). The Fixing Transport Assessments Working Group has also been advising the Department for Transport on updating national guidance to reflect this new emerging practice.

Why does any of this matter to Forest City? While there are some examples of specific developments across the country delivering elements of this approach, Forest City is the opportunity to deliver this at a significant scale.

Forest City is also in a somewhat privileged position, in that it already has an established vision. It is critical that this vision is further developed and further refined as the masterplanning activity continues and to ensure that the needs of communities affected by Forest City can influence the process.

The Forest City Vision for Transport

The vision of Forest City, as cited on its website, is as follows:

"A real city for 1 million people where:

- *People want to live—Beautiful architecture, walkable neighbourhoods, real place-making. Communities that feel like home, not just addresses.*
- *Businesses want to be—East of Cambridge, unlocking Britain's innovation capital.*
- *Families thrive—Community-owned, affordable forever. Built for raising children and putting down roots.*
- *Nature improves—12,000 acres of new native forest. England is one of the most nature-depleted countries in the world. We can build a city and repair biodiversity at the same time.*
- *Infrastructure works—Schools, hospitals, transport, and parks designed from day one—not squeezed in as afterthoughts." (Forest City, 2025)"*

Reflecting this, the Transport Expert Working Group has defined a transport vision for Forest City which it calls Symbiotic Mobility. To distill this into a vision statement:

Forest City's transport system will be better for people and for nature, allowing both to live happy, peaceful, and prosperous lives.

Transport and nature are often seen as two competing sides in conflict with each other. In order to have good transport it needs to be at the expense of the natural world. But another way is possible. One where high quality transport links not only mitigate their impact, but over the longer term the transport infrastructure and services enhance nature. We will now discuss each of these elements in more detail.

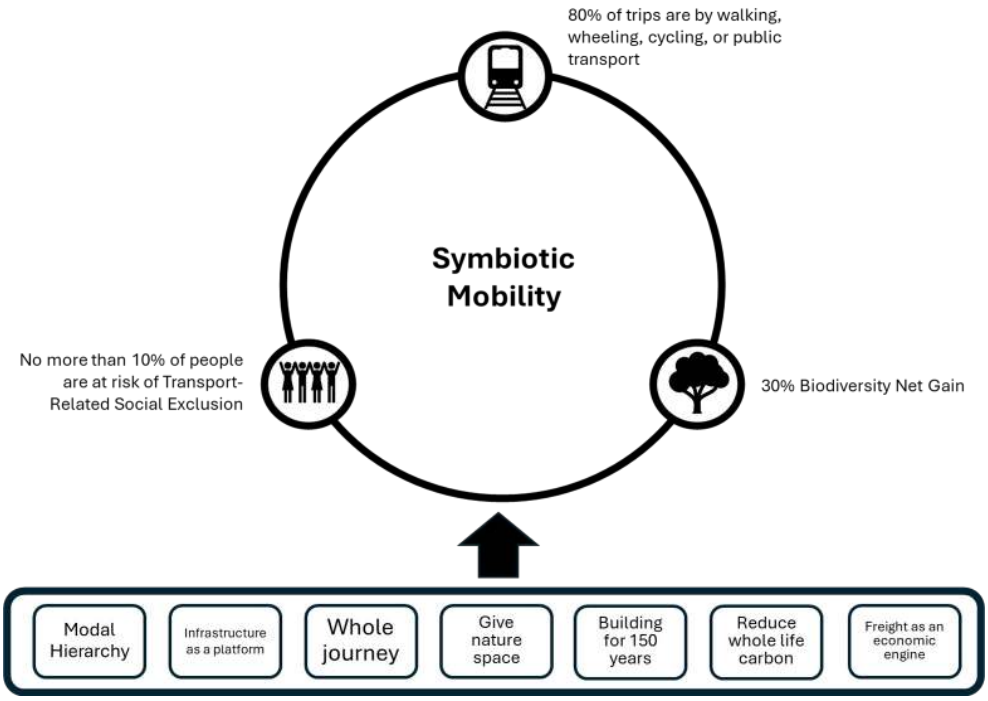


Fig. 4.0.5 Symbiotic Mobility

The Three Core Indicators

The success of Forest City's transport system in achieving a better outcome for people and for nature means that we have to identify key metrics against which we can judge success. In reality, there will be a balanced scorecard of metrics against which to assess progress, but we have identified what we call Three Core Indicators against which delivery should be focussed, and success ultimately judged.



80% of trips are by walking, wheeling, cycling, or public transport. Modal shift away from using single occupancy cars is often framed as an environmental outcome. However, in the context of Forest City, we are reframing this as an economic necessity. Congestion is a productivity drain, and simply continuing to build roads results in more and more of it. It is imperative that more spatially-efficient modes like public transport, walking, wheeling, and cycling get prioritised. This target is feasible and necessary.



30% Biodiversity Net Gain. The transport networks need not just be routes for people, but can also be spaces for nature. What's more, carefully designed, transport networks can give nature the opportunity to thrive, even away from the roadside. This need not involve significant building works either, but is achieved through clever planning and management of the system.



No more than 10% of people are at risk of Transport-Related Social Exclusion (TRSE). To create a transport system for everyone means building it for those who are most vulnerable. This means tackling the causes of social exclusion that are transport-related. The transport network should be judged not on customer experience, but on how it enables the most vulnerable to live happy and prosperous lives[36] .

Achieving these means delivering in accordance with a set of principles. These principles don't necessarily need to be outcomes in their own right, but they are a philosophy by which transport for Forest City is delivered. We have identified **eight principles** that should guide delivery.

Modal Hierarchy.

The transport network needs to be delivered in accordance with a modal hierarchy. This establishes clear rules for system and street design, where specific modes of transport are prioritised in terms of space allocation, directness of routes, and priority at spaces of conflict. Our recommendation is to have a modal hierarchy that prioritises the needs of pedestrians, wheelers, and cyclists first, with public transport close behind. This does not mean car travel is not feasible, but that the easiest and most direct routes within the city are likely to be by sustainable modes.

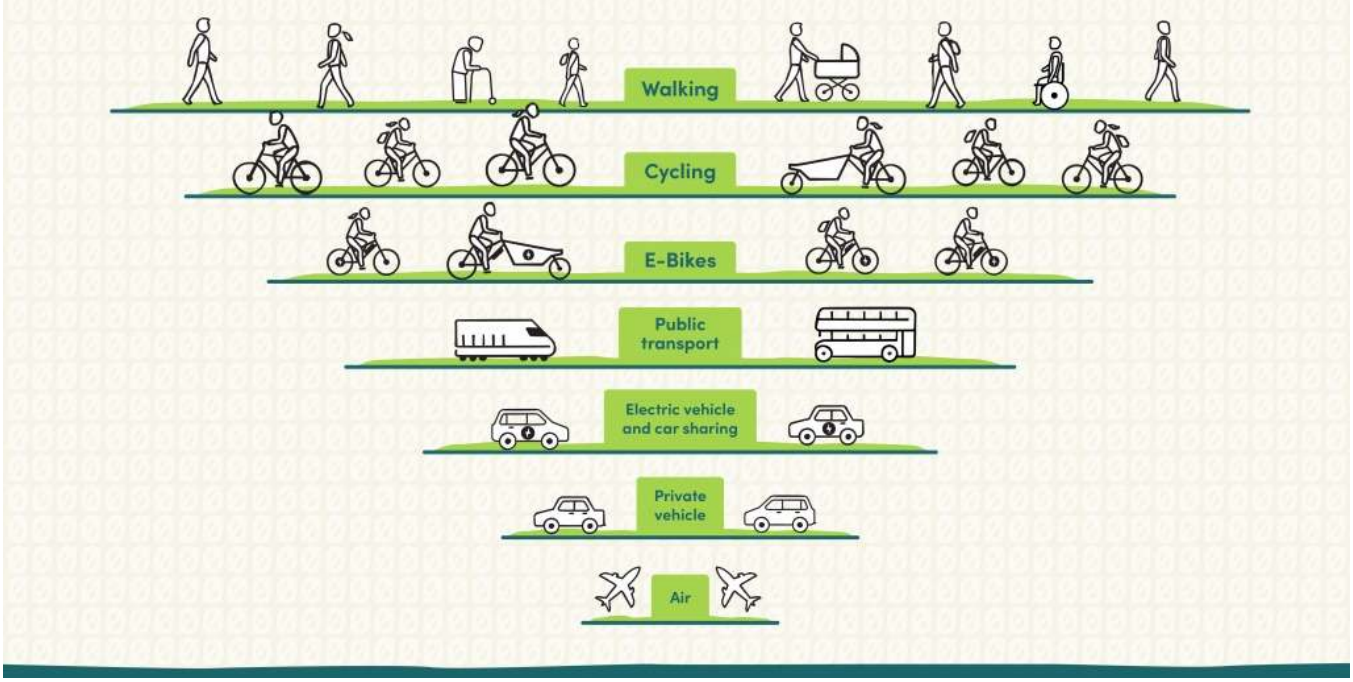


Fig. 4.0.6 Example of a Modal Hierarchy (Litman, 2024)

Infrastructure as a platform.

Transport infrastructure can be the ultimate enabler. A street can host a market during the day, and then have cars pass quietly along it in the evening. We believe that it can play a similar role in the digital space. Rather than Forest City choosing specific transport technologies to deploy, Forest City should create a digital and physical infrastructure necessary for them to have the opportunity to both deploy and scale quickly. This means investing in transport as both a digital and physical infrastructure.

Whole journey.

Transport networks should ultimately be judged by how well they benefit those traditionally not catered for as routes and networks are planned. Such groups are numerous, but include (though not limited to) women and girls, children, the elderly, people with mobility issues such as wheelchair users, people from ethnic minority groups, neurodiverse individuals, and those on low incomes. This means embedding principles of Universal Design and combining that with *Digital Personalisation.* The physical infrastructure and services are designed in a manner that is universal to all, such as step-free access, good lighting, and high contrast wayfinding. Meanwhile, the digital overlay of the city allows people to adjust the journey experience to reflect their own personal needs.

Give nature space.

Nature often does not need significant investment. What it needs is space to thrive. Concepts such as increasing the cover of trees and Sustainable Drainage Systems (SuDS) have been common for many years, and should be applied in Forest City. But we must go further. The network needs to be planned around natural habitats and wildlife corridors, giving nature the space to live and move freely, with minimal hindrance from traffic and the shadow of infrastructure.

Building for 150 years.

Infrastructure often far outlives its design life. With the anticipated impacts of climate change becoming more prevalent even now, the infrastructure we build has to be resilient. Forest City's streets, paths, roads, and railways need to be created not necessarily to last for 150 years from the outset, but to be adaptable to what that future world could bring.

Reduce whole life carbon.

Transport's carbon emissions do not just come from the tailpipe. Much in the way of transport infrastructure is carbon intensive. Using carbon-intensive materials such as concrete means the majority of carbon emissions from infrastructure are emitted before it is even functional. A conscious effort is needed to reduce the whole-life carbon emissions of Forest City's infrastructure.

Freight as an economic engine.

Without efficient and reliable freight operations, the modern and future economy can and could grind to a halt. It carries everything from parcels to building supplies to machinery. In Forest City, freight needs to operate reliably, efficiently, and without delay to underpin the economic prosperity of the city and wider region.

Healthy and happy Lives

The transport system should ultimately make people of the city healthier and happier. Other principles may increase physical activity and improve the journey experience, but our transport system should result in a wider measurable health net gain. This includes supporting the delivery of good quality housing and encouraging social cohesion to improve the mental health of the city. The physical infrastructure and services are designed in a manner that is universal to all, such as step-free access, good lighting, and high contrast wayfinding.

Meanwhile, the digital overlay of the city allows people to adjust the journey experience to reflect their own personal needs.



Fig. 4.0.7 A SuDS pond near Bearsden, Scotland (Sutcliffe, 2023)

4. The Strategic Necessity for our Vision

Introduction

This section sets out in several headings why the vision articulated in the previous section is the right one, and the compelling evidence base behind being as bold as the vision lays out. It is structured around two key themes:

- **The existing challenges forcing a different approach** to tackling transport issues
- Forest City presenting **new opportunities to do something different**

Finally, some of the relevant **Major Transport Projects** are outlined as they require consideration as part of any plans for the region. Most critically this section finds that simply doing what has traditionally been done in transport planning is **not an option.**

Existing challenges forcing a different approach

A. The existing key highway corridors are heavily congested

All major strategic roads around Cambridge experience peak time congestion under existing road conditions. On the most critical of these routes, namely the A14, M11, A11, and A10, congestion issues are particularly acute. In all, traffic on the strategic road network is currently 19% above the levels seen in 2019 (Cambridgeshire and Peterborough Insight, 2025). This contrasts with the local road network, where daily traffic flows are 1% below levels in 2019.

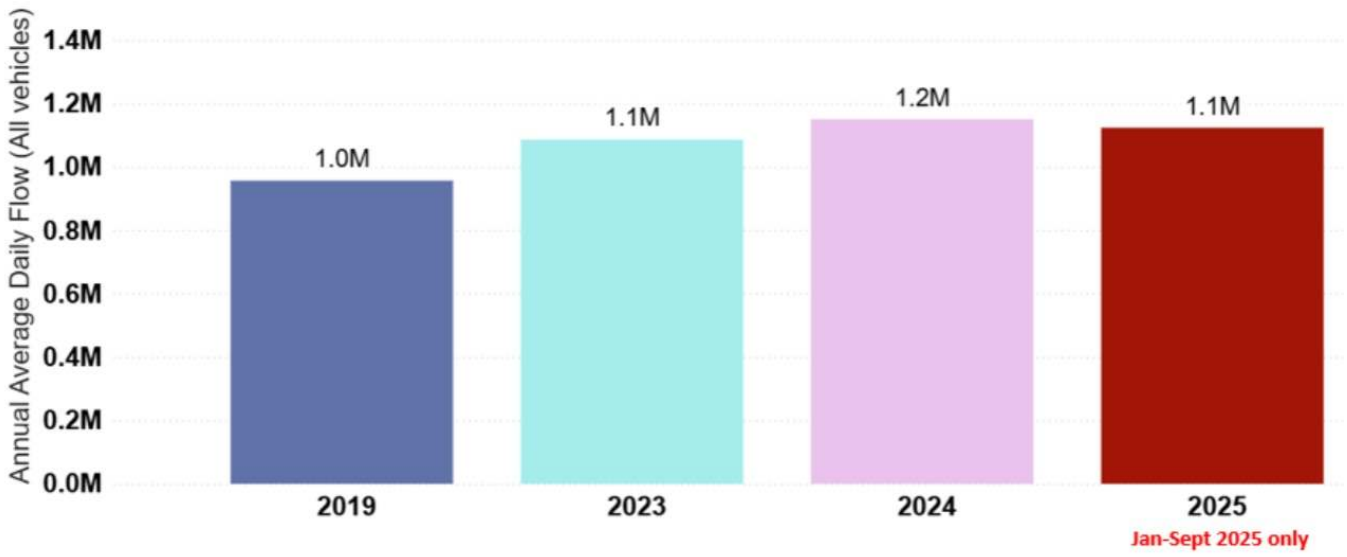


Fig. 4.0.8 Annual Average Daily Traffic Flow on the Strategic Road Network in Cambridgeshire (Cambridgeshire and Peterborough Insight, 2025)

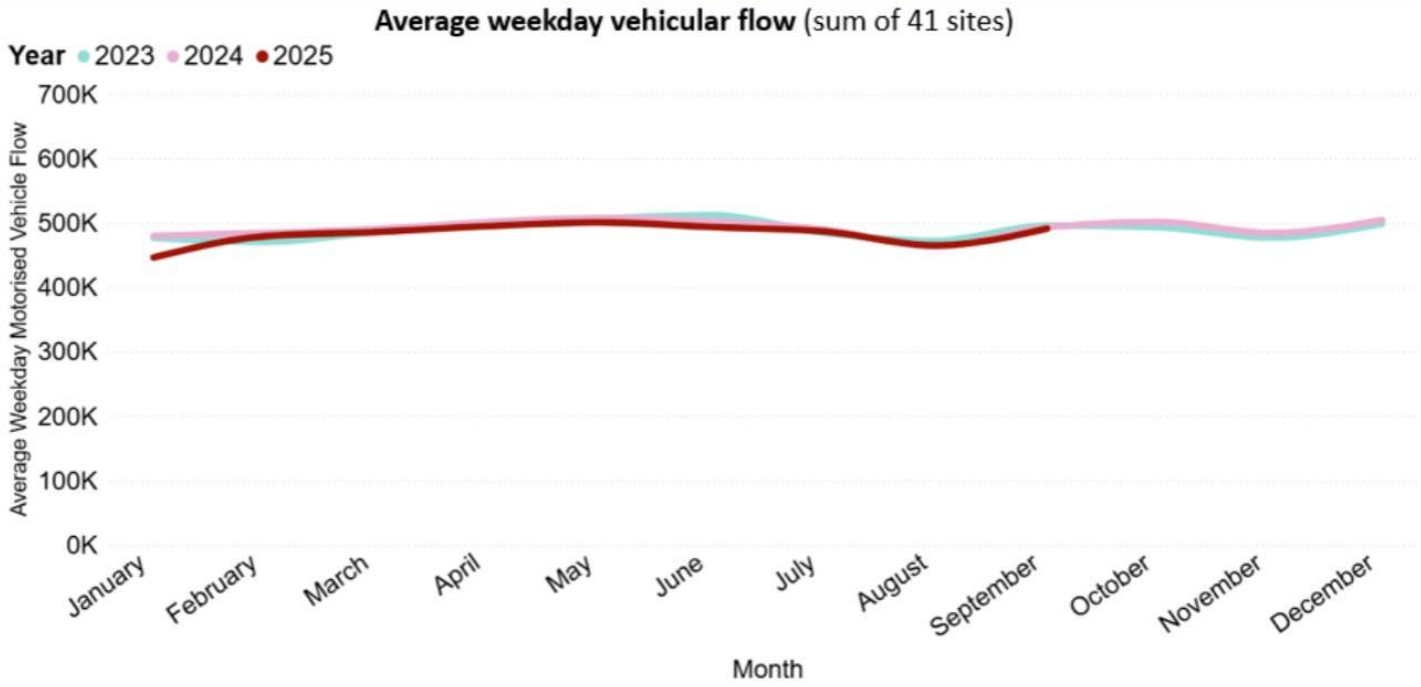


Fig. 4.0.9 Annual Average Daily Traffic Flow on the Local Road Network in Cambridgeshire (Cambridgeshire and Peterborough Insight, 2025)

Data on delays on the key roads in the vicinity of Forest City paint a picture of variances in average delay. There are notable delay pinch points on the A14 north of Cambridge and close to Bury St Edmunds, on the M11 to the west of Cambridge, and further away from Forest City on the A120 in Essex.

Road	Average delay (seconds per vehicle per mile)
A10	19.9
A11	7.1
A14	8.9
A1304	13.9
A1307	28.2
A143	16.2

Table 4.0.2 Average delay on key roads in the vicinity of Forest City (Department for Transport, 2025)



Fig. 4.1.1 Average delays on the strategic road network in the area of Forest City in seconds per vehicle per mile (spvpm) (Data from National Highways (2025))

Policy documents and technical reports confirm the locations of these pinchpoints, and highlight several other pinch points where congestion is particularly acute:

- **A14 (Cambridge Northern Bypass):** Experiences significant morning peak delays (up to 55 seconds per vehicle per mile). Delays are forecast to worsen east of Cambridge by 2031 (National Highways, 2023).
- **The A14/A11 Junction and Copdock Interchange (near Ipswich):** Both are identified as locations where demand exceeds capacity, causing queueing on the A14 during peak hours (National Highways, 2023).
- **The "Fiveways" Roundabout (Mildenhall):** This roundabout is singled out as a major safety and congestion issue due to high speeds, right turns across traffic, and poor layout. It is a critical barrier to reliable travel between East Cambridgeshire and Norfolk (National Highways, 2023).
- **M11 Junction 13 (Madingley Road/West Cambridge):This** junction currently has no north-facing slip roads. Traffic from the north (A14/Huntingdon) cannot exit here to access the West Cambridge Site (University expansion) or Eddington. Drivers are forced to continue to Junction 12 (Barton) and double back, or drive through the city centre/ Girton, adding unnecessary mileage and congestion to local roads (National Highways, 2023).

- **A1303/A14 Junction:** The A1303 (Newmarket Road) acts as the primary access for the Marshall's site (potential future housing) and the eastern business parks. It suffers from severe congestion, which often backs up onto the A14 at Junction 35 (National Highways, 2023).
- **M11 Junction 11 (Trumpington):** This junction serves the Biomedical Campus (Addenbrooke's, AstraZeneca, Papworth). The growth in employment here has overwhelmed the junction's capacity. Without significant capacity upgrades or modal shift, the strategic function of the M11 is threatened by queuing traffic trying to exit for the hospital (National Highways, 2023).

What this means for Forest City: The highways network in the area is already at capacity. Forest City should be planned on a principle of shifting travel away from the use of the private car, which will make congestion worse, and towards sustainable modes of transport that are more efficient at utilising available space for travel.

B. Traditional car-focussed planning would make existing challenges worse

The traditional approach to planning, which prioritises car access and bakes in car dependency, would make existing issues on the strategic highway network much worse.

While a city of one million people will likely result in additional trips by road in any scenario, the approach we are proposing is the difference between an issue that is manageable and chronic, systemic congestion. What we are doing in this section is articulating what would happen if the traditional approach to planning were applied to Forest City.

Using data on average trips per person by different modes from the National Travel Survey, and average trip distances and modal split data by trip distance in the East of England, we estimated the likely additional trips generated by Forest City assuming current trip patterns were maintained. The difference is significant. By 2050 under a traditional approach to planning, Forest City would add a further 33% of vehicle-miles (the measure of intensity of using the road network) to the road network in Cambridgeshire. For Cambridgeshire, Norfolk, and Suffolk, this would be an additional 17%.

Based upon data from the National Travel Survey that reveals the majority of trips are less than 5 miles, we would anticipate that c.70% of this traffic would remain within Forest City, with people driving from one area of the city to another. The other major trip attractor in the area is likely to be Cambridge, reflecting its role as an economic hub for the area. Some commuter traffic to London is also likely, owing to the connectivity provided by the M11.

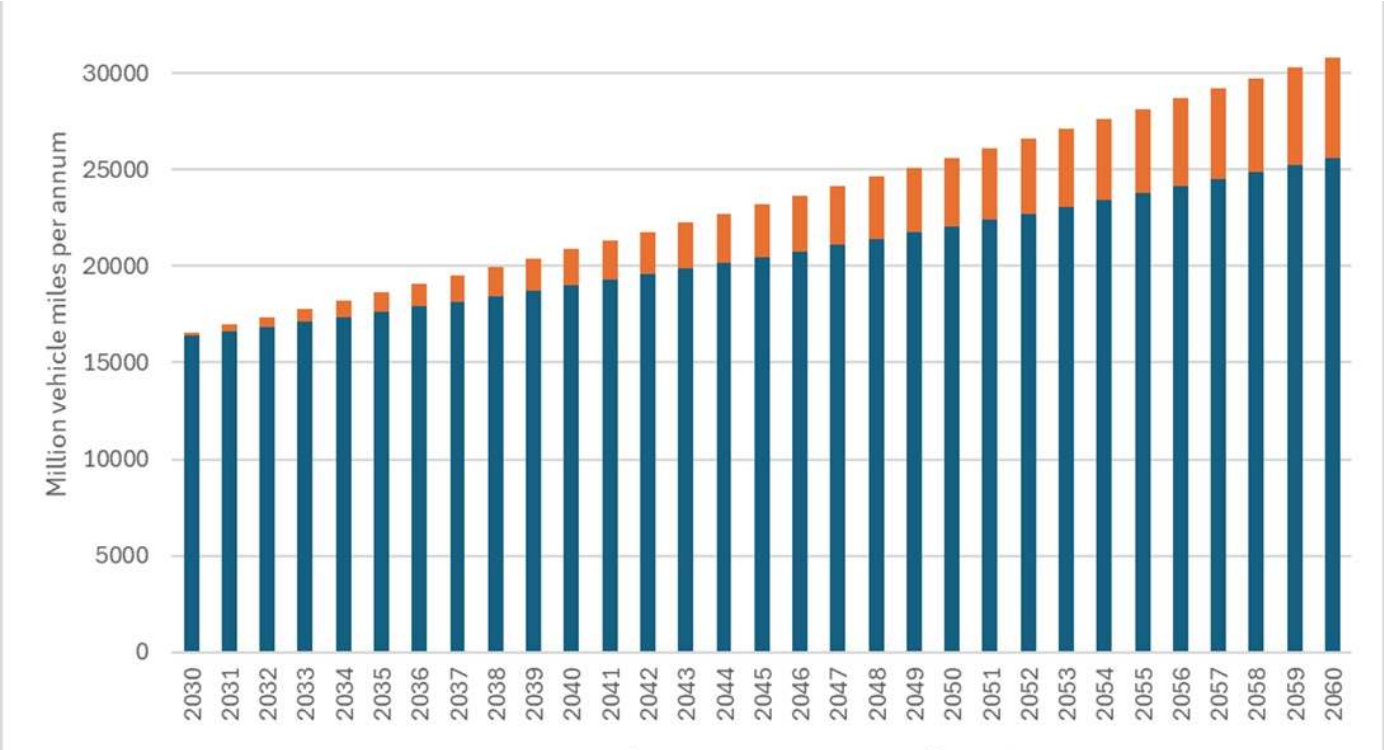


Fig. 4.1.2 The effect of Forest City on the number of vehicle-miles travelled on the road network in Cambridgeshire, Suffolk, and Norfolk each year (own calculations)

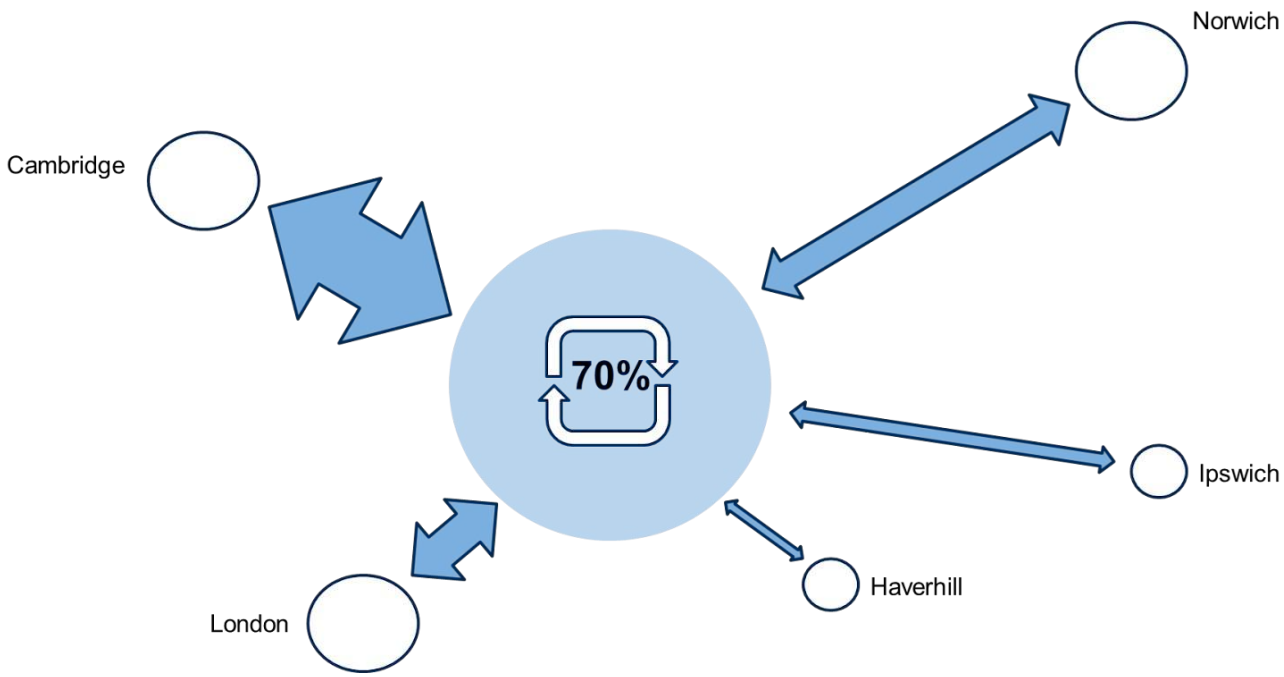


Fig. 4.1.3 Potential distribution of trips on the highway network resulting from Forest City

C. The rail network is not living up to its potential

As of February 2026, the rail network serving Cambridge and the wider Cambridgeshire region finds itself at a crossroads. It faces an infrastructure deficit that threatens to throttle the very economic growth the UK government wants the area to achieve.

Project	Status	Expected Completion	Key Issues / Recent Updates
Cambridge South Station	Delayed	June 2026	Fit-out subcontractor insolvency; signalling integration delays.
Ely Area Capacity Enhancement	Stalled	Unknown	No funding. Business Case submitted 2022.
East West Rail (Bedford-Cambs)	Consultation	Mid-2030s	Route confirmed (Southern approach). £2.5bn funding secured in Spending Review 2025.
Cambridge Resignalling (C3R)	Active	2026-2027	Major blockades Christmas 2025. Prerequisite for Cambs South.
Cambridge South East Transport (CSET)	Inquiry	Late 2020s	Public Inquiry set for 2026. TWAO submitted Jan 2025.

Table 4.0.3 Major rail projects in the Cambridge Area

The immediate landscape is dominated by the imminent, albeit delayed, opening of Cambridge South station, now rescheduled for June 2026. It is the linchpin for the Cambridge Biomedical Campus, intended to decouple economic activity from road congestion. However, its insertion into an already congested timetable highlights the fragility of the network..

Overshadowing local station improvements is the unresolved issue at **Ely Junction.** Despite a Benefit-Cost Ratio (BCR) nearing 5:1, the Ely Area Capacity Enhancement (EACE) remains unfunded for delivery (Network Rail, 2025). This bottleneck strangles cross-country passenger connectivity and national freight movements from Felixstowe, effectively capping the economic potential of the entire East of England.

Furthermore, the East West Rail (EWR) project has moved into a critical phase regarding its approach to Cambridge, with the southern approach remaining the preferred alignment.

Simultaneously, the operational railway is grappling with a significant resignalling programme (C3R) and the introduction of cascaded rolling stock (Class 379s) to address capacity gaps on Great Northern routes.

While piecemeal interventions—such as the Cambridge South station and recent timetable adjustments—are delivering incremental benefits, the lack of a funded holistic solution for the Ely bottleneck and the West Anglia Main Line (WAML) capacity constraints creates a zero-sum game where new services degrade the reliability of existing ones.

Metric	Greater Anglia	Great Northern	Note
On Time (at all stops)	c.85%	c.73%	GA consistently outperforms GN.
PPM (Public Performance Measure)	c.94%	c.96%*	*GN PPM often higher than "On Time" due to buffer times.
Cancellations	1.8%	>2%	Staff shortages are the main driver.
Fleet	Modern (720/745/755)	Mixed (700/717 + 379s)	GN relying on cascaded Class 379s for capacity.

Table 4.0.4 Current overview of train operations in Cambridge for the two primary operators (Source: Office of Rail and Road, 2026)

More immediately to the site is the **rail link between Cambridge and Newmarket.** This section of line is currently single track—in other words trains run on the same track in both directions—severely limiting capacity. This capacity constraint is identified as a reason why trains between Cambridge and Ipswich cannot be boosted from the current one train per hour to two trains per hour. Despite this known bottleneck on the network, there are currently no live proposals to boost capacity in the area.



Fig. 4.1.4 The Single Line Section at the Cherry Hinton High Street Level Crossing on the Cambridge to Newmarket Line (Source: Google, 2026)

More widely on the network, strategic capacity issues limit the scope for a radical change. The most notable being the two track section between Tottenham Hale and Broxbourne. Despite decades of campaigning, this 25km stretch remains a two-track railway, forcing high-speed airport express trains to share the same rails as stopping commuter services.

The argument for four-tracking is based on the necessity of segregating fast and slow trains.

- **The Capacity Cap:** On a two-track railway, the frequency of the service is dictated by the speed differential between the fastest and slowest trains. To run frequent stopping services at stations like Enfield Lock or Waltham Cross, fast trains (Stansted Express) must be held back or spaced widely, reducing overall line capacity. Four-tracking would allow fast trains to bypass stoppers, enabling a metro-style frequency for local commuters and rapid transit for airport and Cambridge passengers.
- **Housing and Growth:** The West Anglia Taskforce and the London Stansted Cambridge Consortium (LSCC) have consistently argued that this upgrade is the key to unlocking up to 80,000 new homes and 45,000 jobs along the corridor.
- **The STAR Project:** Precedent exists in the form of the STAR (Stratford to Angel Road) project, which successfully delivered a third track in the southern section of the Lea Valley. However, this improvement only pushed the bottleneck further north to the Tottenham Hale-Broxbourne sector.

The status of the project as "safeguarded but unfunded" represents a massive opportunity cost. While the land protection prevents the route from being blocked, it does not deliver a single additional seat or train path.

The paralysis means that the WAML remains locked in a zero-sum operational reality: every additional stop added for a local community like Enfield directly degrades the journey time and reliability of the strategic connection to Cambridge. The STAR project demonstrated that incremental widening is possible, yet the ambition to extend this to Broxbourne has withered. As of 2026, the corridor is effectively managed for decline rather than growth, with the safeguarding acting less as a promise of future construction and more as a monument to the unfulfilled ambitions of the Crossrail era.

Further down the line is London Liverpool Street. By the financial year 2024/25, it had retained its title as Great Britain's busiest railway station for the third consecutive year, recording nearly 100 million entries and exits. This metric, while a testament to the economic vitality of the City and the East of England, masks a daily operational reality of severe overcrowding, gateline congestion, and a passenger experience that Network Rail has acknowledged is no longer fit for purpose.

The primary capacity constraint at Liverpool Street is not currently the number of tracks or the frequency of trains—though these are finite—but the ability of the station concourse to process human beings. Operational analysis conducted in 2024 revealed that the existing gateline infrastructure was grossly insufficient. There were only 36 ticket gates serving platforms 1-10 (the main Greater Anglia platforms), creating a severe bottleneck during peak hours.

Recognising that gateline tweaks cannot solve the long-term capacity deficit, Network Rail and its development partners have proposed a radical structural transformation. This project, valued at approximately £1.5 billion, proposes to rebuild the station from the inside out. On 10th February, these plans were approved by the City of London Planning Committee (BBC News, 2026).

What this means for Forest City: While getting more people onto trains is a necessity in order to achieve goals on climate change and reducing congestion, there are known gaps that need to be tackled. Many of the most significant are being worked on now, such as at Ely Junction and Cambridge South station. However, the big capacity crunches such as between Broxbourne and Tottenham Hale remain unfunded meaning that future plans for rail need to take account of such constraints.

D. The local transport network is not achieving its environmental goals

Transport networks generally have a significant negative impact on the natural world. Whilst Environmental Impact Assessments have been mandatory for some time, it is only recently that knowledge of transport's negative effects (especially roads on local habitats) has become widely known. There are four key impacts of transport infrastructure on the natural environment.

Roadkill

Since 2013, the Road Lab Citizen Science Project has received over 103,000 reports of roadkill on British roads (The Road Lab, 2025), but this is likely to be a severe under-estimate; the RSPCA estimates that 75,000 deer are involved in road traffic collisions each year (Royal Society for Protection of Cruelty to Animals, 2022).

Habitat fragmentation and the barrier effect

Roads and rail create physical barriers that isolate populations, leading to reduced genetic diversity. For large mammals, the barrier effect of a highway can be more detrimental than the habitat loss (Brett et al. 2025).

Acoustic and light pollution

Noise pollution from traffic interferes with animal communication (e.g. bird songs used for mating) and predator-prey detection. Light pollution disrupts circadian rhythms and migratory patterns for birds and insects. The European Environment Agency found that 20% of protected areas in the EU are now exposed to transport noise levels high enough to alter animal behavior (European Environment

Chemical Runoff

Heavy metals, microplastics (from tyres), and de-icing salts contaminate roadside soils and local waterways, favoring salt-tolerant invasive species over native flora. In a low-lying county like Cambridgeshire, this chemical load is readily transferred into the drainage ditches and dykes that form the backbone of the local ecosystem. And those effects can be felt well away from the roadside: chemical runoff affects aquatic habitats far down river from where they entered.

Within the context of the area east of Cambridge, there are several notable pieces of infrastructure that could act as a barrier to wildlife. The A14, M11, and A11 form the most significant barriers, due to high traffic levels and high speeds at which traffic moves, combined with significant noise pollution. This is somewhat the case also on the A143 and A1307 to the south. The railway between Cambridge and Newmarket, and from Newmarket to Ipswich also provides limited severance but only due to the relatively limited number of services that run along this route.

Transport is also the leading source of carbon emissions in South Cambridgeshire where much of the planned site is located, being responsible for 43.8% of annual emissions in 2023 (Department for Energy Security and Net Zero, 2025). It is also a leading source of carbon emissions in East Cambridgeshire, with 16.9% of emissions, beaten by emissions from land use and from agriculture (Department for Energy Security and Net Zero, 2025). The area of Forest City is also characterised by higher transport emissions per capita. In South Cambridgeshire, transport carbon emissions are 3.3t CO2e per capita in 2023. In East Cambridgeshire, that figure is 2.6t CO2e, and in Cambridgeshire as a whole that figure is 2.5t CO2e. For the UK as a whole, that figure is 1.7t CO2e.

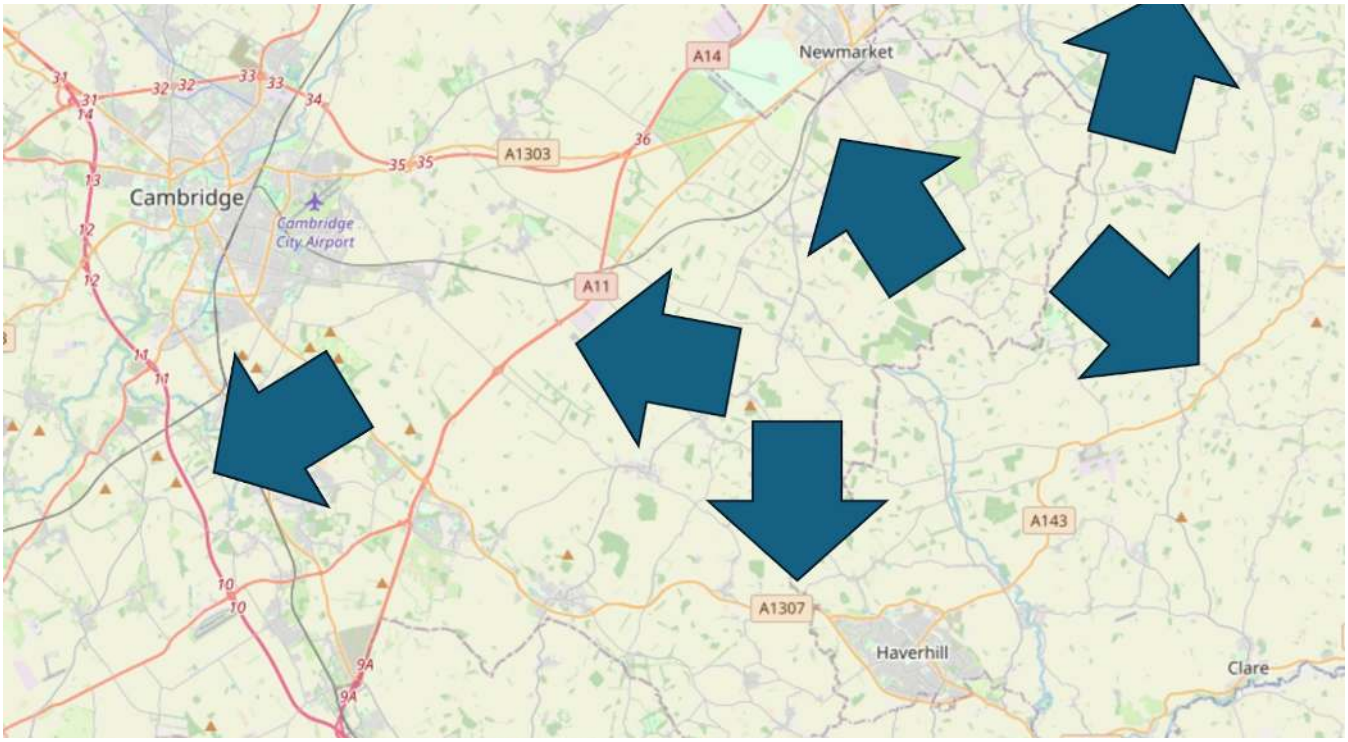


Fig. 4.1.5 General locations of key transport-related wildlife barriers in the area of Forest City

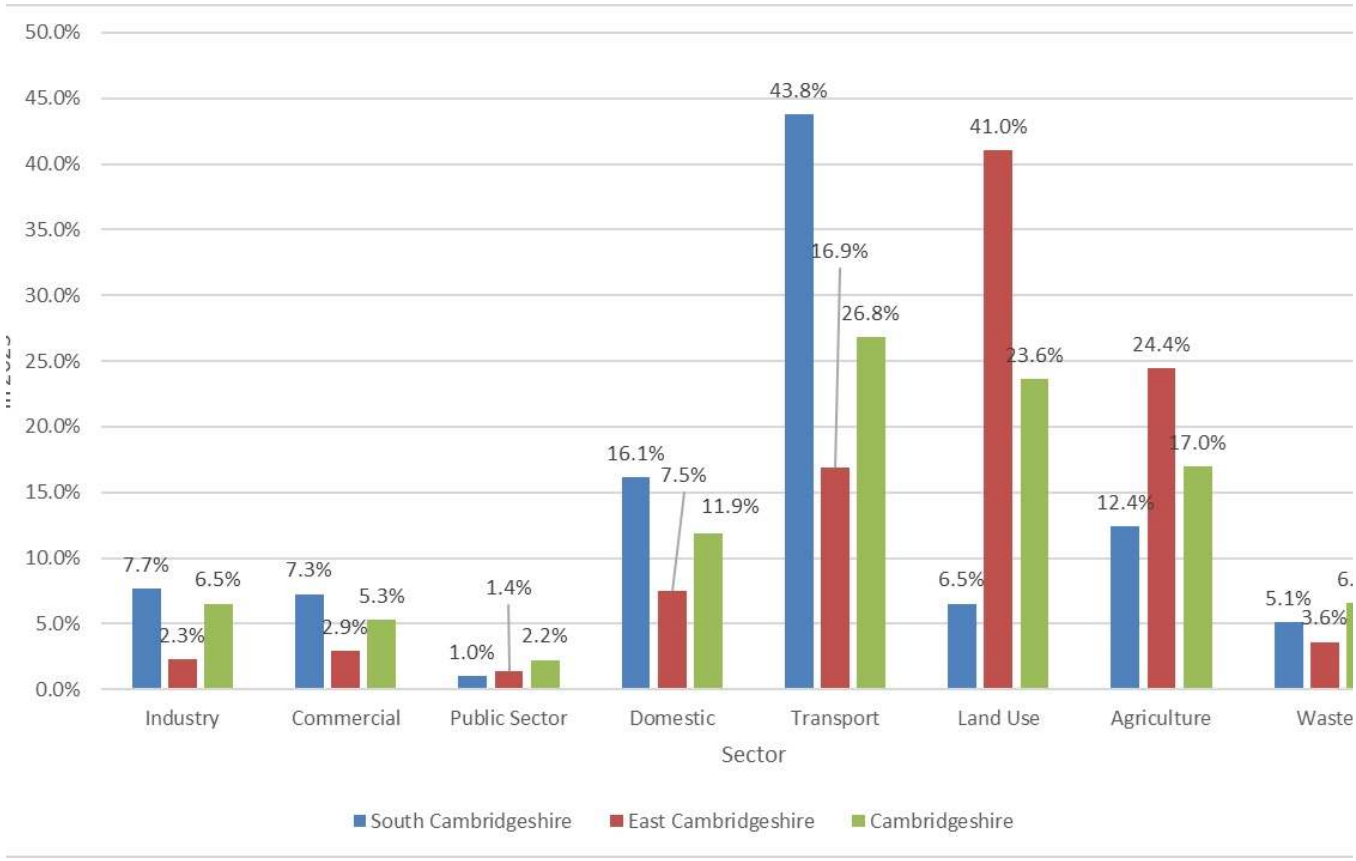


Fig. 4.1.6 Carbon emissions by sector for South Cambridgeshire, East Cambridgeshire, and Cambridgeshire (Department for Energy Security and Net Zero, 2025)

While other sectors of the UK economy significantly reduced their carbon footprint over the last 15 years, transport emissions remained largely flat, falling only 3.2% between 2009 and 2019 before the pandemic (Department for Energy Security and Net Zero, 2025). This stagnation is primarily attributed to rebound effects where improvements in engine efficiency were cancelled out by a consumer shift toward larger, heavier vehicles, such as SUVs, which rose from 7% of the market in 2007 to 25% by 2019 (Committee on Climate Change, 2020). Additionally, the rapid growth of the last-mile delivery sector, fueled by an increase in online shopping, led to a 106% rise in van movements over a decade, further offsetting gains from the adoption of electric vehicles (Department for Transport, 2024).

In Cambridgeshire, these national trends are exacerbated by a sharp rural-urban divide and rapid population growth. While Cambridge has a strong cycling culture, the surrounding county remains highly car-dependent because the public transport system is not yet comprehensive enough to serve those living in market towns and villages where distances are too great for active travel (University of Cambridge, 2019). Efforts to implement radical decarbonisation measures, such as the proposed Sustainable Travel Zone, have faced intense local opposition due to concerns over financial fairness and the lack of viable alternatives to the private car (Greater Cambridgeshire Partnership, 2023).

Consequently, without significant investment in grid capacity for electrification and a "whole-system" approach to rural connectivity, the region risks exceeding its carbon budgets as traffic levels return to pre-pandemic peaks (Cambridgeshire and Peterborough Combined Authority and WSP, 2023).

There is also a dangerous misconception that swapping every petrol car for an electric one will solve our problems. It won't. An electric traffic jam is still a traffic jam. The sheer volume of vehicles required to move one million people using the current car-centric model would gridlock the region, destroying economic productivity and quality of life. Furthermore, EVs are heavier than traditional cars, which increases particulate pollution from tyres and road wear—a health issue that electrification does not solve. We are running out of road space, and the answer cannot be to simply build more roads.

Cambridgeshire's unique geography also poses a specific threat to transport infrastructure. A significant portion of the county's roads are built on peat soils. As the climate changes, leading to hotter summers and wetter winters, this peat shrinks and expands, causing roads to buckle and crack. This isn't just an inconvenience; it's a climate feedback loop. Repairing these roads requires more carbon-intensive asphalt, and the degradation of the peat releases vast amounts of stored carbon into the atmosphere (Cambridgeshire County Council, 2025).
Even green infrastructure has a carbon cost that is often overlooked. Building a new guided busway or a railway line requires immense amounts of concrete and steel. If we justify these projects solely on their operational benefits (getting people out of cars) without counting the carbon cost of building them, we might be making the climate crisis worse in the short term. The challenge is that the payback period for the carbon used to build a new railway might be 20 or 30 years (Lokesh et al., 2022).

