



THE MASTERPLAN

Centrally Located, Globally Connected



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1. FOREWORD

Arden Cross is a nationally significant development opportunity to create a world leading economic hub that co-locates business, living and learning within a fantastic urban realm complemented by high quality infrastructure.

The 140 hectare site will support up to 27,000 jobs and up to 3,000 new homes with future workers, residents and visitors benefiting from unparalleled access to air, rail and road travel. Arden Cross's strategic location in the centre of the UK and its close proximity to an educated and skilled workforce, will provide an attractive proposition for international investors and occupiers looking to establish and expand.

The delivery of the High Speed 2 Interchange Station will place Arden Cross at the centre of the new national high speed rail network and provide a catalyst, further enhancing the site as the best connected development opportunity in the UK.

Arden Cross Ltd (ACL) – the delivery vehicle formed by the consortium of landowners – has a clear ambition to unlock the huge potential of the site and create a positive legacy for the future. Partnership across Government, HS2 Ltd and local stakeholders will be integral to realising this and ACL are committed to working collaboratively to deliver the economic, social and environmental benefits for UK plc.

ACL have produced this masterplan as an innovative and forward thinking approach to the site's development. It harnesses the area's unique landscape and infrastructure offer to create an environment in which people and businesses can thrive.

2. INTRODUCTION

This masterplan demonstrates the significant potential of Arden Cross and the contribution to economic growth that HS2 can bring to the region.

Arden Cross is a key part of UK Central (UKC), a dynamic cluster of economic assets including Birmingham Airport, the National Exhibition Centre (NEC), Birmingham Business Park, Birmingham International Rail Station, and Jaguar Land Rover (JLR).

UKC is a major economic asset for the country, one of the largest outside of London, contributing £5.1 billion to UK GDP per annum. It is a priority for delivering further economic growth, homes and employment opportunities in the region with the strategy for UK Central supported by the Greater Birmingham and Solihull Local Enterprise Partnership (GBSLEP), the West Midlands Combined Authority (WMCA) and the Government.

It is the ambition of ACL to ensure the creation of a major new development that integrates the HS2 station, makes best use of the surrounding assets and contributes to boosting the Midlands and UK economies.

The masterplan has been developed in partnership with stakeholders across the region and demonstrates the scale of opportunity through a shared vision which in turn leads to a set of development principles to unlock the site's full potential.

Delivering the masterplan will require commitment across local, regional and national levels to ensure Arden Cross and its supporting infrastructure is delivered.

Arden Cross will support – and be supported by – national, regional and local ambitions, from the Government's Rebalancing Britain initiative, to the West Midlands Industrial Strategy, and UKC's targets for economic growth. The site can and will become a key driver for economic growth and rebalancing the UK economy.



At the heart of the development is the HS2 Interchange Station – the first stop outside London on the new national High Speed Rail system. It will connect Euston and Old Oak Common, in the capital, with Curzon Street Station in Birmingham City Centre, and ultimately to the north in later phases

Arden Cross on the UK's proposed new High-Speed railway network

3. THE SITE

Arden Cross is a 140 Ha (346 acre) site uniquely located at the geographic centre of the UK and at the heart of the national infrastructure. It is one of the country's best connected development locations with immediate access to air, rail and road infrastructure.

Adjacent to Birmingham Airport, which offers daily direct flights to over 150 destinations, Arden Cross will share a dedicated connection to this important hub, the NEC campus, and Birmingham International Railway Station via an Automated People Mover (APM). A key stop on the West Coast Main Line, Birmingham International provides a direct link to Birmingham New Street station, the busiest commuter hub outside of London.



Birmingham Airport has over 150 international destinations

Arden Cross is located within the UK Central's economic growth initiative; an area of Britain with one of the strongest high-value manufacturing economies, unrivalled higher educational institutes and access to a highly-skilled workforce.

The site will benefit from allocated Government infrastructure funding, that will provide direct access from the M42 regional highway and onto the wider national motorway network of the M1, M5, M6 and M40.



London is currently one hour away by train, which will be reduced to 38 minutes once the first phase of HS2 comes online.

Located between the major conurbations of Birmingham and Coventry, the region is also steeped in history, and benefits from access to open countryside as well as the towns of Warwick and Stratford-upon-Avon, birthplace of William Shakespeare.

The Arden Cross site is directly connected to the national and international transport networks



ARDEN CROSS
UK CENTRAL

4. THE VISION

Arden Cross will become an internationally renowned business destination that provides a world class environment for working, living, learning and leisure. With unrivalled connectivity, by rail, road and air, fantastic public realm and the best in smart technology Arden Cross will offer a bespoke location supporting businesses to invest, innovate and grow.

Through its emphasis on the natural landscape this truly mixed use place will provide for the highest quality of life, excellent productivity and an enabler for a carbon positive future, creating an environment in which people and businesses can thrive.