Finally, the region is facing an acute water crisis. The Environment Agency has flagged that current abstraction levels are unsustainable (Ministry of Housing, Communities, and Local Government et al., 2024), damaging the rare chalk streams that define the local landscape. A city of one million people is a thirsty entity. It requires not just drinking water, but water for construction, for industry, and for keeping green spaces alive in a hotter climate. The infrastructure required to solve this—new reservoirs and pipelines—is itself a major civil engineering undertaking with a high carbon footprint. The issue is that transport planning often ignores this constraint, assuming that water will simply "be provided," leading to disjointed development strategies.

What does this mean for Forest City? The traditional rulebook of planning must be thrown out. You cannot simply expand the current model of suburban estates connected by roads; the carbon cost is too high, and the ground is too unstable.

It means that "business as usual" is a failure state. If you build a car-dependent city, you will build a city that is congested, unequal, and ecologically destructive. You have a limited carbon budget and you must spend it wisely; not on roads that divide us, but on neighbourhoods that connect us.

E. Transport is Contributing to Issues of Social Exclusion

The transport landscape of Cambridgeshire reveals a profound fracture between the connectivity of its affluent hubs and the isolation of its rural and deprived communities. At the heart of this issue is transport poverty, a condition affecting a significant minority of the population, particularly in Fenland and Peterborough where child poverty rates climb to 36% (Ministry of Housing, Communities, and Local Government, 2025). For residents in these areas, the absence of a car often equates to social and economic paralysis. Low-income households in rural areas spend a disproportionate amount of their income on running a vehicle because public transport alternatives are either non-existent or do not align with the realities of working life, creating a phenomenon known as ‘forced car ownership’. This financial burden strips resources from other essentials, locking families into a cycle of deprivation where they travel to work but work to travel.

Our analysis shows that such poverty can manifest itself in the form of Transport-Related Social Exclusion (TRSE). This is where matters such as travel times to key facilities like healthcare by public transport, as well as access to a car has a direct impact on poverty and deprivation. While the analysis shows that much of the area covered by Forest City is not among the most at risk of TRSE, it should not be taken as inevitable that this will continue as a city is built out. For example, the same analysis shows substantial areas of Peterborough - a New Town - are at risk of TRSE.

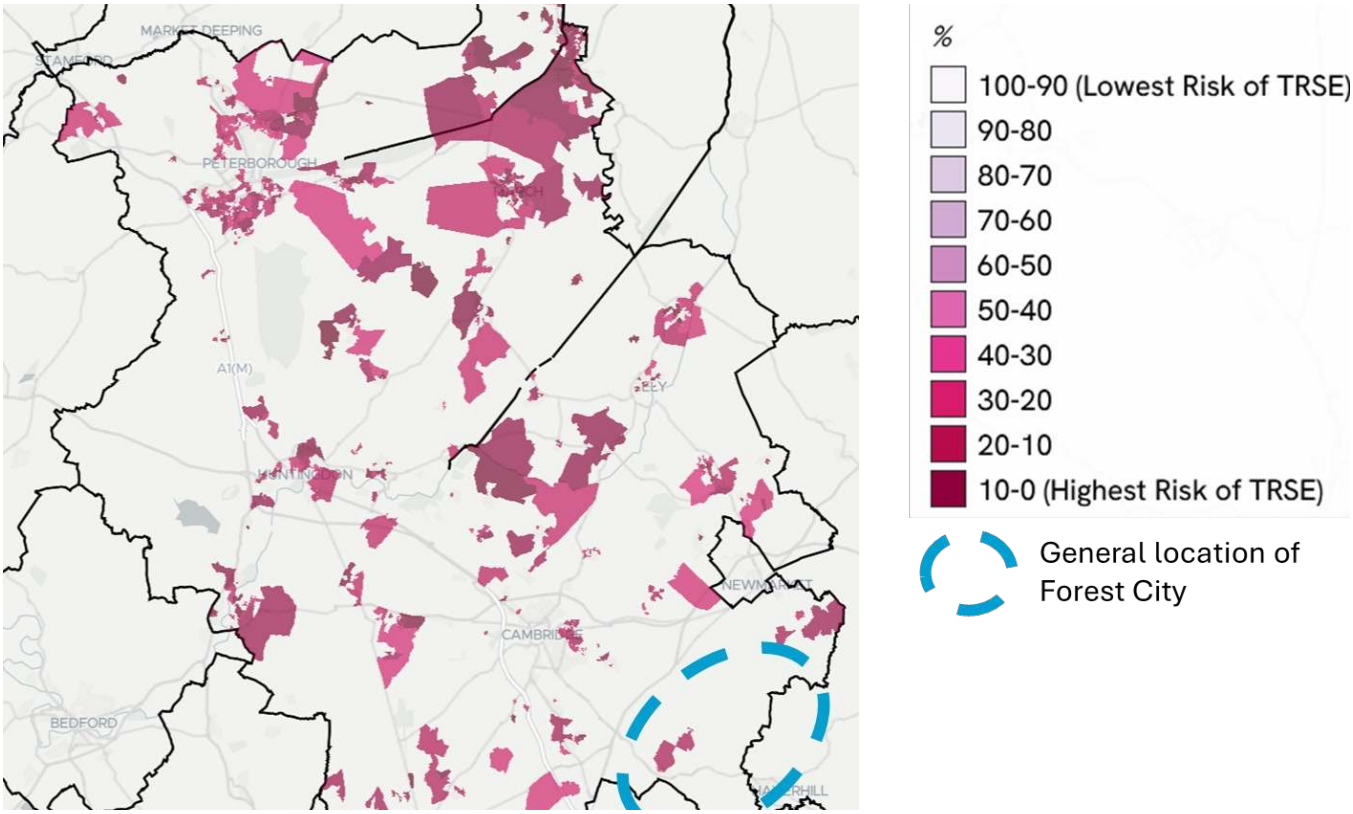


Fig. 4.1.7 Locations of areas at highest risk of Transport-Related Social Exclusion in the Cambridgeshire and Peterborough Combined Authority area (Transport for the North, 2023)

For disabled people, the barriers are physical, informational, and systemic. While Cambridge has a dense bus network, infrastructure often fails at the last meter. Recent audits of the Guided Busway and city bus stops have highlighted severe deficiencies, such as sloping verges and narrow islands that render stops inaccessible to wheelchair users. Furthermore, the unreliability of services imposes a ‘confidence penalty’ on disabled travelers. When a bus fails to arrive or a ramp cannot be deployed, the anxiety generated can deter future travel entirely, leading to isolation. Statistics indicate that disabled people make approximately 30% fewer journeys than their non-disabled peers (Department for Transport, 2025), a disparity driven not by a lack of desire to travel, but by the fear of being stranded in a hostile environment.

Women and girls in the region face a distinct safety deficit. The fear of sexual harassment and violence, particularly during the evening and night, restricts their mobility and freedom. Research indicates that women are more likely to use buses than men (Department for Transport, 2025), yet they are also the most vulnerable to the hub and spoke design of networks which forces them into complex, multi-leg journeys to fulfill caregiving responsibilities. A lack of visible staffing at rural hubs and interchanges exacerbates this fear, forcing many to rely on expensive taxis or simply stay home, limiting their access to the night-time economy and employment.

The **spatial mismatch** between housing and employment is a critical driver of inequality. High housing costs in Cambridge push lower-income workers into peripheral towns and villages like Wisbech and Haverhill. However, both are among the largest towns in the UK without a rail station, severing their populations from the economic engine of Cambridge. This lack of connectivity entrenches deprivation; residents cannot access the higher-paying jobs in the city without a car, yet they cannot afford a car because they cannot access the higher-paying jobs. This cycle of exclusion is clearly mapped in the Index of Multiple Deprivation data for the region

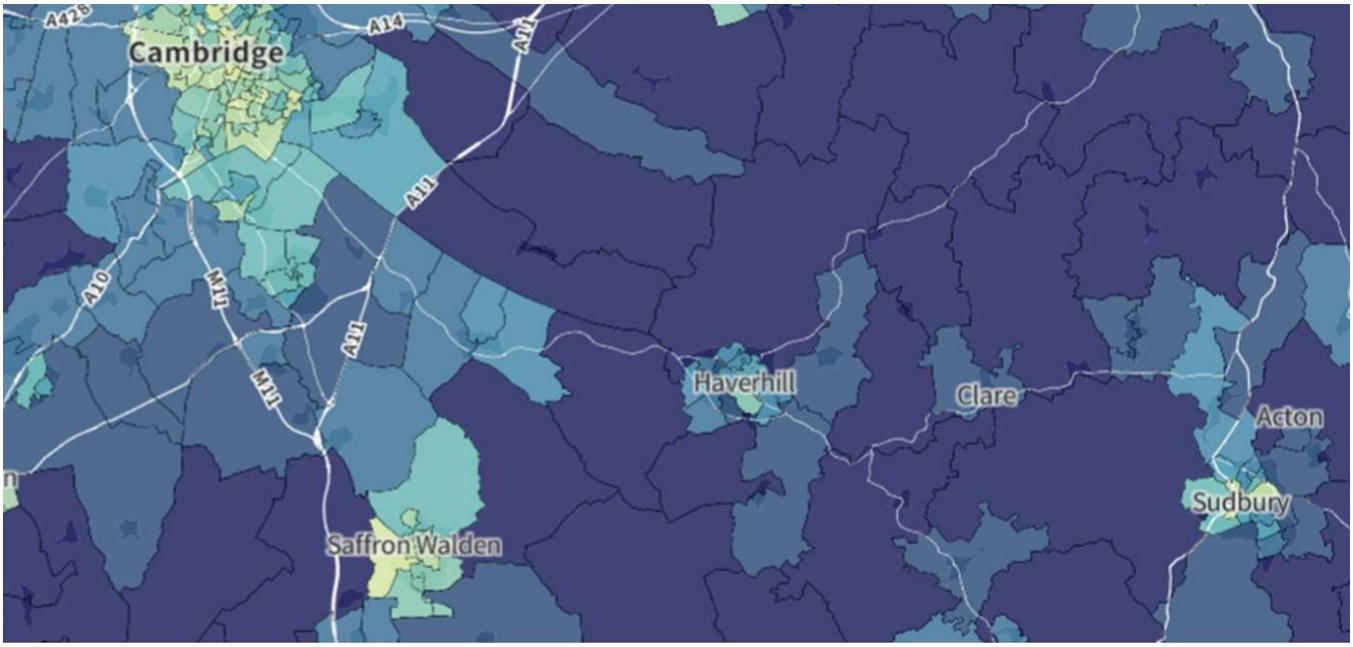


Fig. 4.1.8 Indices of Multiple Deprivation data on Barriers to Housing and Services (which includes connectivity) for the area (Ministry of Housing, Communities, and Local Government, 2025)

Neurodivergent users face a specific set of barriers related to sensory processing and information. The chaotic nature of transport interchanges, coupled with inconsistent signage and noise, can make travel overwhelming. The research highlights that for autistic people, "unexpected changes" are debilitating (Autistica, 2025). In a transport network prone to delays and cancellations, this unpredictability acts as a hard barrier to access. Current systems often fail to provide the granular, reassuring information—such as how busy a bus is or exactly where the stop is—that neurodivergent users need to travel confidently.

Ethnic minority populations in deprived urban areas of the region face a disproportionate risk of road traffic injury. National data indicates that pedestrians from ethnic minority backgrounds in deprived areas are three times more likely to be injured than white pedestrians in non-deprived areas (Living Streets, 2021). This suggests an environmental injustice where poorer, diverse neighborhoods are subjected to higher traffic volumes and poorer pedestrian infrastructure, making the simple act of walking a hazardous activity.

Finally, the **fragmentation of the network** exacerbates all these issues. Because buses, trains, and DRT services often operate in silos with different ticketing systems, a multi-modal journey becomes prohibitively expensive and complex. A low-income worker traveling from a Fenland village to a job in Cambridge might need to pay separate fares for a DRT, a train, and a city bus. This 'interchange penalty'—both financial and logistical—disproportionately harms those who cannot afford to live near their workplace, effectively taxing them for their geography.

What does this mean for Forest City? A city built solely on high-speed tech-enabled transit will fail if it does not account for the varied reality of human lives. A nature-focused city must not be a playground for the mobile elite while pushing the service workers who sustain it into transport deserts. Proximity must be the core design principle; if essential services (health, work, nature) are not within accessible reach of the poorest residents without a car, the city will fail its happiness metrics. It means that the veins of the city (paths, bus routes) must be as carefully designed as its arteries (trains, highways), ensuring that a grandmother in a wheelchair or a night-shift nurse feels as safe and valued in the transport network as a tech CEO.

F. Modal Shift is Necessary

Greater Cambridge is experiencing a **profound disconnect** between its economic dynamism and its infrastructural capacity. The region has seen population growth of 17% over the last decade, with projections of a further 28% increase by 2031, accompanied by 44,000 new jobs. **This hyper-growth is funnelled into a medieval road network and radial arteries that are physically incapable of expansion.** Consequently, traffic congestion has emerged as the paramount crisis, cited by nearly 65% of residents as their single biggest concern. This gridlock is not merely an inconvenience; it acts as a tax on the region's productivity.

While infrastructure capacity is a physical constraint, the reliability of the service is the primary behavioral driver. The research indicates that 40.6% of residents choose their mode of transport based on reliability, yet 42.5% cite the unpredictability of public transport as a major deterrent (Greater Cambridgeshire Partnership, 2018). Buses, which share road space with general traffic on key corridors like Newmarket Road, are victims of the very congestion they aim to alleviate. This unpredictability, forces commuters—who make up 86.5% of frequent travelers—back into private cars, creating a feedback loop of declining bus speeds and increasing traffic volume.

A granular analysis of Census 2021 data reveals a tale of two counties. While Cambridge City boasts an impressive 49% active travel mode share for commuting, the surrounding districts of East Cambridgeshire and Huntingdonshire remain heavily car-dependent, with private vehicle commute shares exceeding 80% (Office for National Statistics, 2023). This structural inequality is driven by the hollowness of the rural bus network; the lack of frequent, reliable alternatives makes car ownership a necessity rather than a choice.

A perceptual barrier is that there is a dissonance in cost perception. Drivers often perceive the marginal cost of a trip (fuel) as lower than a bus fare, ignoring the high sunk costs of ownership (depreciation, insurance). However, for the lowest income quintiles, forced car ownership is a significant financial burden (WSP et al., 2023). This means that in some cases, demand management measures like road pricing, if introduced without robust alternatives, could be regressive, penalising those who have been forced into cars by the failure of the public transport market.

The recent withdrawal of the Sustainable Travel Zone (congestion charge) proposal, following 58% opposition in public consultation (ITV, 2023), underscores the fragility of the social contract regarding transport. The backlash highlights a fundamental trust deficit; the public is unwilling to accept "sticks" (charges) on the promise of future "carrots" (buses). This political deadlock represents a significant non-physical barrier to resolving the region's transport issues.

Finally, a recurring theme in wider transport evidence is the friction caused by poor integration. The lack of seamless connections between rail, bus, and active travel creates a last mile problem. Commuters arriving by train often face a disjointed onward journey. This lack of a unified ‘mobility ecosystem’—where ticketing and scheduling are integrated—makes multi-modal journeys cognitively and logistically burdensome compared to the simplicity of a door-to-door car trip.
Looking ahead, the ‘do nothing’ scenario is catastrophic. The “Future Pressures" analysis in the Eastern Access SOBC predicts that without radical intervention, journey times could double on key radial routes (TetraTech, 2021). This would effectively sever the labor market, making it impossible for workers in affordable housing areas to reach employment hubs, thereby stalling the region's economic engine.

G. The policy narrative is shifting towards planning for sustainable modes

The Expert Group also reviewed many of the key transport and planning policy documentation of relevance to the area, ranging from the **Cambridgeshire & Peterborough Combined Authority (CPCA) Local Transport and Connectivity Plan (LTCP)** to specific area plans like the **Haverhill Area Transport Plan.** It indicated a profound structural change is evident in regional transport planning. The overarching narrative has shifted from facilitating vehicle movements to managing demand through a strict decarbonisation hierarchy.

The documents collectively signal the abandonment of the "predict and provide" model, which historically sought to widen roads to accommodate forecasted traffic growth. The CPCA LTCP explicitly replaces this with a vision-led approach centred on the "Avoid-Shift-Improve" hierarchy (Cambridgeshire & Peterborough Combined Authority, 2025). This policy framework prioritises:

- Avoiding the need to travel (through digital connectivity and better land-use planning)
- Shifting necessary journeys to active or public transport, and only then,
- Improving the efficiency of residual vehicle trips (e.g., electrification).

The strategy accepts that building sufficient road capacity to meet unconstrained demand in a historic city like Cambridge is physically impossible and environmentally untenable.

A striking development in the England's Economic Heartland (EEH) Strategy is the classification of digital infrastructure as a primary transport solution (England's Economic Heartland, 2020). The strategy argues that the most effective way to decongest the A14 and A11 corridors is to remove the commuter entirely. It sets out a requirement to baseline and monitor digital coverage as rigorously as road traffic speeds. By prioritising gigabit-capable broadband and 5G in rural 'transport deserts', it aims to substitute physical mobility with digital connectivity, thereby reducing the strain on the physical infrastructure without pouring concrete.

Within the CPCA LTCP Local Section: Greater Cambridge document, the focus on infrastructure has moved from arterial roads to the creation of a "wheel" of 12 Greenways (Cambridgeshire & Peterborough Combined Authority, 2025). These are not recreational paths but high-quality commuter corridors designed to connect the "Necklace Villages" (such as Waterbeach, Linton, and Comberton) directly to the city's employment hubs. The strategy explicitly intends for these routes to facilitate longer-distance active travel, utilising e-bikes to extend the cycleable catchment area from 5km to 10-15km, thereby directly competing with the private car for inter-urban commuting.

Recognising that rural car usage cannot be entirely eliminated, the strategy proposes a "Ring of Steel" concept using Mobility (Travel) Hubs. As detailed in the Greater Cambridge and East Cambridgeshire sections of the CPCA LTCP, these hubs are positioned on the periphery of the congested urban zone (Cambridgeshire & Peterborough Combined Authority, 2025). The objective is to intercept private vehicles before they enter the city network, facilitating a transfer to mass transit or active modes.

The CPCA LTCP Local Section: East Cambridgeshire document provides a clear case study in shifting investment from road to rail to support housing growth (Cambridgeshire & Peterborough Combined Authority, 2025). It cites the reopening of Soham Railway Station as a critical intervention to support the 2,300 additional homes planned for the town. Rather than proposing a dual carriageway bypass to handle the new residents, the strategy relies on the rail link to Ely and Newmarket to absorb the demand. It further lobbies for the doubling of the track at the Snailwell Loop, positioning rail capacity as the primary constraint on growth, rather than road capacity.

The documents are candid about the need to physically take space away from private cars. The CPCA LTCP discusses the necessity of bus priority measures that may reduce general traffic capacity (Cambridgeshire & Peterborough Combined Authority, 2025). In the context of the A10 Corridor, while road improvements are mentioned, it emphasises that these must be delivered alongside a dedicated cycleway (Soham to Wicken) and improved bus routing. The improvement of the road is no longer just about vehicle throughput but about creating a multimodal corridor where buses and bikes are separated from heavy goods vehicles.

The Haverhill Area Transport Plan (2025) offers a granular view of this shift. It identifies that the A1307 is failing due to a lack of alternatives. However, instead of proposing major road widening, the plan focuses on "Town centre permeability" (Suffolk County Council, 2024) It argues that many residents drive for short, internal trips because walking routes are severed by historic infrastructure design. By fixing the start of the journey—making walking and cycling within Haverhill viable—the plan aims to reduce the load on the arterial road network, proving that local micro-interventions are now preferred over massive macro-infrastructure projects.

Both the Haverhill and Greater Cambridge documents pin their hopes on the CSET scheme. This is a dedicated public transport spine that runs parallel to the congested A1307 but is physically separate from it. This illustrates the new philosophy: rather than trying to fix the car-dominated road (which would just induce more traffic), the strategy is to build an entirely new, separate ecosystem for sustainable travel that offers a faster, more reliable journey time than the car, effectively bypassing the congestion rather than solving it.

The Roads in the East of England report clarifies that where road investment is supported, it is strictly for economic traffic rather than commuter convenience (Transport England et al., 2025). The focus is on the Felixstowe to Midlands corridor and the movement of freight. The justification for road schemes has shifted to unlocking specific industrial sites or Freeports. National Highways now frames road improvements around safety and reliability for logistics, rather than speed for commuters, implicitly acknowledging that the commuter should be on the train or broadband network.

What this means for Forest City: The implications of this policy shift suggest a fundamental restructuring of urban planning where nature and social equity take precedence over private vehicle capacity. The transition to a vision-led approach necessitates the creation of extensive

Greenways and the preservation of rural landscapes by substituting heavy concrete infrastructure with digital connectivity, thereby reducing environmental degradation while simultaneously addressing isolation in transport deserts.

To tackle social exclusion, the policies prioritise repairing severed walking routes and enhancing town centre permeability, ensuring that non-drivers have viable, high-quality access to employment hubs via active travel corridors. This drives a decisive modal shift by intercepting cars at peripheral mobility hubs and explicitly reallocating road space to public transport and essential logistics, ultimately creating a parallel, high-reliability ecosystem for sustainable travel that renders the private car unnecessary for inter-urban commuting.

New opportunities to do something different

A. The Fundamental Impact of Forest City: Changing the Transport Geography

In this area of Cambridgeshire, the strategic transport geography is centred around the city of Cambridge. It is a net importer of people on the average workday. At the time of the 2011 Census, around 50,000 people commuted into the city every day, compared to 18,000 commuting out (Office for National Statistics, 2023). In 2021, this figure was 38,000 commuting in, and 19,000 commuting out[37].

The power of Cambridge as an economic centre naturally decreases as the travel time to it increases. Places such as Histon, Waterbeach, Linton, and Huntingdon have a strong flow of commuters to Cambridge, as do Haverhill and Newmarket. In contrast, Bury St Edmunds, some 40 minutes drive time to Cambridge, has a relatively weak economic link.

Location	Number of commuters to Cambridge in 2011	Estimated mode share of car
Histon and Impington	2,412	41%
Waterbeach	1,356	65%
Linton	1,085	80%
Huntingdonshire	8,272	79%
Haverhill	2,400 (estimated)	71%
Newmarket	1,788	88%

Location	Number of commuters to Cambridge in 2011	Estimated mode share of car
Peterborough	1,655	73%
Peterborough	1,655	73%
Bishops Stortford	450	65%
Bury St Edmunds	180	92%

Table 4.0.5 Estimates of main commuting flows into Cambridge (Office for National Statistics, 2023) [38]

Should Forest City be constructed to the east of Cambridge, with a planned population of one million compared to Cambridge's estimated population of 151,000 (World Population Review, 2026), this will result in a new economic centre in the region. In transport terms, this holds the potential to develop a radical shift in travel patterns.

The relative attractiveness of a location as a transport destination is fundamentally governed by the Gravity Model of spatial interaction. This means that the volume of trips between two zones is directly proportional to their "mass"—defined by population size and economic magnitude (often measured in Gross Value Added or employment density)—and inversely proportional to the friction of distance (or Generalised Cost). In transport modelling, this 'mass' determines a zone's Trip Attraction factor. Locations with significant economic agglomeration offer a higher density of opportunities (employment, retail, leisure), which increases the utility of that destination within discrete choice models (Rodrigue et al, 2024). As outlined in the UK Department for Transport's Transport Analysis Guidance, destinations with superior economic power exert a stronger pull that can override higher travel costs, effectively expanding their catchment areas and dominating regional flow hierarchies (Department for Transport, 2013).

Forest City would add another, and potentially a more significant area of agglomeration attracting trips than Cambridge. In effect, there would become two, or even more, major economic centres: Cambridge and Forest City. This creates the potential for a new key transport corridor between Forest City and Cambridge with two major nodes at either end, along which there is the potential for significant flows of people.

To estimate the scale of this impact, we developed a basic four-stage spreadsheet model, based on population figures for different areas, the number of jobs, journey times by train and car and the associated costs (including costs of interchange). This is based on Forest City being

constructed to a population of one million people. As this model is relatively basic and has not been validated through external data collection (e.g. traffic counts), its results should only be taken as an indication at this stage, and consequently should be treated with extreme caution.

What it shows is that the link between Forest City and Cambridge is likely to be extremely strong, with around 23,000 movements between the two in the peak hours, of which over half will be by road—likely the A14. The only other strong flow of note is with Haverhill—c.7500 trips with a 65% modal share to car. Considering the modal share of trips captured by the Travel to Work data, this percentage share of trips by car is likely to be an under-estimate.

Trip Pairs		Estimated total peak hour trips	Estimated car modal share
Forest City	Cambridge	23004	56.5%
Forest City	Newmarket	1919	59.8%
Forest City	Norwich	1533	52.5%
Forest City	Ipswich	1672	52.3%
Forest City	Haverhill	7575	65.1%
Forest City	Bury St Edmunds	1980	57.5%
Forest City	Braintree	2636	95.9%

Table 4.0.6 Estimated total daily trips from Forest City to other key urban areas

This Forest City to Cambridge corridor should therefore act as the spine of the transport network for the city.

B. New places are a new chance to change travel behaviours

There is often an assumption that when people move home, move jobs, or make another significant change in their life, how they travel will remain the same: they will simply continue to drive.

This is an example of thinking associated with “Motornormativity,” a shared cognitive bias wherein society unconsciously accepts cars as the default, despite their risks and harms that might be deemed morally or legally unacceptable in any other context (Walker et al. 2023). However, research into travel behaviour change shows that this thinking is somewhat simplistic. In fact, moving is probably the biggest opportunity for people to change their travel patterns.

The UK Household Longitudinal Study found a strong association between changes in car ownership and commute mode and the following life events: employment changes, residential relocations, retirement, child birth and changes in household structure (Clark et al. 2014).

This can be visualised in the “Habit Line.” When people are establishing a new habit (in this case a new route to work), they seek information to help form that habit. But once their habit is set by repeated behaviours, no amount of information or encouragement is likely to break their new habit.

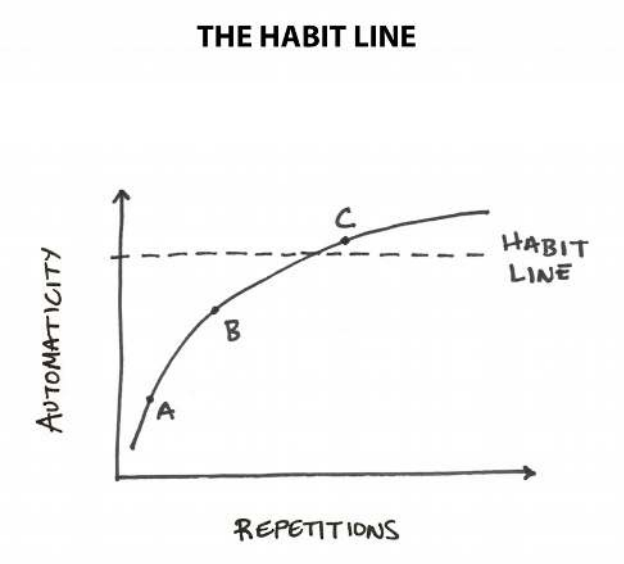


Fig. 4.1.9 The Habit Line (Silvestre, 2018)

Research by the Department for Transport has shown that intervening at this critical time is very effective at changing behaviours. In one study cited in their Moments of Change report, 27% of households completely changed how they travel as a result of a house move, around four times the average of the rest of the population who are not moving home (Department for Transport, 2025).

This also speaks to a recently-established truth when it comes to changing travel behaviours. There has long been an assumption that changing attitudes changes behaviours. Namely, that if you make people more favourable towards public transport (e.g. through marketing campaigns) they will use it more.

In fact, recent research has shown that this relationship is actually bidirectional and that attitudes are often a function of past behaviour (self-justification) rather than the primary driver of it. These findings suggest that the actual effect of attitudes on travel behaviour is significantly weaker than previously thought, implying that transport policies focusing solely on changing mindsets may be less effective than structural interventions that directly alter behavioural patterns (Mehdizadeh et al. 2026).

What this means for Forest City: Forest City has a unique opportunity to embed sustainable travel behaviour from the outset. The moment of moving provides the opportunity to influence travel behaviour so long as the quality of the sustainable transport offer is there from the very start.

C. Cambridge shows a high modal share for sustainable transport is feasible

If Forest City is to be successful in transport terms, arguably its most important metric will be the percentage of trips undertaken by residents on sustainable transport modes. Specifically, walking, wheeling[39], cycling, various forms of public transport, and arguably car sharing.

Currently, the average person in England takes 922 trips per year (Department for Transport, 2025). In the East of England, this is slightly higher at 953 trips per year. When broken down by mode, what can be seen is that the two most dominant modes of travel are using the car and walking. While this gives an image of car dominance, it should be noted that even within the East of England there are pockets where the car does not dominate. For instance within Cambridge, barely 30% of residents travel to and from work using their car in 2011, 28% in a pandemic-affected 2021.



Fig. 4.2.1 Average number of trips per person per annum by mode and region (Department for Transport, 2025)

By UK standards, Cambridge is reasonably well served by public transport. Its Park and Ride sites are exemplars of best practice. Across many of the radial routes there is a good level of bus service, and the city also benefits from a high modal share of bicycles. While progress may still be slow, this provides an excellent basis on which to develop plans for Forest City. Namely, that people are **quite often already regularly using sustainable modes of transport.**

The most immediate and high-impact opportunity lies in the radical reallocation of road space. Shifting priority from private vehicle storage to ‘movement’ (bus lanes, cycleways, loading zones) can simultaneously reduce congestion and improve safety. This means transforming arterial routes from car-dominated corridors into multi-modal boulevards. By dedicating lanes to mass transit and active travel, the region can lock in reliability for efficient modes, making them faster than driving—a critical psychological tipping point for modal shift.

A tool with significant potential for Forest City and Cambridge more widely is a **"Circulation Plan"** similar to Ghent’s. By dividing the city into sectors and using modal filters (like bus gates) to prevent cars from crossing the center, through-traffic is eliminated without banning access. This approach creates a filtered permeability where walking and cycling become the most direct modes for short trips. The success of the Mill Road bridge closure trial demonstrates the local appetite and impact of such measures; scaling this city-wide offers a massive opportunity to decarbonise the system (Connecting Cambridgeshire, 2025).

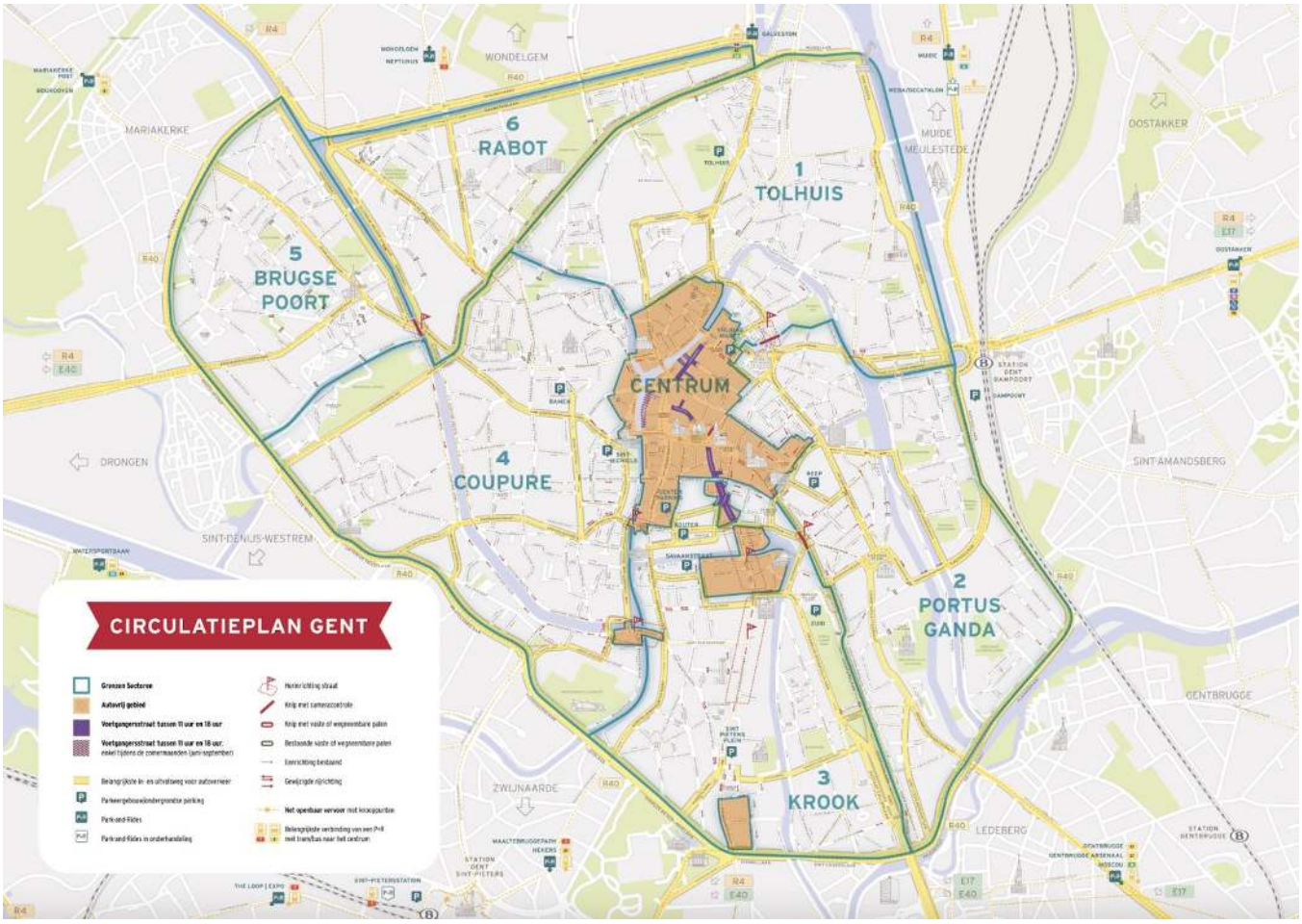


Fig. 4.2.2 The Ghent Circulation Plan, which divides the city into zones and routes traffic around the periphery

Cambridge already has a cycling super-power status, but there is immense potential to expand this into the ‘interested but concerned’ demographic. Completing the Greenways network—high-quality, segregated routes connecting the villages to the city—can effectively shrink the geography of the region. With the rise of e-bikes, commute distances of 5-10 miles become trivial. The Chisholm Trail proves that when high-quality infrastructure is built, usage surges. Replicating this connectivity across all radial routes is a low-hanging fruit with high returns on health and congestion.

Finally, and arguably most critically, new sites such as Forest City offer a ‘blank slate’ opportunity. By designing these new districts as car-free or "car-light" developments (following the Freiburg Vauban model), the region can bake in sustainable behaviors from day one. This means limiting parking at the residential end, creating high-density mixed-use neighborhoods, and ensuring the first bus runs before the first house is occupied.

What does this mean for Forest City? Redefining the city not as a machine for traffic, but as a **landscape for living**. It means that the Grey Infrastructure (roads) should be subservient to the Green Infrastructure (parks, corridors, waterways). In this city, the transport network is invisible because it works; mobility is a service, not a possession. High-speed, automated mass transit moves millions underground or on segregated tracks, leaving the surface level for people, biodiversity, and slow travel. It is a city where you don't need a car to be a citizen.

D. Integrated Transport and Transit Oriented Development could supercharge non-vehicle mobility

Another opportunity that allows Forest City to reshape transport infrastructure and create a path to a sustainable Cambridgeshire is leveraging the immense economic power of rail. The evidence demonstrates that rail investment is a high-yield economic driver, with every £1 spent on the system generating £2.50 in the wider economy (Oxford Economics, 2024).

By resolving the Ely Junction bottleneck, the region can unlock a virtuous cycle of growth. Increased capacity would allow for high-frequency passenger services that effectively merge the labour markets of the Fens with the Cambridge innovation cluster. This integration could boost average wages by an estimated £600 per worker per year by allowing better matching of skills to jobs. Furthermore, maximising rail freight capacity contributes directly to national productivity and environmental goals, removing millions of lorry miles from the road network and cleaning the air for local communities.

Enhancing the Cambridge-Newmarket line (double-tracking) and opening new stations (e.g. at the proposed Cambridge East development or Six Mile Bottom) would transform the eastern corridor.

Integrating these rail spines with the busway network creates a high-capacity polycentric grid, essential for distributing the load of a growing population away from the single central hub. The technical case for a mass transit network—whether the Cambridgeshire Autonomous Metro (CAM) or a Light Rail system—is robust. Such a system provides the capacity (4,000+ passengers per hour) and reliability needed to shift behavior permanently. A tunnelled section under Cambridge could dissolve the historic bottleneck, allowing seamless cross-city journeys (e.g., St Ives to Biomedical Campus) without interchange. This infrastructure acts as a "skeleton" upon which high-density, car-free neighbourhoods can be fleshed out, providing the permanence developers need to invest.

Connecting the disparate employment hubs (Science Park, West Cambridge, Biomedical Campus) with a rapid transit ring or cross-city link creates a unified Super-Cluster. This allows firms to access a deep, unified pool of labor and fosters the serendipitous interactions that drive innovation. It allows Cambridge to "borrow size" from its region, functioning economically like a city of millions while retaining the physical character of a city in the landscape.

The failures of the deregulated bus market present an opportunity for bold structural reform. The success of the "TING" demand-responsive transport trial in West Huntingdonshire proves that innovative, technology-led solutions can serve rural communities where traditional fixed-route buses fail. Scaling this model could end transport poverty in the Fens. Simultaneously, moving towards a franchising model for the core network would empower the Combined Authority to plan routes that serve social needs rather than just commercial profit. This would enable full integration with the rail network—creating a single, seamless system where a ticket from March to the Science Park covers the bus, the train, and the last-mile shuttle, dismantling the barriers of cost and complexity that currently deter users.

The knock on effect of integrated rail and bus networks is further **opportunities for variations in densities.** A vision devised by Create Streets outlines typologies like "Latin Quarters," mansion blocks, and terraced streets that are aesthetically pleasing and popular (Create Streets, 2025). This form of urbanism supports viable local shops and transit stops within walking distance, creating dense neighbourhoods where the car is obsolete for daily needs.

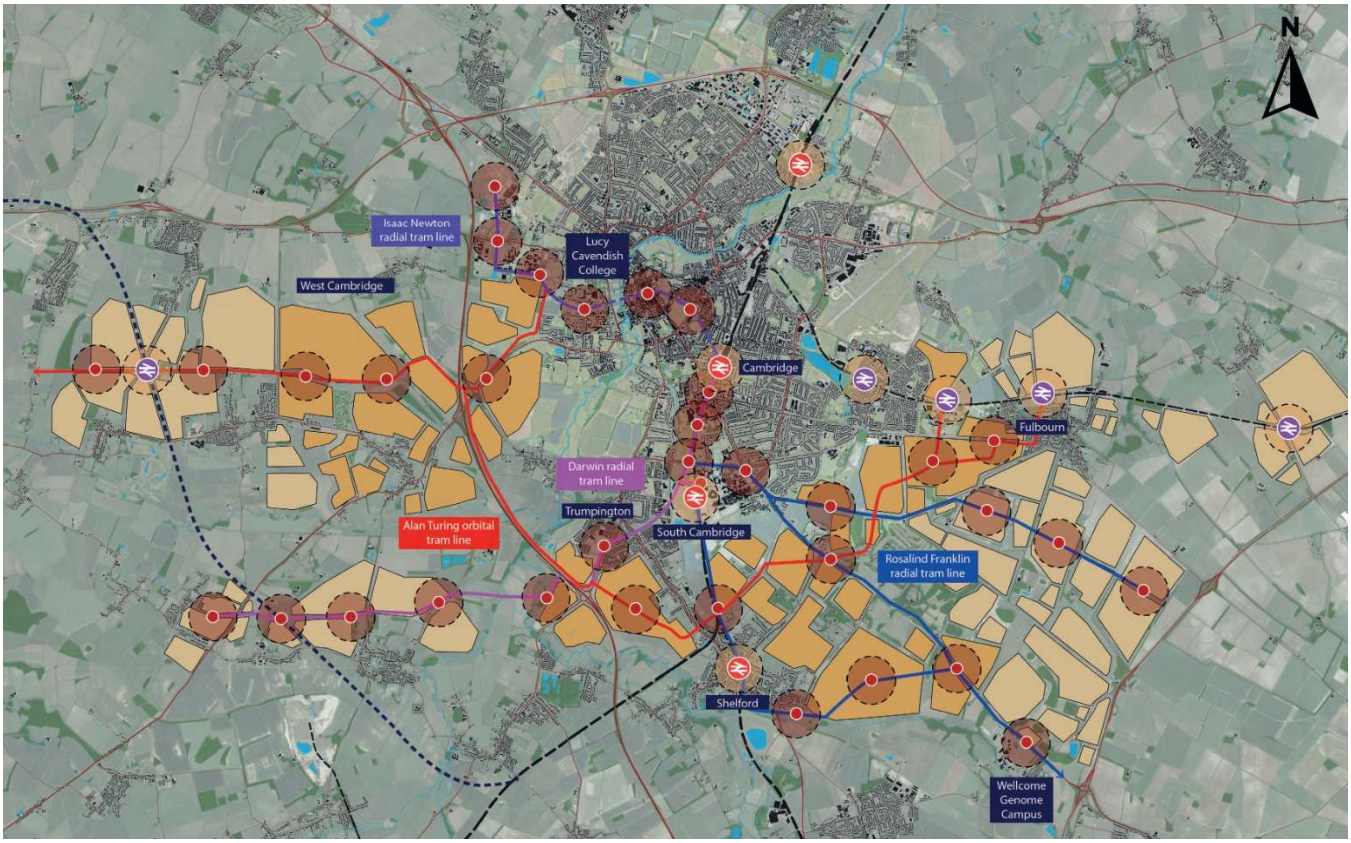


Fig. 4.2.3 Transit-Oriented Development to support expansion of Cambridge (Create Streets, 2025)

Eddington (North West Cambridge) stands as a beacon of what is possible when infrastructure leads development. With 89% of residents commuting by sustainable modes, it proves that if you build high-quality cycle paths and restrict parking people will adapt (Eddington, 2024).

This University-led model of investing for long-term quality rather than short-term profit can be replicated by Development Corporations for the wider region to ensure new towns succeed where Northstowe faltered.
The Cambridge 2040 vision offers a blank canvas to redefine urban living by adopting continental best practices. Utrecht's integration of massive cycle capacity with rail—exemplified by the 12,500-space bike park at its central station—shows how active travel can become a mass transit backbone when treated with seriousness.

Similarly, Freiburg's Vauban district demonstrates that it is possible to build high-density, family-friendly neighbourhoods with incredibly low car ownership (175 cars per 1,000 residents) by designing streets for people rather than vehicles and putting the tram in before the residents arrive. These examples prove that low-car does not mean low-quality; rather, it leads to vibrant, safe, and social public spaces.



Fig. 4.2.4 The Vauban District, Freiberg. An example of a low-car neighbourhood at scale. (ADEUPa Brest, 2005)

What does this mean for Forest City? A city of one million does not need to look like a sprawling metropolis of highways; it can be a network of somewhat dense neighbourhoods linked by integrated rapid transit. It means the school run becomes a safe cycle ride through a greenway, improving child health and reducing parental stress. By embracing these strategies, the new City can be a place where nature is integrated into the commute, where the air is clean, and where mobility is a right, not a privilege dependent on car ownership.

E. Reducing carbon emissions from transport is possible

Cambridgeshire has an unfair advantage when it comes to reducing carbon emissions from transport. It is home to some of the brightest minds in the world. There is the opportunity to treat the region as a living lab for transport innovation by leveraging the region’s high-tech cluster to solve the "rural connectivity" problem. By becoming a global leader in "Mobility as a Service," Cambridgeshire attracts investment not just for its biotech, but for its quality of life and smart infrastructure.

The area has the opportunity to be the Dutch capital of the UK. The land, in the main, is flat and the distances between market towns are manageable, with many within 20 minutes cycling time of a major urban area. This can only be improved with the delivery of Forest City.

By accelerating the rollout of "Greenways"—high-quality, segregated routes for cycling, walking, and horses—we can transform the daily commute from a chore into a joy. This is the low hanging fruit of decarbonisation. It costs a fraction of building new roads, produces minimal embodied carbon, and delivers massive dividends in public health. A population that moves actively is also a population that puts less strain on the NHS, is more productive, and is mentally healthier.

The constraint of the ‘carbon wallet’ is actually a spur for creativity. It forces us to build more cleverly, as opposed to not building. There is the opportunity to pioneer the use of new, low-carbon materials—like hempcrete grown in our local fields or recycled steel. Digital twins (virtual models of the city) can help to optimize every bus route and traffic light, squeezing maximum efficiency out of the system without laying new concrete. This approach saves money, reduces waste, and creates a unique architectural aesthetic that blends the historic with the futuristic.

There is also the opportunity to lead the UK in a fair transition to electric vehicles. By targeting investment in charging infrastructure specifically at the ‘ICE tail[40] , areas—the rental terraces and rural villages—we can ensure that the benefits of clean air and cheap fuel are shared by everyone, not just the wealthy. We can pioneer community car clubs and electric bike rental schemes that give everyone access to modern mobility without the burden of ownership. This turns the transition from a driver of inequality into a driver of social inclusion.

The construction of new water resources, like Forest City’s proposed Great Bradley Reservoir, offers a chance to build multi-functional infrastructure. The embankments can serve as cycle ways; the water bodies as leisure facilities and biodiversity hotspots. By digging once and building systems that serve multiple needs (water storage, transport, nature), we maximise the value of every ton of embodied carbon we spend. We can show the world how to manage water scarcity through intelligent, integrated design.

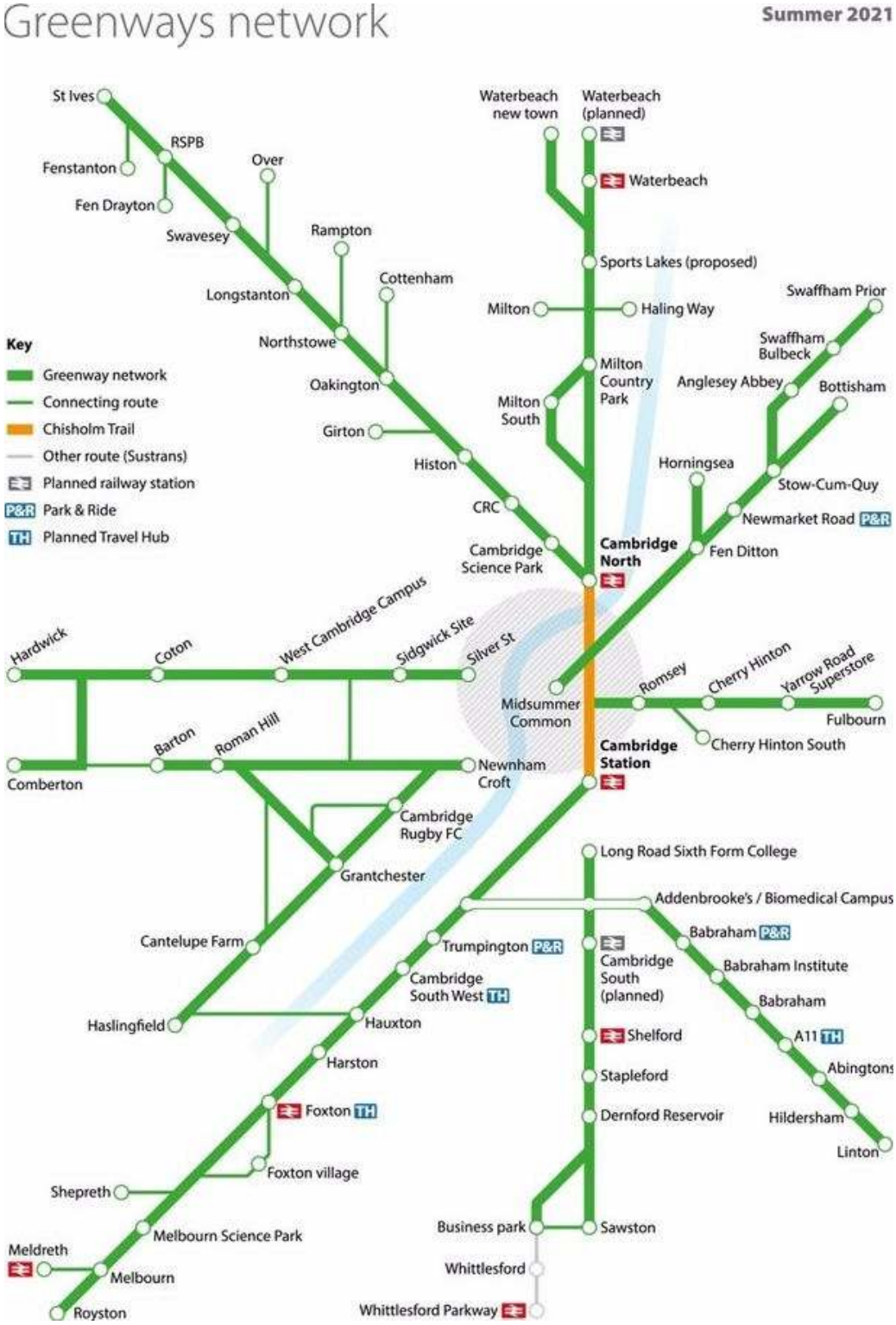


Fig. 4.2.5 Planned Greenways in Cambridgeshire (Cambridgeshire Live, 2021)

What does this mean for Forest City? The chance to build the first true city of the 21st century by designing a place where a child in a rural village has the same freedom of movement as a professor in the city centre, without needing a car. It means creating a region where everything you need—work, play, nature, healthcare—is within a short, pleasant journey. It implies a city that breathes; where the infrastructure is as green as the forest it sits beside. By choosing sufficiency over sprawl, and intelligence over concrete, you aren't just building a city; you are building a blueprint for how humanity can live happily within the limits of our planet.

F. There are significant opportunities to bridge the gaps caused by social exclusion

Cambridgeshire possesses the tools and the potential to revolutionise equitable transport. **Active travel** offers a dual opportunity for health and inclusion. Cambridge already has a strong cycling culture, but the opportunity lies in broadening this to include **cycles as mobility aids.** Recognizing e-bikes, tricycles, and cargo bikes as essential tools for disabled people and families can transform active travel from a commute choice for the fit into a universal mobility tool. Upgrading infrastructure to LTN 1/20 standards—ensuring cycle paths are wide enough for adaptive cycles and free of barriers—would unlock this potential, aligning perfectly with the region's health and decarbonization goals.

The **"Buses and Businesses Against Abuse"** initiative represents a best-practice opportunity to tackle the safety deficit. By training transport staff to be active guardians rather than passive drivers, and by utilizing the physical asset of the bus as a ‘safe space’, Cambridgeshire is pioneering a social intervention that costs relatively little but yields high returns in passenger confidence. Scaling this culture of guardianship across the entire network (including rail and taxi) could make the region a national leader in transport safety for women, transforming the commute from a source of anxiety to a source of security.

Bus Reform and Integration presents a structural opportunity. The moves by the Combined Authority towards bus franchising or enhanced partnerships offer the chance to redesign the network around social need rather than commercial viability. This allows for cross-subsidies where profitable urban routes support vital rural lifelines. Furthermore, the integration of community transport (Dial-a-Ride) into the mainstream network would legitimize and support these essential services, moving them from the fringe to the core of the transport offer.

Targeted Affordability Schemes like the "Tiger" bus pass (£1 fares for under-25s) show how price signals can be used to drive social inclusion. By removing the cost barrier for young people, the region is actively preventing educational dropout and supporting youth employment. Expanding such targeted fare caps to other vulnerable groups—such as job seekers or those on disability benefits—would directly attack the "poverty trap" mechanism identified in the evidence base.

Inclusive Design Standards offer a way to future-proof the region. By adopting strict inclusive design principles for all new infrastructure—from the station platform to the pavement—the region can eliminate the physical barriers that currently disable people. This involves co-production with disabled groups, ensuring that the ‘expert voice’ of the user shapes the built environment. This applies equally to digital infrastructure; ensuring apps are accessible to neurodivergent users and compatible with screen readers is a low-cost, high-impact intervention.

Data and Digital Innovation can be harnessed for equity. The region's tech expertise can be used to create a ‘total transport’ platform that integrates health appointment data with transport planning, ensuring that no patient misses treatment due to a lack of a ride. Using data to map ‘transport poverty’ dynamically allows for targeted interventions—such as subsidized fares or new routes—exactly where they are needed most, moving from a reactive to a proactive management of social exclusion.

What does this mean for Forest City? These opportunities are the blueprints for a ‘landscape of care’. It means building a city where mobility is treated as a utility, like water or electricity—available to all, regardless of postcode or physical ability. It suggests a city where the "bus stop" is not a cold pole in the ground, but a safe, digitally connected community hub. It envisions a place where nature is accessible not just to those with hiking boots, but to those on mobility scooters and adaptive trikes, utilizing a network of greenways that prioritize vulnerable users. It means building a city where the transport system actively repairs social fabrics, connecting the isolated elderly in the Fens to the vibrancy of the city center, creating a metabolic system that nourishes every single resident.

G. Technology could be transformational to how people get around

Historically, pivotal transportation breakthroughs—from the invention of the steam engine to the commercialization of aviation—have expanded economic frontiers, and altered the spatial geography of human settlements and trade. Today, a new wave of technological innovation is emerging, aimed at transitioning an industry historically reliant on fossil fuels and fragmented operational silos into an integrated, zero-emission, and highly automated ecosystem.

Cambridgeshire possess unique assets that can be leveraged to take advantage of those new technological opportunities. Not only is Cambridge a global center for R&D in materials science, digital twinning, and artificial intelligence, the region has the opportunity to become a living lab for intelligent infrastructure.
Initiatives like the Cambridge Centre for Smart Infrastructure and the Energy Efficient Cities initiative position the region to pioneer technologies such as self-healing concrete, AI-optimized traffic flow, and autonomous public transit shuttles. Using the university estate (e.g., Eddington, West Cambridge) as testbeds allows for rapid iteration of modular and digital solutions before wider rollout.

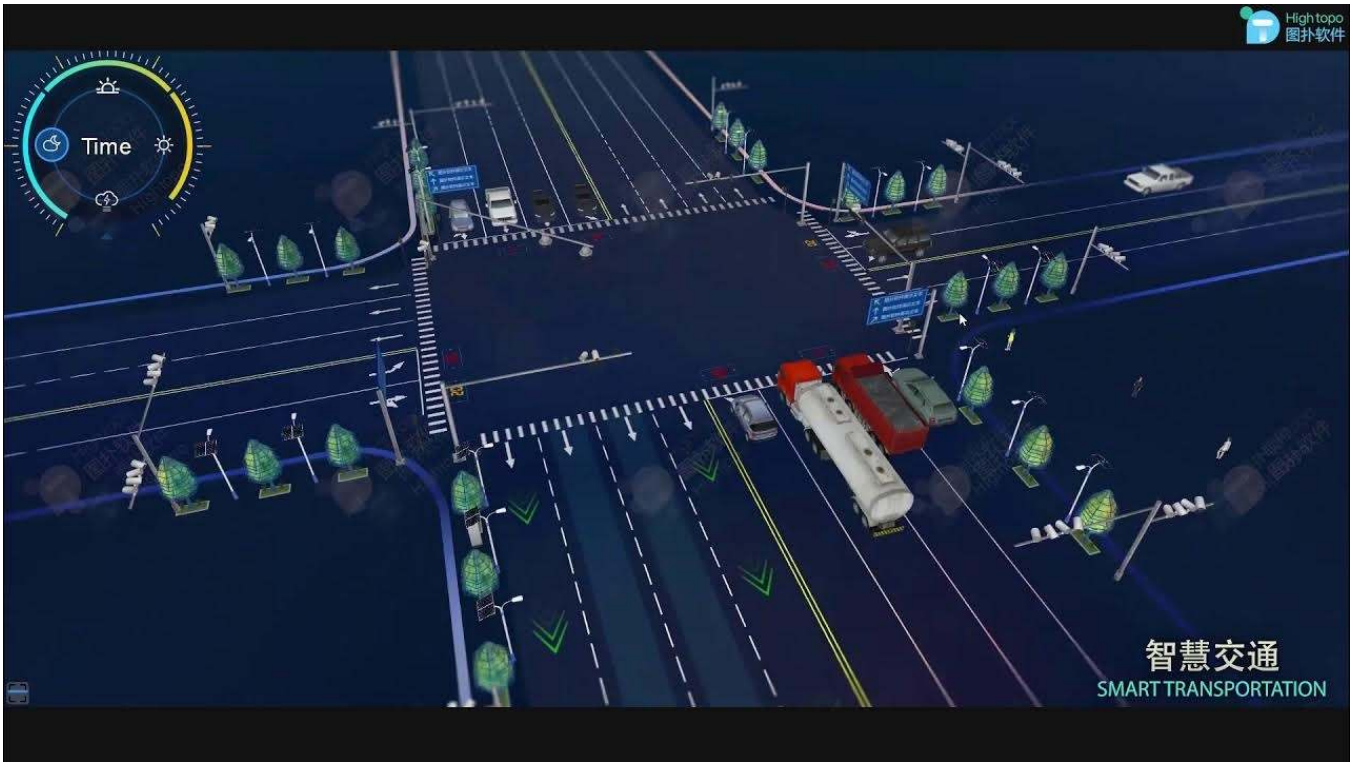


Fig. 4.2.6 Concept of a Digital Twin at an intersection on a highway (Source: Unknown)

There is also a longer time horizon to look at. The future of global logistics and passenger mobility could be rewritten by an array of emerging technologies. Navigating this transition requires a highly nuanced understanding of innovation classification. Incremental technologies—such as battery lightweighting, digital automatic coupling, and sustainable drop-in aviation fuels—are vital for sustaining the current transport paradigm, providing immediate efficiency gains and critical carbon reductions within established infrastructural frameworks.

Conversely, revolutionary technologies—ranging from the software-defined vehicle and two-way integrated network digital twins to the radical hyperconnected logistics architecture of the Physical Internet—possess the power to dismantle existing supply chains and fundamentally alter how we get around.

However, realising the potential of what is often promised of these technologies—reduced urban congestion, enhanced safety, and deep decarbonization—is far from guaranteed. The successful integration of these emerging technologies will not depend solely on engineering breakthroughs, but on the capacity of institutions to embrace adaptive, anticipatory governance and designing infrastructure and policies capable of withstanding a wide spectrum of unpredictable futures.

In undertaking this work, it was not possible to do a deep dive on the potential for specific technologies but we have summarised our cursory review:

Technology	Modes	Primary Domain	Innovation Classification	High-Level Overview
Solid-State & Cobalt-Free Batteries	Road	Passenger and Logistics	Incremental	Advanced energy storage solutions aiming to increase energy density, improve safety, and reduce reliance on critical, geopolitically vulnerable raw materials like cobalt. These sustain the existing electric vehicle (EV) paradigm while improving unit economics and supply chain resilience.
Electric Vehicle (EV) Lightweighting	Road	Passenger and Logistics	Incremental	The application of advanced high-strength steels, carbon-fiber-reinforced polymers, and circular manufacturing techniques to offset the heavy mass of battery packs, thereby extending driving range and reducing lifecycle emissions.
Sustainable Aviation Fuel (SAF)	Air	Passenger and Logistics	Incremental	Drop-in alternative fuels derived from biological or synthetic feedstocks that can be used in existing aircraft engines, reducing lifecycle carbon emissions without requiring new refueling infrastructure.
Alternative Maritime Fuels (Ammonia/ Methanol)	Sea	Logistics	Incremental	The transition from heavy fuel oils to low-carbon alternatives like green ammonia and bio-methanol, requiring engine retrofits but sustaining the fundamental architecture of global maritime shipping.
Wind-Assisted Propulsion	Sea	Logistics	Incremental	The integration of modern sail technologies (e.g. suction wings, Flettner rotors) into cargo vessels to harness wind energy, reducing fuel consumption and greenhouse gas emissions.

Table 4.0.7 Some technologies identified in our research

Technology	Modes	Primary Domain	Innovation Classification	High-Level Overview
Digital Automatic Coupling (DAC)	Land (Rail)	Logistics	Incremental	Automating the mechanical connection of freight train wagons and integrating a digital data line, replacing hazardous manual coupling and improving rail yard efficiency.
Automated Vehicles	All	Passenger and Logistics	Revolutionary	Automating the operation of passenger and freight vehicles to operate on public and private networks. This is at varying degrees of autonomy from human in the loop to fully automated operations.
Virtual Coupling (VC)	Land (Rail)	Logistics	Revolutionary	Utilizing vehicle-to-vehicle (V2V) communication to allow trains to operate in digitally connected platoons based on relative braking distance, drastically reducing headways and increasing track capacity without new physical infrastructure.
Software-Defined Vehicles (SDVs)	Land (Road)	Passenger and Logistics	Revolutionary	A paradigm shift where a vehicle's value, functionality, and capabilities are primarily dictated by its centralized software ecosystem and over-the-air updates, rather than its mechanical hardware.
Physical Internet (PI)	Cross-modal	Logistics	Revolutionary	A hyperconnected logistics system that treats physical goods akin to data packets on the internet, utilizing standardized modular encapsulation and open, shared routing networks to eliminate empty transport miles.

Table 4.0.7 Some technologies identified in our research

Technology	Modes	Primary Domain	Innovation Classification	High-Level Overview
Synchro-modality	Cross-modal	Logistics	Revolutionary	The real-time, dynamic switching of freight between different transport modes (rail, road, inland waterways) based on continuous AI data feeds, replacing static, pre-planned intermodal supply chains.
Advanced Air Mobility (AAM) & U-Space	Air	Passenger and Logistics	Revolutionary	The deployment of highly automated Electric Vertical Takeoff and Landing (eVTOL) vehicles and drones in urban airspace, managed by a dedicated, machine-to-machine digital traffic architecture known as U-Space.
Integrated Network Digital Twins (IN-DT)	Cross-modal	Passenger and Logistics	Revolutionary	Virtual replicas of entire multimodal transport networks featuring two-way, real-time data synchronization, allowing artificial intelligence to autonomously optimise traffic flows, coordinate maintenance, and manage incidents.
Mobility as a Service (MaaS) Level 4	Cross-modal	Passenger	Revolutionary	The integration of all transport services (public transit, micromobility, ride-hailing) into a single digital platform offering subscriptions that eliminate the need for private vehicle ownership,fundamentally altering consumer behavior.

Table 4.0.7 Some technologies identified in our research

Review of Planned Growth and Major Transport Projects in the area

As of February 2026, the region stands at a critical juncture. The governance landscape has shifted significantly following the 2024 General Election and the 2025 Mayoral Election. There is a complex interplay between the new Labour Government's "Plan for Change" and the local growth agenda driven by the Conservative Mayor, Paul Bristow. The establishment of the **Cambridge Growth Company** (CGC) in 2024 has introduced a new dynamic, centralising strategic delivery to overcome historic planning inertia. The following section is a review of major transport projects and plans.

A. The Governance and Funding Landscape in 2026

The infrastructure ecosystem in Cambridgeshire is shaped by a multi-layered governance structure, often resulting in complex funding flows and shifting priorities.

Entity	Role & Strategic Focus in 2026	Key Funding Streams
National Government (DfT/Treasury)	Strategic oversight. Focus on fiscal prudence and national growth missions.	Spending Reviews, Major Road Network (MRN) Fund, Rail Network Enhancements Pipeline (RNEP), Active Travel Fund
Cambridgeshire & Peterborough Combined Authority (CPCA)	Strategic transport authority (LTA). Focus on connecting the north (Peterborough/Fens) to the south.	Local Transport Fund, Devolution Deal Investment Fund, City Region Sustainable Transport Settlements.
Greater Cambridge Partnership (GCP)	Delivery body for the City Deal. Focus on the immediate Cambridge travel-to-work area (CSET, CEA).	City Deal funding (earn-back mechanism dependent on delivery milestones).

Entity	Role & Strategic Focus in 2026	Key Funding Streams
Cambridge Growth Company (CGC)	New development corporation (est. 2024). Tasked with "unblocking" Cambridge growth.	Direct Treasury grants, Homes England recoverable funding (e.g., £23m for Waterbeach station).
National Highways	Delivery of the Strategic Road Network (SRN).	Road Investment Strategy (RIS) periods (currently transitioning to RIS3).
Network Rail	Owner/Operator of rail infrastructure. Delivery partner for EWR and Cambridge South.	Control Period funding (CP7).
Cambridgeshire County Council	Local highway authority for Cambridgeshire. Responsible for managing, maintaining, and improving highways	Council Tax, Block Grant from Government, Section 106 Contributions, Funding Bids.

Table 4.0.8 The Governance Landscape for Transport in Cambridgeshire

This leads to tension. For instance, the cancellation of the GCP's "Making Connections" congestion charge in late 2023 created a funding gap for local bus improvements, which the new Greater Cambridge Transport Strategy (GCTS)—due for completion in late 2026—aims to address. Meanwhile, the CPCA under Mayor Bristow is pushing for a "Growth Plan" to triple the local economy by 2050, emphasising heavy infrastructure like A-road dualling and light rail over the demand-management measures favored by previous administrations.

B. Strategic and Major Road Network Schemes

The road network in Cambridgeshire has historically been radial, feeding traffic into London via the M11 and A1. The lack of high-quality orbital routes has forced freight and cross-country traffic onto single-carriageway roads unsuitable for heavy goods vehicles (HGVs). The current portfolio of projects aims to complete the "Expressway" standard network across the Oxford-Cambridge Arc.

A428 Black Cat to Caxton Gibbet Improvement

The A428 between St Neots and Caxton Gibbet was, until recently, the only remaining stretch of single carriageway between the M1 in Bedfordshire and Cambridge. It represented a severe discontinuity in the strategic road network, linking the dualled A421 (from Milton Keynes) with the dualled A428 (to Cambridge).

The old road carried over 24,000 vehicles per day, far exceeding its design capacity. The resulting congestion cost the local economy millions in lost hours and unreliable delivery times for freight heading to the East Coast ports (Felixstowe/Harwich). The route had a poor safety record, with frequent collisions causing total gridlock. This forced traffic to "rat run" through the villages of Eltisley, Croxton, and Yelling, destroying local quality of life.

The scheme is the keystone of the east-west road corridor. By removing this bottleneck, National Highways creates a continuous dual carriageway from Milton Keynes to Cambridge, directly supporting the labor market integration of the two cities.
The £1 billion project is one of the largest road infrastructure schemes in the UK. It involves the construction of a new 10-mile dual carriageway that completely bypasses the existing alignment. It also includes the following elements:

- **Black Cat Junction Upgrade:** The most complex engineering element is the transformation of the Black Cat roundabout (A1/A421). It is being rebuilt as a three-tier free-flowing junction:
  Level 1 (Ground): The A1 flows uninterrupted north-south.
  Level 2: The new A421/A428 dual carriageway passes over the A1.
  Level 3: A large circulatory roundabout handles interchange traffic between the routes and local roads.
- **Caxton Gibbet Junction:** The existing roundabout is being upgraded to a grade-separated junction, ensuring free-flow conditions for the new dual carriageway while maintaining connectivity to the A1198.
- **De-trunking:** Upon opening, the existing A428 will be reclassified as the A1428 and B1428. It will be handed over to the local highway authority to serve local traffic, cyclists, and equestrians, effectively segregating strategic freight from village life.

The scheme remains on track for a full opening to traffic in **2027.**

A10 Ely to Cambridge Dualling

The A10 corridor is the spine of the Cambridgeshire Fens, connecting Cambridge, Waterbeach, and Ely. It is critical for the region's growth but is currently a single carriageway road operating significantly over capacity.

The development of a new town at Waterbeach (ultimately 11,000 homes) is predicated on significant transport improvements. The existing A10 cannot cope with the additional trip generation The corridor links the high-value science parks of Cambridge (Science Park, Milton) with the labor pools of Ely and Fenland. Congestion here acts as a tax on the region's productivity.

The scheme has been broken down into several potential packages for appraisal:

- **Package 1:** Junction improvements only (lowest cost, lowest benefit).
- **Package 2 (a/b):** Dualling between the A14 (Milton) and Waterbeach (online or offline).
- **Package 3 (a/b):** Full dualling between the A14 and Ely.

Mayor Bristow has explicitly stated a preference for Package 3 (full dualling), arguing that partial measures are insufficient for the scale of growth planned.

The A10 project illustrates the volatility of infrastructure funding. Under the previous Conservative government, the A10 was identified as a beneficiary of "Network North" funding (reallocated HS2 money). The incoming Labour government in 2024/25 initiated a review of capital projects. While the A10 was listed in a "Green Light" press release in July 2025, subsequent CPCA reports from late 2025 indicate that the funding situation is nuanced. The scheme is subject to a "Gateway Review" by independent consultants. The CPCA's current programme indicates that construction is unlikely to begin before 2029, with completion in the early 2030s. This is a significant slippage from earlier targets of 2026/27.

C. Rail capacity and resilience improvements

Rail infrastructure in Cambridgeshire is undergoing its most radical transformation in decades. The focus is shifting from purely radial connectivity (commuting to London) to orbital connectivity (East-West Rail) and capacity enhancement (Ely).

East West Rail (EWR)

East West Rail is the flagship project for the region, intending to restore the "Varsity Line" connection between Oxford and Cambridge, via Bedford and Milton Keynes.

EWR is more than a transport project; it is an economic intervention designed to create a "Silicon Valley" style super-cluster between Oxford and Cambridge. The government estimates EWR will unlock **£6.7 billion** of annual GVA by 2050. The line is also the enabling infrastructure for at least **100,000 new homes** across the Arc.

The route selection for the final section (Bedford to Cambridge) has been controversial. EWR and the DfT have confirmed the Southern Approach into Cambridge.

This route approaches the city from the south, entering via the West Anglia Main Line. EWR argues this maximizes connectivity to the Cambridge Biomedical Campus (via the new Cambridge South station) and Cambridge Central, which are the primary employment destinations. Campaign group "Cambridge Approaches" argued for a Northern Approach

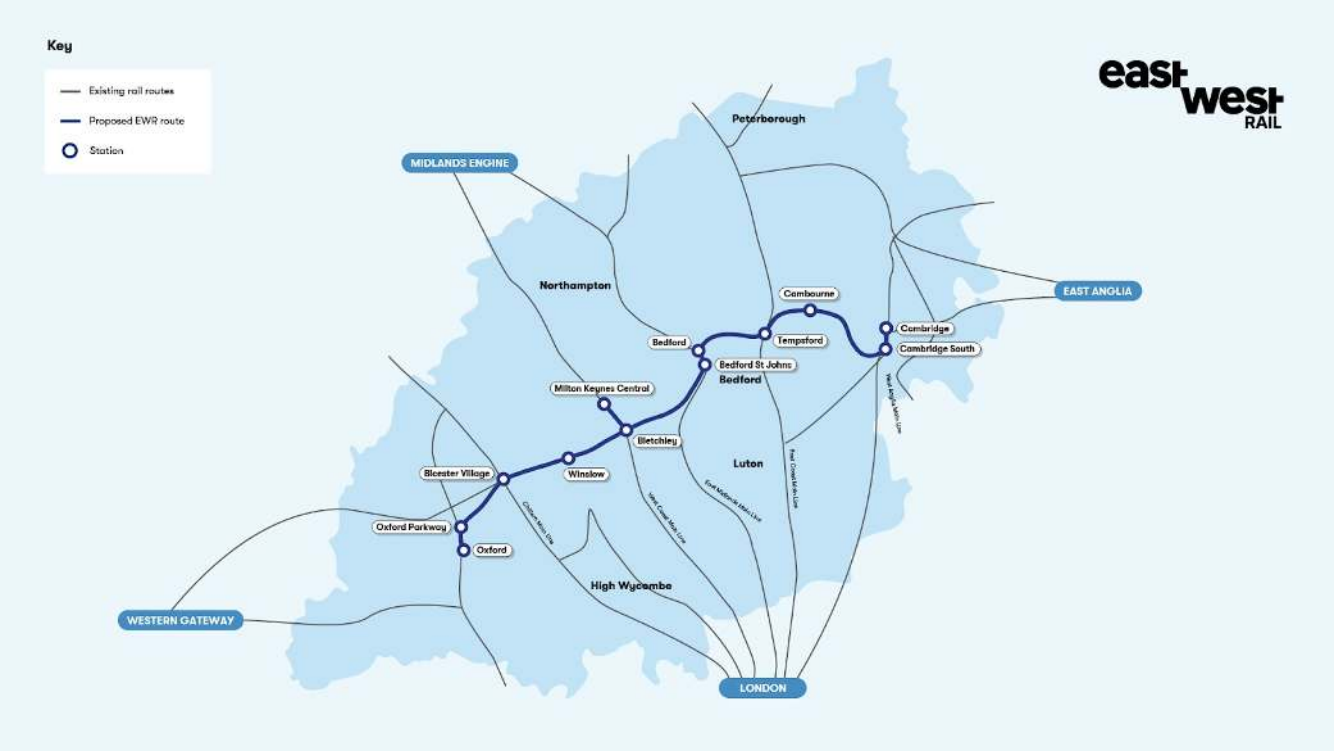


Fig. 4.2.7 Diagram of the East-West Rail route between Oxford and Cambridge, including the preferred option approach Cambridge (East West Rail, 2025)

EWR plans to construct two new stations. At **Tempsford** there will be a new interchange station where EWR crosses the East Coast Main Line. This will allow fast transfers between the Oxford-Cambridge arc and the London-North/Scotland route. At **Cambourne** a new station located north of the town, unlocking significant housing expansion.

For the section to Cambridge, the Autumn 2025 Spending Review confirmed **£2.5 billion** to progress the next stages of the scheme. A non-statutory consultation on refined designs closed in January 2025. Key changes included the consolidation of Marston Vale line stations (reducing stopping points to increase speed) and the refinement of the embankment heights at Tempsford. The project is preparing for its statutory consultation and DCO application. The "You Said, We Did" report (November 2025) solidified the route choices.

Cambridge South Station

Cambridge South is being built to serve the Cambridge Biomedical Campus (CBC), home to Addenbrooke’s Hospital, Royal Papworth Hospital, and AstraZeneca's global HQ.

The campus employs over 20,000 people, but access has been heavily reliant on cars or buses from the distant central station. This created severe congestion on Hills Road and Long Road. This project will build a four-platform station directly adjacent to the campus, enabling staff and patients to arrive by rail.



Fig. 4.2.8 Cambridge South Station under construction (Cambridge Independent, 2025)

Construction began in January 2023. While originally targeted for opening in 2025, the project has faced setbacks. As of February 2026, the station structure is largely complete. The station building is visible, and platforms are in place. The opening date has slipped to June 2026 for two main reasons.

- **Cause 1:** Complexity of re-signalling. Stage 2 commissioning of the Cambridge re-signalling programme (which is integrated with the station works) was only completed during the Christmas 2025 blockade (11-day closure).
- **Cause 2:** The financial administration of a key mechanical/electrical subcontractor in late 2025 caused a hiatus in the internal fit-out.

The delays have pushed the cost from an estimated £173m to approximately **£228m.**

Ely Area Capacity Enhancement (EACE)

Ely Junction is arguably the most critical rail infrastructure constraint in the East of England. It is the convergence point of five lines:

1. West Anglia Main Line (London-Cambridge-Ely)
2. Breckland Line (Norwich-Ely)
3. Fen Line (King's Lynn-Ely)
4. Ely-Peterborough Line (Cross-country to Midlands)
5. Ipswich-Ely Line (Freight from Felixstowe)

Currently, the infrastructure limits throughput to **6.5 trains per hour (tph).** This acts as a hard cap on growth for both passenger services (King's Lynn/Wisbech) and freight.



Fig. 4.2.9 Current Ely North Junction (Network Rail, 2021)

The EACE programme aims to increase capacity to **10 tph**. This involves:

- Remodelling the track layout at Ely North Junction.
- Replacing the Victorian-era Cutter and Common Muckhill bridges (which currently have speed restrictions).
- Upgrading/closing level crossings to improve safety and speed.

Doing so is anticipated to bring several benefits:

- Doubling passenger frequency on the King's Lynn line (from 1tph to 2tph).
- Enabling the Wisbech Rail reopening.
- Increasing freight paths from Felixstowe, removing hundreds of HGVs from the A14
- The Benefit-Cost Ratio (BCR) is estimated at a very high **4.89.**

The status of EACE is a saga of political hesitation. Upon taking office, the new Chancellor Rachel Reeves initiated a review of "unfunded" spending commitments. While the strategic case is universally accepted, the release of the specific £500m+ capital required has been caught in the Treasury's review processes.

As of early 2026, the project has an "amber" status. Detailed design work has continued (funded by smaller tranches), but the "Final Investment Decision" for major construction is pending the outcome of the comprehensive spending review. Regional leaders (Mayor Bristow, Transport East) are lobbying intensely, arguing that EWR and Cambridge South cannot function optimally without the Ely unlock.

D. Delivering local transport improvements through the Greater Cambridge Partnership (GCP)

The GCP, often referred to as the "City Deal," is responsible for transport infrastructure within the immediate Greater Cambridge area. Its existence is predicated on unlocking economic growth by solving the city's severe congestion. To deliver against this remit, there are a number of significant infrastructure projects being delivered.

Cambridge Eastern Access (CEA)

CSET is designed to connect the high-growth employment clusters of the Biomedical Campus (CBC), Babraham Research Campus, and Granta Park. The A1307 in the area is heavily congested. The expansion of the CBC requires a massive mode shift to public transport; the

existing road network simply cannot accommodate the projected 20,000+ new jobs. The solution proposed is a segregated busway, running a travel hub on the A11 to the CBC, bypassing the congested A1307.

CSET is the most contentious project in the GCP portfolio. The proposed busway cuts through the Green Belt and runs along the lower slopes of the Gog Magog Hills. The Magog Trust and Cambridge Past, Present & Future argue that the visual and ecological impact on this sensitive landscape (including the Nine Wells nature reserve) is unacceptable. They proposed an "On-Road" alternative (bus lanes on the A1307), which they argued would be cheaper and less damaging. The GCP rejected the on-road option, arguing it would not deliver the necessary journey time reliability or capacity to induce a mode shift.

The GCP submitted the Transport and Works Act Order (TWAO) application to the DfT on 9 January 2025. The DfT has confirmed that a Public Inquiry will be held in 2026.

Despite the planning risk, funding is secure. Homes England has allocated c.£160m of recoverable funding to the scheme, underscoring its importance for housing delivery.

Cambridge Eastern Access (CEA)

CEA focuses on the Newmarket Road corridor (A1303) and the future development of the Cambridge Airport site (Marshall's Aerospace). Marshall's has announced plans to relocate, unlocking a massive brownfield site for housing (Cambridge East).

The GCP plans to relocate the Newmarket Road Park & Ride to a new, larger site at Airport Way (Phase 1). In October 2024, the GCP Board approved the design work for this move. The rationale is to intercept traffic earlier, before it hits the urban edge. For Phase 2 a proposed high-quality public transport route (busway) would run through the airport site.

Scheme	Delivery Body	Status (Feb 2026)	Key Milestone	Funding Risk
A428 Black Cat	National Highways	Construction (Halfway)	Open 2027	Low
East West Rail	EWR Co	Detailed Design / DCO Prep	Consultation Closed Jan 2025	Low (Funded £2.5bn)
Cambridge South	Network Rail	Construction (Final Phase)	Open June 2026	Low (Budget Increased)
Ely Area (EACE)	Network Rail	Business Case / Review	Funding Decision Pending	High
CSET (Busway)	GCP	Planning (TWAO)	Public Inquiry 2026	Medium (Planning risk)
A10 Dualling	CPCA	Options Review	Start delayed to 2029+	Medium

Table 4.0.9 Summary of progress on key transport schemes in the area

5. Delivering the Vision in Forest City

Introduction

The transport network of Forest City will not be defined by the volume of vehicles it can move, but by the quality of life it sustains. We term our approach Symbiotic Mobility. This concept moves beyond the traditional binary of 'transport vs. environment', where infrastructure is seen as a necessary evil that degrades nature. Instead, we propose a system where mobility infrastructure acts as a contributor to ecological recovery and human happiness.

At its core are Three North Star Indicators: **80% of trips are by walking, wheeling, cycling, or public transport, 30% Biodiversity Net Gain,** and no more than 10% of people are at risk of Transport-Related Social Exclusion. Achieving this does not simply mean providing the alternatives. We must design and build the city in an entirely different way.

This section sets out what is necessary to deliver this, both within the city and to nearby major urban areas and destinations. Much of this is based on principles, with some costing estimates based on places of a similar scale and a Reference Class Analysis[41] of similar schemes to provide a cost estimate range. Further work is needed at the Masterplanning stage to further develop the detail and refine these costings.

Strategic Connections

It is the view of the Expert Working Group that delivery of the Strategic Connections by road and rail should be undertaken according to the same principles established in the Symbiotic Mobility model. Accordingly, many of the improvements that we recommend to strategic connectivity also appear under other sections in this section. However, they are made clear here for the purposes of clarity.

Rail - The Critical Infrastructure

To achieve the required modal shift targets to avoid grid lock on the surrounding roads, delivery of a series of rail upgrades is critical. Put simply, Forest City cannot work as a sustainable city without it.

The cornerstone of this proposal is the creation of a robust rail network that serves both as a commuter metro for the new city and a strategic orbital route for the wider region. This involves two distinct but integrated engineering projects: the double-tracking of the Cambridge to Newmarket line and the creation of the Haverhill to Stansted link, linked together by a heavy rail route through the site.

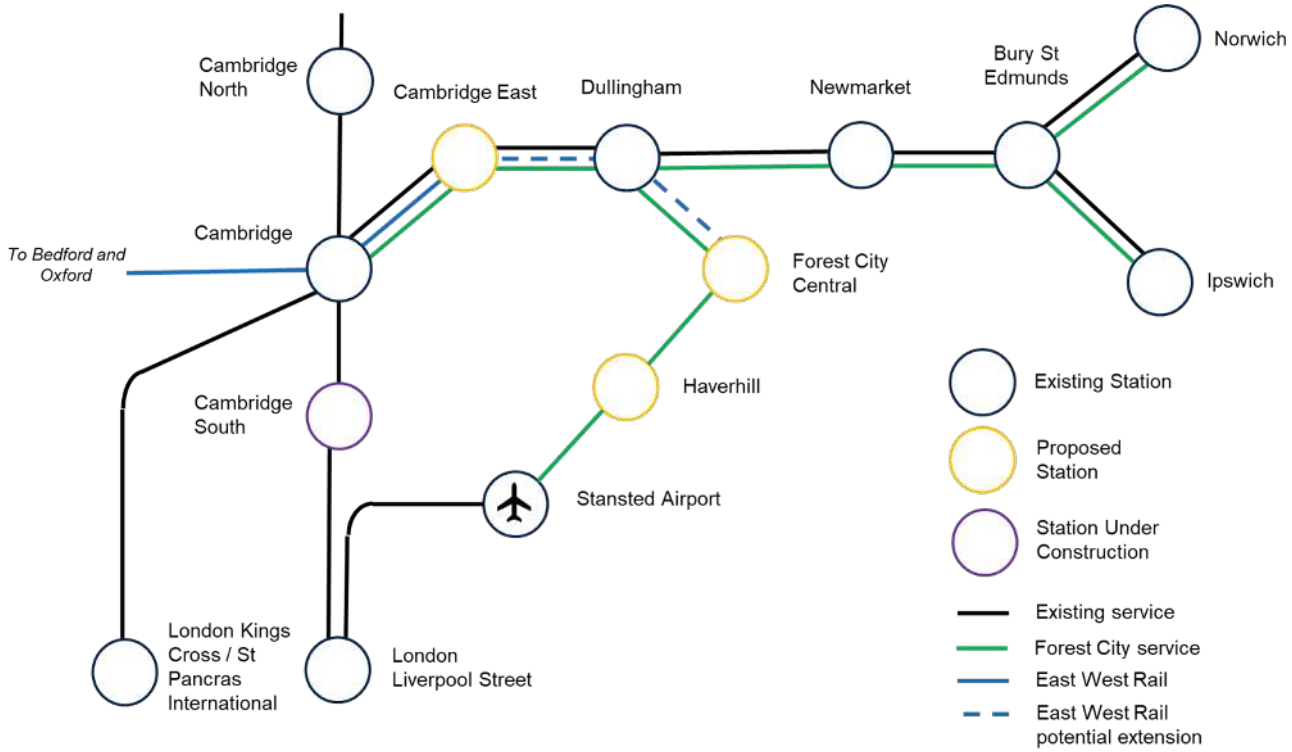


Fig. 4.3.1 Outline of recommended rail service options for Forest City

Levels of Demand

As part of our work, we wanted to estimate what the likely demand for rail travel would be from a city the size of Forest City, with a working assumption of a city of one million people and three stations. For this purpose, we devised a simple Gravity Model to estimate demand to and from Forest City.

In transport planning, a gravity model is a method used to provide estimates of the volume of trips made between distinct geographic zones, drawing a direct conceptual analogy from Newton's law of physics. It calculates that the interaction or travel demand between an origin and a destination is directly proportional to the mass or attractiveness of each zone—such as their respective population sizes, density of employment, or available retail space—and inversely proportional to the friction of the journey between them, which is usually measured by distance, travel time, or cost. Essentially, this means that two large, highly populated zones situated close together will generate a significant number of trips between them, whereas two smaller, distant zones will see very little travel.

At this stage, Gravity Models are useful for defining what the art of the possible is in terms of the numbers of trips generated. It helps to narrow the range of levels of demand from almost infinite to a probable range. It is unlikely that our model will be as accurate as more detailed demand models, but it is useful in giving an indication, pending further work.

In our instance, we have several existing areas where we already have data on population, employment, and levels of rail demand. Namely Cambridge (the nearest major urban area to Forest City), London (the primary destination for all rail trips on the National Rail network), Ipswich, Norwich, and Felixstowe (major destinations within 1-1.5 hours journey time). But for Forest City itself, we had to use proxies: Peterborough and Leicester, with the former acting as the higher estimate and the latter as the lower. A key factor in choosing our proxies was ensuring a variety in the type of rail service and geographical positioning could be tested:

- **Peterborough** is at the outer edge of the main London and South East commuter market. While it is a hub of local rail services provided by CrossCountry, East Midlands Railway and Greater Anglia, the main demand is to and from London, either on local commuter trains (Great Northern / Thameslink) or express services (LNER)
- **Leicester** is situated outside of the main London and South East commuter market, though it has express trains to London. It is also a hub of the local rail network and some cross-country services. While the main passenger demand is north to south, the station serves a variety of markets.

These estimates give a range of rail demand to and from these main destinations of between c.4 million and c.11 million. The overwhelming majority of these trips are likely to be to and from London.

Destination	Higher Estimate	(Proxy = Peterborough)	Lower Estimate	(Proxy = Leicester)
	Annual trips	Daily trips	Annual trips	Daily trips
Cambridge	703,574	1,928	261,598	717
London	9,807,928	26,871	3,646,719	9,991
Ipswich	202,331	554	75,229	206
Norwich	139,021	381	51,690	142
Felixstowe	32,048	88	11,916	33

Table 4.1.0 Estimates of Rail demand from Forest City (Source: Own Analysis)

We would, however, urge some caution with these figures. As previously mentioned, the purpose of the model is to identify what the art of the possible may be. However, the proxies used are in situations where the most dominant mode of transport in those respective areas is the car. As it is the intention that Forest City be a place where the use of public transport is common amongst its population, it is possible that rail use may be much higher than this estimate.

These results indicate that the level of rail demand created by Forest City is likely to be significant, and investment in the rail network is essential to ensuring its effective operation as a city.

Double-Tracking the Cambridge to Newmarket Line

The existing single-track railway between Cambridge and Newmarket is the primary bottleneck preventing reliable east-west connectivity. Currently, trains must wait at the Dullingham passing loop to cross, constraining service frequency to one train per hour (tph) in each direction. To support the density of the new Cambridge East city, a 'turn-up-and-go' frequency of at least 4 tph is required. A single track cannot support the stopping patterns required for new urban stations without severely disrupting regional Ipswich/Norwich services.

- **Operational Resilience:** Double-tracking provides the flexibility to recover from delays. Currently, a minor delay at Cambridge propagates immediately to Newmarket and Bury St Edmunds due to the single-line token exchange (or modern equivalent) constraints.
- **Strategic Freight:** The route is a strategic corridor for freight moving from the Port of Felixstowe to the Midlands and the North (via Peterborough). Double-tracking facilitates the removal of HGVs from the A14, aligning with the 'Nature City' goal of reducing road-based pollution.
- **Engineering Alignment:** The line was historically double-tracked (singled in the 1980s), meaning the trackbed width and bridge clearances largely exist, reducing the capital cost and environmental impact of restoration compared to a new build.

The line traverses Coldham’s Common and the densely populated Cherry Hinton area of Cambridge. While the trackbed exists, modern safety standards and the need for electrification (overhead catenary) will require careful design to minimise visual intrusion. The strategy proposes a ‘Green Corridor’ approach, where the rail infrastructure is integrated with acoustic barriers and wildlife corridors to protect the common land.

There are two further challenges that any infrastructure upgrade must overcome. The line has a number of level crossings, to which works or alternative crossing arrangements will need to be provided to maintain safe operations of trains and connectivity between communities for

which level crossings are the primary crossing point.

The second challenge relates to possible enhancements to the east of Forest City, namely the 1km railway tunnel at Warren Hill. This tunnel only has capacity for a single line, so any double-tracking would require a new tunnel to be bored at this location. Options for boosting capacity at this location would require further investigation.

The Dullingham—Forest City Central—Haverhill—Stansted Link

This report strongly recommends a bold new rail alignment connecting the Newmarket line southwards to Stansted Airport via Haverhill. This 'Eastern Orbital' serves three strategic purposes: it reconnects Haverhill, provides direct airport access for the eastern region, and relieves the congested Cambridge station of interchange traffic.

Haverhill was historically served by the Stour Valley Railway (Shelford to Marks Tey) and the Colne Valley and Halstead Railway. Both were closed in the 1960s. Rather than reinstating the exact historical line into Cambridge (which is now obstructed by the Genome Campus and housing), the proposal advocates for a northern approach to Haverhill from Dullingham. A new chord would branch south from the upgraded Newmarket line near Six Mile Bottom/ Dullingham, and run to the planned central area of Forest City.

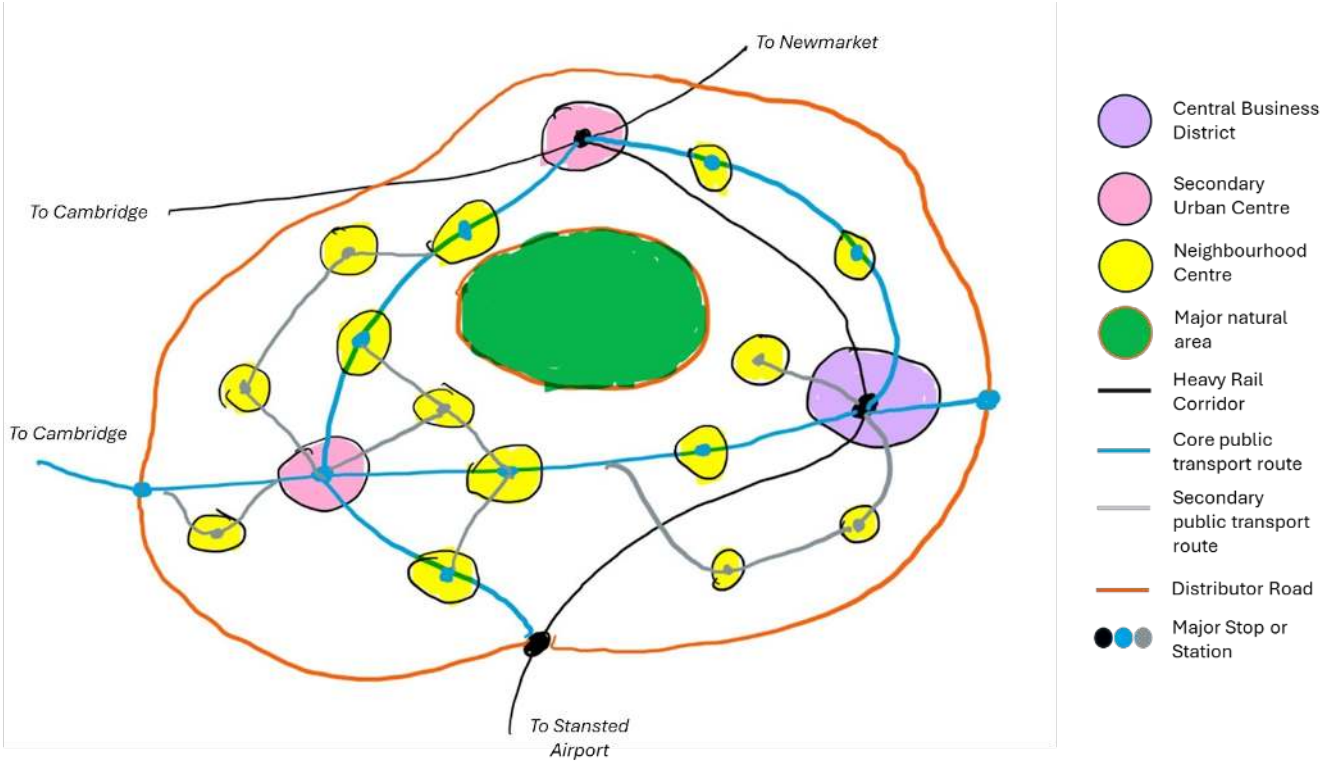


Fig. 4.3.2 Concept Diagram of main urban centres, neighbourhood centres, and core transport networks in Forest City

From there, the line should continue south towards Stansted Airport, linking up with the airport through a new tunnel at the northern end of the existing station, making Stansted Airport a through station as opposed to a terminating station. This then provides fast, direct links to London Liverpool Street from Forest City.

The area of land to the south of Haverhill is largely countryside with some small villages, with a gentle but undulating topography. From an initial analysis of the topography, delivering such a line is likely to be technically feasible, though we would caution that some tunnelling may be required in locations where there are sharp elevation changes. Furthermore, as we propose no intermediate stations in this area, and the countryside is likely to be strongly valued, there is the risk of local opposition and objection to such a rail link.

Such routes could utilise parts of the former Colne Valley or Saffron Walden (Audley End to Bartlow) alignments, though significant new infrastructure would still be required. This creates a powerful ‘Eastern Arc’, allowing residents of the new city to access the airport without entering the M11 corridor. Additionally, at the present time, rail passengers from Suffolk and East Cambridge must travel into Cambridge and then catch a Crosscountry service to Stansted. This adds unnecessary congestion at Cambridge station, something our proposal avoids.