5. ARDEN CROSS COMPONENTS

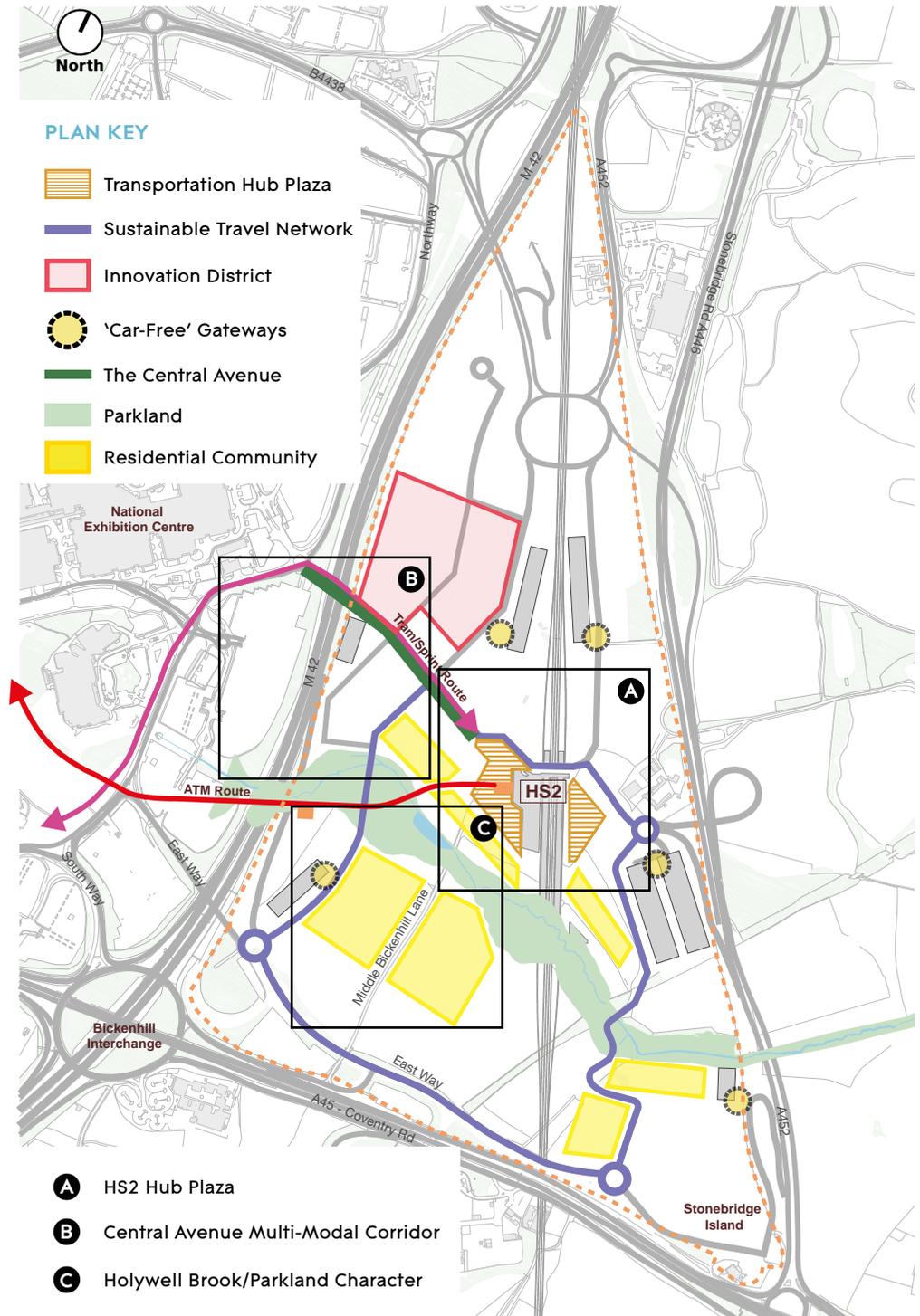
The vision for Arden Cross will be realised through a series of key components and development principles that will define the overall quality of place.

Arden Cross will feature a series of separate urban quarters, each with their own unique character. This will underpin the attractiveness of the place to major corporate and institutional occupiers, new businesses and start-ups, people looking for high quality living environments and unique leisure experiences.

These new community districts will be set against a backdrop of exceptional, fully-integrated public realm and a vibrant mix of alternate uses that integrates with the unique, natural characteristics of the area.

Residential Community

The new residential community at Arden Cross will be formed by high quality high density urban living that is set among a green landscaped environment with parkland at its heart. With up to 3,000 homes providing a rich mix of housing typologies - from one bed apartments to town houses - supported by community facilities, future residents will have access to a diverse mix of employment, leisure and recreational opportunities alongside the unrivalled connectivity of road, rail and air. The residential neighbourhoods that comprise the new community will be integrated with the wider area through dedicated cycle, walking and public transport corridors.



Arden Cross key masterplan components

Innovation District

This will house a combination of research and development facilities with high value manufacturing accommodation, aimed at enhancing the range of employment opportunities at UK Central.

In addition, this district will feature the opportunity for co-location of higher educational campuses, providing academic support and internship for students, together with industry partners. It will support innovation in the UK's leading industries, centred on an 'innovation employment corridor', all running off Central Avenue and linked to HS2 and local/regional transit systems.

Communal exhibition and showcase facilities will help to foster innovative collaboration across the UK's leading industries.

Transportation Hub Plaza

The hub will be a lively arrival space with a vibrant high quality public realm incorporating a mix of uses, whilst Station Square will be a main thoroughfare, offering places to dwell for visitors, workers and residents.

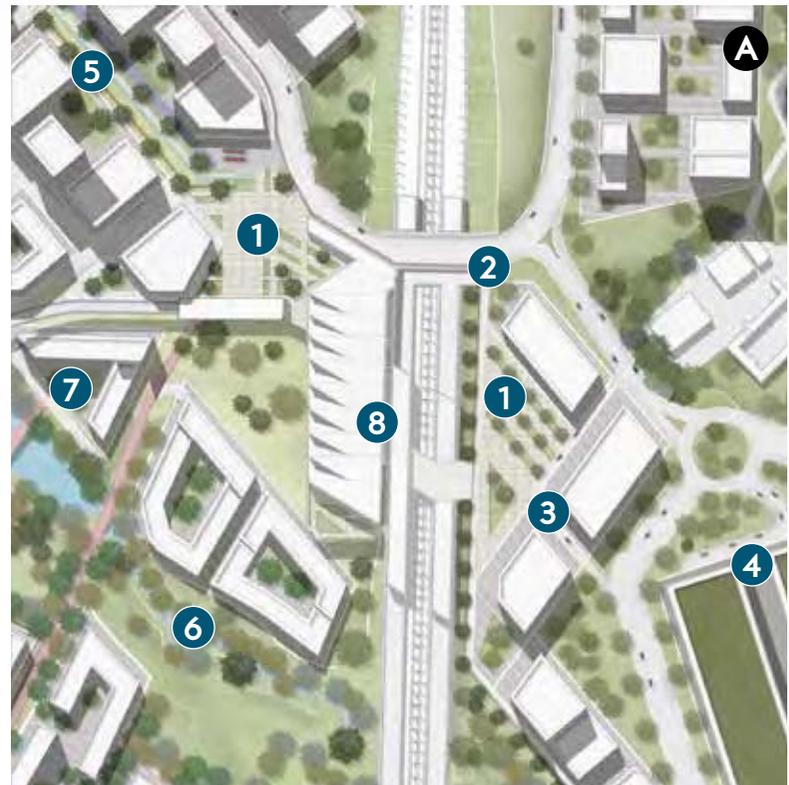
Station Square will be defined by its unparalleled links to the site-wide mass transit systems and attractive pedestrian/cycle routes.

It will incorporate leisure, retail and cultural attractions at ground level, with Grade A commercial offices/hotels/residential above.



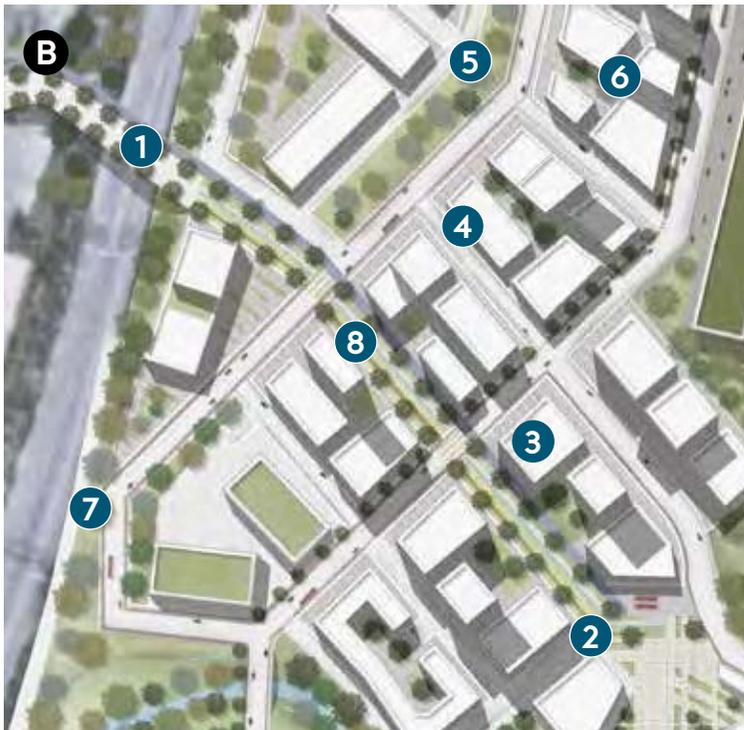
PLAN KEY

- 1 Transportation Hub Plaza
- 2 Sustainable Travel Network
- 3 Intermodal onward travel hub
- 4 'Car Free' Gateways
- 5 The Central Avenue
- 6 Parkland
- 7 Community Education facilities
- 8 HS2 Interchange Station



The HS2 Transport Hub Plaza

5. ARDEN CROSS COMPONENTS



PLAN KEY

- 1 Future multi-modal bridge connectivity to NEC site
- 2 Station plaza with ground floor commercial activities
- 3 Grade A office space and intercontinental hotels
- 4 'Innovation' district research and development
- 5 A network of green space and civic amenity
- 6 Jigsaw Innovation Campus
- 7 Landscape buffer zones
- 8 Central Avenue

The Central Avenue

Central Avenue will enable movement between the Interchange Station at Arden Cross to the wider UK Central region, via the NEC campus, Birmingham International Railway Station and Birmingham Airport.

A high quality, people friendly movement corridor, Central Avenue will feature active frontages supporting retail and leisure uses, creating a high quality urban streetscape.

This 'aspirational' movement corridor, enabling Arden Cross to integrate with established urban centres to the west, would prioritise public transport modes along its length.