The utility of the rail backbone is dependent on the placement of accessible, multi-modal interchanges. We propose three new stations:

Station Name	Location	Primary Function	Strategic Connections
Forest City	Forest City CBD	**City Core Hub:** The primary commuter station for Forest City	Interchange with Mass Transit, Cycle Greenways, and local public transport networks.
Dullingham	Existing Dullingham station	**Eastern Gateway:** A strategic Parkway interceptor to catch traffic before entering both Forest City and Cambridge.	Interchange with A11, A14, and the proposed Six Mile Bottom New Town.
Haverhill	A1307 / A1017 Interface	**Southern Hub:** A park-and-ride site for the South of Forest City, and the wider West Suffolk/ Essex rural area.	Access to Haverhill town centre via local buses and active travel routes.

Table 4.1.1 List of proposed stations for Forest City

Infrastructure must be matched by high-quality services. We propose the extension of two major franchises to serve the new infrastructure. The first is East-West Rail. While the core EWR route focuses on Oxford-Cambridge, the 'Eastern Section' offers immense potential for regional connectivity.

EWR services should not terminate at Cambridge. **We recommend they continue east via the doubled Newmarket line to terminate at Forest City Central station**. This connects the new Forest City directly to the Oxford-Cambridge Arc knowledge clusters (Milton Keynes, Oxford) without a change of train. Furthermore, reinstatement of the Snailwell loop (Soham to Newmarket), which would be delivered by other partners, would allow EWR services to route via Ely if required, adding resilience.

The Stansted Express brand currently denotes fast access to London. We propose an extension of this service to become a '**Stansted Regional**'. Utilising the new Haverhill-Stansted link, a service should operate: *Cambridge—Cambridge East—Dullingham—Forest City Central—Haverhill—Stansted Airport—Tottenham Hale—London Liverpool Street.*

Such a service holds significant potential to tackle a variety of issues, without the need for further costly infrastructure improvements between Broxbourne and Tottenham Hale. It provides Forest City residents with a direct link to London, enhancing the economic attractiveness of the city. It supports the growth ambitions of Stansted Airport by radically improving its connectivity to a wider region and a new city. This service could also intercept airport-bound traffic from the A14 and A11, reducing vehicle miles on the M11.

From our review of available options, given available capacity constraints on the railway and need for infrastructure upgrades elsewhere, we would recommend two heavy rail services forming the baseline operation:

- **An extended Stansted Express service** running through the site and providing onward connections to London and Cambridge, though rebranded as a Stansted Regional service. This service would have a calling pattern of London Liverpool Street, Tottenham Hale, Stansted Airport, Haverhill, Forest City Central, Dullingham, Cambridge East and Cambridge. This would provide a service every 15 minutes within the city between Dullingham and Haverhill via Forest City Central.

- **An extended East West Rail service** from Cambridge East to Forest City, terminating at the station in the Central Business District (CBD) and calling at Dullingham. This would operate up to 5 trains per hour between Forest City Central and Dullingham, and onto Cambridge and beyond. Combined with the extended and rebranded Stansted Express service, a frequency of up to every 7 minutes may be feasible between Cambridge, Dullingham and Forest City Central.

Origin and Destination	Journey Time	Frequency of service
Dullingham to Forest City	c.9 minutes	7 minutes
Dullingham to Haverhill	c.15 minutes	15 minutes
Haverhill to Forest City	c.6 minutes	15 minutes
Forest City	c.27 minutes	7 minutes
Forest City	c.16 minutes	15 minutes
Forest City to London Liverpool Street	c.1 hour 3 minutes	15 minutes

Table 4.1.2 Illustrative journey times and frequencies on heavy rail services within Forest City

Haughley Junction Upgrade

To fully realise the potential of the rail connections to Forest City, the connection to the Great Eastern Main Line (GEML) at Haughley Junction (near Stowmarket) must be upgraded.

Currently, trains travelling from Cambridge/Newmarket to Norwich must reverse at Stowmarket or Ipswich, adding significant time and consuming platform capacity. A new north-facing chord at Haughley Junction is required to allow direct running between the Cambridge-Newmarket line and the Norwich line. This would facilitate a direct Forest City -> Norwich service, effectively providing another strategic link to a major urban area in East Anglia.

Upgraded Cambridge Station

The existing Cambridge station, despite recent improvements to the western ticket hall, faces severe capacity constraints during peak hours. With the arrival of East West Rail (EWR) and the proposed Eastern Orbital services, passenger throughput is projected to increase significantly. A major upgrade is therefore required.

- **The Eastern Entrance:** A new, high-capacity entrance, planned as part of East-West Rail, must be constructed on the eastern side of the station (access via Clifton Road/Rustat Road). This will serve the dense residential areas of Romsey and Coleridge, and Forest City commuters arriving via the cycle greenways, preventing them from needing to cross the tracks to the congested western square.

- **Two New Platforms:** The extended Stansted service will necessitate new north-facing platforms at Cambridge, so that terminating trains do not take up capacity at the existing platforms. Subject to final plans for EWR, there is potential for these two new platforms on the Eastern side of the existing tracks.
- **Enhanced Concourse & Gatelines:** The upgrade must include a new gateline and expanded concourse space to prevent passenger bottlenecks. The current single-sided entry acts as a throttle on the station's efficiency.
- **Active Travel Hub:** In line with the nature-focussed vision, the Eastern Entrance should incorporate a flagship 'Active Travel Hub' with high-density cycle parking and direct integration with the Chisholm Trail, ensuring seamless multi-modal journeys.

Mass Transit Link to Southern Cambridge

For the new city to function as a nature-focussed entity, internal reliance on private cars must be minimized. A high-capacity mass transit system is essential to handle the short-hop trips from the South of Forest City into the Cambridge Biomedical Campus and Cambridge City Centre.
Current proposals for the Cambridge South East Transport (CSET) link rely on a busway model running through the Green Belt. This has faced significant opposition due to environmental damage and the limited capacity of bus-based systems. Busways typically fail to generate the land-value uplift necessary to fund ‘nature-first’ urban realm improvements.

We recommend deploying either an S-Bahn system or a rapid tram network as part of the core of the system in the city. For this strategic link, we specifically recommend that we extend **Line 1: Forest City to Cambridge, via the secondary centre in the South West.** This should be the first line to be constructed, as not only does it provide the main service across the south of the city, but would also provide a link to Cambridge and its growth areas in the south of the city. Depending on the technology deployed, there is the potential to integrate into the Cambridge Autonomous Metro service that is planned for the South of the city. It has interchanges with Line 2 in the secondary centre in the South West, and Heavy Rail at Forest City station.

For operating this system, there are two choices of technology: an S-Bahn and a light rail (or tram). For each there are trade-offs that need to be considered during the feasibility stage and during the development of more detailed costings. In this report we are presenting light rail as the lower cost option, and the S-Bahn as the higher cost option

The key strength of an S-Bahn is its **capacity.** A single S-Bahn line can carry between 60,000 and 90,000 passengers an hour, making it the highest capacity transport system (TUMI, 2021). Depending on the system density, its journey times can also rival that of heavy rail.

Stations are usually located between 0.5 and 0.9 miles apart. Furthermore, provided the system does not mix with other types of rail traffic, frequencies can be high. Its challenge is its cost, which can vary wildly. If the service is purely overground, costs can be similar to that of heavy rail—around £93 million per mile according to our analysis of similar schemes[42] . But for systems mostly underground, that cost can be as high as £343 million per mile.

In contrast, light rail is **much more flexible**, and a **lower cost to deliver.** Light rail systems typically have a higher stop density, with anywhere between 1.5 stations per mile (such as the Manchester Metrolink) and 8 stations per mile (such as in Vienna). In the context of this link, there is a potential benefit to a light rail option. Whereas an S-Bahn will likely require an interchange onto the CAM at a Park and Ride site, light rail can be more easily integrated. This is either through interchange at a Park and Ride site, or potentially upgrading the CAM to a tram and providing a direct route straight into the city.

Strategic Interceptors: The Four New Park and Rides

To protect the nature city from external traffic, a cordon strategy is required. Four new strategic Park and Ride (P&R) sites will intercept traffic at the periphery. Combined with parking restraint and charges in the city centre, they are necessary to ensure that external traffic does not permeate into the city.

Specifically, we recommend the following 4 sites,

Dullingham

This intercepts A11 (Norwich/Thetford) and A14 (Bury/Ipswich) traffic, as well as acting as a hub for local bus services towards parts of Cambridge and Newmarket. This would primarily serve the Northern Hub of the city, but also provide a fast direct rail connection off the A14/A11 into Cambridge and Forest City. We would estimate a capacity of around 2000 spaces for this site.

A11/A1307 Hub (The Southern Interceptor)

This should be located near Babraham/Granta Park (Site B in CSET consultations). It helps to intercepts traffic from the M11 and areas to the West of Cambridge. We would estimate a capacity of around 1000 vehicles for this site. This site could potentially support the Granta Park and Babraham Research Campus clusters, reducing employee car commuting.

Haverhill

This should be located close to Haverhill. Not only does this provide a link to the city centre, but it can also provide access to the southern area of the city. This has the added benefit of moving the P&R further out captures traffic before it hits the urban edge of the new city, allowing the internal streets of the new development to be car-free or car-lite. We would estimate that this site would have around 2000 spaces.

Eastern Edge

This should be located at Eastern End of Mass Transit Line 1, and close to the city centre. Its primary role will be to intercept traffic heading towards the city centre, and when combined with proactive traffic management and parking charges and restrictions, would discourage any driving into the city. This would be the largest site, with an estimated 3000 spaces.

Strategic Highway Infrastructure: The Contingency Principle and Managed Capacity & Contingency

While the focus is on rail, the reality of the A14 and A11 requires targeted intervention. However, this report strictly adheres to the principle that road capacity is for flow management, not volume growth. Our initial modelling estimates that without intervention, Forest City will generate an additional 13,000 vehicles towards Cambridge every peak hour, primarily along the A14. with existing corridors at capacity, and the Forest City focus on sustainability, additional road building on strategic connections is unacceptable.

The Contingency Principle

We recommend that, as a general principle, upgrades to highway capacity must be legally tethered to the delivery of sustainable transport improvements and upgrades. Notably the delivery of strategic rail improvements and active travel networks. This means that the funding for highway improvements should only be made available once sustainable transport schemes have been contractually committed to and received associated approvals. Enforcing this will mean the dynamic of infrastructure development is radically changed in Forest City.

A14 Technologically-Enabled Upgrade

Between Huntingdon and Cambridge, the A14 is already a technologically enabled road. We recommend upgrading to an equivalent standard at least as far as Newmarket. This could

include implementing mandatory variable speed limits (e.g. 50mph during heavy flow) to smooth traffic and prevent shockwave congestion, and the use of technology to respond to incidents in real time.

Consideration should be given to upgrading this section to full Motorway status. While seemingly a procedural change, such a change bans certain vehicles (e.g. agricultural) from using the route. Consequently, freeing up precious capacity for freight and personal travel.

Junction Upgrades (M11/A11 & A14)

These critical nodes at M11 Junction 9 (Stump Cross Interchange), the A14 Junctions 36 and 38 are critical congested nodes that are likely to be extensively used by road traffic heading to Forest City. Each junction may require new junction arms, and where required grade separation improvements to allow free-flow movement between the A11 and A14 East, removing weaving conflicts. A new grade-separated junction may be required to serve the upgraded Dullingham station, ensuring station traffic does not queue back onto the A11.

The Uncertainty: The M11 Junction 8 (Stansted Airport) to 9 (Stump Cross Interchange)

A significant uncertainty in our plans in highway terms is the requirement to upgrade M11 Junctions 8 to 9. This is a substantial stretch of motorway - just over 20 miles—that currently experiences congestion at peak hours. We would anticipate that the development of Forest City may increase the number of vehicle movements along this corridor, even if only for freight movements. However, the scale of any upgrade, or the need for it, is uncertain at this stage. This will require detailed discussions with National Highways.

Integration with Existing Communities

The area covered by Forest City will constitute a number of pre-existing communities, as well as existing highways, rights of way, and transport services. Many people in those communities have established patterns of travel, and in the delivery of Forest City such matters will need to be considered. Plus, there is a very real challenge of ensuring that the transport of existing areas does not get worse as a result of Forest City being delivered.

We are confident that the delivery of the services and infrastructure outlined in this chapter so far (and in forthcoming sections of it) will constitute an improvement to the transport experience of most people in these communities.

However, there are a number of practical matters that need consideration which, while we are not able to provide detailed solutions on now, must be considered and acted upon.

Communities as Part of the Planning and Delivery Process

Best practice in transport planning dictates that in masterplanning and scheme delivery, meaningfully engaging with communities is essential. What constitutes meaningful engagement, however, is subject to interpretation. While one community may feel they have had a say in the plans, others may not.

Forest City has set itself the task to meaningfully engage with people as part of the development of the city, which is welcome. With regards to the transport infrastructure and services, best practice dictates that infrastructure developers and project leads should undertake engagement at every stage of delivery (Active Travel England, 2025):

- **Before (Baseline):** Gather data on people's perceptions, travel patterns, and priorities, while establishing clear communications to explain the reasons for the proposed changes.
- **Feasibility Design:** Involve the local community, decision makers, and key stakeholders to collaboratively discover the area and evaluate design options , while clearly communicating the reasons why any unviable options are not being taken forward.
- **Preliminary Design:** Notify stakeholders that the project is moving forward and explain how they can input into the design, ultimately engaging the local community to understand their views on the final proposals.
- **Detailed Design:** Explain any design changes that were made based on previous feedback and keep the community updated on the next steps towards statutory consultation and construction.
- **Business Case:** Communicate the processes, outcomes, and decisions of the business case to stakeholders, and more widely to the public when significant.
- **Statutory Consultation:** Follow formal legal procedures to advertise proposals and allow the public to respond, and formally consult defined statutory consultees such as emergency services, freight representatives, and bus operators.
- **Construction/Implementation:** Provide advance warning of construction works to affected residents and businesses, ensuring that any temporary changes are communicated alongside the final layouts.
- **Post-implementation:** Keep the community updated on any unfinished snagging elements, establish agreements for community-owned features like planting, and provide ongoing feedback by continuing to monitor the scheme's impact.

This involvement should not be tokenistic, but be an opportunity. Not only for communities to have their say, but also to ensure that they can feel a sense of co-ownership. We will not detail plans for how to engage here, but any such plans for engagement must aim to create that feeling among communities.

Some discussions have also taken place about how communities can be involved in the delivery of services. Whilst much in the way of transport services and infrastructure are delivered by the public sector, community ownership and delivery is not unheard of. A great example is Community Rail Partnerships (CRPs), which organise activities to boost the use of local stations and train services. This includes supporting station adopters, who plant flowers, create artworks, and keep the station tidy, to running activities with community groups and local schools centred around the railway. The Cam Valley CRP is the nearest such organisation, focussed on the railways between Cambridge and Whittlesford Parkway, and Cambridge and Meldreth.

Existing Settlements and the Built Form of Forest City

As much as feasibly possible, Forest City should aim to integrate existing roads, and rights of way networks into its built form. Whilst some changes are likely to be required, such as stopping up some existing roads or diverting rights of way, this should be kept to a minimum.

This is not without precedent. In the development of Milton Keynes, despite the city being constructed in accordance with a radically different urban form than most British cities, many of the historic villages and towns have been woven into the fabric of the new city. These include not just the village of Milton Keynes, but at least 18 other villages including Bradwell, Fenny Stratford, Great Linford, Shenley Brook End, Shenley Church End, and Great and Little Woolstone. Some roads and paths were diverted and stopped up as the new city was built, but the existing places still thrive today.



Fig. 4.3.3 The historic village of Loughton was retained in Milton Keynes, despite significant development around it (Source: Google (2026))

Interim Solutions for Public Transport

The plans for Forest City include some radical proposals for improved public transport. These will take time to construct and for regular services to come online. In the meantime, existing and new communities will need servicing by public transport. Our view is that this can be achieved in one of two ways.

Adaptable interim solutions

This means running public transport services that can be spun up quickly and adapted as necessary, so that they are operational from day one. These could be local bus services that offer a frequent service on existing roads and through existing villages to key destinations such as Cambridge or Haverhill. This may also include improving or re-routing existing bus services such the 13/X13 (Cambridge to Haverhill), the 14/14A/14B/15/15A/15X (Bury St Edmunds to Haverhill) and PR2 (Cambridge to Stetchworth).

The obvious benefit here is such services can be set up quickly, subject to capacity in local bus operators to run the services. The challenge of delivery is in terms of timing of these services, and maintaining a frequency and quality of operation that is both attractive for people to use, and financially sustainable.

An example is Fastrack in Kent. While this involved some construction of dedicated busways, the services were planned and delivered at sites at Eastern Quarry and Dartford before the bulk of residential development in the area was completed. Fastrack Route B began operating in 2006, ensuring the transport corridor was functional to serve the very earliest phases of developments like The Bridge, rather than waiting for a commercially viable population threshold to be reached first (Ebbsfleet Garden City, 2026).



Fig. 4.3.4 Kent Fastrack service in Dartford (Walker, 2009)

Running regular services as a loss leader

Forest City is likely to incur a significant capital cost to construct public transport networks such as new railway lines, tram networks, and potentially metro networks.
Running transport services as loss leaders (i.e. running the service at a loss ahead of future revenue growth), would entail running the planned service from the outset. The benefits are that existing communities receive an enhanced service, and future development is accelerated to take advantage of the increased connectivity.

A good example of this in the UK is Barking Riverside station in London. While some early housing phases were completed beforehand, a strict planning condition dictated that the bulk of this 10,800-home development could not be built until a rail link was operational. At 1,500 homes completed, the developer could not proceed any further until the station had planning permission, and the development could not proceed past 4,000 homes without the station being operational and serving passengers. The London Overground extension and the new Barking Riverside station opened in 2022. As well as giving new journey opportunities to existing residents, the station acted as the catalyst that unlocked the remaining residential construction phases (CEPA, 2024).



Fig. 4.3.5 Barking Riverside Station (Source: Thompson, 2023)

Modal Share Framework

To justify minimal highway widening despite massive population growth, strict modal share targets must be implemented as non-negotiable.

Under the Symbiotic Mobility Model, this modal share is 80% by sustainable transport modes.

In the event that this target is not met, or a set number of movements exceed a 'trip budget' for a particular route (e.g. no more than 200 additional vehicles in the morning peak hour), Forest City is required to deliver sustainable transport measures to mitigate to bring the number of trips back under the trip budget agreed with National Highways.

Achieving Modal Shift Through a New Transport Geography

The element that will be most critical to these plans is having a city structure and density that actively encourages the use of sustainable modes of transport. Traditional cities are based on strong radial movements into a traditional city centre. The high intensity of these flows means that public transport benefits, as it can provide frequent, high capacity services into and out of these urban centres. As car travel is affected by congestion on similar busy corridors, there is greater potential for public transport to have a high modal share on these routes. For example, in 2023, Birmingham City Centre, 59% of commuters in the morning peak used public transport to travel into the centre (Transport for West Midlands, 2024). Meanwhile in Manchester, 64% of commuters did a similar thing (Transport for Greater Manchester, 2024).

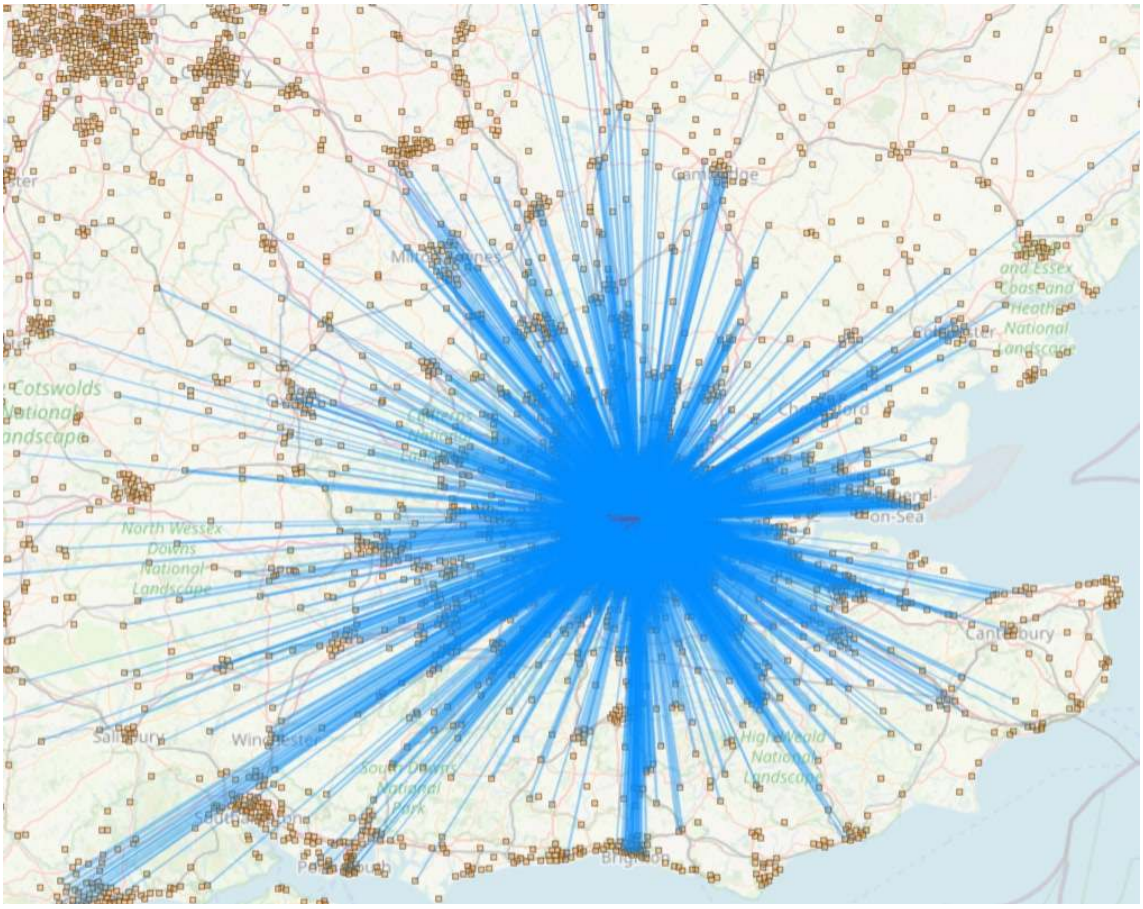


Fig. 4.3.6 Travel to Work data from the 2011 Census showing highly radial movements into and out of a Mid Layer Super Output Area in Westminster in Central London (Datashine, 2018)

In the case of Forest City, it is unlikely that travel would follow a more strictly radial pattern such as that seen in a traditional British city. This is for two reasons. The first is geography. Forest City will have on its doorstep the primary economic centre of the area: Cambridge. At the time of the 2011 Census, around 50,000 people commuted into the city every day, compared to 18,000 commuting out (Office for National Statistics, 2023). This figure was 38,000 commuting in, and 19,000 commuting out in 2021[43]. It is a major economic hub that, on its own, changes the geography to one characterised by two key centres.

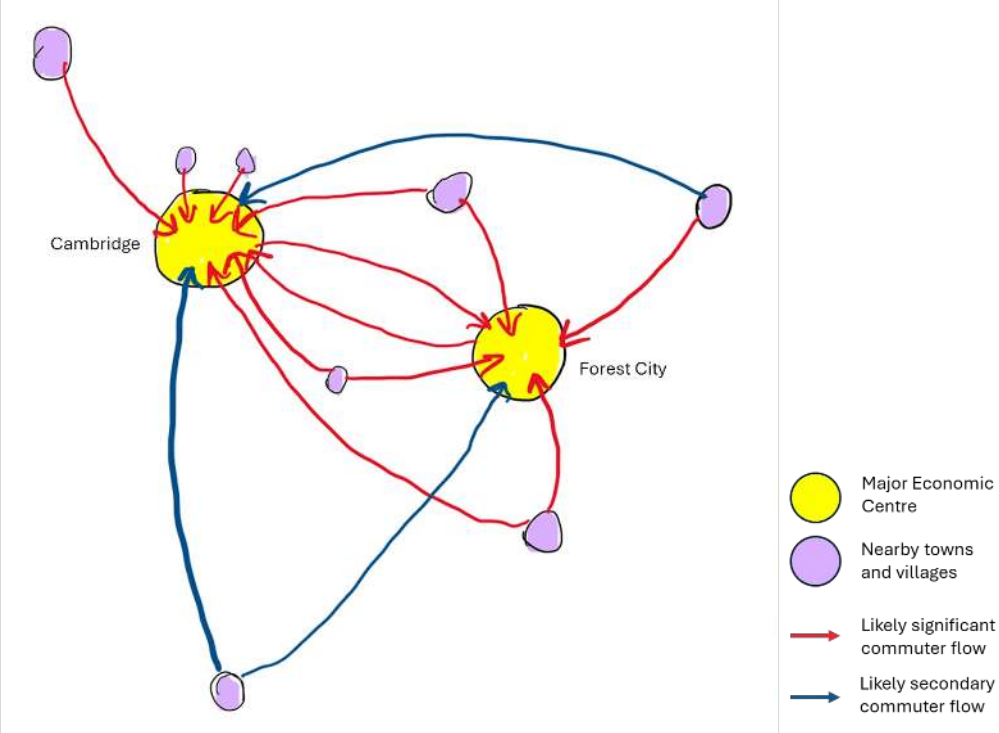


Fig. 4.3.7 Concept Diagram of economic centres and likely significant commuter flows, showing the impact of Forest City shifting a focus from just Cambridge

The second reason is that of planning around nature. As the vision for Forest City plans to have nature at its heart, to a significant degree the built form of the city needs to be planned around the locations of existing and planned natural habitats, as opposed to planning the most efficient built form and then planning nature around that.

The net result of this is what will likely be a poly-centred urban form acting as another economic node to Cambridge. Such poly-centred urban forms typically tend to favour the use of the private car, as travel patterns become much more dispersed to and between the key urban and employment centres. Something that Forest City seeks to avoid.

Consequently, our recommendation is to develop the city based on the concept of 3 primary urban centres. One such centre will likely be the CBD, where land uses are likely to favour offices and employment space. The other two such centres, positioned here in the South West

and Northern parts of the city, provide a similar role, but likely with more of a mixture of residential units contained within them.

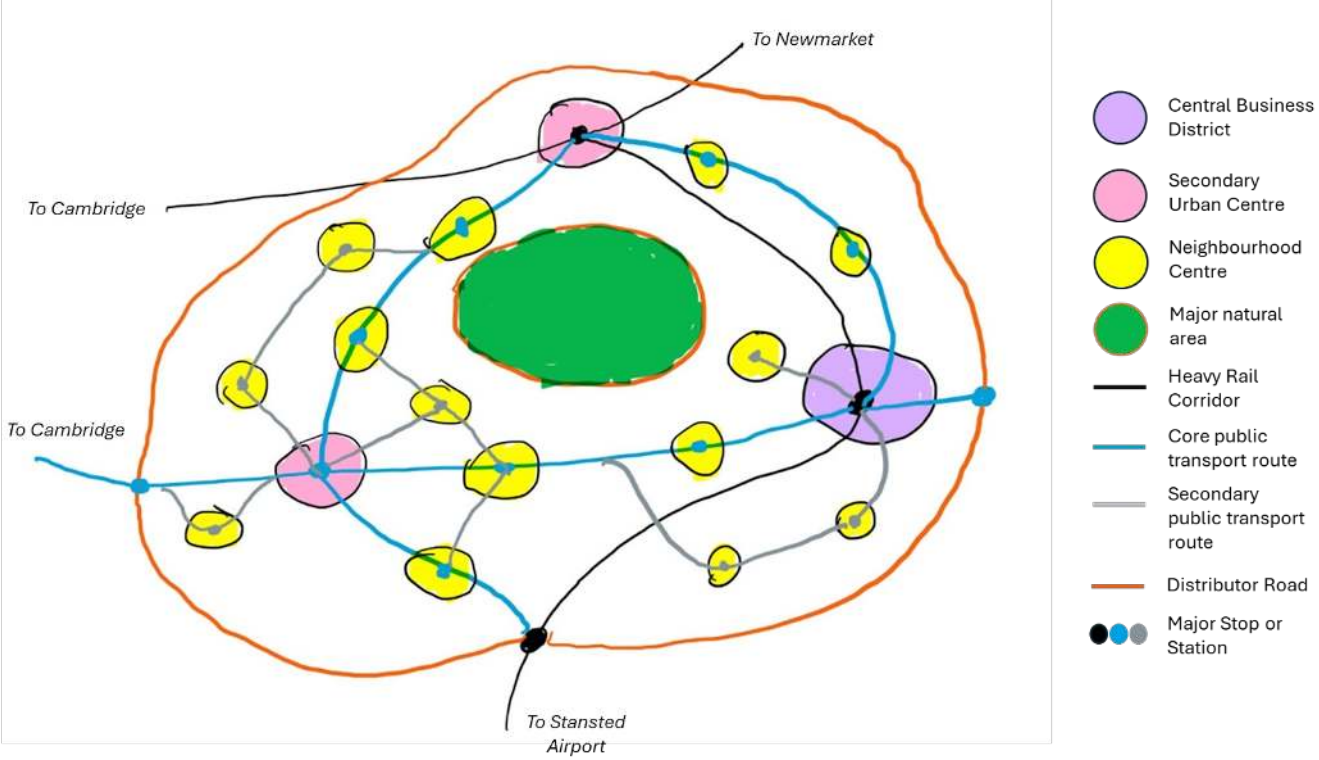


Fig. 4.3.8 Concept Diagram of main urban centres, neighbourhood centres, and core transport networks in Forest City

What is critical is that each of these centres and Cambridge are linked by **high capacity, high frequency public transport services.** More details on this are provided later in this section, but for now it is sufficient to say that this will likely consist of a mixture of these types of transport modes: Heavy Rail, S-Bahn, (a mixture of suburban heavy rail services and metro service), and a Tram network.

The capacity that is likely to be needed to cater for such journeys into, out of, and between these centres can only be provided by high frequency, high capacity public transport. To give an estimate of the likely capacity needed for trips into and out of these centres, commuting trips into and out of the CBD and the Major Urban Centres, an estimate was derived based on commuting figures into and out of a similar multi-centred urban conurbation: the West Midlands. The results of this in Table 1 show that public transport is the only means to move a significant number of people into and out of these main centres.

Area	Equivalent	Commuting trips (AM Peak)	Required time to move that amount of commuters			
			Trains (Heavy Rail)	Trains (S-Bahn)	Trams	Cars
CBD	Birmingham City Centre	67,000	1 hour 30 minutes	1 hour	3 hours	45 hours
Secondary Centre (North)	Wolverhampton	36,000	55 minutes	25 minutes	2 hours	24 hours
Secondary Centre (South East)	Coventry	20,000	30 minutes	20 minutes	1 hour 5 minutes	13 hours

Table 4.1.4 Time required for different modes to move different numbers of people for the major centres of Forest City [44]

Achieving Modal Shift Through Land Use Planning

The other side to the structure of the city is density. Here, our recommendation is simple: higher densities lead to greater use of public transport, so increase densities closer to stops, stations, and interchanges. Additionally, it needs to be recognised that different types of public transport system require different densities in order to be effective. Table 2 provides some basic guidance on the kinds of densities that are needed to support a variety of public transport systems.

Mode	Residential density (dwellings per hectare)	Job density (jobs per hectare)	Service characteristics commentary
Irregular Buses	20-30	50	Hourly or half-hourly suburban bus service
Regular Buses or Bus Rapid Transit (BRT)	40-60	125-185	'Turn up and go' frequency (every 10–15 mins). Requires dedicated lanes or priority.

Mode	Residential density (dwellings per hectare)	Job density (jobs per hectare)	Service characteristics commentary
Tram	60-80	300	High capacity, frequent service. Requires medium-rise apartments or terraced density.
S-Bahn / Suburban Rail	100 (close to station) 50 (catchment)	Over 300	Connects suburbs to city centres. Relies on 'nodes' of high density around stations.
Heavy Rail / Metro	100+150	Over 300	Mass transit for major urban corridors. Requires high-density urban fabric.

Table 4.1.5 Recommended density of housing and jobs for different forms of public transport Sources: Urban Transport Group (2019), Lincoln Institute of Land Policy (1996), Pharoah (2018)

We recommend that a design standard be established so that density varies in accordance with distance from public transport. Within 500 metres of a stop on a high density public transport corridor or feeder service, density of development should be high with no car parking provided (aside from some limited disabled parking). Between 500 metres and 1000 metres away from the stop, densities should still be relatively high, with some limited parking provided remote from destinations, such as in a public car park. Over 1000 metres away, densities should be lower, with parking limited again.

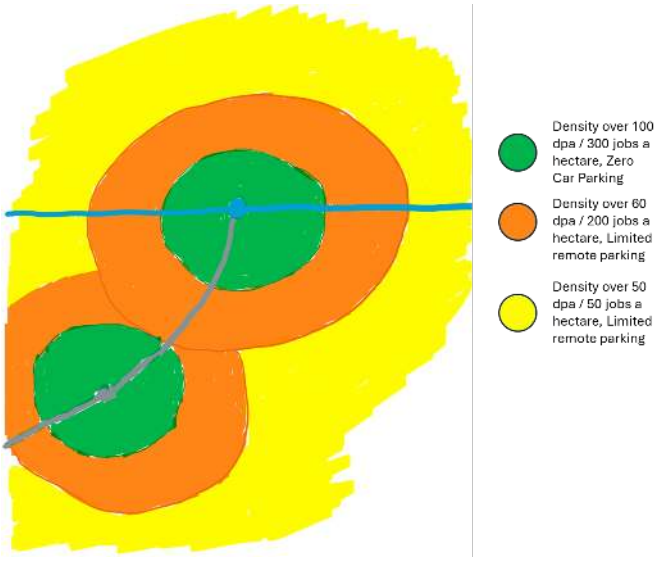


Fig. 4.3.9 Concept Diagram of densities and parking levels in relation to distance from public transport stops in Forest City.

It is likely that some land uses will require access by vehicles other than service vehicles (e.g waste disposal) the emergency services, and some private vehicles. Notable examples will include freight distribution hubs, rail freight depots, and warehousing and factory operations. These should be located close to junctions on the distributor road, with good access by public transport for employees.

The Street Block

Street layouts need to prioritise the movement of pedestrians, wheelers, and cyclists, and permit the efficient and effective operation of public transport routes. Whereas public transport requires straight line service operations, with the exception of some Demand Responsive Transport Services, pedestrians and cyclists require a 'mesh' of streets that provide convenient and safe access in all directions.

We therefore recommend that the basic street layout of the city be based on the 'Superblocks' model. In this model, the built up areas are laid out in a series of blocks measuring 1 mile by 1 mile. Within these blocks, all streets are designed so that people on foot, in wheelchairs, and travelling by bicycle have priority. This is achieved through street design features and design for low traffic speeds (we would recommend a design speed of 5mph). Vehicle access is still possible, but is restricted to a set number of entry and exit points. All other points are usable by people on foot, in wheelchairs, and on bicycle, but physical barriers prevent vehicles from using them. On the edges of the block there are roads, and segregated public transport and bicycle routes, which provide some degree of vehicle access to all areas.

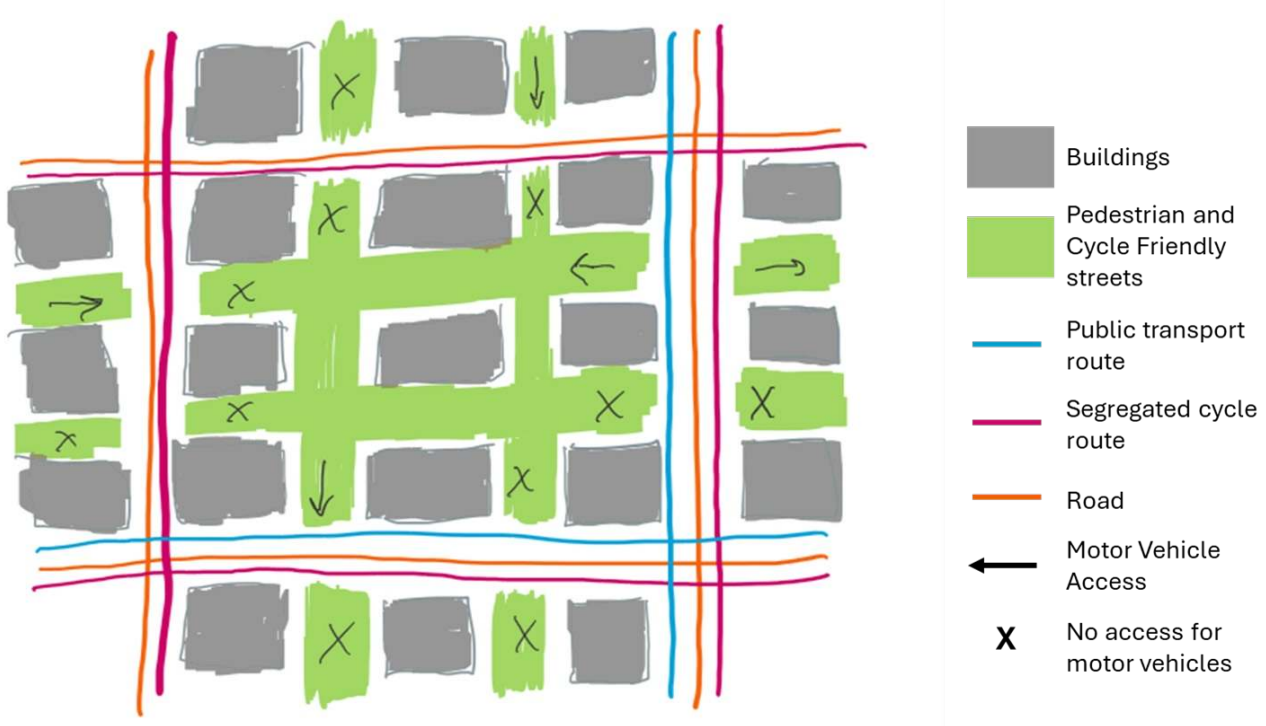


Fig. 4.4.1 Concept design of the Streetblock, based on the Superblocks model

The strength of this model comes in travelling between blocks. If people wish to travel between one block and another by vehicle, the route is less direct as they have to travel around the block to use an access point. Meanwhile, for people walking, wheeling, and cycling, they simply cross the street to access the next block. Public transport benefits from having a segregated stretch of city street, which could be complimented by priority signalling at junctions.



Fig. 4.4.2 Street designs prioritising pedestrian use in Barcelona's Superblocks (Guiding Architects, 2024)

At its core is a strict modal share target: **private motor vehicles must account for no more than 20% of all trips** originating or ending within the city. To achieve this, we cannot simply provide alternatives; we must design the built form of the city to favour sustainable modes by default.

Delivering Several Principles via Public Transport

Public transport in any city needs to balance two things before it considers the capacity of the system—frequency and coverage. What this articulates is that while a city may want frequent services running to every street corner, they are fundamentally constrained by the cost and availability of vehicles and staff, and the geography of the city. So each city needs to decide on this trade-off, and Forest City is no different.

Our proposed approach errs more on the frequency side than it does the coverage side. As previously mentioned, the backbone of Forest City will be a high frequency, high capacity public transport spine, supported by a series of feeder services connecting the neighbourhood centres and other areas into the system, all enabled through seamless interchange at Mobility Hubs. We will now discuss each aspect of the system.

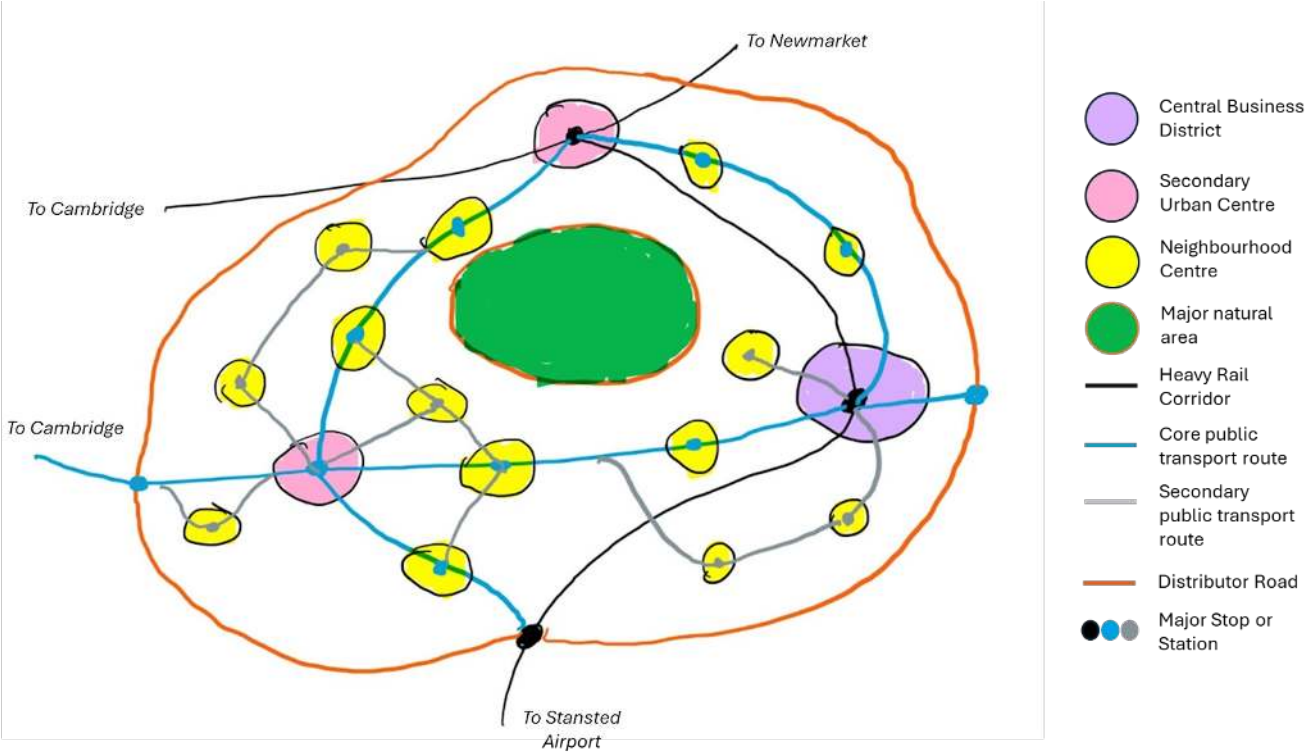


Fig. 4.4.3 Concept Diagram of main urban centres, neighbourhood centres, and core transport networks in Forest City

High Frequency Public Transport Spine

For this part of the system, we recommend three technologies. Heavy Rail, S-Bahn, and Tram. A new heavy rail line should run north to south through the site, with stations located at Dullingham, the City Centre (referred to as Forest City Central), and close to Haverhill (referred to as Haverhill). From our review of available options, given available capacity constraints on the railway and need for infrastructure upgrades elsewhere, we would recommend two heavy rail services forming the baseline operation:

- **An extended Stansted Express service** running through the site and providing onward connections to London and Cambridge, though rebranded to reflect the fact that the service runs to Forest City. This service would have a calling pattern of London Liverpool Street, Tottenham Hale, Stansted Airport, Haverhill, Forest City Central, Dullingham, Cambridge East and Cambridge. This would provide a service every 15 minutes within the city between Dullingham and Haverhill via Forest City Central.

- **An extended East West Rail service** from Cambridge East to Forest City, terminating at the station in the CBD. This would operate up to 5 trains per hour between Forest City Central and Dullingham, and onto Cambridge and beyond. Combined with the extended and rebranded Stansted Express service, a frequency of up to every 7 minutes may be feasible between Cambridge, Dullingham and Forest City Central.

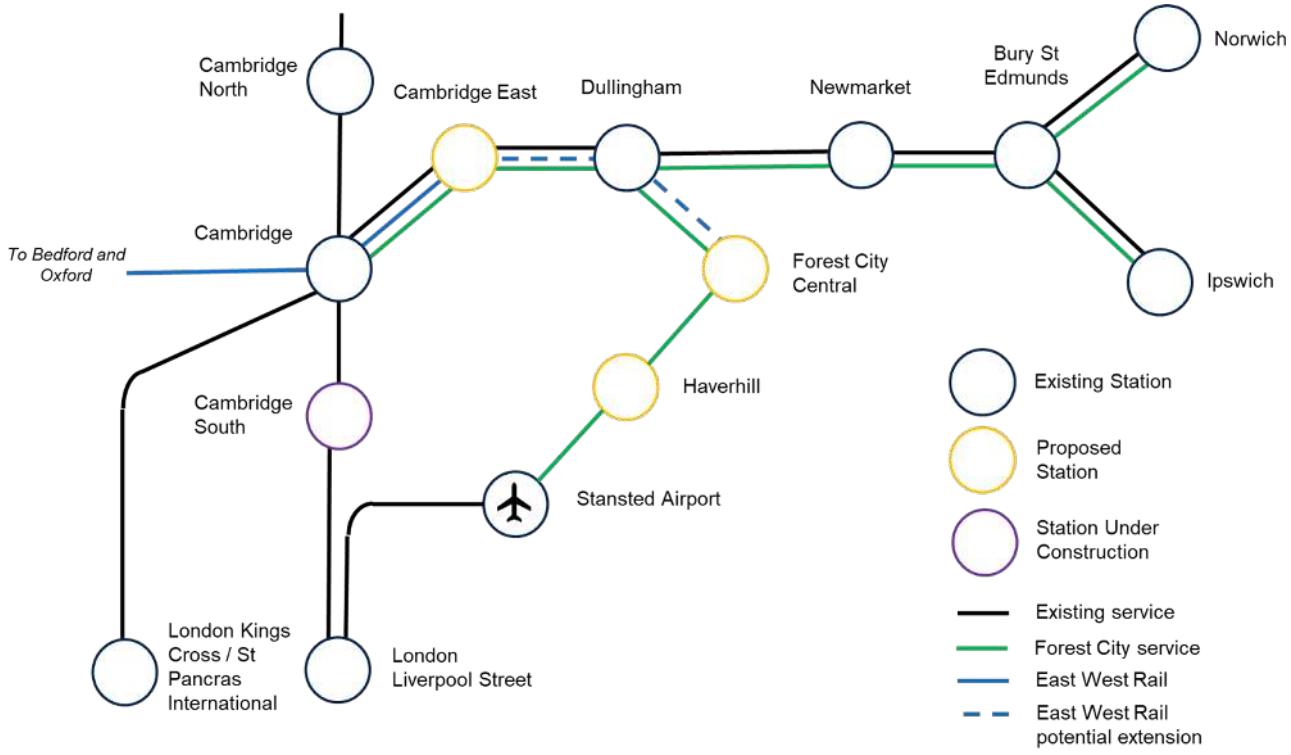


Fig. 4.4.4 Outline of recommended rail service options for Forest City

Further technical feasibility will be needed to identify infrastructure requirements for this level of service. We would recommend at least two platforms at Haverhill, between two and six platforms at Dullingham depending on the requirement to move the existing station, and at least eight platforms at Forest City.

Should a direct route towards Stansted Airport not prove to be technically feasible, an alternative is to have a heavy rail connection between Cambridge and Forest City via Dullingham only, extending some of the existing Cambridge to London Liverpool Street services to Forest City. We anticipate that, depending on the availability of trains and staff, up to four trains per hour could be extended. This would provide a route to Cambridge, but this would be at the expense of longer journey times to London and a need to change trains at Cambridge for Stansted Airport. More detail on this is provided in the Strategic Connections section.