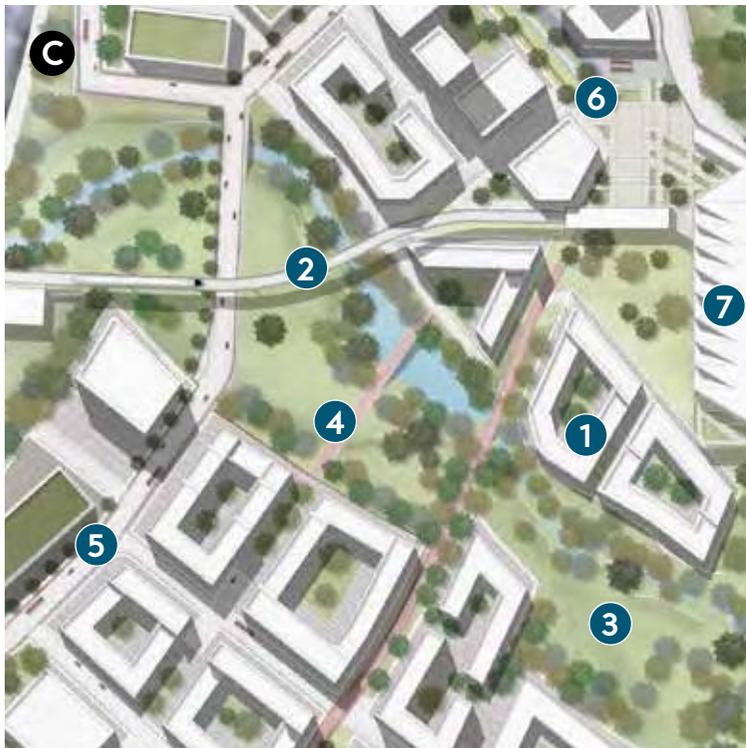
Dedicated mass transit lanes, a cycle 'super-highway' and landscaped pedestrian routes filter into permeable development plots and on to the other key character areas at Arden Cross.

'Car-Free' Gateways & the Sustainable Transport Network

Personal-vehicle parking facilities at the highways gateways to Arden Cross; allowing a 'car-free' settlement, where visitors/ workers/residents move around the site using sustainable transport modes : Cycles, electric scooters, autonomous 'on-demand' mass transit systems.



The Central Avenue multi-modal corridor



Parkland

The masterplan for Arden Cross has been devised with significant consideration given to the historic landscape of the area.

Arden Cross will provide an exceptional network of interlinked landscaped environments with the 10 Ha Hollywell Brook nature corridor at its centre.

The Hollywell Brook landscape will form the focal point of the residential neighbourhood. The landscape and ecology strategy extends through all parts of the development, with retention of natural elements and ability to deliver biodiversity net gain.

PLAN KEY

- 1** Homes overlooking Hollywell Brook landscape
- 2** Automated People Mover (APM)
- 3** Amenity open space and wildlife habitat landscape
- 4** New pedestrian and cycle movement network
- 5** Dedicated mass transit movement routes
- 6** Integrated onward travel interchange
- 7** HS2 Interchange Station

Hollywell Brook/Parklands character area

6. DEVELOPMENT PRINCIPLES

6.1 URBAN ACTIVITY, USES AND DEVELOPMENT DENSITY

Arden Cross offers a unique opportunity to set the benchmark for future international urban innovation and development of leading mixed-use environments.

Testing has already been undertaken for a 'market-ready' land use strategy and accommodation quantum. However the flexible and adaptable nature of the masterplan will allow it to respond to changes in the social and economic climate.

A high-density, activity-intensive strategy will be implemented around the High Speed transport hub; providing a rich mix of cultural, commercial, leisure and retail activity.

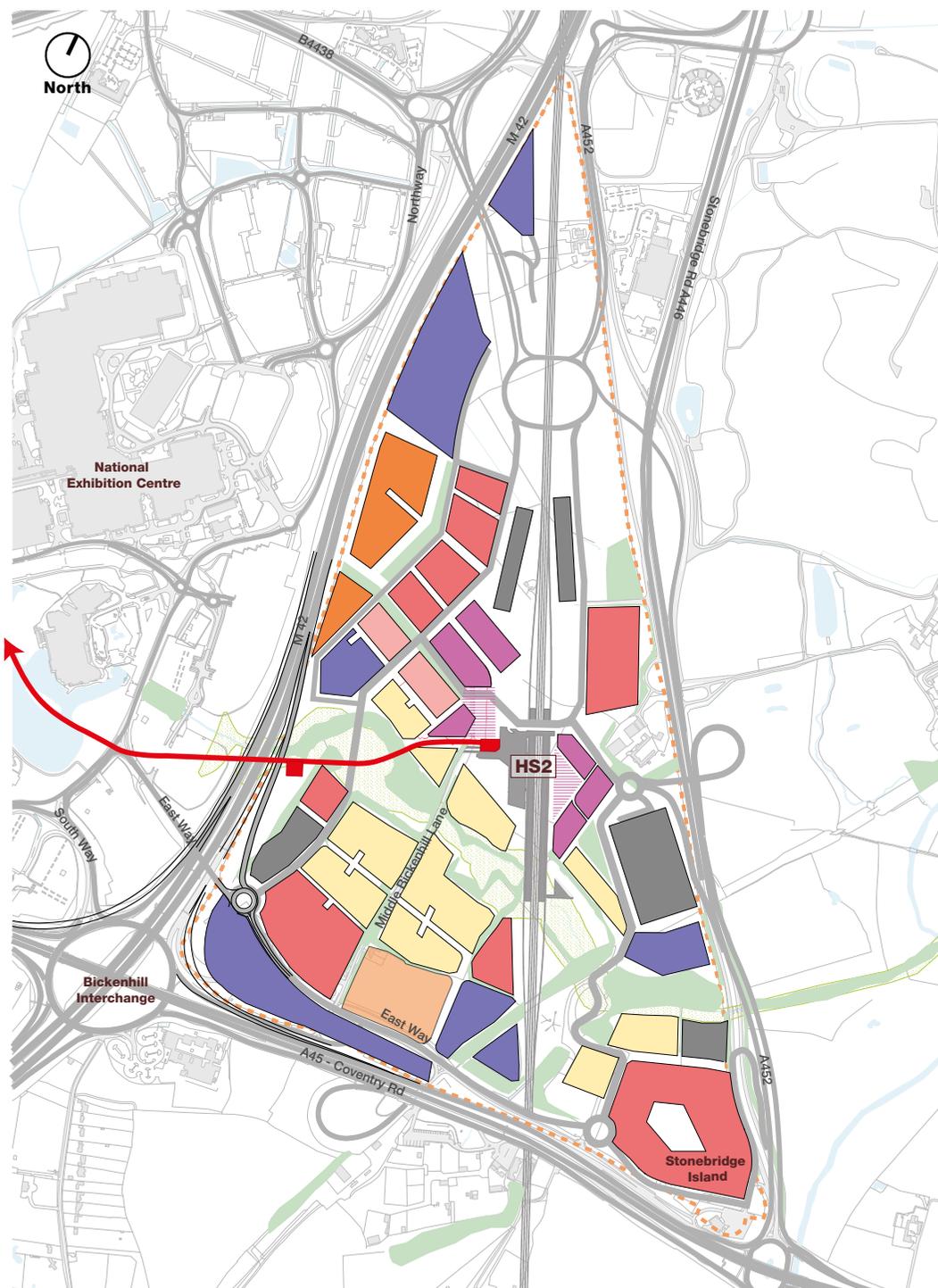
From Station Square, movement corridors lead to innovation and employment districts, higher education campus outposts with industry partners, creative and starter spaces providing a range of jobs, and mixed typology homes overlooking natural greenspace all connected via dedicated public transport routes.



Identified development plots at Arden Cross; with potential for a phased delivery, linked to enabling infrastructure implementation



A 'fine-grained' approach to the development plot build-out is envisaged; with a flexible land use strategy which adapts to economic conditions



Arden Cross will benefit from a phased and flexible land use strategy linking to efficient enabling infrastructure provision and public transport accessibility.

A fine-grained approach is being taken to the development plot build-out, massing and density, overlaid with a pedestrian permeability network linked to the landscape and public realm strategy.

PLAN KEY

- Research And Innovation
- High value manufacturing & Production
- Residential communities
- HS2 Arrival Amenities & Grade A Offices
- Hotels & Hospitality
- Academic campuses
- Personal parking zones
- Landscape & Public Realm
- APM

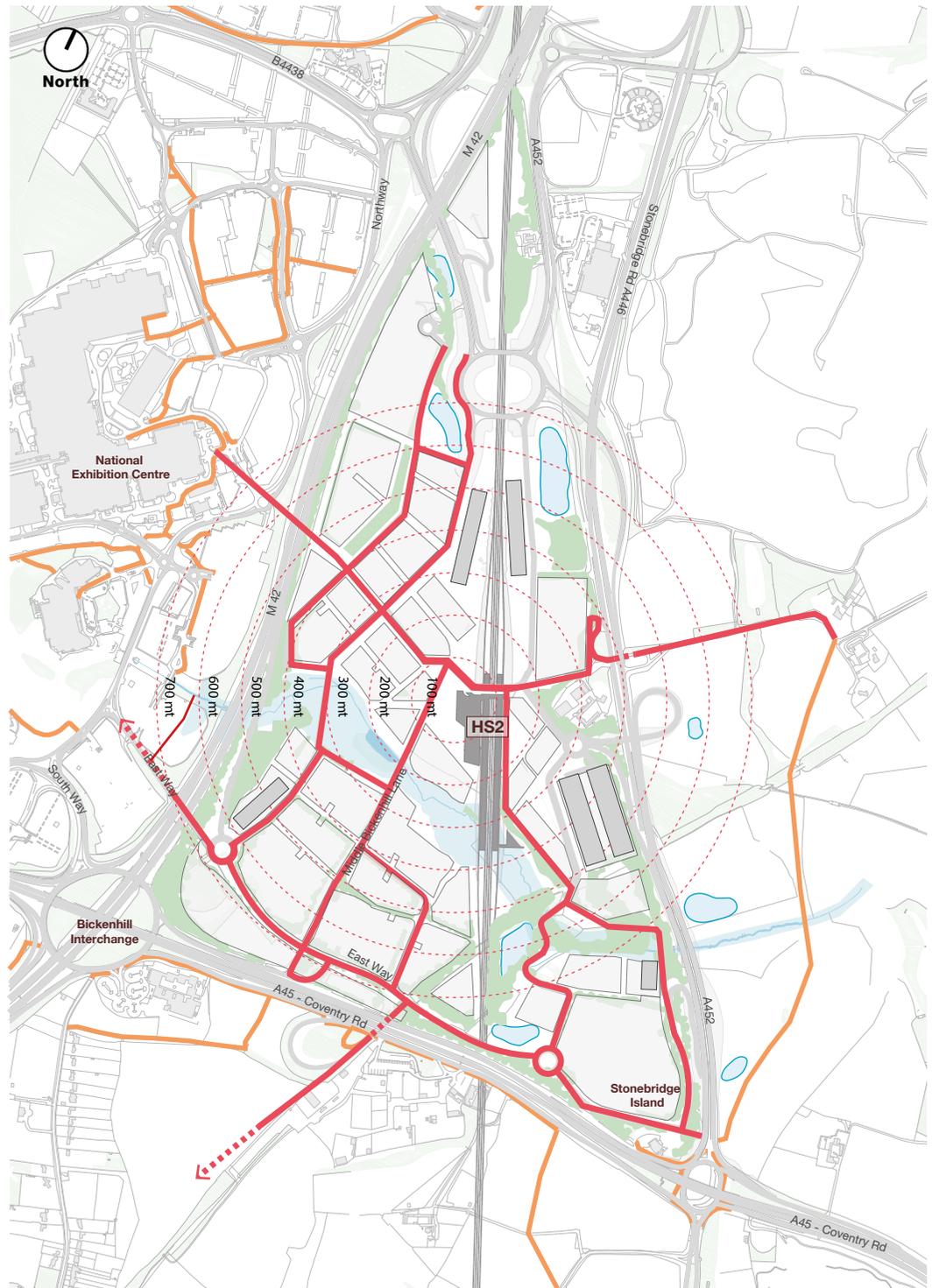
A diverse land use strategy for the creation of a new community