Origin and Destination	Journey Time	Frequency of service
Dullingham to Forest City	c.9 minutes	7 minutes
Dullingham to Haverhill	c.15 minutes	15 minutes
Haverhill to Forest City Central	c.6 minutes	15 minutes

Table 4.1.6 Illustrative journey times and frequencies on heavy rail services within Forest City

For the remainder of the system, we recommend deploying either an S-Bahn system or a rapid tram network as part of the core of the system. In this system, we have identified three key lines that should be developed:

- **Line 1:** Forest City to Cambridge, via the secondary centre in the South West. This should be the first line to be constructed, as not only does it provide the main service across the south of the city, but would also provide a link to Cambridge and its growth areas in the south of the city. Depending on the technology deployed, there is the potential to integrate into the Cambridge Autonomous Metro service that is planned for the South of the city. It has interchanges with Line 2 in the secondary centre in the South West, and Heavy Rail at Forest City station
- **Line 2:** Dullingham to Haverhill, via the secondary centre in the South West. This provides the main public transport spine across the West of the City, It has interchanges with Line 1 in the secondary centre in the South West, and Heavy Rail at both Dullingham and Haverhill.
- **Line 3:** Forest City to Dullingham, via neighbourhood centres in the North East of the city. This would connect up communities in this area of Forest City to the CBD and the secondary centre at Dullingham. It has interchanges with Line 2 at Dullingham, and Heavy Rail at both Dullingham and Forest City.

For operating this system, there are two choices of technology: an S-Bahn and a Tram. For each there are trade-offs that need to be considered during the feasibility stage and during the development of more detailed costings. In this report we are presenting light rail as the lower cost option, and the S-Bahn as the higher cost option.

The key strength of an S-Bahn is its **capacity**. A single S-Bahn line can carry between 60,000 and 90,000 passengers an hour, making it the highest capacity transport system (TUMI, 2021). Depending on the system density, its journey times can also rival that of heavy rail. Stations are usually located between 0.5 and 0.9 miles apart. Furthermore, provided the system does not mix with other types of rail traffic, frequencies can be high. Its challenge is its cost, which can vary wildly. If the service is purely overground, costs can be similar to that of heavy rail - around £93

million per mile according to our analysis of similar schemes. But for systems mostly underground, that cost can be as high as £343 million per mile.

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In contrast, light rail is **much more flexible**, and a **lower cost to deliver.** Light rail systems typically have a higher stop density, with anywhere between 1.5 stations per mile (such as the Manchester Metrolink) and eight stations per mile (such as in Vienna). Our analysis shows that they cost around £74 million per mile to deliver. This makes them excellent for providing coverage while maintaining high frequencies. However, this is at the cost of capacity and journey times. A light rail line can carry between 18,000 and 20,000 people per hour, but with journey times much slower than that of an S-Bahn due to the frequent need to stop.

Regardless of the system chosen, the Working Group has two key observations to make. Firstly, the high frequency, high capacity public transport spine must have its own dedicated infrastructure segregated from other modes, so that it runs reliably and is able to meet its potential. Secondly, within the major centres it will be necessary to consider how this system operates. It may be necessary to operate all or part of the system in these centres in tunnels to avoid conflict and issues of severance caused by rail and tram lines on the surface, with potentially circular systems operating to avoid conflict in the central core. Whilst here we have estimated costs for both systems on the assumption that the system will operate at street level, we have produced a concept of how such a system could work in major centres.

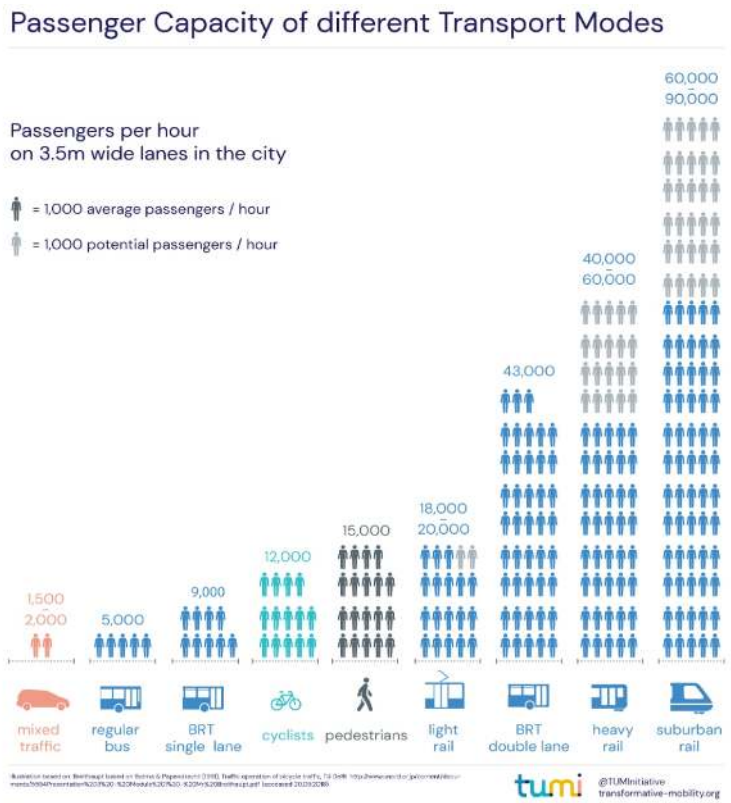


Fig. 4.4.5 Passenger capacity of different types of mode of transport (TUMI, 2021)

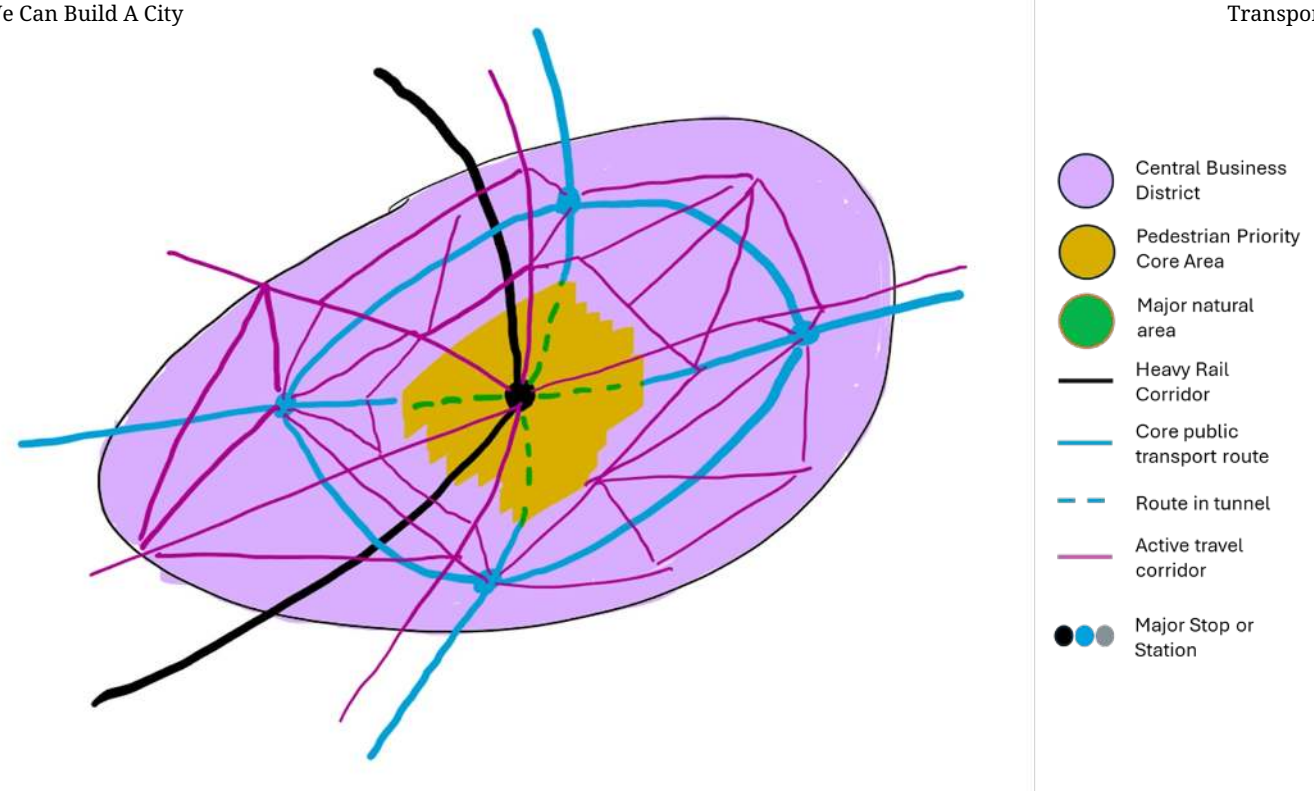


Fig. 4.4.6 Concept design of transport systems in core areas

Origin and Destination	S-Bahn		Light Rail	
	Journey Time	Frequency of service	Journey Time	Frequency of service
Dullingham to Forest City Central	c.20 minutes	7 minutes	c.40 minutes	7 minutes
London	c.15 minutes	5 minutes	c.30 minutes	5 minutes
Ipswich	c.30 minutes	5 minutes	c.55 minutes	5 minutes

Table 4.1.7 Illustrative journey times and frequencies on S-Bahn / Light Rail routes within Forest City

Feeder Services

The purpose of the feeder services is to provide local connectivity to nearby neighbourhood centres and hubs from where people can continue on their journey via the core routes. The focus in this area of the system is not on frequency but improving coverage, meaning that people will be required to interchange onto high frequency, high capacity routes to continue their journey.

It should be noted that the need to interchange between modes of transport does bring an ‘interchange penalty’. This consists of several layers: physical effort, cognitive load, reliability risk, and comfort loss.

Most critically, however, is that these aspects can be mitigated in a manner so that the interchange penalty can be minimised to the point where public transport is still the best option. Within Forest City, we anticipate many of these factors coming into play:

- Frequent connecting services: where passengers do not have to fear missing a connection, because the next service is almost right behind it.
- Integrated ticketing: removing the financial penalty of a transfer so the user doesn't pay twice.
- Reducing transfer time in the hub: ensuring that trains and buses meet one another, or are across the same platform from each other.

For the feeder services connecting neighbourhood centres off the high capacity corridors, 3 systems hold the greatest potential: trams, Very Light Rail, and Buses. Similar to that of the high frequency, high capacity routes, there are trade-offs between these different options, which we will set out here. Note that when devising the construction costs of the transport networks of Forest City, we have not included costs for the creation of these routes.

Trams specialise in being **much more flexible.** As mentioned already, light rail systems typically have a higher stop density, making them excellent for providing coverage and high frequencies but coming at the cost of capacity and journey times.

A Very Light Rail System can best be described as a tram-lite. Similar to trams, they are a flexible system with high stop densities. But crucially, as the vehicles do not need to achieve the same standard of safety as a tram, and the physical infrastructure requirements are less, they are **lower cost** than their tram equivalent. The trade-off is capacity, with Very Light Rail vehicles having a much reduced capacity per vehicle than trams. Furthermore, the challenge with VLR is that, to date, there has been only one technical trial of the technology, in Coventry. As such, the technology is not yet proven in real world operation.



Fig. 4.4.7 Very Light Rail System for Coventry being tested (RailUK, 2023)

Buses are probably the most critical form of public transport in the UK, carrying more passengers per year than any other mode of public transport. Their great strength is in their **flexibility and low capital cost.** They can operate frequent services on high demand corridors with segregated tracks, and they can operate the village bus service. However, this comes at a cost. Even frequent bus routes have a lower passenger capacity than trams and trains, and their operational costs per vehicle are higher—though offset by lower capital costs. While they can get stuck in traffic, this can be mitigated with priority bus infrastructure and dedicated bus lanes.

It is our recommendation that for these Feeder Services, a mix of service operations is provided depending on the level of anticipated demand for feeder services. In locations in the city where the feeder service itself may have high passenger volumes, **trams or Very Light Rail** are likely to become more viable. Buses can play a variety of roles across the city as either fixed route or demand responsive services, as well as providing an essential public transport link between the city and surrounding small towns and villages.

The Seamless Interchange at Mobility Hubs

Mobility hubs function as the critical interface in an integrated transport system, seamlessly connecting high-capacity public transport with local, sustainable travel options to solve the ‘first and last mile’ challenge.

By clustering diverse modes—such as shared bikes, e-scooters, and car-club vehicles—around core bus or rail stations, these hubs bridge the gap between a commuter's front door and the transit network, making multi-modal journeys a viable alternative to private car ownership. This physical integration is often supported by digital connectivity, or 'Mobility as a Service' (MaaS), which unifies ticketing and information into a single platform, further reducing the friction of switching between modes. In a new city environment, this allows for a 'network of hubs' approach, where varied hub sizes—from major interchanges to smaller neighbourhood 'mini-hubs'—ensure that sustainable transport is accessible within a short walk of every home.



Fig. 4.4.8 Concept of a Mobility Hub (CoMoUK, 2026)

Beyond mere connectivity, mobility hubs are a powerful tool for driving behavioural change and solidifying a low-carbon culture. By co-locating visible, convenient alternatives to the private car, such as EV charging points and cargo bike hire, they physically disrupt car dependency and normalise shared mobility. Research indicates that this 'push and pull' strategy —making sustainable options more attractive while reducing the dominance of private parking —effectively encourages a modal shift towards active and shared travel. For example, successful hubs in the UK and Europe have demonstrated that when users are presented with a reliable suite of options at a single location, they are more likely to abandon car ownership in favour of a 'mobility mix' that adapts to their specific daily needs.

Finally, mobility hubs contribute to the social fabric of a city by transforming transport nodes into vibrant community assets through ‘placemaking’. Rather than sterile waiting areas, these hubs are designed to improve the public realm, incorporating amenities such as parcel lockers, cafés, coworking spaces, and green infrastructure. This multifunctional approach ensures that land is used efficiently—a critical consideration for high-density sustainable developments—and turns transit stops into safe, social spaces that residents value. In the UK, pilots like those in the West Midlands have shown that even in non-urban settings, adding these community layers (like social spaces and local information) helps hubs become safe, well-used focal points that support local economic activity and reduce social exclusion.

Integrated Services And Ticketing

The foundation of a truly integrated system lies in a ‘clock-face’ or ‘pulse’ timetable strategy, where predictability replaces the need for passengers to memorise complex schedules. Instead of optimising individual routes for the benefit of a single operator, the entire network is designed around mobility where vehicles from different modes—trains, trams, and buses—arrive and depart simultaneously. This synchronisation creates a heartbeat across the city: at regular intervals (e.g. every 15 or 30 minutes), the network converges to allow seamless transfers between high-speed regional connections and local feeder services, with dwell times kept to a strict minimum. By standardising these intervals, the system guarantees that a transfer is always available, effectively creating a turn up and go culture where the waiting penalty for changing modes is virtually eliminated.

Complementing this physical synchronisation is the complete removal of administrative friction through a unified tariff union. In this model, ticketing is decoupled from the mode of transport; a passenger does not buy a ticket for a train or a bus, but rather purchases access to the network itself within a specific zone or duration. This means a single travel pass—whether a daily ticket or an annual subscription—is valid on every piece of moving infrastructure within the city, from heavy rail and trams to shared bikes and e-scooters. This one-stop shop approach removes the psychological and financial barrier of paying a penalty every time a user switches modes, thereby incentivising complex, multi-modal journeys that would be prohibitively expensive or confusing under a fragmented operator model.

The result of combining pulse scheduling with unified ticketing is a system where the network effect becomes the primary driver of ridership, rather than the speed of individual vehicles. Research indicates that passengers value reliability and total journey time over maximum velocity; by ensuring that connections are guaranteed and transfers are seamless, the system competes directly with the convenience of the private car. This approach fundamentally shifts the user's relationship with transit: rather than planning a specific trip around a timetable, residents inhabit the network as a continuous utility, much like water or electricity. The integration ensures that even lower-density areas receive high-quality coverage, as the pulse spreads the benefits of the core spine out to the periphery.

A Highway Network that Maintains Access While Prioritising Sustainable Travel

The following recommendations establish a transport hierarchy designed to prioritise social inclusion and ecological connectivity while managing essential vehicular movements.

Strategic Framework: The 'Link and Place' Matrix. To tackle social exclusion, the transport hierarchy must move beyond a purely functional classification of vehicle capacity. Instead, it should adopt a Link and Place matrix approach, where every street is evaluated not just on its traffic flow (Link) but on its value as a destination for social interaction (Place). Research indicates that well-connected networks significantly reduce social isolation by preventing the creation of cul-de-sac enclaves which force car dependency. Therefore, the hierarchy proposed below is not a rigid segregation of users, but a graduated system of permeability where the most vulnerable road users—pedestrians and cyclists—are granted the highest priority across all tiers. This ensures that non-drivers (often the most socially excluded groups, including the elderly and low-income residents) retain independent mobility throughout the city.

The Peripheral Distributor: An Ecological 'Green Ring' The proposed single-carriageway distributor road encircling the city should function as a 'Green Ring' rather than a barrier. While its primary function is to distribute traffic (similar to the Strategic Route or SPN 1 classifications in national guidance), its design must be led by the nature-based city ethos. It is recommended that Land Bridges (Green Bridges) be implemented as a standard feature, not just for wildlife connectivity but to maintain recreational access between the city and the surrounding rural landscape. To prevent the severance effect often caused by distributor roads, this route should utilise a single carriageway profile with a focus on consistent flow rather than high speed, incorporating park edge characteristics where it interfaces with the city boundary. This road must connect primarily to the designated Freight-Only Routes and Primary Routes, restricting direct access to residential zones to preserve the integrity of the inner city Superblocks.

Primary Routes: The Superblock Exterior Grid The Primary Routes should act as the structural grid of the city, defining the perimeter of the Barcelona-style Superblocks. These routes will handle the majority of public transport and essential vehicle traffic connecting major centres. However, unlike traditional Main Distributors, these must be designed with 'Place' in mind. Recommendations include mandating segregated cycle tracks (Cycleways) and wide footways on both sides, as per LTN 1/20 standards, to ensure that high traffic volumes do not intimidate active travelers. To support social inclusion, these routes should feature Toucan crossings (combined pedestrian/cycle crossings) and prioritised bus lanes to ensure that public transport remains a faster, more attractive option than private car use, thereby democratising travel efficiency.

Secondary Routes: The Superblock Interior and Green Streets Inside the Superblocks defined by the Primary Routes, the Secondary Routes should function as Green Streets or Shared Surface Streets. These routes link neighbourhood centres but must be engineered to prevent through-traffic (rat-running), effectively creating the 'filtered permeability' central to the Superblock model. It is recommended that these streets be designed for speeds of 10-15mph using visual narrowing, planters, and surface texture changes rather than vertical calming (humps) which can impact emergency access. These routes are the primary domain of social interaction; therefore, parking should be deprioritised or moved to peripheral 'hubs' to free up street space for community use, play, and urban greening, directly tackling the isolation often found in car-dominated residential estates.

Freight-Only Routes: The 'Service Skeleton' To segregate goods vehicles from vulnerable road users, a dedicated Freight-Only network is recommended. This hierarchy tier acts as a Service Skeleton, connecting the external distributor road directly to logistics hubs and distribution centres without passing through residential Superblocks. These routes should be designed with wider lane widths and larger turning radii to accommodate HGVs (similar to Industrial Access Roads), but strictly segregated from the active travel network. Where these routes must intersect with the pedestrian/cycle network, grade separation (underpasses or bridges) is recommended to eliminate conflict risk. This ensures that the economic lifeline of the city does not compromise the safety or environmental quality of the living areas.

The Active Travel Overlay: Universal Permeability While the vehicle hierarchy is stratified, the active travel network must be 'flat' and universal. It is recommended that foot and cycle paths maintain universal permeability, meaning they can traverse all boundaries that block cars. For example, where a Secondary Route meets a Primary Route, a modal filter (bollards/planters) should physically block cars while allowing cyclists and pedestrians to pass freely. This creates a 'network of short cuts' for non-motorised users, making walking and cycling the most direct and convenient mode of transport for local trips, which is essential for integrating marginalized communities who may rely on non-motorised transport.

Resilience and operational hierarchy Finally, the hierarchy must account for resilience against climate risks, a key consideration for a nature-based city. The Primary Routes and Freight-Only Routes should be designated as the Resilient Network. This ensures they receive priority maintenance (e.g. winter gritting, flood clearance) to maintain access to critical services (hospitals, power stations) during extreme weather events. However, to tackle social exclusion, this Resilient Network must also include key bus routes and primary cycle corridors. This guarantees that in times of crisis, the mobility of the transport-disadvantaged is protected with the same priority as the movement of freight and emergency services.

Achieving Infrastructure as a Platform Through Digital Infrastructure and Purpose-Driven Innovation

The global trajectory of urban mobility currently faces a paradox of investment versus outcome. Despite decades of capital-intensive investment in physical transport infrastructure—expanding roadways, constructing light rail systems, and enhancing bus networks—the fundamental modal split in major urban centers remains stubbornly resistant to change. This resistance persists despite the widespread availability of alternative modes, suggesting that the barrier to modal shift is no longer strictly the availability of physical infrastructure, but the friction involved in navigating it. The legacy approach to transport planning, characterized by a 'predict and provide' model focused on physical capacity, has reached a point of diminishing returns. To break this stagnation, the sector must transition to a 'decide and provide' model facilitated by a new paradigm: **Transport Infrastructure as a Platform (TIaaP).**

The TIaaP concept posits that transport networks must be re-engineered as digital assets as well, with physical infrastructure serving as the hardware upon which mobility services run as software. This transition restructures the mobility ecosystem into a 'system of systems', where silos between road, rail, air, and maritime are dissolved by a unifying digital experience. By treating infrastructure as a platform, authorities can move beyond static asset management to dynamic flow orchestration, unlocking value that is currently trapped in fragmented systems. At the core of the platform is the concept of the digital representation of physical assets. However, precision in terminology is vital for procurement and systems architecture. The industry recognises three distinct levels of sophistication, defined by the direction and automation of data flow :

- **Digital Model:** This is a static digital representation of a physical object or system with no automatic data exchange. Data from the physical object is used to create the model, but once created, it does not update automatically. This is useful for the design and construction phase but offers limited value for real-time operations.
- **Digital Shadow:** This represents a significant leap forward, characterised by a one-way flow of data from the physical object to the digital representation. Sensors on the physical asset (e.g. a bridge or vehicle) provide continuous or frequent updates to the digital version, ensuring it reflects the real-time state of the asset. However, there is no automatic feedback loop; insights generated in the digital shadow must be manually actioned in the physical world.
- **Digital Twin:** The apex of this hierarchy is the Digital Twin, characterized by two-way synchronisation. Data flows continuously from the physical to the digital to update the state, and crucially, interventions determined by the digital system (often via AI) are automatically implemented in the physical world via actuators or digital commands.

For a TIaaP to function effectively, it must aspire to the Digital Twin level. For instance, a Smart Motorway system that detects congestion (physical to digital) and automatically lowers speed limits on overhead gantries to smooth flow (digital to physical) represents a functional twin.

Current AI applications in transport are already diverse and impactful. Computer vision is used for the automated inspection of rail infrastructure, detecting vegetation encroachment before it causes outages. Natural Language Processing (NLP) is employed to analyze thousands of customer feedback submissions to identify systemic service failures.

More advanced applications involve **predictive and prescriptive analytics.** In the context of 'Planned Works and Maintenance Management', AI analyzes historical degradation rates and current asset conditions to predict failures before they occur. This allows maintenance to be scheduled proactively, bundling multiple interventions into a single road closure to minimize disruption. The economic value of this AI-driven efficiency is substantial; analysis suggests that improved works management alone could deliver over £500 million in benefits by reducing the economic drag of roadworks.
The fuel for this platform is data, but data in the transport sector is historically siloed within proprietary systems or specific modes. The TIaaP requires a **Common Mobility Data Space**—a federated infrastructure that allows data to be shared securely between competing operators, public authorities, and third-party innovators.

The European Mobility Data Space (EMDS) serves as a leading model for this architecture. It provides the governance framework and technical standards to enable interoperability while respecting data sovereignty. This is crucial because private operators (e.g. ride-hailing firms, logistics companies) are often reluctant to share data due to commercial sensitivity. A well-architected data space allows for the sharing of specific insights (e.g. 'average travel speed on this road segment') without revealing proprietary raw data (e.g. location of every vehicle').

This data layer must be built on open standards to prevent vendor lock-in and ensure that the platform remains a public utility rather than a private monopoly. Standards such as the **FEDeRATED semantic model** for logistics allow different digital twins to 'speak' to each other, creating a seamless flow of information across the supply chain.

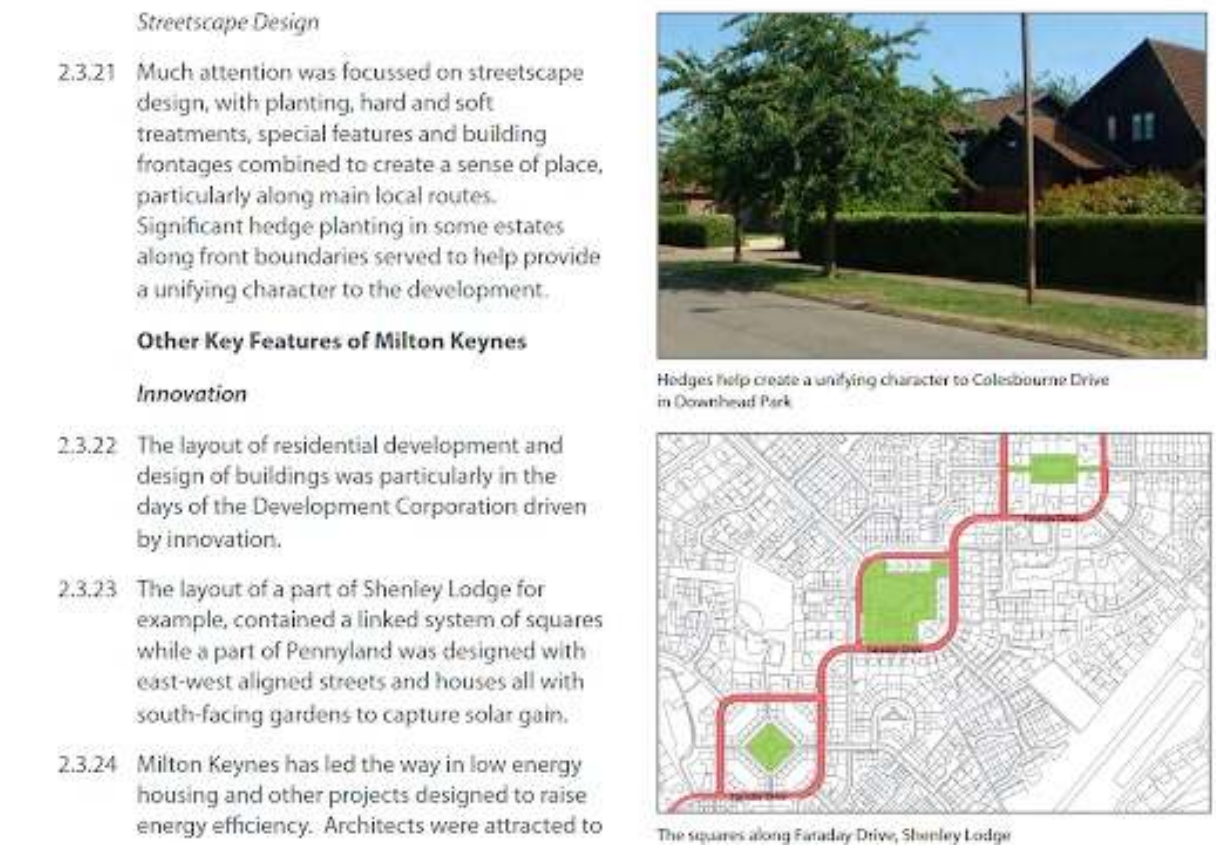
The enabling infrastructure for TIaaP is advanced connectivity. The transition to 5G and future 6G networks is not merely about faster consumer internet but about enabling ultra-reliable low-latency communication (URLLC) required for safety-critical transport applications.
This connectivity underpins Vehicle-to-Everything (V2X) communication, allowing vehicles to communicate with each other (V2V), with infrastructure (V2I), and with the network (V2N). This creates the Internet of Motion, where a vehicle is no longer an isolated metal box but a node in a dynamic network. Patent analysis shows that 'Communication and Security' technologies are the dominant driver of the digitalization megatrend in transport, reflecting the industry's focus on building this nervous system.
Developing the full system architecture will require construction from the ground up, and engagement with a variety of stakeholders while doing it.

Achieving a Whole Journey approach Through Design Standards and Digital Personalisation

Delivering a whole journey approach in the city and beyond would involve delivering a wide variety of interventions across the transport system, and across many different partners. People tend not to worry about who runs services when they are using them every day—they just want them to work for them. Consequently, what we recommend is a series of broad interventions to be delivered across Forest City and beyond to make a Whole Journey concept a reality.

The Street Design Guide

To deliver a Whole Journey approach, the physical environment must offer absolute predictability. We recommend establishing a strict Street Design Guide for the entire city. This policy would mandate that every bus stop, pavement, and interchange adheres to a single, high-specification inclusive design standard, removing the anxiety of the unknown that currently paralyses many disabled travellers. This includes, for example, mandating 2000mm minimum pavement widths to accommodate two wheelchair users passing and enforcing flush kerbs at all crossings. Crucially, this charter must extend to micro-infrastructure: specifying consistent tactile paving layouts for visually impaired users and ensuring seating is provided at 50-metre intervals along key pedestrian routes to support ambulant disabled people.



Streetscape Design

2.3.21 Much attention was focussed on streetscape design, with planting, hard and soft treatments, special features and building frontages combined to create a sense of place, particularly along main local routes. Significant hedge planting in some estates along front boundaries served to help provide a unifying character to the development.

Other Key Features of Milton Keynes

Innovation

2.3.22 The layout of residential development and design of buildings was particularly in the days of the Development Corporation driven by innovation.

2.3.23 The layout of a part of Shenley Lodge for example, contained a linked system of squares while a part of Pennyland was designed with east-west aligned streets and houses all with south-facing gardens to capture solar gain.

2.3.24 Milton Keynes has led the way in low energy housing and other projects designed to raise energy efficiency. Architects were attracted to

Hedges help create a unifying character to Colesbourne Drive in Downhead Park

The squares along Faraday Drive, Shenley Lodge

Fig. 4.4.9 Streetscape Design Guide for Milton Keynes contents

Digital Twin for Personalised Accessibility

While infrastructure provides the base, digital personalisation offers the flexibility. We recommend the development of a city-wide Digital Mobility Twin that feeds unified travel apps. Unlike standard journey planners that optimise for speed, this system would optimise for personal capability. A neurodivergent user could select a ‘low sensory’ route that avoids crowded interchanges and loud environments, addressing the sensory and social demands identified as major barriers. A wheelchair user would see real-time data on lift status and bus ramp deployments—not just scheduled data, but live operational status—tackling the uncertainty that is a primary driver of travel anxiety. This digital layer gives users the confidence that their specific chain of travel is unbroken before they leave their front door.

Mobility Hubs as Community and Nature Nodes

Mobility Hubs should be distributed equitably, not just in the city centre but in peripheral neighbourhoods where transport poverty is most acute. Each hub should serve as a seamless interchange between active travel (secure parking for adapted cycles and cargo bikes), mass transit (rapid bus/rail), and shared mobility (EV car clubs). To align with the nature focus, these hubs should be ‘green nodes’—featuring living roofs, pollinator gardens, and natural shading. Crucially, they must be designed as safe spaces for women and girls, incorporating high-visibility lighting, transparent structures for natural surveillance, and Help Points that connect instantly to human support, directly addressing the ‘guardian deficit’ often felt at isolated stops.

Recognising Cycles as Mobility Aids

The city's active travel network must move beyond the ‘two-wheeled’ paradigm. Policy should formally recognise cycles as mobility aids, designing infrastructure that accommodates non-standard cycles such as tricycles, handcycles, and heavy e-cycles used by disabled people. This means cycle lanes must be wide enough for adaptive bikes (minimum 2 metres) and free of restrictive barriers like chicane gates that block legitimate users.



Fig. 4.5.1 Adapted bicycles for disabled cyclists

Giving Nature Space

Based on the evidence reviewed regarding the interactions between transport infrastructure and the natural environment, here is a blueprint for integrating nature into Forest City. These recommendations are designed to avoid the ecological pitfalls of the past and build a resilient, healthy urban environment.

Construct Land Bridges as Standard

Over all primary transport arteries, there should be land bridges as standard. This should be a substantial continuation of the landscape over the road, designed to carry soil, hydrology, and vegetation. Research indicates that these structures are essential for reconnecting fragmented habitats, allowing genetic exchange between separated populations of wildlife, and reducing collision risks for large mammals. By planting this bridge with native hedgerows and trees, you effectively render the road invisible to wildlife, turning a barrier into a corridor.

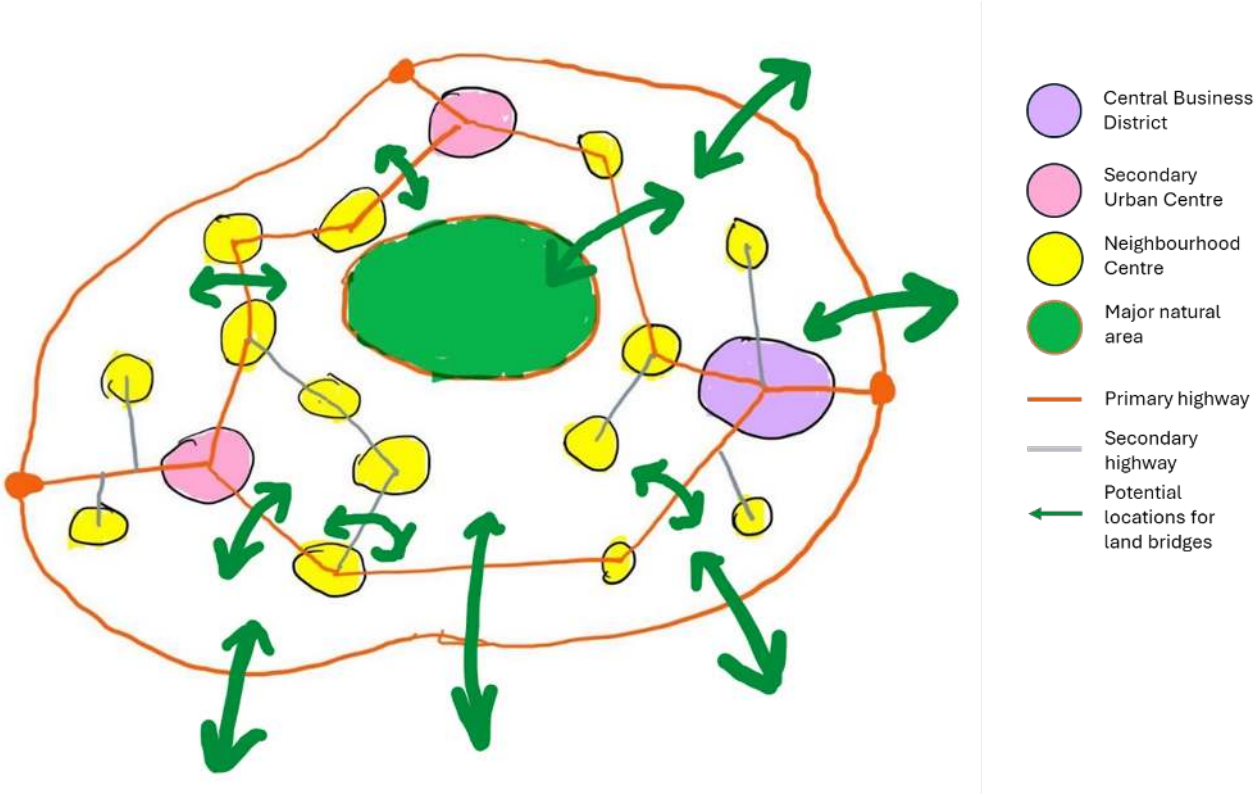


Fig. 4.5.2 Concept diagram of locations of land bridges

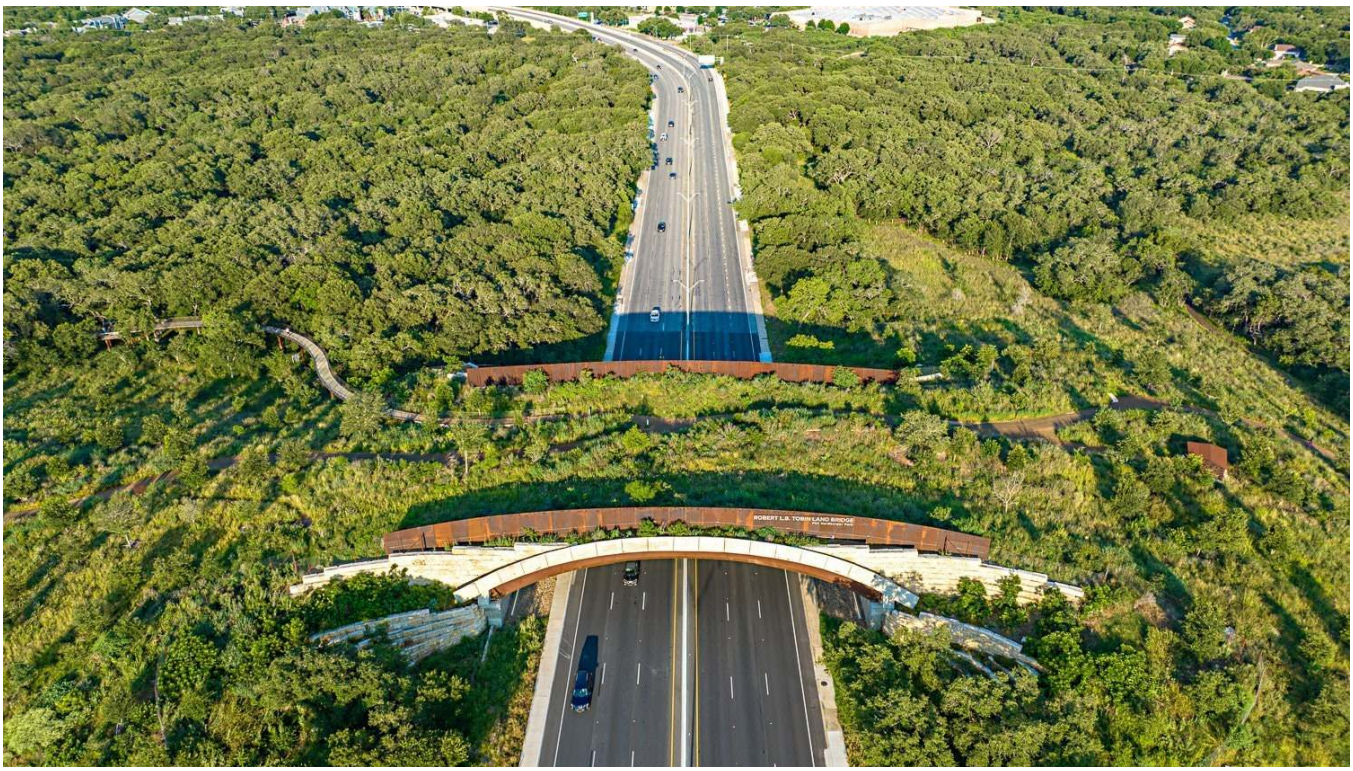


Fig. 4.5.3 San Antonio's Tobin Land Bridge at Hardberger Park

Revolutionise Verge Management with 'Cut and Collect'

Do not treat road verges as lawns to be manicured. Instead, treat them as linear nature reserves. ‘Cut and Collect’ mowing should be applied across the entire city's verge estate. Evidence from trials on the Isle of Wight and elsewhere suggests that removing grass clippings reduces soil fertility, which suppresses rank grasses and allows diverse wildflowers to thrive. This simple operational shift transforms sterile green strips into vibrant pollinator corridors, supporting bees and butterflies that are vital for urban biodiversity. Furthermore, reducing mowing frequency—as demonstrated in urban trials—can significantly boost the abundance of invertebrates like spiders and bugs, which form the base of the urban food web.

Engineer Permeability for Animals into the Network

The road network must be permeable to wildlife at the ground level. Transport corridors typically act as barriers for smaller animals like badgers, otters, and amphibians. In addition to land bridges, install oversized culverts and dry tunnels under all major roads, specifically designed for these species. These may be paired with wildlife-proof fencing that guides animals towards these safe crossings and away from the tarmac.

Design 'Greenways' for Active Travel

Shift the focus of commuter transport from cars to active travel by creating a network of Greenways similar to the Chisholm Trail in Cambridge, which compliment the public transport network. Unlike roads, which pollute and sever, cycle paths and walkways can function as linear parks that connect people with nature during their daily routines. These routes should be lined with species-rich hedgerows and fruit trees, providing a ‘cultural ecosystem service’ that boosts mental health and wellbeing while sequestering carbon. By designing these routes to be the most direct and pleasant way to cross the city, you simultaneously tackle congestion, air quality, and public health.

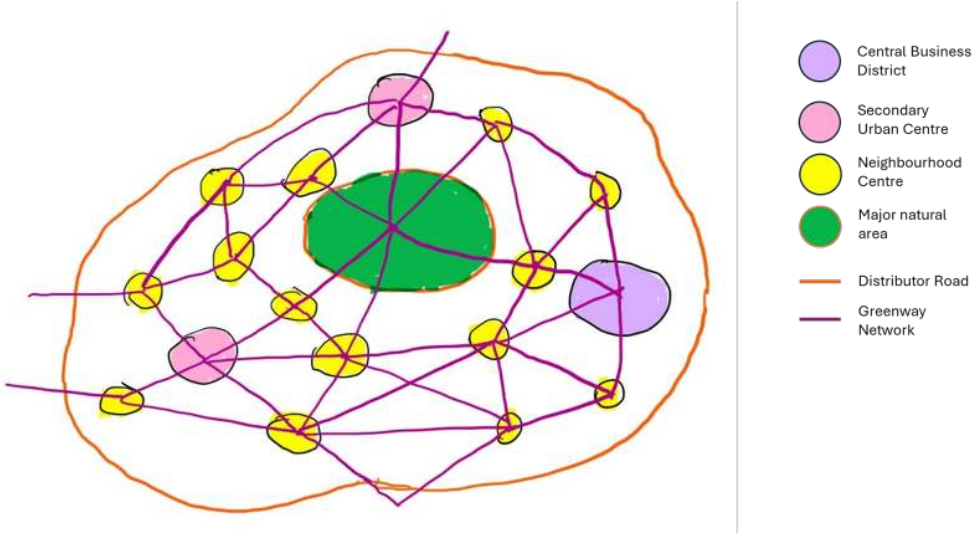


Fig. 4.5.4 Concept plan of a Greenway Network for Forest City

Treat Road Runoff as a Resource, Not Waste

Cambridgeshire is a water-stressed region, and Forest City must not exacerbate this by draining road runoff straight into sewers. Implement Sustainable Drainage Systems (SuDS) such as reedbeds, swales, and balancing ponds along all transport corridors. These features will filter out heavy metals, rubber, and oils from tyre wear before the water reaches sensitive chalk streams, preventing the chemical degradation of aquatic habitats. Furthermore, these wetland features add biodiversity value in their own right, creating habitats for dragonflies and amphibians while slowing the flow of water to reduce flood risk.

Create a 'Ghost' Lighting Network

Finally, Forest City should manage the ‘invisible’ pollutant of artificial light. Many nocturnal species, particularly bats and moths, are deterred by streetlights, which can sever their feeding routes just as effectively as a physical wall. Use the latest directional LED technology and smart dimming systems to create ‘dark corridors’ where lighting is minimized or turned off during peak wildlife activity periods. By carefully plotting these dark zones to align with land bridges and underpasses, the city remains connected for wildlife 24 hours a day, not just when the sun is up.

Building for 150 Years Via Resilience and Adaptability

Designing a transport system for a conurbation of one million people that will last for 150 years requires a fundamental break from the status quo.

Designing a transport system for a conurbation of one million people that will last for 150 years requires a fundamental break from the status quo. Our recommendations integrate the themes of resilience, modularity, and nature-based solutions to ensure the city thrives over a 150-year horizon.

Spatial Planning: The Transit-Oriented Development Model

Concentrate the one million population along high-capacity mass transit corridors (rail, light rail, metro) radiating from the core areas, separated by ‘Green Wedges’ of protected biosphere. High-density mixed-use development at transport nodes ensures that mass transit is financially viable and minimises transport poverty by bringing services closer to residents. The Green Wedges act as flood plains, urban cooling zones, and biodiversity corridors, protecting the city from climate shocks.

Infrastructure Standards

Mandate 150-Year Design Life standards for all core civil engineering assets. Bridges, tunnels, and main embankments must be built to last 150 years (ideally referencing the Champlain Bridge standard). The systems within these structures (stations, signaling, energy, surface finishes) must be modular and swappable. This ‘shell and core’ concept allows the infrastructure to adapt to unknown future technologies (e.g. hyperloop, autonomous pods) without requiring demolition. All modular components must be designed for disassembly, ensuring materials can be recovered and reused at the end of their cycle

Implement Blue-Green Grids

Transport corridors can also act as corridors for nature and water. Every new road, rail line, and busway must include integrated Nature Based Solutions (NBS). This includes, but not limited to, swales for drainage, wildlife crossings, and continuous pollinator pathways. Transport budgets must include a ring-fenced percentage (e.g. 10%) for NBS implementation and long-term maintenance. This mitigates the Urban Heat Island effect of a dense city of one million and manages extreme rainfall events without overloading sewer systems.

The Digital Twin Mandate

Require a full-lifecycle Digital Twin for all major infrastructure projects. The Digital Twin must be used for stress-testing resilience against climate scenarios (e.g. +4°C world) before construction begins. It should serve as the living ‘owner's manual’ for the city, tracking asset condition and informing predictive maintenance for the next century. Data from the Digital Twin should be open (where security permits) to allow the ‘living lab’ ecosystem of startups and researchers to innovate on top of the city's infrastructure.

Reducing Whole Life Carbon Emissions Through Lifecycle Management and New Materials

The most effective strategy for reducing embedded carbon is to rigorously apply the carbon reduction hierarchy, starting with the principle of ‘Build Nothing’. Infrastructure planning must prioritise demand management and digital substitution over the creation of new physical assets. Before any new road or rail project is approved, authorities should exhaust all possibilities for upgrading or retrofitting existing assets. By extending the life of existing structures through preventative maintenance and technological upgrades, the massive ‘carbon mortgage’ associated with new materials can be avoided entirely.

When new infrastructure is unavoidable, the design phase must focus on ‘Building Less’ through route and structural optimization. Engineers should prioritize alignments that follow natural topography to minimize the need for carbon-intensive earthworks, tunnels, and viaducts, which represent the largest concentrations of embodied carbon in transport projects. Lean design principles should be mandated to ensure material quantities are optimized to meet performance standards without over-specification.

A critical shift is required in material specification, particularly regarding concrete and asphalt, which typically account for the majority of a project's embodied carbon. Standard Portland cement should be replaced wherever possible with low-carbon alternatives such as geopolymer concrete, calcined clay cements, or mixes with high replacement rates of ground granulated blast-furnace slag (GGBS). For road infrastructure, the use of warm-mix asphalt and the incorporation of recycled aggregates and reclaimed asphalt pavement should become the default standard. These substitutions can drastically lower the carbon intensity of the ‘product stage’ (A1-A3) without compromising structural integrity.