6. DEVELOPMENT PRINCIPLES

6.2 SITE WIDE CONNECTIVITY

The masterplan layout has been designed to encourage walking, cycling and sustainable movement patterns around Arden Cross. The masterplan links new public parks and civic spaces, and enhanced natural landscape features in a network of activity corridors, providing public amenity as well as an ecologically-rich wildlife habitat.

These movement corridors will provide attractive and safe site-wide pedestrian/cycle routes, aligned with the public realm and green and blue landscape strategy. A clear wayfinding strategy, utilising both hard and soft landscape and landmark architectural elements will ensure ease of movement across the site. This strategy is reinforced through distinct development of character neighbourhoods, focused around living, working, play and leisure.



Pedestrian + Cycle routes integrated with the site landscape strategy

The Arden Cross opportunity area is currently bound by strategic highway routes, which provide important regional road connectivity to the rest of the country with a number of crucial improvements already planned including upgrades to Junction 6 of the M42.

The delivery of these infrastructure components will align with both regional and local authority transport initiatives, bringing additional economic improvements to the UK Central Hub strategy.



PLAN KEY

-  Primary Pedestrian & Cycle Routes
-  Existing Footway
-  Walking Distance



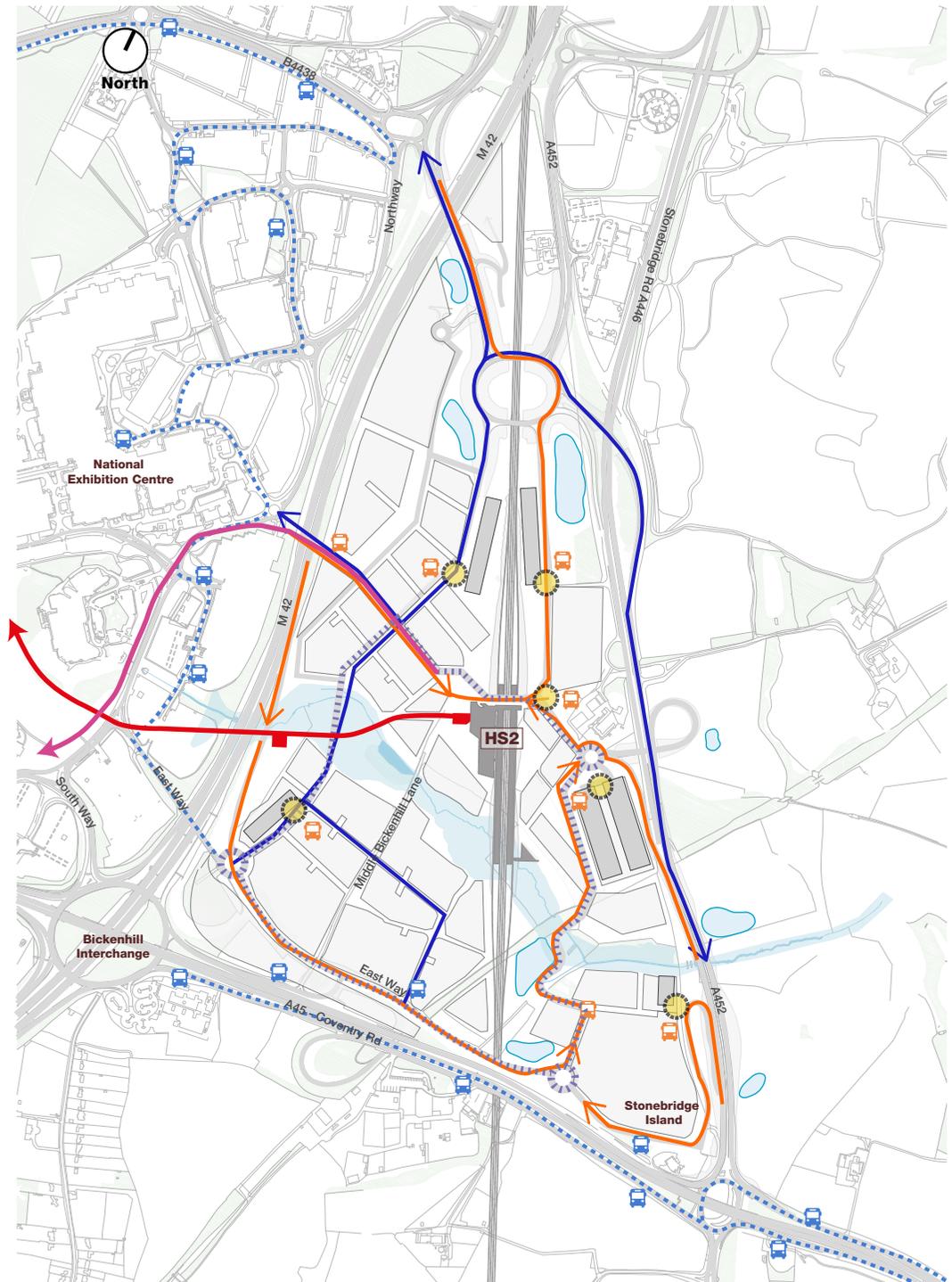
6. DEVELOPMENT PRINCIPLES

6.3 INTEGRATED PUBLIC TRANSPORT PROVISION

Crucial to the over arching strategy for Arden Cross, is the seamless integration of all public transit systems across the site and beyond. Whilst encouraging walking and cycling, through attractive and safe landscaped routes, new site-wide public transit networks are proposed, connecting all the new character areas of the Arden Cross community.