Where structural demands permit, there should be a strategic shift toward bio-based materials and lower-carbon metals. Timber, specifically engineered wood products like Cross Laminated Timber (CLT) and glulam, should be prioritized for station canopies, footbridges, and noise barriers. Unlike concrete and steel, which emit carbon during production, sustainably sourced timber acts as a carbon store, effectively turning parts of the infrastructure into a carbon sink.

To address carbon over a long-term horizon, infrastructure must be designed for circularity and disassembly. We must move away from the ‘demolish and dispose’ model to one where assets are viewed as ‘material banks’ for the future. Components should be designed with mechanical connections that allow them to be easily deconstructed and reused at the end of their service life. This should be supported by the use of ‘Material Passports’—digital datasets that track the specifications and history of materials—ensuring that steel beams or concrete panels installed today can be certified for reuse in 100 years, retaining their embodied carbon value rather than being downcycled or landfilled.

Finally, these technical strategies must be enforced through robust procurement and governance frameworks. A Shadow Carbon Price should be applied during the appraisal of all projects, assigning a high monetary value to carbon emissions to ensure that high-carbon options are financially unattractive. Procurement tenders must mandate Environmental Product Declarations (EPDs) for all key materials, setting strict limits on the allowable embodied carbon per unit. By contractually binding the supply chain to these targets, authorities can drive market demand for low-carbon innovations and ensure that carbon reduction is treated with the same rigor as cost and schedule.

Recognising Freight as an Economic Engine

Urban logistics is the metabolism of the city. It is the flow of food, medicine, consumer goods, and waste that keeps the urban organism alive. Yet, despite its critical importance, freight is frequently treated as an afterthought in urban planning—a 'technical' problem left to the private sector to optimize, rather than a political or social issue for city makers to govern. This neglect has consequences. In many European cities, over half of local authorities lack a specific freight policy.
Forest City, must reject the technical-rational model which views the city merely as a neutral surface for supply chains. Instead, we must recognise that logistics shapes the city. It dictates the spatial structure, influences land values, and affects the lived experience of every citizen. The movement of goods involves material flows, financial flows, waste, and crucially, human labour.

Combatting Logistics Sprawl through Industrial Intensification

One of the most pervasive trends in modern urbanism is 'logistics sprawl'—the migration of warehousing and distribution centres from the urban core to the periphery. Driven by rising land values and gentrification in city centres, logistics operators are pushed to cheaper suburban land. While this makes individual depots cheaper to operate, the systemic cost is enormous. Delivery vehicles must travel further to reach consumers, increasing Vehicle Miles Travelled (VMT), emissions, and congestion on arterial roads.

Furthermore, logistics sprawl has a profound social impact. It spatially disconnects low-income workers from job opportunities. Warehousing jobs, often entry-level positions vital for social mobility, move to locations inaccessible by public transport, forcing workers into car dependency or unemployment.

We recommend a strict zoning policy of **Industrial Intensification.** We must protect strategic industrial land within the city limits from residential encroachment. But more than protection, we need innovation. The city plan should support **mixed-use logistics developments.**

Vertical Logistics: In high-density districts, zoning should require multi-storey logistics facilities. Ground floors and basements can serve as local freight centres or 'dark stores' for

rapid delivery, while upper floors accommodate offices or even residential units (provided noise attenuation meets strict standards).

Micro-Hub Integration: Every new residential neighbourhood or commercial district exceeding a certain gross floor area (e.g. 2,000 sqm as seen in Tokyo standards) should be legally required to provide off-street loading and consolidation space. By keeping logistics proximate, we reduce stem mileage for vehicles and keep employment accessible to residents without cars, directly tackling social exclusion.

A Tiered Hierarchy of Consolidation Centres

The current model of urban delivery is highly inefficient. A single high street shop might receive deliveries from five different suppliers in five different vans, each half-empty. This fragmentation consumes road space and generates unnecessary emissions. The solution is consolidation—bundling goods from multiple carriers into fewer, fuller vehicles for the final leg of the journey.

We propose that the city treats its consolidation network as **public utility** infrastructure, akin to water pipes or electricity grids. The city should construct and own the delivery infrastructure, leasing it to operators to lower barriers to entry.

1. **Strategic Gateways (The Outer Ring):** Located at the intersection of inter-city rail and highway networks, these massive facilities receive heavy goods. They must be multimodal, giving the option for rail freight to reduce pressure on regional roads.
2. **Urban Consolidation Centres (UCCs - The Middle Ring):** Located at the edge of the larger centres. Here, goods are transferred from larger vehicles to electric vans or e-bikes. Experiences from cities like Utrecht and Amsterdam show these centres are most effective when paired with ‘noise-sensitive delivery windows’, allowing night-time access that relieves daytime congestion.
3. **Micro-Hubs (The Inner Capillaries):** Located within neighbourhoods—potentially repurposing underused car parks or municipal basements. These serve as the launchpad for walkers and cargo bikes.

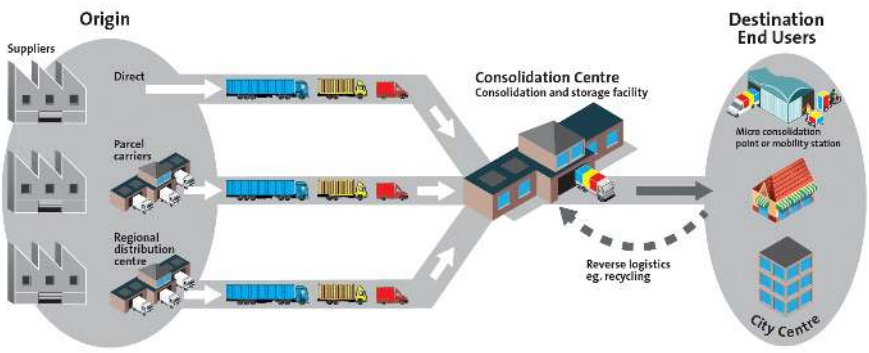


Fig. 4.5.5 Example Freight Consolidation Model in the West of England (TravelWest, 2023)

The Cargo Bike Revolution

For the last mile in dense residential zones, even the electric van is too large and intrusive. The future of urban delivery is human-scale. In residential areas and main centres, delivery by internal combustion engine is banned or heavily priced, while delivery by cargo bike is prioritised.
Infrastructure design is critical. Cycle lanes must be wide enough (2.5m+) to accommodate cargo bikes, which are wider and heavier than standard bicycles. We must also provide secure cargo bike corrals for parking, as lack of secure storage is a major barrier to adoption for small businesses.

Dynamic Kerbside Management

The kerb is the most contested real estate in the city. It is fought over by parked cars, delivery vans, buses, taxis, and cyclists. In most cities, kerb management is static—a metal sign says “Loading Only 8am-6pm”. This is inefficient; spaces sit empty when not used by vans, or vans double-park when spaces are full.

We propose implementing **Dynamic Kerbside Management.** This digitizes the kerb, allowing different uses at different times of day based on real-time demand. Logistics operators can book a specific 15-minute loading window via an app. This guarantees them a space, reducing the ‘cruising time’ and emissions associated with searching for loading areas. A space might be a loading zone from 4am to 10am, a food truck spot from 11am to 2pm, and a pick-up/drop-off zone for ride-hailing in the evening.

The city can charge for these slots, with higher prices during peak hours. This sends a price signal that encourages **retiming**—moving deliveries to off-peak hours when the city is quieter.

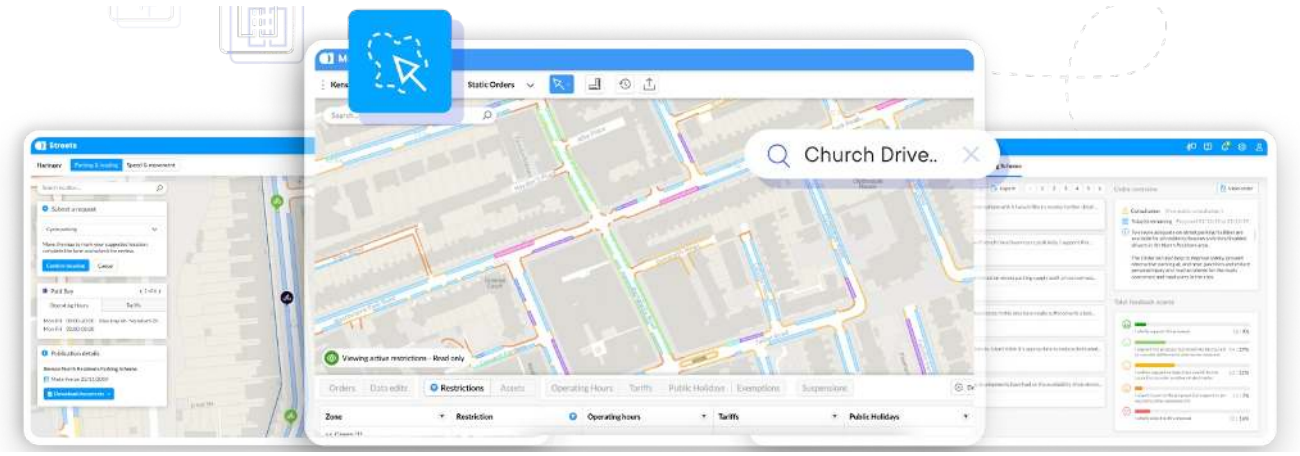


Fig. 4.5.6 Example of a Digital Kerbside system (Appyway, 2025)

6. Financing Forest City's Transport Infrastructure

Introduction

Financing the construction of a city of the scale of Forest City will likely be a significant challenge. This is not only the cost of the capital outlay for construction, but issues of ongoing maintenance, financing of services, and the opportunities to raise revenue - either through direct charges or general taxation to fund them. In this section, we provide some food for thought on this, based on the UK experience with infrastructure financing through a series of public, private, and public-private models. We also provide some initial estimates of costs of some of the major infrastructure needed for Forest City.

Anticipated Capital Outlay for Infrastructure

The Working Group was asked to identify potential costs for construction of the transport infrastructure needed to deliver Forest City. At such an early stage of development, costs of infrastructure are tricky to forecast accurately, as the scope of infrastructure may change, the specifications of it may change, and a vast array of other uncertainties affecting the costs may come to bear. There is an engineering adage that you only know the true cost of a scheme once you put a spade in the ground, and that is not without precedent.

We have based our forecasts by using a Reference Class Analysis, or Reference Class Forecasting as it is sometimes referred to as. The methodology is as so:

1. Gather together information on similar projects that have been delivered, including their technical specifications, estimated costs, and actual outturn costs
2. Calculate the average cost per unit of that infrastructure. For example, new roads and railways are £ per kilometre constructed
3. Calculate the Standard Deviation, so that the variance in costs is understood
4. Create an adjustment factor. This was done based upon the 80th percentile of the variance observed,. For example, if the data showed that the 80th percentile project ran 35% over budget, an adjustment factor of 1.35 would be added to the average cost per unit.
5. Calculate the adjusted cost per unit by applying the formula Adjusted Cost Per Unit = Average Cost Per Unit x (1 + Adjustment Factor)

6. Use the Adjusted Cost Per Unit

These calculations for the different types of infrastructure considered as part of Forest City are shown below.

It should be noted at this stage that, despite including international examples in our analysis, publicly-available data on scheme specifications, estimated costs and outturn costs was somewhat tricky to find across most of the types of infrastructure. Furthermore, some of types of infrastructure showed significant degrees of variation in costs, notably Busways and Heavy Rail. Our ability to adjust for these factors was affected by the time available to undertake this work. As a consequence, our confidence in these estimates is **Medium,** namely they have been derived by a methodologically sound method, but are likely to be affected by significant variances.

Type of infrastructure	Unit	Average cost per unit	Standard Deviation	Uplift Factor	Adjusted costs per unit
Busway	Kilometre	£7,951,808.41	£6,155,348.69	1.24	£17,812,050.85
Cycle Links	Kilometre	£1,401,805.47	£2,913,027.83	0.19	£1,668,148.50
Drone Delivery	Landing / Take off Point	£851,503.57	£792,713.32	0.17	£999,097.52
Freight Consolidation	Consolidation Centre	£708,650.00	£343,716.60	0.20	£853,529.56
Heavy Rail	Kilometre	£47,142,333.48	£59,028,889.13	0.99	£93,598,960.30
Highways	Kilometre	£30,929,783.95	£25,932,324.15	0.85	£57,315,636.33
Junctions	Number of junctions	£158,037,000.00	£119,701,401.50	0.24	£196,008,023.20
Light Rail	Kilometre	£62,019,720.81	£31,128,998.09	0.20	£74,423,664.97

Table 4.1.8 Outcomes of Reference Class Analysis for Forest City

Using this baseline, we have calculated a range of costs for the core infrastructure to be delivered to support Forest City. The purpose being to get an overall indication of the cost of the most important infrastructure needed for Forest City to develop. This infrastructure has been identified as the following:

- Heavy Rail connections to Cambridge and to Stansted Airport (the low cost option not including a link to Stansted Airport, and the highest cost option including this option)
- Upgrade to Cambridge Station (2 platforms assumed)
- Haughley Junction Upgrade
- Mass Transit Lines 1 to 3 (the low cost option being tram, the high cost option being S-Bahn)
- Park and Ride sites on the edge of the city
- Greenway network of walking and cycling routes
- The highway network of the city, assumed to be 2500km
- Distributor Road to the East and South, assumed to be 50km in length
- A14 Upgrade between A10 and M11 (the low cost option being just a Smart Motorway, and the high cost option being a Smart Motorway plus an additional lane in each direction)
- Freight consolidation centres (x3)
- A Traffic Management System

Unless otherwise stated, the lowest cost option is based on the average cost per unit of that particular infrastructure, and the highest cost option being the average cost per unit plus the adjustment factor.

As expected, there is a significant cost range estimated from our work. We estimated that in the lowest cost scenario, the transport infrastructure cost of Forest City would be **at least £8.61 billion.** Meanwhile, the highest cost options would be **at least £16 billion.**

We also gave an assessment of our confidence in the costings for individual items. Whilst our overall confidence in our cost estimates is **Medium** (reflecting the early stage of development and limited sample sizes of some infrastructure types), we used a range of confidence levels.

Low reflects either significant variances of costs in this specific type of infrastructure, or a limited sample size in our analysis. **High** reflects low variances in the costs of these schemes, and a good sample size of schemes in our analysis.

Item	Option	Estimated Cost	Confidence
Heavy Rail Link (including stations)	Low (Dullingham to Forest City Central)	£1.3 billion	Medium
	High (Dullingham to Stansted Airport)	£4.2 billion	
Double-tracking Cambridge to Newmarket	Low	£414 million	Medium
	High	£823 million	
Cambridge Station Upgrade	Low	£54 million	Medium
	High	£96 million	
Haughley Junction Upgrade	Low	£95 million	Medium
	High	£187 million	
Mass Transit Lines (core network)	Low (tram)	£4 billion	Medium / Low
	High (S-Bahn)	£5 billion	
Park and Ride Sites (x3)	Low	£30 million	High
	High	£78 million	
Greenway Network	Low	£300 million	High
	High	£333 million	
Highway Network (est. 2500 km)	Low	£77 million	Medium / High
	High	£143 million	
Distributor Road (est. 50km)	Low	£1.5 billion	Medium
	High	£2.8 billion	

Table 4.1.9 Estimated costs of core transport infrastructure

Item	Option	Estimated Cost	Confidence
A14 Upgrade (A10 to M11)	Low (Smart Motorway)	£379 million	Low
	High (Extra Lane + Smart Motorway)	£2 billion	
Junction Upgrades (A14 / A11, M11 / A11, A14 / A10)	Low	£474 million	Medium
	High	£588 million	
Freight Consolidation Centres (x3)	Low	£171 million	Medium / High
	High	£187 million	
Traffic Management System	Low	£16 million	High
	High	£18 million	
Total	**Low**	**£8.61 billion**	Medium
	High	**£16 billion**	

Table 4.1.9 Estimated costs of core transport infrastructure

Infrastructure Financing Options

In the post-PFI landscape, no single model can serve as a universal solution. Instead, the government and industry are coalescing around a suite of specialized models, each designed to handle specific risk profiles and asset classes. The following sections analyze the three most viable frameworks for strategic road and rail: the Regulated Asset Base (RAB), the evolving Public-Private Partnership (PPP/MIM), and Land Value Capture (LVC).

The Regulated Asset Base (RAB) Model

The RAB model is the bedrock of the UK's privatised utility sectors (water, energy, rail networks). It functions by calculating the total value of the capital assets used to provide a regulated service. An independent economic regulator (such as Ofwat, Ofgem, or the ORR) then determines an 'allowed revenue' that the company can recover from consumers. This revenue covers operating costs (Opex), depreciation, and a return on the capital invested (WACC - Weighted Average Cost of Capital).t

Historically used for maintaining existing networks, the RAB model has recently been adapted for single-asset ‘greenfield’ projects. This Greenfield RAB model is distinct because it allows the project company to start charging customers during the construction phase, rather than waiting for the asset to be operational.

Currently, the government is proposing to use a RAB model for the **Lower Thames Crossing**, a £9 billion road tunnel connecting Kent and Essex. This is a pioneering application of utility regulation to the strategic road network. Under this proposal, a private company (LTC Co) would finance and build the tunnel, regulated by the Office of Rail and Road (ORR). The revenue stream would likely come from ‘shadow tolls’ paid by the government or direct user charges, but protected by a regulatory settlement that guarantees a return on efficient investment.

The primary merit of the RAB model is its ability to lower the cost of capital. By providing a regulatory backstop and allowing early revenue, it reduces the risk premium demanded by investors. It is particularly effective for ‘mega-projects’ where the construction period is long and capital requirements are vast (e.g. Sizewell C nuclear plant).

However, the risk allocation is controversial. Construction risk—traditionally borne by the private sector in PFI—is partially transferred to the consumer in a RAB model. If the project goes over budget, the ‘allowed revenue’ may be adjusted upwards, increasing bills. This shields investors but exposes the public (or bill-payers) to cost overruns.

Feature	RAB Model Characteristics
Primary Funding Source	User charges (bills/tolls) or taxpayer subsidy via regulated revenue.
Risk Transfer	Shared. Investors take some performance risk; consumers take some construction cost risk.
Cost of Capital	Low (typically WACC driven). Attractive to pension funds/insurers.
Regulatory Burden	High. Requires bespoke license and active oversight by an independent regulator.

Table 4.2.1 Features and characteristics of the RAB model

The Mutual Investment Model (MIM)

While England placed a moratorium on PFI, the Welsh Government evolved the concept into the Mutual Investment Model (MIM). This model retains the core Design-Build-Finance-Maintain

While England placed a moratorium on PFI, the Welsh Government evolved the concept into the **Mutual Investment Model (MIM).** This model retains the core Design-Build-Finance-Maintain (DBFM) structure of PFI—ensuring assets are maintained for 25-30 years—but introduces critical governance changes to address PFI's transparency deficits.

The defining feature of MIM is the public equity stake. The public authority (e.g. Welsh Government) acts as a co-investor, taking up to 20% of the equity in the Special Purpose Vehicle (SPV) delivering the project. This entitles the public sector to a share of any financial surpluses (e.g. from refinancing gains) and grants it a seat on the board of directors. This open book approach creates an alignment of interest that was absent in the adversarial PFI contracts.

Market participants, including major contractors and advisors like PwC, are advocating for a broader 'Public-Private Partnership 2.0' adoption in England based on the MIM principles. However, a critical barrier remains: construction risk. Following the collapse of major contractors like Carillion and ISG, the construction sector has largely withdrawn from fixed-price, date-certain contracts for complex infrastructure.

To make PPP 2.0 viable for new rail or road links, the model must evolve further. Recommendations from the market suggest that the public sector may need to retain certain risks that the private sector cannot efficiently price, specifically **inflation risk** on materials and labor. A 'pain/gain' share mechanism for construction costs, rather than a hard fixed price, is seen as essential to bringing Tier 1 contractors back to the bidding table.

Land Value Capture (LVC)

Land Value Capture is distinct from RAB and PPP in that it is a funding source rather than just a financing structure. It is predicated on the Henry George theorem: public investment in infrastructure (especially rail) generates massive unearned windfalls for private landowners. A study of the Montreal Metro cited in the indicates that land values increase by 13% within 500 meters of a new station and **10% within 1km.** LVC seeks to capture a portion of this uplift to pay for the infrastructure that created it.

Transport for London (TfL) successfully used LVC for the Northern Line Extension to Battersea. A Tax Increment Financing (TIF) zone was created, allowing TfL to borrow against the future growth in business rates in the Nine Elms enterprise zone. Crossrail was similarly funded via a Business Rate Supplement (BRS) and Community Infrastructure Levy (CIL).

Another example is the E-Rail Model. This is a commercial approach where a private entity secures option agreements with landowners. The landowners agree to pay a percentage of their land's future value uplift conditional on the railway obtaining planning permission and being built. This effectively makes landowners co-investors in the rail line.

For strategic rail links, LVC is potentially transformative. If a route passes through agricultural land (valued at c. £20k/hectare) which, if rezoned for housing around new stations (e.g. Tempsford), would skyrocket in value to residential rates (c. £2m+/hectare). Capturing even 20-30% of this 100x uplift could fund a significant portion of the capital cost.
The risk is that the value uplift is realized only after the infrastructure is built and housing sold, whereas construction capital is needed upfront. This requires the government or a development corporation to front-fund the project against future receipts. It is also legally difficult to prove exactly how much value rise is due to the rail line versus general market inflation, leading to valuation disputes.

7. Next Steps

Introduction

The journey of transport master planning is rarely linear, but it typically follows a distinct rhythm. The initial phases are characterised by expansive thinking—visioning, goal-setting, and the broad articulation of a desired future. This is the ‘blue sky’ phase, where ambition is the primary currency. However, as the process transitions into the next steps, the nature of the work undergoes a fundamental shift. We will soon enter the ‘delivery pivot’. This is the moment where the broad brushstrokes of strategy must be resolved into the sharp lines of investable, deliverable, and socially acceptable projects.

For this next stage, three pillars will determine the success or failure of the master plan: Governance, Technical Rigour, and Community Co-creation.

Governance: The Architecture of Decision Making

Before a single line is drawn on a map or a single workshop is convened, the governance structure must be established. It is the skeleton of the master plan. Without a robust governance architecture, the project will collapse under the weight of competing stakeholder demands, technical contradictions, and political cycles.

Best practice in major transport programmes dictates a ‘tiered’ governance structure. This separates strategic direction (political) from operational delivery (technical) while ensuring clear lines of communication between the two. Conflating these layers is a common failure mode; when politicians get involved in the minutiae of junction design, or engineers attempt to set political strategy, the programme stalls.

We recommend a three-tier model, inspired by the structures used by **Transport for the North and Midlands Connect.**

The Sponsoring Board (Strategic Level)

At the apex of the structure sits the Sponsoring Board. This group owns the vision. Its primary role is to provide political cover for the difficult trade-offs that are inevitable in transport planning.

- **Composition:** This board should include senior decision makers within Forest City, and representatives from key external partners (e.g. local councils).
- **Remit:** They provide the strategic direction. They do not approve the technical methodology; rather, they approve the outcomes of that methodology. Their focus is on the 'Gateway' decisions—giving the green light to move from one phase to the next.

The Programme Board (Executive Level)

Beneath the Sponsoring Board is the Programme Board, often chaired by the **Senior Responsible Owner (SRO).** The SRO is the single individual personally accountable for the success of the programme.

- **Role:** This board is the engine room. It manages the budget, the schedule, and the risk register. It resolves conflicts between different workstreams (e.g. when the environmental team conflicts with the highways engineering team).
- **Delegated** Authority: Crucially, the Sponsoring Board must delegate financial and decision-making authority to this group within agreed tolerances. For example, the Programme Board should have the power to approve spend up to a certain threshold without returning to the Sponsoring Board, ensuring agility.

The Technical Steering Group (Operational Level)

The foundation of the structure is the Technical Steering Group. This body assures the quality of the evidence base.

- **Composition:** Technical leads, external consultants, and subject matter experts (e.g. air quality scientists, traffic modellers).
- **Function:** They debate the nuances of the transport model, the methodology of the consultation, and the technical details of option appraisal. They ensure that the work complies with WebTAG (Transport Analysis Guidance) and other statutory requirements.

The Gateway Review Process

Self-regulation in major projects is rarely effective due to ‘optimism bias’—the tendency for project teams to underestimate costs and overestimate benefits. To counter this, a possible method to use is the Gateway Review process.

The Gateway process introduces ‘checkpoints’ where an independent team (peers from other authorities or external experts) reviews the health of the project before it can proceed.

Gateway	Item	Item
Gate 0: Strategic Assessment	Programme-wide	Does the plan align with the Climate Emergency declaration? Is the scope realistic given the budget?
Gate 1: Business Justification	Project-specific	Is there a robust strategic case? Have we identified a shortlist of viable options? Is the stakeholder support confirmed?
Gate 2: Delivery Strategy	Procurement	How will we buy the necessary services? Is the supply chain capacity available?
Gate 3: Investment Decision	Final Approval	Is the Full Business Case (FBC) complete? Is the funding secured?

Table 4.2.2 Example Gateways for the Masterplan

Implementing these gates now prevents the sunk cost fallacy later. If the case for progressing is weak, Gateways will catch this before more money is spent.

Managing Risk and Uncertainty

A robust governance structure must actively manage uncertainty, not just risk. While risks are events that might happen (e.g. ‘funding bid rejected’), uncertainty relates to the fundamental unknowns of the future context (e.g. "Will working from home persist at current levels?").

The governance bodies should maintain a dynamic **Uncertainty Log**, as mandated by WebTAG Unit M4. This log categorises external factors into:

- Near Certain: Things included in the core model (e.g. committed housing developments).
- More than Likely: Things included in sensitivity tests.
- Reasonably Foreseeable: Things noted as risks.
- Hypothetical: Things excluded from the core analysis.

The Technical Steering Group updates this log, and the Programme Board uses it to stress-test the master plan. For instance, “Does our proposed rapid transit network still stack up if commuter demand drops by 15%?”

Community Co-creation: The Engine of Legitimacy

If governance is the skeleton, community co-creation is the muscle that moves the master plan forward. The failure to engage effectively is the single most common cause of project delay and cancellation. We must distinguish between **Consultation** (statutory obligation, often passive) and Co-creation (active partnership). The master plan should aim for the latter. This involves moving up the ‘Ladder of Participation’ from ‘Informing’ to ‘Empowering’.

The Citizen Assembly: Deliberative Democracy in Action

One of the most powerful tools for resolving the complex trade-offs inherent in transport planning is the Citizen Assembly. Unlike a town hall meeting, which tends to attract those with the strongest (and often most negative) views, a Citizen Assembly is designed to be representative of the silent majority.

The recruitment process uses a technique called Sortition (random selection).

1. **Invitation:** Thousands of letters are sent to random addresses across the region.

2. **Selection:** From the pool of respondents, a stratified sample is selected to match the demographic profile of the area (age, gender, ethnicity, income, and geography).
3. **Inclusivity:** Crucially, participants are often remunerated for their time (e.g. with vouchers or a stipend). This removes barriers to entry for low-income residents, single parents, and young people—groups often excluded from traditional planning. It ensures the room reflects the community, not just the 'usual suspects'.

The Assembly does not just vote; it learns. The process typically spans several weekends:

- **Learning Phase:** Independent experts (climate scientists, transport planners, public health officials) present evidence. They explain the constraints: "We have limited road space; we cannot have wide pavements, cycle lanes, and parking".
- **Deliberation Phase:** Participants work in small groups, facilitated by neutral moderators, to discuss these trade-offs. They explore the 'why' behind their preferences.
- **Decision Phase:** The Assembly produces a set of recommendations or 'guiding principles' for the Master Plan.

Co-design Workshops and 'Walkshops'

While Assemblies act at a strategic level, Co-design Workshops are essential for specific schemes or corridors. These sessions bring technical planners and local residents together to design solutions.

Standard workshops often revolve around maps on tables, which can be abstract and confusing. A Walkshop takes the process to the street. Planners and residents walk the route together.

- **Mechanism:** A resident pointing to a junction and saying, "I can't cross here with my pram because the green man is too short", provides qualitative data that a traffic model might miss.
- **Trust Building:** This visible presence of planners on the ground demonstrates a commitment to understanding the lived experience of the community.

Digital Engagement: Reaching the Silent Majority

Physical workshops are deep but narrow. To achieve breadth, the Master Plan must utilise **Digital Engagement Tools (PropTech).**

Tools like **Commonplace, Remesh,** or **Stickyworld** allow residents to drop “pins” on a digital map of their area to leave comments (e.g. “Need a bike rack here, "Speeding traffic here”). The real power lies in the analytics. Natural Language Processing (NLP) can analyse thousands of comments to generate heat maps of sentiment. This converts qualitative opinion into quantitative data that can sit alongside traffic flow data in the evidence base.

The public often opposes change because they cannot visualise it. Digital Twins or 3D models allow residents to see before and after scenarios on their smartphones/tablets. For example, Southampton City Council used 3D modelling to help residents explore local plan proposals. This transparency reduces the fear of the unknown and often softens opposition to infrastructure changes.

Integrating Co-creation with Technical Work

The Golden Thread must connect the co-creation outcomes to the technical workstream. It is not enough to just ‘listen’; the feedback must change the model. For instance, if the Citizen Assembly prioritises ‘safety’ over ‘speed’, the technical team must adjust the **Multi-Criteria Analysis (MCA).** Feedback from the digital engagement should be imported as a layer into the GIS (Geographic Information System) used by the planners. This ensures that when an engineer looks at a junction, they see not just the traffic count, but the community's safety concerns overlaying it.

Technical Workstream: The Evidence Base

While co-creation provides the legitimacy, the technical workstream provides the deliverability. A Transport Master Plan must be built on a foundation of rigorous data and robust modelling. If the evidence base is weak, the wrong solutions will be delivered.

Historically, transport planning relied on Roadside Interview Surveys (RSIs) and Household Travel Surveys (HTS). These methods are expensive, disruptive, and offer only a snapshot in time (often a single day in November). The industry is currently undergoing a paradigm shift towards the use of Mobile Network Data (MND).

MND utilises the signalling data from mobile phones as they connect to cell towers. By triangulating these connections, Mobile Network Operators (MNOs) like O2/Telefonica or Vodafone can anonymously track the movement of millions of devices across the transport network.

This has a number of advantages over traditional methods:

- **Sample Size:** MND typically captures 30-40% of the adult population, compared to <1% for manual surveys. This allows for a statistically significant analysis of even minor routes.

- **Temporal Granularity:** MND collects data 24/7, 365 days a year. This is critical for understanding the ‘Leisure Economy’ and weekend travel, which traditional peak-hour models often ignore.
- **True Origin-Destination (OD):** Roadside cameras only see a vehicle at a single point. MND sees the entire journey, from home to work, revealing the true demand patterns that drive congestion.

The Master Plan will also likely require a hierarchy of models to answer different questions. Strategic Demand Models (Macro) answer the Big Questions. (e.g. "If we build a new ring road, does it induce demand? Does it reduce city-wide carbon emissions?"). It uses Gravity Models to distribute trips based on land use (housing/jobs) and ‘Logit Models’ to predict mode choice (Bus vs. Car) based on cost and time. This model provides the headline figures for large scale planning.

Microsimulation Models (Micro) test the ‘Operational Reality’. These individuals and vehicles (including aggression levels, gap acceptance). They are essential for designing specific junctions or bus priority corridors. It proves that a scheme works in practice, not just in theory.

The ‘Golden Thread’ and Next Steps

The ultimate success of the Master Plan depends on the Golden Thread—a clear narrative line that connects the high-level vision (defined by the Sponsoring Board and Citizen Assembly) to the detailed Technical Appraisal (conducted by the Steering Group).

Immediate Recommendations (The First 100 Days)

To operationalise this framework, we recommend the following immediate actions:

1. **Establish the Governance:** Within Month 1, formally constitute the Sponsoring Board, Programme Board, and Technical Steering Group. Draft and sign off their Terms of Reference (ToR).
2. **Commission the Gate 0 Review:** Invite an independent peer team to conduct a 'Strategic Assessment' review. Use this to validate your scope and budget before fully committing.
3. **Launch the 'Transport Futures' Assembly:** Tender for an independent facilitation partner (e.g. Involve or similar) to recruit and run a Citizen Assembly. Aim for the first session to coincide with the 'Option Generation' phase.
4. **Audit the Data Assets:** Conduct a 'Data Gap Analysis'. Determine if existing models are fit for purpose (e.g. are they multi-modal? Do they cover weekends?). Initiate the procurement of Mobile Network Data (MND) to plug these gaps.
5. **Develop the Appraisal Framework:** Draft the MCA criteria now. Don't wait until options are generated. Defining what success looks like early prevents retro-fitting the criteria to suit pet projects.

Conclusion

The next stage of the master planning exercise is the most critical. It is the bridge between the dream and the reality. It requires a difficult balance: the political courage to hold the vision, the humility to co-create with the community, and the technical discipline to prove the case.

By adopting the tiered governance structure, embracing the deliberative power of Citizen Assemblies, and harnessing the granularity of new forms of data, you can build a Master Plan that is not just a document on a shelf, but a resilient, deliverable roadmap for Forest City.

Endnotes

[35] We go into the data in some of these areas later in this report
[36] For a comparison, TRSE for West Suffolk, Ipswich and Great Yarmouth are 23%, 16% and 70% respectively https://www.transporteast.gov.uk/strategy/latest-projects/trse/
[37] The 2021 Census was significantly impacted by movement restrictions associated with the COVID-19 Pandemic. Department for Transport guidance urges caution when using both 2011 and 2021 Census data, so consequently we have shown data from both the 2021 and 2011 Census' here.
[38] Census 2021 Travel to Work Data is not shown due to issues associated with COVID-19 restrictions affecting the Census
[39] This refers to people with mobility aids travelling using these aids, for example a wheelchair.
[40] Drivers of Internal Combustion Engine cars who are expected to be at the tail end of the transition to electric vehicles
[41] A Reference Class Analysis, or Reference Class Forecasting, predicts the outcome of a planned action based on actual outcomes in a reference class of similar actions to that being forecast. In this case, what is being forecast is infrastructure costs.
[42] Both figures cited here are based on a Reference Class Analysis of similar scheme types undertaken for this work - for heavy rail and metro style services.
[43] The 2021 Census was significantly impacted by movement restrictions associated with the COVID-19 Pandemic. Department for Transport guidance urges caution when using both 2011 and 2021 Census data, so consequently we have shown data from both the 2021 and 2011 Census' here.
[44] Commuting trips sourced from Transport for West Midlands (2024). Time estimates based on estimates of capacity of modes per hour derived from TUMI, (2021)
[45] Both figures cited here are based on a Reference Class Analysis of similar scheme types undertaken for this work - for heavy rail and metro style services.

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Report 5. Four-bed Home Cost Feasibility

By Edward Collinson & James Bonham

1. Introduction

Overview

Forest City is an incredibly ambitious plan for a one million person city in the East of England situated near Cambridge; a city with one of England's most acute housing demand.

This report assesses the feasibility of delivering a 4-bedroom family house using modern methods of construction (MMC) within the cost parameters set out in the brief. A 4-bed home will not be the only housing type in Forest City, but it is a paradigmatic one, and also central to repairing the social contract; one of the most important elements in Forest City's vision.

Whilst the overall Forest City plot site is 45,000 acres, the area expected to be allocated for housing, after 12,000 acres of woodland and 8,000 acres of commercial space are taken into account, is around 20-22,000 acres. With approximately 4000,000 homes for one million people, this leaves densities to run at around 45-49 dwelling per hectare (dph), comparable to the average density of central London, but significantly lower than boroughs such as Islington and Kensington & Chelsea which average 74 dph[43].

Ensuring that housing is highly affordable, (e.g. a cited 60% discount on current Cambridge prices), is vital. It will mean much faster market absorption rates, therefore permitting quicker overall buildout times. Locking down approximate housing unit costs is therefore key to modelling the project's overall viability in the masterplanning stage.



The initial conclusions of this report suggest that significant innovation will be required to achieve this, not solely in terms of construction methods but also in vertical integration, delivery methods, ownership structures and supply chain management to reach an approximate 40% reduction in current benchmark delivery costs for equivalent homes in the UK. The exact strategic framework will need to be iterative and contingent on further investigation.

We recognise the significant challenge here. But there is also an extraordinary opportunity for transforming the envelope of possibility for housing delivery models in the UK that can create high quality, sustainable housing at scale.

The Brief

The brief identified a target build cost of £200,000 (factory or build cost) and an upper threshold of approximately £250,000 including groundworks, and seeks to understand whether these targets are achievable within current market conditions in order to retail the same unit for £350,000 to ensure sufficient budget for high specification finish, healthy margins for innovative developers and to pay back for the cost of land procurement and infrastructure.

The purpose of this report is not to develop a detailed design or propose a finished housing product. Instead, it provides a reality check against prevailing construction costs, using a representative timber frame house type to test the gap between normal market delivery and the cost levels required by the brief.

During the course of the analysis, the reference unit size was refined from an initial assumption of approximately 1,900 square feet to a range of 1,500–1,600 square feet, in order to ensure that the feasibility assessment remained aligned with the briefed cost thresholds and reflected what could credibly be delivered as a 4-bedroom family house within the target budget under current market conditions.

The analysis therefore focuses on a typical 4-bed house of approximately 1,500–1,600 square feet, constructed using panellised timber frame and delivered to a standard that is mortgageable and compliant with mainstream UK warranty requirements. This size and construction type reflect what would ordinarily be expected for family housing of this nature and allow meaningful comparison with current market costs.

The report first sets out what a 4-bed timber frame house of this size would normally cost to build in today’s market, based on industry norms and typical cost apportionment. It then examines what the cost structure would need to be to meet the £200,000 and £250,000 targets, and quantifies the level of cost reduction and value engineering required.

The intent is to be explicit about the scale of the challenge and the level of innovation required to meet it. Where the briefed cost targets diverge materially from market norms, this is stated clearly. Where achieving those targets would require fundamental changes to delivery model, scale, or specification, those implications are identified.



Fig. 5.0.1 Typical Georgian Terrace House in Islington, London where densities reach 75 dwellings per hectare

Finally we also provide limited direction on next steps and solutions for systemic cost reductions.

2. Baseline Market Cost for a Typical 4-bed Timber Frame House

This section establishes a baseline market cost for delivering a typical 4-bedroom family house using panellised timber frame construction, against which the briefed cost targets can be tested.

Before setting out the cost breakdown, it is important to be explicit about scope. The costs presented in this section represent what would normally be included in a standard UK build cost for a mortgageable family house and what is excluded.

Cost scope: inclusions and exclusions

This scope reflects a typical ‘build to shell + first fix’ level that would be expected prior to final fit-out, and aligns with how many volume house builders and MMC suppliers assess core build cost.

Inclusions	Exclusions
Groundworks and foundations	Fitted kitchens and kitchen appliances
Primary timber frame structure	Sanitaryware beyond basic allowances
Upper floors and roof structure	Fitted joinery beyond standard doors and skirtings
Windows and external doors	Furniture, fittings, and equipment (FF&E)
Roof coverings	Landscaping, parking surfaces, and external works beyond basic drainage connections
Internal partitions and stairs	Professional fees
First-fix plumbing and electrics	Planning costs
Space heating systems to current regulatory minimums	Finance costs
Site labour, preliminaries, and normal contractor overheads	

Table 5.0.1 Housing parameter inclusions and exclusions

Baseline Assessment

For the purposes of this baseline assessment a representative reference unit has been defined to provide a consistent basis for comparison with prevailing market costs. The reference unit is assumed to be a 4-bedroom family house, arranged as a terraced or semi-detached typology, with a gross internal area of approximately 150m² (1,600 square feet). Construction is assumed to be panellised timber frame, delivered to a mainstream, mortgageable specification with no premium finishes or bespoke detailing.

Publicly available UK-facing benchmarks commonly cite timber frame housing costs in the region of £1,700–£2,300 per m² for complete build costs. These figures are widely referenced across self-build guides, supplier literature and industry commentary, and provide a useful indication of broad market positioning. However, these benchmarks are typically optimistic, blended and inconsistently scoped.

In many cases they combine elements of shell, fit-out, preliminaries, and overheads without clear definition, assume favourable ground conditions, understate contractor risk and preliminaries, or rely on partial client-managed delivery. As a result, they do not reliably represent the likely cost of delivering mortgageable, warranty-backed family housing under contemporary market conditions.

Given these limitations, the methodology adopted in this report is to treat public-facing benchmarks as directional context only, and to apply a more conservative benchmark range to reflect current delivery reality. A research based higher benchmark range base of £2,300–£3,400 per m² has therefore been adopted, incorporating allowances for preliminaries, risk, and the commercial conditions typically associated with developer-led delivery at scale. A midpoint value of £2,850 per m² is used as a reference point within this range to test typical market

delivery against the briefed cost thresholds.

To illustrate the practical implications of this range, the following cost outcomes apply to the defined 150m² reference unit:

- £1,700 per m² → £255,000, representing optimistic self-build or blended assumptions
- £2,300 per m² → £345,000, representing tightly managed developer-led delivery
- £2,850 per m² → £427,500, representing a mid-range stress-test benchmark
- £3,400 per m² → £510,000, representing risk-heavy or less efficient delivery conditions

This range-based approach is intended to stress-test the feasibility of the brief under realistic conditions, rather than to present a best-case scenario. It provides a transparent and defensible basis for assessing the scale of the gap between prevailing market delivery and the cost targets set out in the brief.

The delivery context suggests that the second figure (£2,300 per m²) may be most closely aligned with the Forest City scenario under current market conditions, but to provide a clear and consistent point of reference, the following table adopts the midpoint of the benchmark range (£2,850 per m²) and applies it to the defined 150m² reference unit. This midpoint has been selected to represent a balanced stress-test scenario, avoiding both optimistic low-end assumptions and worst-case delivery conditions, and enabling direct comparison with the cost thresholds set out in the brief.

Cost Category	Typical % of total cost	Total cost (£)
Groundworks and foundations	15.4%	£65,835
Timber frame structure	22.9%	£97,898
Roof structure and coverings	8.0%	£34,200
External envelope (windows, etc)	15.4%	£65,835
Internal structure and partitions	10.3%	£44,033
MEP (plumbing, electrics, heating)	15.4%	£65,835
Site labour and preliminaries	12.6%	£53,864
TOTAL	100%	£427,500

Table 5.0.2 Core Assumptions

Market Capacity and Delivery Model Context

The benchmark cost analysis above establishes the scale of the gap between prevailing market delivery costs and the briefed cost targets. To understand whether this gap could realistically be closed, a review was undertaken of current developer and MMC supplier capacity, delivery models, and indicative cost positioning.



Fig. 5.0.2 Modular housing factory

This review is not intended to provide a comprehensive survey of the market, nor to substitute for formal supplier engagement. Its purpose is to test whether existing delivery models and suppliers operating at scale are currently positioned to deliver housing at, or near the briefed cost thresholds, or whether alternative structures would be required.

Donaldson Timber Systems (DTS)

- Largest offsite timber frame manufacturer in the UK
- Approximate capacity: 10,000 units per year
- Provides framing systems only, with significant technical support for developers

Vistry Group

- Approximate capacity: 17,000 units per year, with ~7,000 MMC units
- Operates a full developer model
- Recent profit warnings suggest cost and margin pressure within the sector

Persimmon Homes

- Indicative build costs quoted at £180–£250 per square foot
- At 1,400 sqft this equates to £252,000–£350,000 all-in, including groundworks and fees
- Reinforces the gap between mainstream delivery and the briefed cost targets

A-modular

- Indicative cost: ~£250 per square foot all-in
- Modular system with flexibility, but limited capacity

Elsi

- Indicative cost: ~£350 per square foot for insulated open panel systems • Approximate capacity: 100 units per year
- Strong MMC rationale and experienced team, but insufficient scale for the brief

Cuby Industries (USA)

- Claimed delivery cost: ~$100 per square foot
- Metal and expanded foam construction
- Highly standardised, ‘product-led’ housing
- Micro-factory model: each factory capable of one unit per day across three shifts
- Approximate output: 2,500 units per year across multiple factories
- Environmental performance reported as poor
- Factories financed and operated directly by the company

This final international example demonstrates that very low per-square-foot costs are theoretically achievable, but typically rely on highly standardised products, alternative construction methods, and vertically integrated factory ownership. This may not translate directly to the UK context.

Interim Observations

Taken together, this supplementary information reinforces the baseline conclusion that:

1. A £200,000 build cost for a 4-bed house is well below current UK market norms
2. Terraced housing represents the most cost-efficient typology
3. Achieving the briefed targets is unlikely through conventional procurement alone
4. Any credible route to cost parity is likely to require:
    - Strict size discipline
    - Scale delivery
    - Standardisation
    - Potentially increased manufacturing control

Baseline Conclusion

This baseline assessment demonstrates that the briefed cost targets of £200,000 build cost or £250,000 including groundworks represent a significant material departure from prevailing market delivery costs. When tested against a realistic benchmark range, and in particular the adopted midpoint stress-test case, the scale of reduction required extends beyond incremental value engineering and, in practice, is likely to exceed a 20–35% range once scope definition, risk allocation, and procurement constraints are fully accounted for.

Indicative UK benchmarks reinforce this position. Publicly available data suggests that UK new build housing costs typically fall within a broad range of £1,400–£3,000 per m^2, depending on specification and delivery context.

- Good-quality family housing commonly builds in the £1,900–£2,400 per m^2 bracket.
- Timber frame housing is frequently cited in the £1,700–£3,000 per m^2 range for complete build costs, albeit with inconsistent scope definitions.
- Timber frame kits alone (structure only) are often quoted at approximately £250 per m^2, highlighting the substantial gap between structural package cost and total delivered build cost.

When these benchmarks are considered alongside current developer and MMC supplier capacity, delivery models and indicative cost positioning, the conclusion is reinforced: **there is no clear evidence that the briefed cost targets can be achieved through conventional market procurement, even at scale, while maintaining mortgageable and warranty-backed standards.**

Taken together, this baseline indicates that achieving the briefed targets would require **a fundamental change in delivery approach,** potentially involving alternative ownership structures, deeper manufacturing control, or vertically integrated production models, rather than incremental efficiencies within existing procurement frameworks.

3. Translating Market Evidence Into a Target Production Budget

This section translates the market evidence set out in Section 2 into a target production budget aligned with the briefed cost threshold of £250,000 per unit.

The approach taken is deliberately simple and transparent. Having established typical market costs for a 4-bed timber frame house of approximately 1,600 sqft, the study applies cost apportionment across the main construction disciplines. These proportions reflect how costs are typically distributed in mainstream UK housing delivery, rather than assuming wholesale changes to scope or specification.

The purpose of this exercise is not to claim that the target budget is readily achievable, but to define what the cost structure would need to look like if the briefed targets were to be met. This allows the scale of value engineering required to be clearly understood and tested.

The budget below therefore represents a target condition, against which procurement strategy, system design, and delivery model can be evaluated.