On arrival at Arden Cross, via HS2, interchange inter-modal facilities will be clearly accessible to the visitor; the arrivals plaza is a space for 'decision making' for onward travel. Whether traditional buses and taxi services, or a wider range of 'green' transport modes, including on-demand autonomous vehicles, personal electric scooters and pedal cycles.

Alongside rail, visitors and site users will be able to reach the site via the proposed Sprint Bus service, extension to the Midlands Metro tram, new very light rail services, and expansions to Solihull's cycle and footway networks.



Site-wide new public transport systems



Middle Bickenhill repurposed as a dedicated pedestrian/cycle and mass transit corridor

'Car-Free' Gateways

Supporting the commitment to incorporate sustainable transport modes, Arden Cross will feature land-use efficient multi-storey parking at the key 'gateway' entrances to the site. This will allow removal of personal cars from the site's internal road network, with visitors able to transfer to the sustainable public transport modes which service the community from these gateway sites.

Sustainable travel network

Alternative transport is rapidly becoming the norm and Arden Cross is master planned to support sustainable travel across the site and beyond, utilising a network of interconnected multi-modal movement corridors and safeguarded routes. This permeability will engage leading technology to provide an integrated environment for walking, cycling and public transport systems.

An Automated People Mover (APM) will provide fast and convenient connectivity between the HS2 transport hub, Birmingham Airport, the NEC and the West Coast Main Line via Birmingham International Railway Station



PLAN KEY

- Existing Bus Route
- Existing Bus Stops
- Bus Route In
- Bus Route Out
- New Bus Stops
- APM
- Tram / Sprint
- Autonomous Vehicle Loops

6. DEVELOPMENT PRINCIPLES

6.4 LANDSCAPE AND PUBLIC REALM STRATEGY

The current Arden Cross landscape provides a wonderful canvas on which to craft a unique matrix of public spaces for the future development, centred around the Interchange station.

Historic tree lines, wildlife-rich hedgerows and site-wide water features have been identified early in the masterplanning design process as components on which to retain, enhance and establish a new green and blue infrastructure strategy at Arden Cross.

This will be formed from a strategy of seamless integration and connectivity between all new public realm and open space components. These areas will act as the 'green glue' connecting the site's other uses and providing the framework for a phased development approach for the new mixed use community.

There will be a clear public realm hierarchy where civic quality hardscapes juxtapose against semi-natural wildlife habitat, experienced through a truly connected open space strategy linked to the pedestrian and cycle networks.

The proposed strategy is based on the principle of landscape which 'works for a living', creating a network which addresses climate change, delivers convivial public spaces and wildlife habitat.



Arden Cross Landscape & Public Realm network

Movement corridor networks have been sized to allow for generous street tree planting to provide summer shade and urban heat islands, space for natural drainage systems and future-proofing how people move around the Arden Cross site, for example through provision of generous footways for shared cycle/scooter transport modes.

The HS2 station and arrivals plaza will mix clear civic-quality hardscapes with the spirit of the existing natural landscape. Partially located within an enhanced, ecologically rich Hollywell Brook 'river-valley' setting, it will provide a balanced approach to landscape areas accessible for public amenity and those protected for wildlife habitat. This will assist in the ambition of Arden Cross Ltd to deliver a sustainable site that offers biodiversity net gain as an integral part of its landscape and ecology strategy.

Retained historic landscape features will be incorporated within the new Arden Cross development character areas, instilling a sense of place from day one.

PLAN KEY

- 'Civic quality' Public Realm
- Living Noise Barriers / Screen Planting
- Parks, squares and play grounds
- Extended historic Hedgerows
- Preserved Heritage Landscape
- Wetland Habitats and Ponds

Existing hedgerows will be supplemented by new native planting, enhancing the regional landscape character and providing seamless wildlife corridors and attractive walking routes.

With the opportunity to create a new urban settlement at Arden Cross, the open space strategy must address the needs of all those that live, work and visit. Localised play areas (from door-step through to equipped) will be provided within accessible distances from new homes, with sports pitches for recreation and new school provision.



6. DEVELOPMENT PRINCIPLES

6.5 FUTURE PROOFED

The approach to the development of Arden Cross will be to create a future proofed environment that can respond to climate change and the need for greater resilience.

The 'Blue-Green' network strategy at Arden Cross is fundamental to this design approach; whether providing mitigation for flash-flooding or the use of extensive street tree planting to moderate 'heat islands' within the urban setting.

The masterplanning team has considered a 'taxonomy' of environmental urban components which collectively address the impacts of climate change and environmental quality.

As noted in the Landscape & Public Realm section of this masterplan, new native planting throughout the Arden Cross settlement will encourage rich biodiversity, supplemented by 'segregated' wildlife zones to ensure safe habitats for fauna.

The delivery of the HS2 railway has a robust strategy for protecting, mitigating and enhancing biodiverse landscape affected by the infrastructure project wherever possible. The Arden Cross masterplan framework aims to build on this all-inclusive approach and extend its reach across the whole of the development site.