Target Budget to Achieve £250,000 Total Build Cost

Reference unit: 4-bed family house | Approx. 1,600 sqft | Terraced panellised timber frame:

Cost category	Target % of total	Target budget (£1675 per m^2)	Baseline cost (£2,850 per m^2)
Groundworks and foundations	15.4%	£38,500	£65,835.00
Timber frame structure	22.9%	£57,250	£97,898.00
Roof structure and coverings	8.0%	£20,000	£34,200.00
External envelope (cladding, windows, doors)	15.4%	£38,500	£65,835.00

Table 5.0.3 Target budget

Cost category	Target % of total	Target budget (£1675 per m^2)	Baseline cost (£2,850 per m^2)
Internal structure and partitions	10.3%	£25,750	£44,033.00
MEP (plumbing, electrics, heating)	15.4%	£38,500	£65,835.00
Site labour and preliminaries	12.6%	£31,500	£53,864.00
Total	100.0%	£250,000	£427,500.00

Table 5.0.3 Target budget

This target budget implies an overall build cost of approximately £1,675 per square metre, materially below prevailing market norms for housing of this type.

Interpretation of the Target Budget

Relative to typical market delivery, the £250,000 target budget requires a system-wide reduction across all cost categories, rather than selective savings within individual disciplines. When scaled proportionately from the benchmark cost plan, every major work package is required to operate at approximately 58–60% of benchmark cost levels simultaneously.

This implies:

- Reduced structural and envelope costs compared to standard procurement
- Materially lower preliminaries and site labour costs
- Tightly constrained scope and specification
- Avoidance of bespoke design, complex geometry, or plot-specific variation

The most significant pressure points are the structural frame, external envelope, and site labour, where reductions would need to be achieved concurrently rather than sequentially. Incremental efficiencies in any single discipline are therefore insufficient to close the gap on their own.

Implications For Delivery Approach

Achieving this cost structure is **unlikely through conventional design-and-build procurement**. It implies a delivery model in which cost reduction is embedded at a system level, rather than applied through late-stage value engineering.

Such a model would be characterised by:

- High repetition of unit types
- Standardised components and interfaces
- Simplified detailing
- Scale-driven procurement
- Reduced on-site labour input
- Limited architectural variation at the structural level

These implications directly inform the discussion in the following section regarding delivery models, supplier engagement, and the potential need for increased manufacturing control or alternative ownership structures.



Fig. 5.0.3 Dense, repetitive, and standardised housing in Kensington & Chelsea

Target Budget Conclusion

The £250,000 target budget illustrates the magnitude of change required to meet the briefed cost thresholds. While this cost level is not theoretically impossible, it represents a step-change from current market norms and would require disciplined size control, predominantly terraced typologies for this paradigmatic housing unit, and a fundamentally cost-led delivery strategy.

The target budget should therefore be treated as a test condition, not an assumption. Subsequent phases must focus on whether this cost structure can be validated through supplier engagement, scale manufacturing, or alternative delivery models, or whether adjustments to scope, size, or the brief itself are required.

4. Delivery Model Implications

The target budget set out in Section 3 has direct and material implications for the delivery model. The scale of cost reduction required, when applied proportionately across all cost categories, indicates that conventional design-and-build procurement, even when combined with panellised timber frame construction, is unlikely to achieve the briefed thresholds in isolation.

At the required cost level, control must shift upstream, away from late-stage value engineering and towards early control of manufacture, procurement, and assembly logic. The analysis demonstrates that incremental savings within individual work packages are insufficient; instead, cost reduction must be achieved simultaneously across multiple disciplines through repetition, standardisation and reduced transactional friction.

While established timber frame suppliers are capable of supporting volume delivery, they operate within commercial frameworks that necessarily include margin, risk pricing and logistics overheads. Panellised systems can deliver programme and labour efficiencies, but do not, on their own, resolve the structural cost gap identified in the target budget analysis.

The implications point toward a delivery model that may need to evolve over time. Early phases may rely on existing suppliers and systems to validate assumptions and test reference unit pricing. **However, sustained delivery at the target budget is likely to depend on increased standardisation, tightly defined component sets and repeatable assemblies, potentially supported by greater manufacturing control where volume justifies it, including site-adjacent or partially integrated production models.**

No assumptions are made at this stage regarding immediate investment in proprietary factories or vertically integrated manufacture. Such measures are treated as contingent options, to be evaluated only once demand certainty, supplier pricing, and operational feasibility have been established through subsequent phases.

The key conclusion is that achieving the briefed cost targets is less a question of construction method and more a question of delivery discipline and production structure. Whether these conditions can be realised in practice should form the focus of further work, through direct supplier engagement and validation of reference unit pricing against the target budget.

5. Conclusions and next steps

Summary Conclusions

- Benchmark testing indicates that a 4-bed timber frame family house of 1,600 square feet would typically be delivered at a total build cost materially above £250,000, with a realistic midpoint benchmark of approximately £427,500 when allowances are made for preliminaries, risk, and contemporary delivery conditions.
- The briefed cost thresholds of £200,000 build cost or £250,000 including groundworks therefore represent a very substantial departure from prevailing market norms, requiring a system-wide cost compression of approximately 40% or more relative to a realistic stress tested benchmark.
- Under current UK market conditions, and using conventional procurement routes, it is exceptionally difficult to identify a developer or contractor capable of delivering such units at cost, let alone with a sustainable commercial margin.
- Panellised timber frame construction offers programme and labour efficiencies, but does not in itself resolve the underlying cost gap identified in this study.
- Achieving the briefed cost targets is therefore less a question of construction method and more a question of delivery structure, scale, and manufacturing control.



Fig. 5.0.4 Robotic assembly of housing skeletons by UK startup, Automated Architecture (AUAR)

Implications for Delivery

Taken together, the findings indicate that whilst **tightly managed delivery can deliver homes at £345,000**—£95,000 over the target price—delivery at the briefed cost levels is unlikely to be achievable through existing market structures alone. Even at scale, conventional developer models and third-party supply chains retain commercial margins, risk pricing, and overheads that materially constrain how far costs can be reduced. A guaranteed pathway toward the very ambitious briefed target price, would require a departure from standard procurement models, potentially involving shared-risk arrangements, deeper integration with manufacturing partners, or cost-led production structures. Delivery would need to be organised around **production logic rather than market-rate contracting.**

Of course, it is worth keeping in mind that retailing a 150m², 4-bed house at £450,000 rather than the proposed £350,000, would **still mean that the Forest City development would very likely hit all affordability criteria** and therefore concurrent market absorption rate criteria (similar homes in Cambridge cost over £1m); a remarkable achievement given the scale of the project.

Pathway to Even Lower-Cost Delivery

The above conclusions are unlikely to be a surprise to seasoned observers of the UK construction industry. The issues we identify are ones that UK housing developers have struggled with for decades. But stepping back and looking at the opportunity that a building project the size of Forest City would provide for welcomed disruption, the possibilities for just such a shake-up are certainly prevalent. Although the UK has managed such scale in living memory, building 400,000 homes on a single site, would create a radically different environment for any developer and a supply chain of contractors to operate within especially when combined with the forward looking recommendations in Report 6 and the environmental standards proposed in Report 2.

Further work should therefore focus on testing whether alternative delivery structures and production logic could credibly close the cost gap. This should include:

- Further validation of reference unit pricing through direct supplier engagement with preliminary drawings
- Assessment of the scale and volume thresholds required to support materially lower unit costs
- Exploration of joint venture or partnership models capable of supporting cost-led delivery
- Developing a credible professional training proposition to ensure that workforce readiness aligns with skills need for delivery and brings down labour force cost in the medium term

These steps are necessary to determine whether the briefed cost targets represent a realistic delivery ambition, or whether adjustments to scope, size, or commercial assumptions are required. Nevertheless, this is a proposition which if achieved would revolutionise the UK construction industry with significant national benefits.

Report 6. Future Technology

By Rob Pickering

Summary

This report presents the Phase 1 output of the Forest City Future-Proof Technology Working Group. It provides an initial technical analysis of how emerging technologies may influence the long-term design and infrastructure requirements of a new city of one million residents.

The analysis presented here should be understood as work-in-progress. The detailed modelling, engineering design and financial analysis required to fully substantiate these conclusions will take place in later phases of the programme. However, several technology trends are already sufficiently clear to justify incorporating them into early masterplanning decisions.

In particular, choices made during the initial design of the City— the allocation of infrastructure corridors, plant space, utility routes, communications ducting and data governance frameworks—are extremely difficult and expensive to change once construction begins. The purpose of this report is therefore to identify areas where early decisions can preserve long-term flexibility or unlock future technological opportunities. The report focuses specifically on technologies that could materially influence the physical structure and infrastructure systems of the city, rather than short-lived product or platform choices.



The analysis presented here draws on discussions within the technology working group together with independent technical research and drafting undertaken during Phase 1 of the programme. The sections that follow summarise the current state of this work and identify low-regret provisions that can be incorporated into early planning while more detailed technical work continues. There are five sections in all and the findings are summarised here:

Section 1 — Energy: Peak electrical demand is estimated at approximately **460 MVA,** exceeding the capacity of the nearest Grid Supply Point. An integrated approach combining grid connections, distributed storage, district heating from data centre waste heat, and geothermal energy is recommended.

Section 2—Building technology: The scale and duration of the programme necessitates construction methods beyond conventional UK approaches. Industrialised construction, engineered timber, automation, and digital verification each present viable pathways. The recommended course of action is to design in enabling conditions—logistics staging, heavy transport access, and digital handover standards—rather than to prescribe a single method.

Section 3—Data networking: FC's proximity to major international and regional fibre routes presents an opportunity to establish communications infrastructure as permanent civic infrastructure. A distributed architecture of district connectivity centres linked by high-capacity fibre rings could support carrier-neutral access, distributed data centres, and terabit-scale local exchange capacity. An early decision on the ownership and governance model for fibre infrastructure is required.

Section 4—Digital twins and the Open Source City: The digital twin should serve as the programme's authoritative record of spatial truth across the full project lifecycle. An early decision is required on whether to adopt a single platform or a standards-led federation, with open interoperable deliverables mandated in either case. The Open Source City ambition should be anchored in publishable data layers, defined schemas, and governance distinguishing open civic data from protected operational information.

Section 5—Federated smart home technology: Forest City should not seek to develop federated smart home platforms directly. The recommended approach is to establish enabling conditions: open city-level interfaces for energy signals, physical sensor readiness in the built environment, and interoperability-focused procurement. Privacy, consent, and cybersecurity should be treated as design inputs from the outset.

Introduction

Why This Report Exists

Forest City 1 is an unusually ambitious proposition: a new city built at scale and at speed, intended to remain permanently affordable while being genuinely beautiful and environmentally restorative

The Future Proof Technology Working Group exists because the project's built-environment decisions will be made in the near term, but the city must continue to work well for decades. If we optimise only for today's technologies, we risk repeating familiar failures of long-lived infrastructure, where retrofitting becomes disruptive, expensive, or simply impossible at the scale a city demands.

Our Phase 1 task is therefore to identify a small set of technology shifts that it would be an oversight not to plan for, as Forest City moves into later phases (detailed business case and masterplanning).

The Scope and Intent

This report is not a catalogue of gadgets, nor a prescriptive manual instructing domain specialists how to do their jobs. The focus is on technology that changes assumptions, constraints, and required provisions, not on selecting products. It is a future facing risk-and-opportunity scan designed to help other working groups make robust decisions under uncertainty.

Specifically we aim to:

- Make broad technology predictions that inform the way we build the city.
- Identify wildcard technologies that may plausibly emerge during the build-out and materially change cost, speed, labour availability, carbon performance, resilience, or quality of life.
- Translate those possibilities into practical ‘design-in now’ requirements so future adoption is cheap and non-disruptive.
- Provide a transparent logic for prioritisation so that we can scrutinise, challenge, and improve it throughout the build process.

How This Group Interacts With Other Specialisations

The Working Group is cross-domain. Our role is enabling and challenging. We support functional areas by:

Principles Used Throughout This Report

- Highlighting developing technology-driven constraints and opportunities that alter planning assumptions.
- Identifying ‘design-in now’ provisions that protect optionality.
- Recommending early standardisation approaches to avoid lock-in and enable competitive ecosystems.

We do not attempt to substitute for energy engineers, architects, transport planners, water specialists, environmental scientists, policy leads, or finance modellers. Instead, we aim to give those experts a shared forward-looking set of assumptions and practical provisions so that masterplanning remains robust under multiple plausible futures.

- Evidence-led: separate ‘known’, ‘likely’, and ‘speculative’.
- Time-to-impact: consider when a technology intersects the build/occupation timeline.
- Option value: prioritise things cheap to design-in now but expensive to retrofit later.
- Neutrality and interoperability: prefer open interfaces and standards over vendor lock-in.
- City-scale realism: focus on what can operate and be maintained at million-person scale.
- Resilience by default: design systems that fail safely and degrade gracefully.

How to Read this Report

Sections are organised into five technology domains most likely to influence masterplanning. Each section ends with:

- What to design-in now (physical and digital)
- What to standardise early (interfaces, data, governance)
- Wildcard watchlist (what to track, and triggers)
- Risks and mitigations (including second-order effects)

Keeping it Current

Technology is never static; this report will never be ‘finished’. A process within Forest City will be developed to define:

- Update cadence (at Phase gates; then ongoing)
- Incorporating critique (including red-team challenge and external review)
- Where the living version is maintained and how changes are governed

Methodology and Selection Criteria

This report combines structured horizon scanning with practical city-making constraints. Inputs include expert interviews, a literature scan, comparable project references, and adversarial review where available.

Each technology (or technology cluster) is assessed against a simple rubric:

Each technology (or technology cluster) is assessed against a simple rubric:

- Potential impact on city form, capital expenditure, and operational expenditure
- Likelihood of maturation during the build-out
- Retrofit pain if ignored
- Standards readiness and interoperability potential
- Safety, resilience, and governance implications

1. Energy

Electricity Supply Architecture

A city of one million residents will require electricity infrastructure at a scale rarely seen in recent UK developments. Preliminary modelling undertaken by the working group suggests a peak electrical demand on the order of ~**460 Megavolt-Ampere (MVA)** if the city is fully electrified across heating, transport and buildings. This may prove conservative once the electrical demands of the transport system and any heavy commercial users (e.g. data centres) are fully modelled.

This figure should be treated as a **ballpark peak demand requirement,** but it provides a useful basis for evaluating the scale of infrastructure that may ultimately be required. Two broad electricity supply architectures are currently being considered.

Grid-Supplied Electricity Model

In the conventional model, the city would rely primarily on the national transmission system for electricity supply.

Electricity would be delivered via **Grid Supply Points (GSPs)**—the substations where electricity from the national transmission network is transferred to regional distribution networks.

Initial investigations suggest that the **nearest primary GSP at Burwell** is already close to full capacity [47] . As a result, it is unlikely that a development on the scale of Forest City could rely solely on this infrastructure.

In practice, the **National Energy System Operator (NESO)** may require that the city connects to multiple GSPs, both to provide sufficient capacity and to ensure system resilience. This could imply the construction of **new high-capacity transmission connections and potentially a second GSP-scale connection** serving the development.

Although a number of solar farms exist in the surrounding region, these installations cannot materially reduce the size of grid infrastructure that must be constructed. Transmission systems must be sized assuming non-production from intermittent sources, meaning the city must be capable of importing its full peak demand from the grid when renewable generation is unavailable.

Using conventional planning assumptions, providing electricity infrastructure at this scale could involve **capital expenditure in the region of £2.4 billion to £2.8 billion [48],** depending on the final connection architecture and delivery model [49] .

Load Smoothing and Distributed Storage

One important factor that could significantly influence the final infrastructure requirement is the **ability to smooth peak demand.** The headline **~460 MVA peak demand** reflects a conventional planning assumption in which buildings draw power from the grid in real time with limited buffering, storage or local generation capacity. However, emerging storage technologies and local generation (primarily solar) make it increasingly possible to shift and smooth electrical demand over time.

Modern **$LiFePO_4$ (lithium iron phosphate) battery systems** are sufficiently safe and cost-effective to be deployed at domestic scale. A battery pack roughly the size of a household refrigerator can store enough energy to supply a typical property for at least **24 hours of**

normal operation, depending on system efficiency and heating configuration and whether other primary heat sources besides electricity are used (see below) [50].

If large numbers of properties within the city were equipped with such storage, with or without local micro generation, and if these systems were orchestrated collectively, the city could effectively operate a **distributed battery fleet.**

Such an approach could allow:

- Local buffering of electricity demand
- Smoothing of short-term peaks
- Coordinated charging during low-demand periods
- Reduced peak import requirements from the national grid

Deployed at scale, the **effective peak demand seen by the grid could be substantially lower than the raw demand of the city itself.** In that scenario the grid connections and upstream infrastructure required to support the city may be **materially smaller—and therefore less costly—than conventional planning assumptions suggest.**

Energy Abundance Model: SMR or Other Zero-Carbon Generation

Much of the near-term UK commercial environment encourages energy minimisation: electricity is expensive, grid upgrades are constrained, and many sensible design choices are about reducing demand and shifting load. That remains a rational default response to the current national energy context.



Fig. 6.0.1 Rolls Royce SMR render

However, one plausible future is the opposite; a world of abundant electricity, driven by a combination of new nuclear including Small Modular Reactor (SMR) programmes, grid-scale renewables, storage, and other developments that materially reduce marginal cost and increase supply [51]. In such a scenario, the binding constraint for homes and businesses may move from 'energy scarcity' to asking how we take advantage of cheap, plentiful power safely and flexibly.

If that future materialises, households and local businesses could adopt technologies with far higher electrical demand than current norms. Examples might include robotics (potentially including humanoid robots), more intensive local automation, high-capacity charging, and substantially increased local or regional compute footprints. Even if these outcomes arrive unevenly, the retrofit cost of upgrading end-consumer electrical supply and local distribution capacity could be extremely high relative to the modest incremental cost of designing-in headroom during initial construction.

An alternative architecture would treat electricity not as a constrained resource but as a **strategic abundance.** Under this scenario the city could produce a substantial proportion of its electricity locally rather than relying primarily on grid imports.

The implications of this approach could include:

- Large-scale electrification of heating and transport
- High-capacity computing and digital infrastructure
- Hydrogen production and industrial processes
- Long-term energy cost stability

If periods of electricity abundance arise, the city could both become a net exporter and also support **large-scale electrolysis facilities to produce hydrogen.** Electrolysers can act as flexible electrical loads, absorbing surplus electricity and converting it into storable fuel [52] for transport, industry or long-term energy storage [53].

However, the SMR-based architecture is currently treated as a **strategic option rather than a dependency.** The development and its core infrastructure should not rely on the availability of SMR technology, given the regulatory, financing and programme uncertainties currently involved.

End-Consumer Supply: Three-Phase, high-current service provision

Forest City should strongly recommend that every end-consumer's premises are provided with **three-phase supply capability** and service equipment/tails sized to **at least 100 amps**, even if initial loads do not require it [54].

This recommendation should be framed as optionality rather than immediate necessity. The incremental physical cost of installing two additional conductors and appropriately rated service heads during initial construction is expected to be small compared to the cost and disruption of retrofitting later. Furthermore a three-phase baseline also improves flexibility for future electrification and load-balancing, even in an energy-constrained world.

There is an **important caveat** here: The local Distribution Network Operator (DNO) will ultimately decide network design and service criteria using their standard commercial and engineering processes. The recommendation is therefore not to override DNO authority, but to ensure Forest City's masterplan, building standards, and developer requirements do not inadvertently lock premises into a low-capacity single-phase future that becomes a long-term constraint.

Local Distribution: Over-Provisioning High Voltage (HV) Capacity or Building For Expansion

Forest City should recommend that the physical distribution build is planned around easy expansion, either via:

- Over-provisioned **11 kilovolt (kV) and 33 kV** capability (where justified and feasible), and/or
- **Ducting-first construction** that makes additional conductors simple to add later without re-digging

In practical terms, the guiding principle should be:

- Prefer ducting used exclusively (or as the dominant approach) for distribution routes where future growth is plausible.
- Target low initial utilisation (e.g., designing routes so that early deployments run at ~10–30% of eventual capacity), leaving space for additional conductors and upgrades with minimal disruption.
- Ensure that route planning, easements, and access rights anticipate future cable additions, jointing access, and substation expansion.

Data Centres, Heat Recovery and District Heating

Large electricity connections also create opportunities to co-locate **high-capacity data centre infrastructure** near the primary grid connections serving the city.

Data centres convert almost all of the electricity they consume into heat. Rather than treating this heat as waste, the city could treat it as a **valuable thermal resource.** Waste heat from data centres could be captured and distributed through **district heating networks [55],** significantly reducing the energy required to heat buildings across the city [56].

This approach could be strengthened further through the use of **large-scale underground thermal storage,** sometimes referred to as **seasonal thermal batteries.** These systems allow excess heat produced during periods of high data centre activity to be stored underground and recovered later when heating demand increases.

If implemented at sufficient scale, this combination of data centre heat recovery, district heating and thermal storage could materially reduce the amount of electricity required to heat the city.

Geothermal Energy

Alongside heat recovery, the city may also be able to draw on **geothermal energy systems.** Conventional UK policy has tended to prioritise geothermal development only in locations where natural geothermal hot spots exist. However, the area between **Haverhill and Newmarket does not appear to have significant natural geothermal hotspots,** which might traditionally make geothermal development less likely.

This assumption may now need to be reconsidered. The UK possesses extensive deep drilling expertise developed through decades of North Sea oil and gas exploration, and advances in hard-rock and deep drilling technologies mean geothermal systems may now be technically feasible in locations that lack natural geothermal reservoirs [57].

Many modern geothermal designs use **closed-loop systems,** in which fluids circulate through sealed underground pipe networks rather than relying on natural aquifers. These systems significantly reduce environmental risks such as groundwater contamination and can operate without requiring naturally occurring geothermal water reservoirs.

Rough conceptual estimates suggest that **around twenty installations of this scale could theoretically supply the domestic energy needs of a city of one million residents.** When combined with district heating networks, underground thermal storage and heat recovery from data centres, geothermal energy could dramatically reduce the amount of electricity required for heating across the city.

Early Infrastructure Provisions

Regardless of the final electricity generation strategy, several provisions appear to be **low-regret design choices:**

- Reserving land for large primary substations (14 ha per substation)
- Safeguarding corridors for high-voltage transmission routes
- Reserving land near grid connections for energy-intensive infrastructure such as data centres
- Enabling future expansion of grid connections and local generation

These provisions are relatively inexpensive to include during early planning but extremely difficult to retrofit once the city is built.

The technologies discussed in this section should not be viewed as independent options but as components of a coherent energy system. Grid imports, local generation, distributed batteries, hydrogen electrolysis, district heating, thermal storage, geothermal energy and data-centre heat recovery can reinforce one another when designed together. Forest City therefore has an opportunity to treat energy infrastructure as an integrated system rather than a collection of separate utilities, enabling greater resilience, lower long-term costs and increased flexibility as technologies evolve.

2. Building Technology

Construction at City-Scale

Forest City represents an unusually large and sustained construction programme. Delivering housing, civic buildings and infrastructure for a city of one million residents and 8,000 acres of commercial land will require construction methods capable of operating **reliably, quickly and repeatedly over decades.**

Traditional UK construction approaches often struggle with cost predictability, labour availability, build speed and carbon intensity. As a result, it is plausible that the technologies and methods used to construct Forest City may differ significantly from those used in recent UK developments.

This section therefore examines emerging building technologies and construction approaches that could materially affect how the city is delivered, with particular attention to **industrialised construction, engineered timber systems, automation and robotics, and digital quality assurance.**

The objective is not to prescribe a single construction method, but to identify the **enabling conditions Forest City should design into the development** so that multiple construction approaches remain viable.

Industrialised Construction

One of the most significant shifts in construction globally is the gradual move toward industrialised [58] construction [59]. Instead of constructing most building components on site, industrialised approaches manufacture large parts of buildings in controlled factory environments before transporting them to site for assembly. These approaches include:

- Volumetric modular construction
- Panelised building systems
- Hybrid prefabricated structures combining factory and on-site work

Industrialised construction can offer several advantages at the scale required for Forest City:

- Faster build times
- Improved quality control
- Reduced waste
- More predictable costs
- Reduced reliance on scarce on-site labour

However, such approaches impose different logistical and design constraints. Transport limits, crane capacity, staging areas and supply chains become critical elements of the construction system.

For a development of Forest City's scale, the ability to support **high-throughput, factory-supported construction** methods could significantly accelerate delivery while improving build quality.

Engineered Timber and Hybrid Structures

Another technology likely to influence future construction is the increasing use of engineered timber systems, particularly cross-laminated timber (CLT) and related products.

Engineered timber offers several potential advantages:

- Significantly reduced embodied carbon compared with conventional concrete structures

- Rapid assembly using prefabricated structural elementsHigh structural strength-to-weight ratios
- Opportunities for hybrid structures combining timber, steel and concrete

Many European cities are already seeing mid-rise and high-rise buildings constructed using timber or hybrid structural[57] systems[58]. For Forest City, engineered timber could play an important role in reducing the carbon footprint of the development while also supporting faster construction cycles.



Fig. 6.0.2 School in France built from Cross Laminated Timber

However, widespread use of timber construction may require early coordination with regulators, insurers and supply chains, particularly in relation to fire regulations, acoustic performance and long-term durability.

Automation and Robotics in Construction

Construction automation is also advancing rapidly. Robotic systems are increasingly being used for tasks such as:

- Automated earthworks and site preparation
- Robotic bricklaying and block placement

- Precision concrete finishing
- Automated surveying and inspection

At the same time, **inspection drones and mobile scanning systems** are becoming routine tools for monitoring construction progress and verifying work.

While these technologies are unlikely to eliminate the need for skilled labour, they may significantly improve productivity and consistency over long construction programmes. For a project as large as Forest City, designing sites and logistics systems that can accommodate **robotic equipment and automated construction workflows** could become increasingly valuable.

Digital Quality Assurance and ‘Scan-as-Built’ Construction

Large developments often suffer from discrepancies between design drawings and what is actually built. Emerging digital construction techniques aim to address this through routine scanning and verification during construction, producing accurate digital records of completed work.

These approaches may include:

- Routine Light Detection and Ranging (LiDAR) scanning of structures during construction
- Automated comparison between design models and scanned reality
- Digital handover of verified ‘as-built' models to building operators

This approach aligns closely with the digital twin principles described in section 4, ensuring that the city’s digital model reflects the real built environment as accurately as possible. At city scale, such practices could dramatically reduce long-term maintenance and operational risks.

Local Supply Chains and Advanced Fabrication

Another opportunity for a development of Forest City’s scale is the creation of **local manufacturing and fabrication capacity.**

High demand for building components over a sustained period could support regional manufacturing of:

- Modular building elements
- Engineered timber components

- Prefabricated facade systems
- Computer Numerical Control (CNC)-milled stone and architectural components

Advanced fabrication technologies, including CNC machining and automated milling, increasingly make it possible to produce **high-quality architectural materials at scale while retaining design flexibility.** Encouraging such supply chains could improve economic resilience while reducing transport and construction emissions.

Early Infrastructure Provisions

As with energy infrastructure, the most important question for Forest City is not which technologies will ultimately dominate, but what enabling conditions should be designed into the city from the start. Low-regret provisions that may support a wide range of construction approaches include:

- Reserving logistics space for large-scale construction staging
- Ensuring road layouts and site access suitable for heavy modular transport
- Designing crane access and lifting zones into early masterplans
- Establishing standards for scan-as-built verification and digital handover
- Ensuring building data and models integrate cleanly into the city's digital twin

These provisions are relatively inexpensive to plan early but difficult to retrofit.

Construction Systems As Long-Term Infrastructure

Construction methods are often treated as temporary decisions affecting only the building phase. However, for a development of Forest City's scale and duration, construction systems themselves become a form of **long-term infrastructure.**

By designing the city to accommodate industrialised construction, automated building processes and advanced fabrication methods, Forest City could significantly improve build speed, reduce costs and lower the carbon footprint of the development.
The objective of this section is therefore not to select a single construction technology, but to ensure that Forest City's design and governance frameworks allow the **most effective construction methods available at any point during the build-out to be deployed efficiently.**

3. Data Networking

Connectivity as Foundational Infrastructure

High-capacity data connectivity is a foundational requirement for a modern city. As economic activity, services and public infrastructure become increasingly digital, the resilience, capacity and openness of the underlying communications infrastructure will have long-term implications for economic development, innovation and civic services.

For a new city built at large scale, it becomes possible to treat communications infrastructure as long-lived civic infrastructure, similar in importance to roads, water systems or electricity networks.

Forest City therefore has an opportunity to design connectivity infrastructure from the outset in a way that prioritises resilience, openness and long-term competition rather than relying on ad-hoc commercial deployments.

Strategic Fibre Routes Through the Site

The proposed Forest City footprint benefits from the presence of several significant fibre infrastructure assets in the surrounding area. Most notably, a major transnational fibre route linking London and Amsterdam passes close to the site[59] and is believed to include a possible breakout site within or near the development boundary[60] . This route forms part of the wider European long-haul fibre network and provides extremely high-capacity connectivity between major digital hubs including London, Amsterdam and other European exchange points.

In addition, Cambridge City Council and the University of Cambridge operate fibre ducting extending from Cambridge toward Linton, which runs close[61] to the boundary of the proposed development area[62]. Taken together, these assets mean that F**orest City has the potential to obtain direct dark fibre access toward Cambridge, London and Amsterdam,** providing an unusually strong foundation for digital connectivity.

Connectivity Along Transport Corridors

Major fibre routes are often installed alongside transport infrastructure such as railways, motorways and trunk roads. These corridors provide relatively secure, continuous rights-of-way for long-distance fibre cables.

The proposed development area is located close to several such transport corridors, increasing the likelihood that additional fibre routes will either pass through the site or can be connected to it relatively easily. The presence of multiple routes significantly improves resilience, as fibre networks can be designed so that traffic can automatically reroute if a cable is damaged.

This combination of international trunk fibre, regional fibre routes and transport-corridor connectivity creates an opportunity to design Forest City's data infrastructure with unusually high levels of redundancy and capacity from the outset[63] .

District Connectivity Centres

Rather than treating connectivity as a purely centralised system, Forest City could adopt a distributed connectivity architecture. One possible model would be to establish a number of district connectivity centres located throughout the city[64]. These facilities would act as local aggregation points where fibre from buildings, neighbourhoods and mobile networks connects into the wider metropolitan and international fibre network.

Each connectivity centre could include:

- Carrier interconnection facilities
- Fibre distribution frames
- Mobile network backhaul aggregation
- Edge computing or micro-data-centre capacity

By interconnecting these facilities using high-capacity fibre routes arranged in a city-wide ring topology, Forest City could achieve extremely high resilience. If any single fibre segment were cut, traffic could simply be routed around the ring in the opposite direction. Such an architecture would also allow data centres and digital infrastructure to be distributed across the city rather than concentrated in a single location.

Data Centres and Digital Infrastructure

Strong fibre connectivity naturally creates opportunities for the development of data centre infrastructure. Modern data centres often seek locations that combine reliable power infrastructure, multiple independent fibre routes and proximity to major digital markets. Forest City could therefore be an attractive location for data centres serving workloads in Cambridge, London and continental Europe.

As discussed in section 1, co-location of data centres near primary energy infrastructure could also enable large-scale heat recovery, allowing waste heat from computing infrastructure to be captured and used in district heating systems. The relationship between power infrastructure, fibre connectivity and heat networks therefore represents a potential opportunity for integrated infrastructure planning.

Local Exchange Fabrics and Ultra-Low Latency Workloads

The presence of high-capacity international fibre routes near the development also creates the possibility of establishing a local internet exchange fabric within Forest City. This should not be viewed as an attempt to create a new national or international internet exchange comparable to existing hubs such as the London Internet Exchange or the Amsterdam Internet Exchange[65]. Forest City's geographic proximity to London means that the latency advantages of such a facility for conventional internet traffic would likely be limited.

Instead, the primary value of a local exchange would be enabling ultra-high-bandwidth traffic between organisations located within the city itself.

Modern compute workloads increasingly involve large volumes of east-west traffic between distributed compute clusters. Examples include distributed GPU training clusters for machine learning, large-scale simulation and modelling, edge computing and data-processing pipelines, and high-bandwidth research networks. In many cases these workloads benefit from data-centre-class latency and extremely high throughput between facilities, even when those facilities are located in different buildings.

By establishing a local exchange fabric interconnecting district connectivity centres and data centres within Forest City, organisations could achieve latency characteristics approaching those of intra-data-centre networks while still operating across multiple independent facilities.

With modern optical transport technologies already supporting multiple terabits per second of capacity on a single fibre pair, it is plausible that such a city-scale exchange fabric could operate at aggregate capacities measured in terabits per second, particularly as AI and high-performance computing workloads continue to expand.

Such an architecture would allow companies and research institutions within the city to deploy distributed computing systems spanning multiple sites without requiring that all compute infrastructure be concentrated within a single large data centre.

Ownership and Governance Models for Fibre Infrastructure

A key decision for any new city is how the underlying fibre infrastructure should be owned and governed. Several models are possible.

Carrier-built infrastructure

The most common model in existing developments is to allow telecommunications operators to build their own infrastructure independently. While this approach requires little initial investment from the city, it often leads to duplicated infrastructure, uneven coverage and reduced competition in areas served by a single provider. In some cases the first operator to deploy infrastructure can effectively establish a local monopoly, limiting competition and consumer choice.

Municipal Fibre Networks

Some cities choose to build and operate their own fibre networks, providing services directly to residents and businesses[66]. Municipal fibre networks can ensure universal coverage and competitive pricing, but they require significant operational expertise and ongoing management. Operating a telecommunications network may not align with the core competencies of a city authority.

Municipal Carrier-Neutral Ducting

An alternative approach is for the city to build and maintain carrier-neutral ducting infrastructure while allowing telecommunications providers to install their own fibre within those ducts. Under this model the city acts as the owner of the passive infrastructure while private operators compete to deliver services. This approach can significantly lower the cost of market entry for new providers and helps prevent monopolistic infrastructure ownership.

Dark Fibre Cooperative Models

A further option is to establish a dark fibre co-operative. Under this model the city sponsors the construction of shared fibre infrastructure that is made available to multiple telecommunications providers on non-discriminatory wholesale terms. Participating carriers can light the fibre with their own equipment and offer services independently, while the underlying infrastructure remains shared. This approach can combine strong competition between service providers with efficient use of physical infrastructure and reduced duplication of civil works.

Forest City as a Distributed Hyperscale Campus

Taken together, the connectivity architecture described in this section suggests the possibility of treating Forest City as a distributed hyperscale digital campus. Rather than concentrating computing infrastructure within a single large data centre complex, the city could support a network of interconnected facilities linked through high-capacity fibre rings and local exchange fabrics.

District connectivity centres, carrier-neutral ducting and multiple independent fibre routes would allow organisations to deploy computing infrastructure across multiple buildings while maintaining extremely high bandwidth and low latency between sites.

In effect, the city itself could function as a large-scale distributed data-centre environment capable of supporting workloads that traditionally require tightly coupled computing infrastructure.

As optical networking technologies continue to advance and terabit-per-second fabrics become commonplace, it becomes increasingly plausible for geographically distributed facilities within a city to operate as part of a single high-performance computing system. This model could make Forest City particularly attractive to AI research organisations, high-performance computing users and data-intensive industries.

Early Infrastructure Provisions

As with energy and construction systems, the most important step for Forest City is to ensure that the physical provisions required for high-quality connectivity are included from the outset. Low-regret provisions include:

- Installing extensive carrier-neutral ducting throughout the city
- Ensuring all buildings include appropriate fibre entry[67] points[68] and risers[69]
- Reserving locations for district connectivity centres
- Protecting routes for long-distance fibre corridors
- Enabling easy interconnection with regional and international fibre networks

Once streets, buildings and underground utilities are constructed, retrofitting such infrastructure becomes extremely expensive.
Ensuring that the City's physical design supports high-capacity fibre connectivity from the start is therefore likely to be one of the most valuable long-term digital infrastructure investments Forest City can make.

4. Digital Twins and The Open Source City

A digital twin is a virtual model of a physical object. It is a data based manifestation connected to its physical object by 2-way information flows, so that it mimics the object in all aspects. Digital twins can be used to plan and very quickly and cheaply test hypotheses about how the physical object will behave and interact with its environment in a non-destructive way without impacting the physical environment.

What This Section Will Cover

This section considers a range of plausible futures in which **digital twin** practices become central to how large developments are designed, delivered, verified, and operated, and where Forest City pursues ‘open source city’ principles throughand where Forest City pursues ‘open source city’ principles through **open data formats, open interfaces, and auditable foundations.**

The core question is not whether Forest City should build a single master digital twin platform, but what **minimum standards, capture practices, and interoperability requirements** Forest City should set so that:

1. We can quickly generate reliable **baseline** digital twins of the development site
2. We can maintain living digital twins as designs develop and construction progresses
3. Data remains usable across multiple disciplines, contractors, and tools without being trapped in proprietary formats
4. Openness (where safe) becomes a compounding civic asset rather than a one-off publishing exercise

The section should treat the digital twin as a **chain of custody for spatial truth:** from early feasibility to masterplanning, from design models to construction verification, and from ‘as-designed’ to ‘as-built’ to ‘as-operated’. At city scale, the failure modes are predictable: inconsistent coordinate systems, variable survey quality, incompatible file formats, and brittle handoffs between Geographic Information Systems (GIS) and Building Information Modelling (BIM). Our objective is to challenge developers to use best-available emerging technology and to define standards throughout the build process that demand **open data interoperability** and **maintained, high-quality digital twins.**

A key theme is that these technologies cross over with standard developer tool choices and incumbent building workflows. Forest City is unlikely to dictate every vendor choice, but it can —and will—challenge developers to adopt best practice by specifying outcomes and standards: **minimum capture quality, open deliverables, and a maintained digital twin through the build process.**

Outline Thoughts We Will Report On

Digital twin baseline: ‘ground truth’ as early infrastructure

In some plausible futures, the speed and reliability with which the project can establish a baseline digital twin becomes a major determinant of schedule and risk. A high-quality baseline can reduce surprises, shorten design cycles, and improve coordination between disciplines. This includes terrain, vegetation, drainage, constraints, and a defensible model of existing assets, particularly underground unknowns.

Digital twin through design: ‘as-designed’ models that remain portable

As designs develop, developers will use a mix of Building Information Modelling (BIM) tools and workflows. Forest City's interest is that outputs remain interoperable and consistently referenced. This is where GeoBIM matters: bridging building-scale BIM exchange with city/territory-scale geospatial models so that the city's twin does not fracture into parallel truths[70] .

Digital twin in construction: ‘as-built truth’ that is measurable and updateable

A likely direction of travel is that construction verification increasingly relies on routine scanning and evidence capture, not just manual inspection and drawings. The digital twin becomes a maintained record of what was actually built, with repeatable update cycles, quality metrics, and clear responsibility for handover.

A practical focus: quality, formats, and handoffs (GIS ⇄ BIM ⇄ reality capture)

At scale, the difficult part is rarely ‘capturing some data’; it is maintaining quality and ensuring repeatable exchange across organisations and tools. Forest City should establish non-negotiable baseline standards for:

- Coordinate reference systems and control networks
- Survey accuracy classes and metadata requirements
- Versioning and provenance (who captured what, when, how, with what uncertainty)
- Exchange formats that avoid lock-in and enable long-lived reuse

Concrete Capture and Data Themes

LiDAR (airborne + mobile + handheld): terrain mapping, vegetation, and as-built verification

LiDAR is likely to remain a primary method for fast capture of topography, structure, and construction progress. The practical issue is less, ‘Can we collect LiDAR data?’ and more about how we ensure consistent referencing, metadata, and quality so the data is re-usable across the programme. Here we emphasise that point clouds must be delivered with clear provenance and defined accuracy, and must integrate cleanly into the project's digital twin[71] .

Mobile/handheld scanning and emerging ‘democratised capture’

Some futures may see cheap scanning used routinely for progress capture and internal verification. This is promising, but also a quality risk if low-control capture is treated as

equivalent to high-integrity baseline surveys. High-integrity truth capture should be separated from low-friction situational capture, and define where each is acceptable.

Ground penetrating radar (GPR): utilities planning, archaeology/geotech risk reduction

GPR can reduce uncertainty about what is underground, but only if it is captured, referenced, and stored in a way that can be re-used, especially when combined with known asset records and subsequent as-built updates[72].

Open mapping and GIS: what can be open, what must be protected

There is a plausible future where open mapping accelerates planning, innovation, and accountability, yet it must be balanced against security and privacy risks. Regardless of what is public, the internal programme twin should treat underground asset truth and constraints mapping as critical dependencies.

Open tooling as an enabler (e.g., Quantum GIS)

We should explicitly consider open-source tooling such as QGIS as part of an interoperability strategy—not necessarily as the only tool, but as a practical test of portability. Mandating that key deliverables can be inspected and validated in open tooling is a concrete way to reduce lock-in risk and keep the twin maintainable for decades.

Open Source City

Forest City's ‘open source city’ ambition can be made practical by anchoring it in the digital twin and its surrounding ecosystem.

Open data by default where safe

The city can publish carefully curated layers (and schemas) that enable a broad ecosystem—researchers, civic technologists, suppliers, startups, residents—without exposing sensitive details. This includes planning artefacts, environmental baselines, and high-level infrastructure descriptions, with strong security review and redaction norms.

Standard machine-readable formats and versioning

The value of openness compounds when data is reliably structured and versioned. A core principle should be that anything released publicly (or shared programme-wide) should be reproducible, documented, and maintained as the city evolves—rather than posted once and forgotten.

Open interfaces and reference implementations

Where Forest City defines city-level interfaces (e.g. data APIs, event streams, access patterns), publishing open specs—and, where sensible, reference implementations—to reduce lock-in and increase auditability. This supports competition and long-term maintainability.

Governance: openness without naivety

There may be a perceived tension between the efficiency and competition benefits of 'Open' and the need to safeguard operational security of critical national and city level infrastructure. We should explicitly acknowledge this with well defined infrastructure security criteria and a clear boundary between open civic layers and limited distribution operational security layers. These standards should be carefully engineered in consultation with expert stakeholders to achieve necessary operational security redaction, without impacting transparency and the value of adjacent open data layers.

How Forest City Should Respond

It remains an open question whether Forest City should commission and operate a single end-to-end digital twin platform as part of the project, or whether the city should rely on a federation of widely used third-party tools and platforms connected by standards. A unified platform could offer strong benefits (consistency, simplified governance, reduced friction in handovers), but it also carries risks (lock-in, procurement complexity, long-term operational burden, and the challenge of keeping pace with a fast-moving vendor landscape).

Regardless of which delivery model ultimately prevails, the later-phase decision is the same: **Forest City should make the digital twin a single source of spatial truth**, and ensure that surveying, design development, construction verification, and handover data can all be ingested into a coherent, maintained twin without bespoke rework.

Forest City should therefore consider the following minimum responses:

1. **Decide early whether to standardise on a single digital twin platform, or a standards-led federation**

Forest City should explicitly choose an approach rather than allowing multiple incompatible partial twins to emerge by default. Two viable models are:

- **Single platform standardisation:** choose a primary digital twin platform and require that all suppliers deliver in forms that can be ingested and maintained within it.

- **Federation via open standards:** allow multiple platforms, but require a rigorous set of open deliverables, shared referencing, and a defined authoritative truth layer that remains consistent across systems.
  The common failure mode at City scale is not a lack of tools, but fragmented, inconsistent models.

These two approaches have different costs, benefits and risks. A single platform is likely to reduce friction and overheads of dealing with multiple systems, but will also decrease flexibility and potentially suffer from stagnation and lock-in over time. Open federation with a minimum set of interop standards will allow the tooling to adapt dynamically as requirements and technology develop but will be technically and operationally more complex.

Either way, a clear, city wide definition of minimum interoperability based on open standards will need to be defined. A sensible hybrid approach may be to define interoperability standards which are non-negotiable, and then recommend a reference default toolchain and parameters which are known to implement this. This allows for a simple, compliant path of least friction, whilst supporting innovation in the tools should the need arise.

2. **Mandate open, interoperable deliverables at each lifecycle stage (even if a single platform is chosen)**
   As noted above, even if Forest City standardises on one platform, it should still require exportable open deliverables to avoid long-term dependency[73] and to keep data[74] reusable[75]. In practice[76], this means requiring baseline surveys, design models, and as-built captures to be delivered in open or widely interoperable forms as a minimum ‘public truth layer’

3. **Define digital twin quality as measurable requirements**
   The claim, ‘We have a digital twin’ should be testable. Forest City should define minimum expectations for:

   - Coordinate systems and control networks
   - Accuracy classes and error bounds
   - Metadata completeness (capture method, time, calibration, uncertainty)
   - Validation and QA procedures

This is how Forest City challenges developers constructively; requiring outcomes that can be audited.

4. **Require a maintained digital twin through construction, not a one-off model**
   Forest City should set expectations that the twin is updated at defined milestones (and potentially on a cadence during heavy construction). The deliverable should be a living record supporting coordination, reducing disputes, and improving handover into operations.

5. **Insist on robust GIS ⇄ BIM handoffs (GeoBIM)**
   If Forest City does not plan for GIS/BIM integration early, the project risks parallel universes: one city-scale model and one building-scale model that do not align. Forest City should therefore require consistent referencing, clear transformations, and unambiguous ownership of the 'authoritative' layers of truth.

6. **Use open-source tooling as a compliance test, not an ideology**
   A practical enforcement mechanism is to require that key deliverables can be loaded, inspected, and processed in open tooling (e.g. QGIS for GIS layers and point clouds). This is a check that the programme is not trapped in a single proprietary ecosystem even if one primary platform is chosen.

7. **Treat underground asset truth as a first-class dependency**
   Given the safety and cost impacts of underground unknowns, Forest City should explicitly incorporate underground asset data quality and integration as part of the twin requirements, and require that underground data is maintained and updated throughout construction as 'as-built truth'.

8. **Make Open Source City tangible via publishable layers, specs, and governance**
   Forest City should define which layers should be publishable (and when), the standard schemas and versioning expectations, and the governance boundary between open civic data and protected operational/security data. This ensures openness becomes a maintained asset rather than an aspirational label.

Summary recommendation: Forest City should treat the digital twin (and its open ecosystem) as a foundational programme asset and decide early whether to standardise on a single platform or a standards-led federation. In both cases, it should require open deliverables, measurable quality, and a maintained twin through the full build lifecycle so the city avoids fragmented partial models and retains long-term optionality.

By doing this, Forest City will unlock significant efficiency benefits of data lead development and digital twinning. It would also serve to generate a detailed model which could then be used to accelerate other UK and international development projects.

Wildcards to Track

- Wider adoption of routine reality capture as a contractual norm (scan-to-verify, not just draw-to-build)
- Increasing convergence of GeoBIM workflows and standards (reducing bespoke GIS/BIM integration)
- Low cost scanning improvements (useful for progress capture, but with quality pitfalls if misapplied)
- Component-level semantic models that enable richer ‘as-built truth’ (beyond geometry)
- Evolving norms or regulation about public sharing of city-scale twin data (balancing openness and security)

5. Federated Smart Home Technology

What This Section Will Cover

This section explores potential futures in which federated, open smart home technology plays a role in energy coordination, security and resident well-being. We consider scenarios where homes and buildings coordinate in ways that **could** support improved energy efficiency, demand management, and resident protection. While elements of these systems may mature over the development cycle, the direction, pace, and social acceptability of adoption are uncertain. The emphasis here is therefore on optionality: what Forest City should do now to avoid blocking beneficial futures, without assuming any single technical outcome.

Outline Thoughts We Will Report On

Energy purchasing and demand management

In some plausible futures, federated smart home systems could allow residents (or resident cooperatives) to participate in collective energy purchasing, coordinated load shifting, or flexible demand response[77] . These approaches might reduce peak electricity usage, lower costs, and reduce strain on local infrastructure. However, their viability will depend on evolving market structures, regulation, device interoperability, and resident trust—any of which could develop in different directions.

Smart home monitoring and resident protection

Some futures may see optional, privacy-preserving in-home sensing support improved safety and wellbeing—ranging from environmental monitoring (air quality, humidity, temperature) to safety detection (falls, smoke, unusual inactivity) and limited health monitoring (patterns that

may indicate risk). Adoption is likely to be uneven and culturally sensitive. The section should therefore frame these capabilities as possibilities that may emerge, alongside risks such as overreach, surveillance concerns, misuse, and cybersecurity exposure.

It is possible that future city systems—particularly energy systems—will increasingly expose interfaces for demand response, dynamic tariffs, and resilience measures (e.g., islanding modes, local constraints). Federated smart home systems could integrate with these city interfaces, but only if designed around open standards and clear governance. This section should explore what 'good' integration might look like, without committing to a specific[78] platform[79] .

Integration with wider city systems

It is possible that future city systems—particularly energy systems—will increasingly expose interfaces for demand response, dynamic tariffs, and resilience measures (e.g., islanding modes, local constraints). Federated smart home systems could integrate with these city interfaces, but only if designed around open standards and clear governance. This section should explore what 'good' integration might look like, without committing to a specific platform .

How Forest City Should Respond

Forest City is unlikely to build federated smart home platforms itself. The key decision is therefore what minimum enabling conditions the city should create so that residents, landlords, innovators, and service providers can adopt mature systems later without costly or disruptive retrofits. This can be framed as a set of practical recommendations:

1. **Provide clean, open interface points at the city layer**
   City-managed systems (especially energy-related systems) should expose well-defined, standards-based interfaces that future smart home/federation platforms could connect to—covering areas such as tariff signals, demand response events, local capacity constraints, and (where appropriate) aggregated reporting. These interfaces should be designed to avoid lock-in, minimise data collection, and support multiple competing ecosystems.

2. **Design in physical 'sensor readiness' as a low-regret provision**
   The built environment should make future sensing and device deployment straightforward. This could be as simple as:

   - Providing ducting/conduit routes that reach key rooms and likely sensor locations
   - Ensuring convenient power availability for low-voltage devices (or clear upgrade paths)

- Making maintenance/retrofit access non-disruptive (service voids, accessible risers, sensible mounting options)
- Documenting ‘as-built’ routes so that future installations do not require exploratory work

The intent is not to overfit to today's devices, but to make unknown future devices easy to deploy safely and neatly.

3. **Prefer interoperability-friendly choices in any baseline provision**
   Where Forest City or its delivery partners provide baseline smart-home-adjacent infrastructure (e.g., metering, building management in multi-unit buildings, shared sensors), selection criteria should explicitly include interoperability, exportable data, and the ability to integrate with multiple third-party systems. This should reduce the risk that early choices create a long-term constraint.

4. **Support emerging standards and open ecosystems without owning them**
   Forest City should treat certain standards and open-source reference implementations as strategic enablers, tracking them, engaging early, and using procurement and partnership approaches that make adoption easier. This might include relationships with suppliers who demonstrate credible standards alignment, participation in relevant industry groups, and a bias toward widely used open formats and protocols.

5. **Make governance, privacy, and security design inputs, not afterthoughts**
   Because trust is likely to determine whether federated smart home systems are adopted at all, Forest City should treat privacy-by-design patterns, consent models, and cybersecurity expectations as core requirements for any city interface and any baseline provision. The goal is to enable beneficial futures while avoiding a brittle or surveillance-prone outcome.

Summary recommendation: Forest City should not attempt to predict or build the federated smart home system. Instead, it should design-in optionality through open city-level interfaces, sensor-ready physical infrastructure, and interoperability-friendly procurement—while actively supporting emerging open standards so that future adoption can be low-friction, competitive, and trusted.

There are significant individual and society benefits to smart systems that enhance individual wellbeing, improve living environments, and allow optimal purchasing of utility services. While being deeply mindful of privacy concerns, the smart services that Forest City enables should become a template for desirable, objectively safe services that are viewed as enhancing the private realm of its citizens and their agency.

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APPENDICES

Appendix A. Demography, Land Status, and Current and Future Use

This appendix sets out the following:

- Basic demographic facts about Forest City's (FC) proposed redline area of 45,000 acres
- How the land is currently used
- The status of our engagement with Landowners at the time of writing
- A basic breakdown of future use with map
- A list of monuments and a selection of notable listed buildings

Summary

The plot is mainly grade 2 arable land used for cereal farming. There are 8,000 people who live in 24 villages spanning three authorities—East and South Cambridgeshire and West Suffolk—and the plot area divides roughly equally between all three areas. 35% of people are retired. Landowners controlling 8,000+ acres of land are quite warm to our terms of £60k an acre.

Things to note: the expansion of HMP Highpoint, the proximity of a stud owned by Sheikh Mohammed, PM of the UAE, and a solar farm development which has not yet received planning permission.

Political Geography

The site splits evenly between East Cambridgeshire (14,500 acres - 32%), South Cambridgeshire (13,900 acres - 30%) and West Suffolk (16,600 acres - 36%). The Forest City plot therefore sits on 1.8% of the total area of Suffolk, and 3.4% of the total area of Cambridgeshire.

We have identified 24 villages in all that would be affected.

Balsham	Great Bradley	Little Ditton	West Wickham
Brinkley	Great Thurlow	Little Thurlow	West Wratting
Burrough Green	Great Wratting	Saxon Street	Westley Bottom
Carlton	Kirtling	Six Mile Bottom	Westley Waterless
Cowlinge	Kirtling Green	Stetchworth	Weston Colville
Dullingham	Little Bradley	Upend	Woodditton

Table A.0.1 List of the 24 villages within or abutting the redlined area

Demography

The data below is taken from the National Census broken down in official data by parish. It gives a sense of the demography and current living arrangements. The population for the area is around 8,000 people, leading to a density of 0.45 people per ha. Spare occupancy for 2+ bedrooms runs at 60% for the area, 90% of homes are detached or semi detached and oil heating runs at an average of 62%.

Note: there are small discrepancies between the total redlined area (18,000 ha) and Parish boundaries (17561 ha).

Parish Name	Area (ha)	Area (acres)	Population	Mean age	Household size (1 person) %	Economic activity (retired)
Balsham	1839	4544	1,625	44.1	23.3	41.2
Brinkley	527	1302	368	40.9	24.8	34.4
Burrough Green	919	2271	407	43.4	N/A	N/A
Carlton	978	2417	180	45	20	45.5
Cowlinge	1243	3072	302	40.1	20.3	40.2

Table A.0.2 Parish demography

Parish Name	Area (ha)	Area (acres)	Population	Mean age	Household size (1 person) %	Economic activity (retired)
Dullingham	1370	3385	764	42.9	18.4	36.2
Great Bradley	948	2343	406	43.7	22.2	36.6
Great Thurlow	829	2049	187	38.8	28.6	33.5
Great Wratting	545	1347	194	44.6	16.5	38.9
Kirtling	1265	3126	373	45.5	27.2	37.6
Little Bradley	394	974	380	N/A	N/A	N/A
Little Thurlow	571	1411	230	44.2	27.3	27.5
Stechworth	1170	2891	655	39.4	28.3	31.5
Stradishall	569	1406	490	38.6	17.3	25.7
West Wickham	1188	2936	404	41.1	17.4	36.1
West Wratting	1434	3543	490	41.3	16.7	37.7
Westley Waterless	464	1147	134	42.5	20	33.3
Weston Colville	1308	3232	435	43.5	23.5	33.8
TOTAL/ Average	**17561.0**	**43394**	**8024.0**	**42.3**	**22.0**	**35.6**

Table A.0.2 Parish demography

Farmland Use

The proposed redline area is overwhelmingly agricultural in character. Arable farming is the dominant land use across the corridor between Newmarket and Haverhill, with cereal production — principally winter wheat and barley — forming the basis of most rotations.

Oilseed rape, sugar beet, field beans and root crops serve as break crops. Livestock are present but secondary: sheep and cattle are reported on individual holdings, concentrated on the valley-floor grassland associated with the upper River Stour system and its tributaries near Great Bradley and Haverhill. The soils and topography across the area are variable but broadly productive especially in wheat with some farms approaching a world-beating 10 tonnes per ha. The western edge of the site, towards Newmarket, is underlain by free-draining chalk and chalky loams supporting large-scale arable production in an open, low-relief landscape. That area is also world famous for its grass used for grazing horses.

Moving east and south, the plateau farmland transitions to heavier boulder clay and clay-with-flints, which present greater trafficability constraints and waterlogging risk but remain firmly in arable use. The upper Stour catchment introduces localised flood sensitivity along valley floors. This soil gradient is a primary determinant of crop choice and cultivation timing across the site and will inform the treatment of land within FC's proposed Nature Reserve and green infrastructure network.
Agricultural Land Classification (ALC) grades the majority of the site as Grade 2 — very good quality land — with a smaller proportion classified as Grade 3. An illustrative ALC map is provided at Figure A1 below.

FC acknowledges that the proposed development will involve the permanent loss of Best and Most Versatile (BMV) agricultural land, a material planning consideration under the NPPF. Mitigations are addressed in Appendix E directly and in the main body of the report, which sets out the exceptional public interest justification for the scheme and the absence of suitable lower-grade alternatives of sufficient scale.

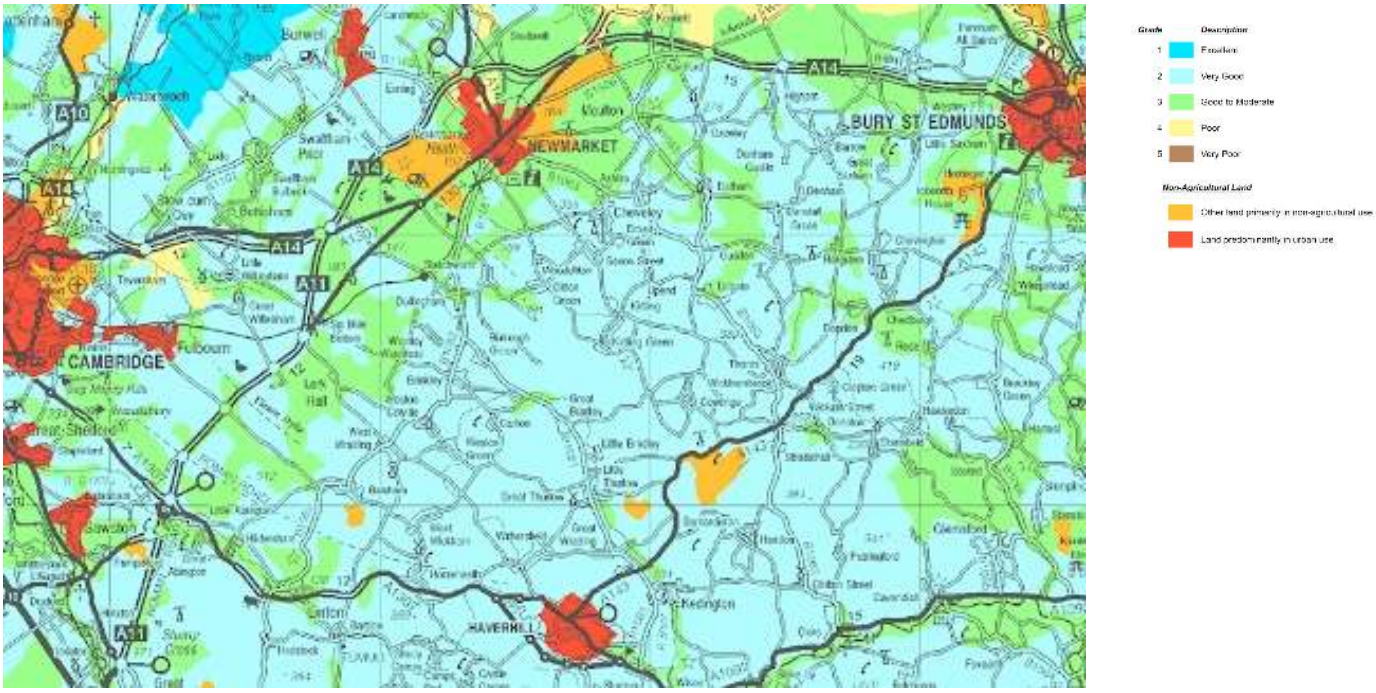

Fig. A.0.1 Agricultural Land Classification

SSSI's

Woodland cover is limited but ecologically significant. The area contains seven Sites of Special Scientific Interest with a total size of 234 ha (578 acres) including Balsham Wood (35 ha), one of the last surviving areas of ash and maple woodland on chalky boulder clay in Cambridgeshire, and Trundley and Wadgell's Wood near Great Thurlow (79 ha), a semi-natural ancient coppice woodland on boulder clay soils. Both are noted in the SSSI section below. Their presence influences land management across adjacent arable blocks. Forest City would retain all SSSIs within the 12,000 acre Nature Reserve.

OBJECTID	REF_CODE	NAME	MEASURE (ha)	HYPER LINK	CONTACT _NO	GlobalID
69	1002789	69	69	69	69	69
676	1002702	69	69	69	69	69
341	1002757	69	69	69	69	69
820	1001880	69	69	69	69	69

Table A.0.3 SSSIs

OBJECTID	REF_CODE	NAME	MEASURE (ha)	HYPER LINK	CONTACT _NO	GlobalID
820	1001880	69	69	69	69	69
1676	1002836	69	69	69	69	69
675	1002822	69	69	69	69	69
2367	1002845	69	69	69	69	69

Table A.0.3 SSSIs

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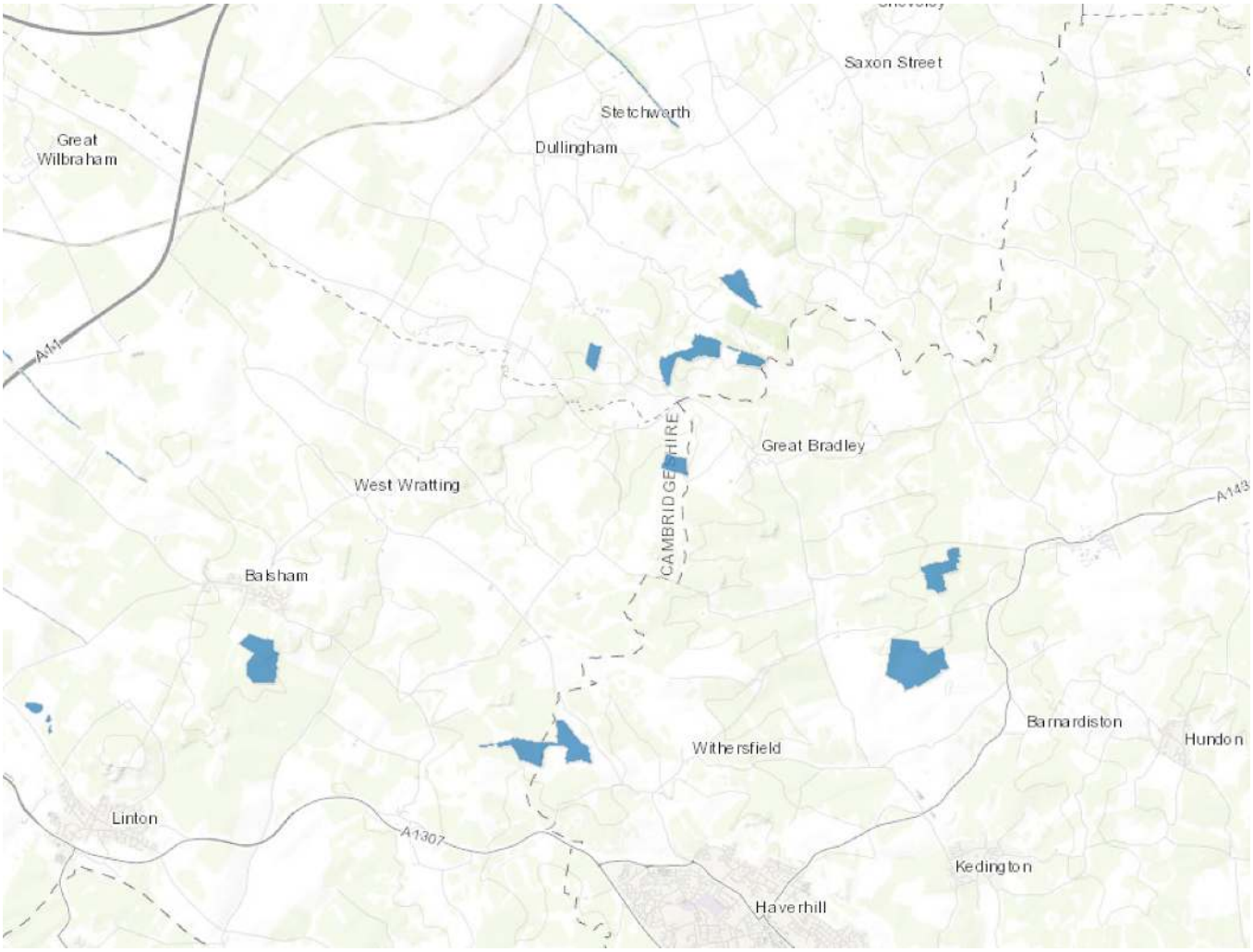

Fig. A.0.2 Map of SSSI sites

https://en.wikipedia.org/wiki/Park_Wood,_Cambridgeshire
https://en.wikipedia.org/wiki/Balsham_Wood
https://en.wikipedia.org/wiki/Carlton_Wood
https://en.wikipedia.org/wiki/Ten_Wood
https://en.wikipedia.org/wiki/Out_and_Plunder_Woods
https://en.wikipedia.org/wiki/Trundley_and_Wadgell's_Wood,_Great_Thurlow
https://en.wikipedia.org/wiki/Over_and_Lawn_Woods

Other schemes being promoted in the area

Kingsway Solar

The biggest scheme currently under proposal is the Kingsway Solar project. Proposed by Downing Energy, over some 3,000 acres, which have been optioned with three landowners, the proposal is requires a significant pylon extension in order to connect to a substation. The Mayor of Cambridgeshire & Peterborough has come out against the scheme.

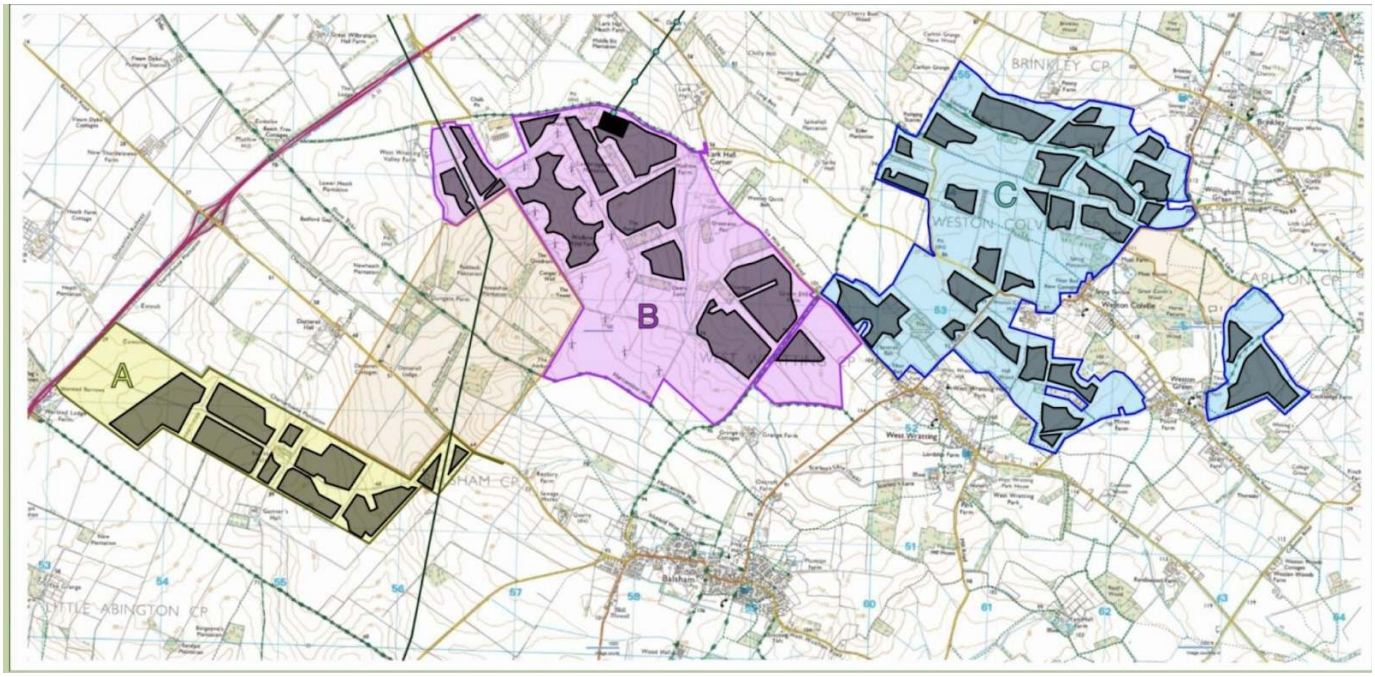

Fig. A.0.3 Kingsway Solar map

Downing Renewable Developments | Developing Renewable Energy...

Urban & Civic

An option of 1,800 on land by Urban & Civic and Hill, originally submitted as a proposal for ‘Westley Green’ as part of New Towns (Six Mile Bottom). It was rejected and is also not part of the local plan[83] .

HMP Highpoint

The prison at Stradishall is undergoing a very significant rebuilding project and will eventually become one of Europe’s biggest prisons[84] .

TfL Windfarm

Land owned by XXXX has windfarms operating on it which are owned by TfL’s pension scheme. We don’t envisage that being a problem for the foreseeable future.

Proposed future land use

- 12,000 acres forest / nature
- 8,000 acres commercial + amenities including stations, leisure centres etc of which 1300 or 2 square miles of office space. Some of which will be hyper dense CBD and residences
- 21,000 - housing at an average of 47 dph
- 1,700 for reservoir
- 2,300 for other amenities including roads and energy

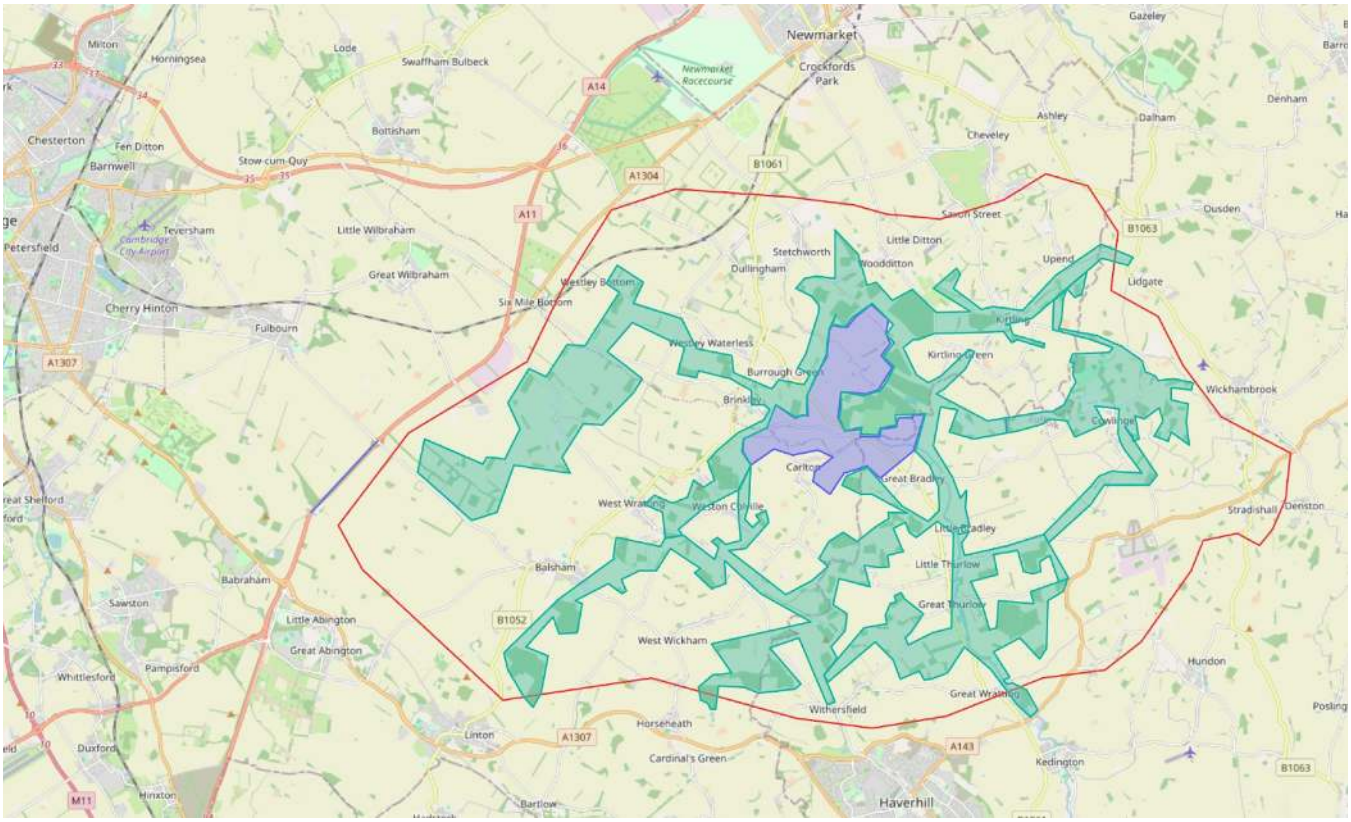

Fig. A.0.4 Early draft site map and redline

An average of 45-50 dwellings per hectare (dph) is proposed across the residential area. For context, Islington and Kensington both exceed 75 dph, and central London averages 51 dph . The proposed density is therefore consistent with medium-density urban environments and reflects the land constraints set out above. The overall land budget across the proposed uses is finely balanced, with limited scope for further contingency allocation.

List of Notable buildings

There are 25 scheduled monuments including Devil's Ditch/Dyke and well over 100 grade 2 (mainly residential) properties listed in or abutting the plot. A selection of Grade I and Grade II* buildings are listed below.

List of Scheduled Monuments

DULLINGHAM HOUSE
Heritage Category: Park and Garden
Grade: II
List Entry Number: 1000618

Worstead Street (Via Devana) near Cambridge
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1003263

Bowl barrow 160m south west of the National Stud clubhouse
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1015012

Fleam Dyke
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1006931

Moated site in Beeton's Plantation
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1019818

Medieval moated site 160m north east of The Hall
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1020059

Four bowl barrows at Allington Hill, 420m south west of Allington Hill Farm
Heritage Category: Scheduled
Grade: Not applicable
List Entry Number: 1016820

Devil's Ditch, Reach to Woodditton
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1003262

Lidgate Castle and C16 Fortified Manorial Complex
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1006024

Roman villa SE of Lidgate
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1002971

Moat NW of village
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1006017

Moat House moated site
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1019174

Moated site at Yen Hall Farm
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1019184

Moated site at Fairstead Farm
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1019802

Moated site at Cowlinge Hall
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1019524

Bowl barrow 135m south of Waterhall Cottage, Wickham Street
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1018040

Moated site W of Gifford's Hall
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1005990

Moated site at Ganwick Farm, 580m west of House Farm
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1019807

Moated site and fishpond immediately north east of All Saints' Church
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1019808

Moated site and associated garden immediately east of The Hall
Heritage Category: Scheduled MonumentGrade: Not applicable
List Entry Number: 1019525

Moated site 300m north west of Hunts Park Farm
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1019806

Moated site 300m south west of Sowley Green Farm
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1020139

All Saints' Church, remains of
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1006898

Moated Sites, Earthworks, and Ponds at Kirtling Tower
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1013140

Moated site at Seven Elms Green, 210m south west of Erratts Farm
Heritage Category: Scheduled Monument
Grade: Not applicable
List Entry Number: 1019817

Selection of Grade I +II*

CHURCH OF ALL SAINTS
Heritage Category: Listed Building
Grade: I
List Entry Number: 1227173
View this list entry
https://historicengland.org.uk/listing/the-list/list-entry/1227173

CHURCH OF ALL SAINTS
Heritage Category: Listed Building
Grade: I
List Entry Number: 1264889
View this list entry
https://historicengland.org.uk/listing/the-list/list-entry/1264889

KIRTLING TOWER
Heritage Category: Listed Building
Grade: I
List Entry Number: 1126291
View this list entry
https://historicengland.org.uk/listing/the-list/list-entry/1126291

CONCORDIA HOUSE
Heritage Category: Listed Building
Grade: II*
List Entry Number: 1127932
View this list entry
https://historicengland.org.uk/listing/the-list/list-entry/1127932

WEST WRATTING PARK HOUSE
Heritage Category: Listed Building
Grade: II*
List Entry Number: 1127902
View this list entry
https://historicengland.org.uk/listing/the-list/list-entry/1127902

WINDMILL AT MILL COTTAGE
Heritage Category: Listed Building
Grade: II*
List Entry Number: 1165266

View this list entry
https://historicengland.org.uk/listing/the-list/list-entry/1165266

CHURCH OF ST MARY
Heritage Category: Listed Building
Grade: II*
List Entry Number: 1181580
View this list entry
https://historicengland.org.uk/listing/the-list/list-entry/1181580

PARISH CHURCH OF ST MARY THE LESS
Heritage Category: Listed Building
Grade: II*
List Entry Number: 1127104
View this list entry
https://historicengland.org.uk/listing/the-list/list-entry/1127104

GREAT THURLOW HALL
Heritage Category: Listed Building
Grade: II*
List Entry Number: 1181879
View this list entry
https://historicengland.org.uk/listing/the-list/list-entry/1181879

CHURCH OF ST PETER
Heritage Category: Listed Building
Grade: II*
List Entry Number: 1127132
View this list entry
https://historicengland.org.uk/listing/the-list/list-entry/1127132

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85 Greater London Authority Research Unit, London's Housing Stock, November 2024. Available at: https://www.london.gov.uk/sites/default/files/2024-11/London%27s%20Housing%20Stock%20-%20Research%20Unit%20-%20November%202024.pdf
86 https://en.wikipedia.org/wiki/Dalham_Hall

Appendix B: Invest East Strategic Planning Statement (March 2026)

By Steve McAdam

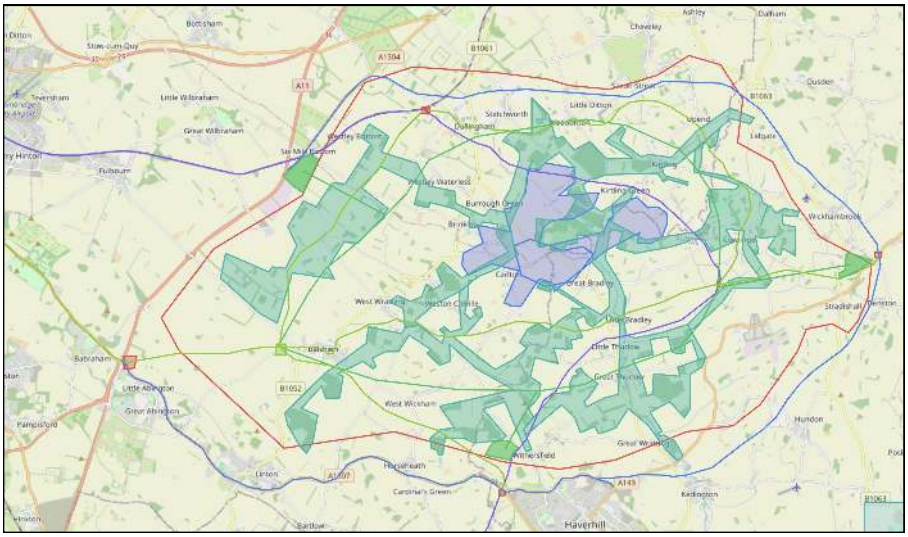
Forest City recognises the East of England as one of the fastest-growing areas of the UK and a consistent net contributor to the Treasury. The project's advisory board recognises that infrastructure is a critical catalyst for productivity, clean energy, connectivity, and new housing, and will support massive growth (via Forest City) when connected through to Ipswich, the Energy Coast, and the region's deep harbours. We see the opportunity to contribute significantly to a full East-West vision.

Forest City is a proposed new city, the first in Europe in over 50 years, to be built on agricultural (grade 2 and 3) land in Suffolk and Cambridgeshire between Newmarket and Haverhill.

Roughly one third larger than the size of Bristol, the vision is to build 400,000 homes across 45,000 acres, (18,200 ha) including the provision of 12,000 acres of new forest and re-wilded land, thereby creating England's largest, contiguous land-based nature reserve.

Taking inspiration from Bournville and large scale US CLT models, Forest City will set up a city-wide Community Land Trust to retain genuinely affordable housing over the long term, and build-in land value capture as a central feature.\\

This is a long-term project, which will underpin the UK's response to Silicon Valley, transforming the East of England economy, combining infrastructure and housing; and agglomerating the benefits of both to generate transformational growth with GVA expected to be £53bn once fully built out.



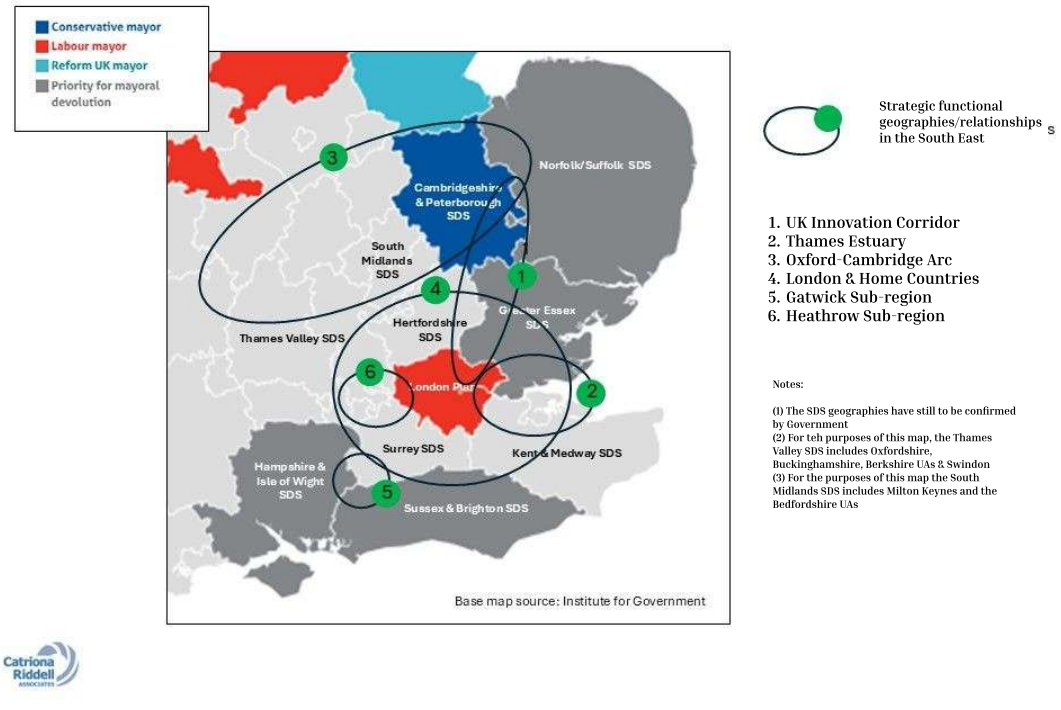
Forest City early draft map showing the outline for a nature reserve, new road and rail links and proposed site for a 1600+ acre reservoir

Previous Growth Plans for Suffolk have tended to focus activity on Felixstowe and not to the west of the county. However, the area around Haverhill (pop 30,000) has long been considered to have considerable growth potential. A strategic case to alleviate pressure on the A14 through a rail link with Cambridge South, is being promoted by Railfuture East Anglia and local MP Nick Timothy, as is a fresh look at mass transit solutions in Greater Cambridge by Cambridgeshire and Peterborough Combined Authority (CPCA) and the Cambridge Growth Company. Better rail links towards Newmarket are also under discussion by East West Rail and CPCA.

That growth has not been formally proposed in this region before, is a function of the poor transport networks, the need to improve the connectivity of Ipswich (especially to jobs in Cambridge), and the priority of getting freight from the ports and especially Felixstowe to the M1/M11/M25. Forest City will substantially address these issues, thus assuring the connectivity of Haverhill and accelerating delivery of better rail services to Newmarket.

Spatial Development Strategies

It is envisaged that Forest City would provide a central plank for the respective Growth Plans and hence the Spatial Development Strategy (SDS) for both CPCA and for that of Suffolk and Norfolk, as well as make a key strategic contribution to the Spatial Development Strategy of Essex, to complement and work with the growth that is planned for the north of Essex addressing the emerging map of Strategic Planning Authorities and ‘functional geographies’. (See diagram below)

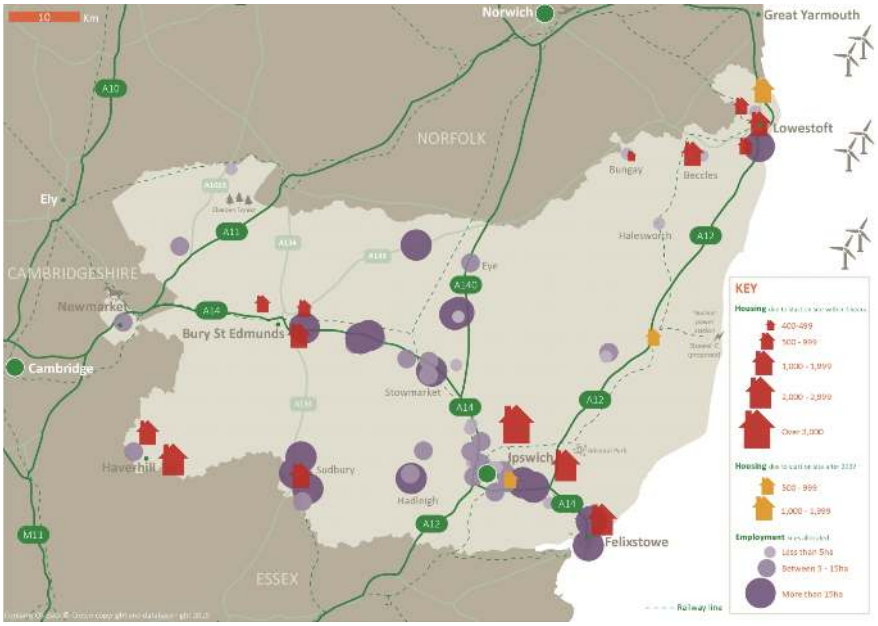


Emerging Strategic Planning Authorities via Catriona Riddell Associates.

Boost the strengths of the region

By providing a powerful focus for local economic development, Forest City will seek to:

- Underpin a major overhaul of transport provision for the East of England by further leveraging East-West Rail's double tracking to Newmarket, adding a rapid transport link to Stansted Airport and London Liverpool Street via a new 'Haverhill Parkway' station, and other major improvements to existing road and rail infrastructure including the A1307.
- Support for the Business Case on Ely Junction, together with new heavy and light rail investment and providing further support for the ports in the region, including Freeport East.
- Integrate the existing energy infrastructure, including the new investment at Sizewell C and support growth in clean tech, agritech and advanced manufacturing building on the Suffolk Growth Framework (see diagram above).
- Underpin the Business Case for a new system of reservoirs, extended pipelines and innovative water supply drawing on current MHCLG research and 'sponge city' strategies.



Extract from Suffolk Growth Framework (October 2019)

Forest City looks to impact not only our incoming cohort of residents and national targets, but also the 6.4 million people, who currently live in the East of England region through improved job opportunities, expanded skills provision and apprenticeships, enhanced transport links and increased provision of affordable housing.

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improved job opportunities, expanded skills provision and apprenticeships, enhanced transport links and increased provision of affordable housing.

At city scale, economies in delivery will be sustained through new methods of construction, on-site production, low carbon materials, digital technologies and robotics companies. These elements, approaches and skills are essential for unlocking growth and delivering positive outcomes for both communities and the economy.

- Reinforce the region's innovation and knowledge economy; networking the local university provision, including Essex, UAE, ARU and Middlesex Universities, as well as (the global top ten) University of Cambridge and UCL.
- Provide renewed impetus to resolving the challenges faced by neighbouring Ipswich, responding to its low-wage, low-skill economy.
- Knit together the Growth Corridors of Cambridge to Norwich, Ox-Cam, the UK Innovation Corridor and the Thames Estuary Growth Corridor; further substantiating the aspiration of this region to be the UK's response to Silicon Valley (with a GVA of £900bn).

Forest City Powering the East of England



Up to 400,000 homes, at an average density of 45dph.



Over £45bn in infrastructure investment including up to £16bn for transport.



8,000 acres of commercial space located in an SEZ. £53bn in GVA



12,000 acres of new woodland to create England's single largest, land-based nature reserve.

We will work with key government departments (MHCLG, DSIT and DEFRA) and all local stakeholders to achieve this vision, including CPCA, Suffolk County Council, West Suffolk District Council, Transport East, England's Economic Heartlands, Anglian Water, Local Government East, Natural England, and the Environment Agency.

In this way, the Forest City project will provide a focus for the work of the emerging Invest East Board, which is seeking to use the emerging strategic planning framework to significantly uplift the foreign direct investment into the East of England region.

Appendix C: Note on CLT mortgage viability

By Tom Chance

Summary

We were tasked to look at whether UK banks and building societies would, in principle, offer mortgage products to homes that fell within a Community Land Trust Model (CLT). We have reviewed the literature on existing lending to CLTs for similar mortgage products and on lending for First Homes and other forms of discount market sale. We have also spoken to two lenders including the Nationwide Building Society who confirmed they would lend on this, and indeed already do so today.

Willingness to lend would be subject to the precise details of the tenure, and how the CLT element relates to wider charging schedules for the stewardship and governance of the city, which needs further exploration.

At this stage we have also not made assumptions about whether the tenure in the city is leasehold, or freehold with covenants on properties.

Valuations for retail mortgages for residents

To date, CLTs selling homes at discounted values have calculated the initial sale price, and resales, by one of three means:

A. A percentage of the Open Market Value (OMV) of the home, often initially based on build cost and/or local incomes, and calculated at the point of each sale.

B. An initial price reflecting e.g. actually build costs, uprated by an index such as CPI.

C. Pegged to local median incomes from the ONS Annual Survey of Hours and Earnings, with assumptions about borrowing power of different household sizes.

All three present puzzles for the Forest City:

1. With (A), what would the basis of an OMV valuation be if there is no open market in the city, and the surrounding areas would not be comparable?

2. With (B) and (C), how can homeowners realise the value of maintenance and any improvements (e.g. an extension, or new higher spec kitchen)?

3. With (B) and (C), might values diverge significantly over time between the Forest City and other local housing markets, leaving people stranded in the city?

As CLT homes have been a small market to date, and are usually a first step into home ownership rather than long-term residences, these issues haven't been a significant problem for existing CLTs.

The current Forest City plan proposes a fourth model, in which valuations reflect the value of the building, without the locational value of the land. But is there an accepted methodology for surveyors to determine this value? Insurers use a 'rebuild cost' but it is generally understood to bear little resemblance to reality, and again would not normally reflect maintenance and improvements made by homeowners.

Ground rents and city financing

The current City plan proposes charging ground rents and using this to fund services across the city. The benefits of this could include:

1. Calculating the ground rent in relation to the value of the land, creating a localised land value tax (and incentivising leaseholders to maximise the economic value of the land).
2. Cross-subsidising local services through the rental income from commercial, retail and industrial land uses.

However, it could also be a regressive tax, much like council tax, so some work would need to be done on modelling potential ground rent incomes, and city running costs.

It would also be a harder sell politically, with a broad cross-party consensus that leasehold is inherently bad. To date the CLT movement has successfully exempted CLTs from measures to ban new leasehold houses and new residential ground rents, and have primary legislation (that requires secondary legislation to implement) to exempt CLT homes from leasehold enfranchisement.

While this is partly due to the non-profit, democratic nature of the model, it may also be because it's a small sector currently. We have the historic example of the enfranchisements in Letchworth as a warning. It would be all the more important to ensure that Forest City homes provide most of the benefits of freehold ownership (e.g. through 999 year leases with as few encumbrances as are necessary) and protections against abuses (which the CLT should provide). Ground rents just on commercial land would be a separate matter and standard practice for that market.

City and neighbourhood governance

The current plan talks about ‘the City’ owning the land, and being a giant CLT. This would certainly be possible but it raises two fundamental questions:

1. **What is the governance model for the city?**

Would there be a local authority, and would that local authority in effect be, or own, the CLT? Or will the city fall within the bounds of an existing unitary authority, and have its own equivalent of a town council? The nature of the governance, and the relationship with the ‘CLT’ bit, needs working through as it may be that the enabling legislation for the city needs to give specific powers to the city authority.

2. **Is it just a city-wide CLT?**

CLTs were designed to achieve three things: to take land out of the market, separating its value from the improvements; to give communities control of the land, through a participatory democratic model (distinct from the representative democratic function of a council); and to ensure the community stewards the land for the wellbeing of current and future generations. This provides not only for positive economic outcomes, but also a richer civic life producing better public health and more equitable economic growth. Currently the City plan delivers on the first, but not the second and third characteristics. One could, instead, break the city into neighbourhoods, each with its own CLT. Or—since the ground rents on land would be financing core services—have most land in the City authority, and then parcels at neighbourhood level for amenities like affordable housing and community spaces owned by neighbourhood CLTs in which there is the potential for participatory engagement.

Appendix D. Mitigations against loss of arable land

The loss of around 45,000 acres (18,210 ha) of farmland is not an insignificant issue both from a national food security perspective and at a regional level. Mapping the Forest City plot against NE's RALC shows that the vast majority of the land is grade 2 with some grade 3. The FC plot represents 1.6% of all in use arable land in the East of England[87] and a total of 0.2% of total farmland in England. In the main, the plot is highly productive in cereal (more than 8 tonnes per hectare for wheat) and beet.

Mitigation measures

The question that FC should seek to answer is what is our mitigation strategy. A framework for mitigation might be provided by the AL1 strategy currently being deployed in Cornwall for "Regenerative, Low Impact Development". It suggests that inhabitants on a former greenfield plot should derive a minimum of 30% of food from that which is grown / reared on site. This might not be possible with a population of one million people. But a 10% minimum commitment from FC to grow food from within the plot, might serve as a way to hold the project accountable.

Other mitigations or offsets might also include:

1. A long term commitment to divert FC's already extracted, but non-potable water for regional farming purposes. Given the Environment Agency's already stringent water use regime, this would be of very real benefit to vegetable growers in the wider Suffolk region.
2. Investment in Agritech, specifically new national centre of excellence educational facilities with dedicated long term funding to come directly from the City. This would help drive long term agricultural productivity across the nation to make better use of the remaining land.
3. Demonstrating how within City infrastructure will be dual-purposed for the benefit of food use. An example of this could be this scheme in East Anglia which used waste heat from sewage treatment works to heat food producing greenhouses.
4. One off financial commitment to funding regional agricultural infrastructure e.g. communal/cooperative grain stores in collaboration with DEFRA/NFU or other appropriate body.
5. A financial remediation package for businesses and employers directly affected by the change of use.

87 Figure derived from calculating total arable land only in East of England (1,417,000 hectares x 80%) https://www.gov.uk/government/statistics/agricultural-facts-england-regional-profiles/agricultural-facts-east-of-england-region