Living walls	
Urban thermal regulation	X
Air Quality (noise/pollution)	X
Increased biodiversity and habitat provision	X
Convivial living conditions	X



A taxonomy of environmental elements : Urban components delivering 'eco-system' services

6.6 DELIVERING COMMUNITY INFRASTRUCTURE

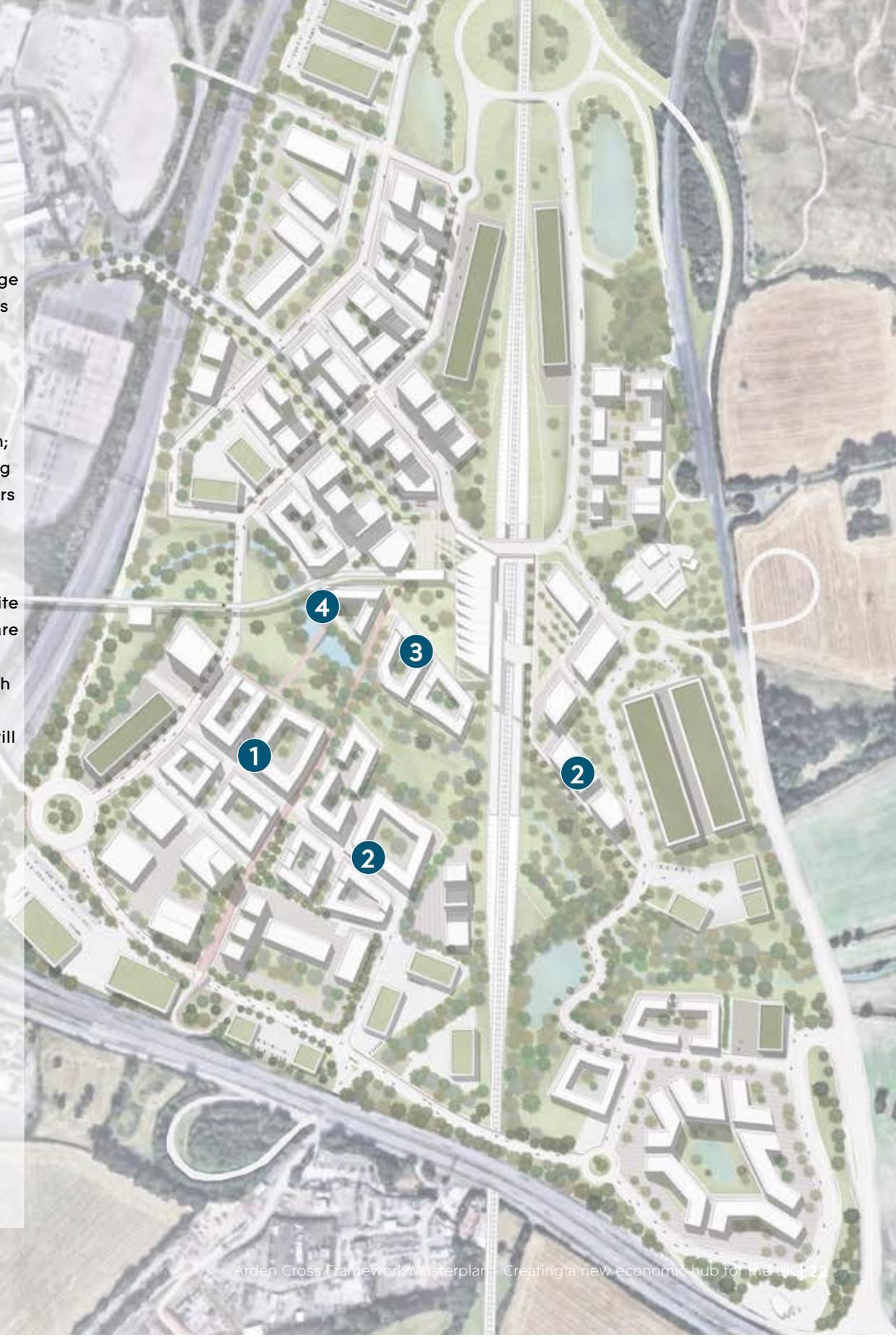
Vital to the success of the pioneering community will be the provision of a range of infrastructure to meet the community's needs.

A range of housing typologies is being considered which would provide for a varied and diverse residential population; from commuting professionals and young families through to more mature members of society.

To support this new community at Arden Cross, provision has been made for on-site primary and nursery education, health care and wellbeing, leisure and community centres. All vital social components which come together to make a successful mixed use community and all of which will be located on the main public transport routes and close to multi-functional/ shared open space

PLAN KEY

- 1 Healthcare and Wellbeing
- 2 Community & Leisure Centre
- 3 Early Years Nursery
- 4 Primary School



6. DEVELOPMENT PRINCIPLES

6.7 PHASED ENABLING INFRASTRUCTURE

To ensure that the new 'pioneering' urban community, centred around the station, can successfully grow and integrate with existing neighbouring settlements a series of key 'enabling infrastructure' components will need to be delivered.

Whilst existing site highways, such as the East Way, can be upgraded to adapt to new transport requirements (such as dedicated bus routes), additional connectivity components will be necessary.

Solihull Metropolitan Borough Council, together with Highways England, have already identified potential new highways and connectivity infrastructure which will help to facilitate the new HS2 transport hub and future settlement proposals. These also include new access and egress initiatives on the southern end of the Arden Cross site.

New highway connections to Arden Cross will be delivered as part of the HS2 railway infrastructure works, which includes access for additional inter-modal provision at the station.

Through the masterplanning process, the design team have identified desirable public transit routes and integration of future regional transport initiatives, to reduce personal vehicle use accessing Arden Cross/



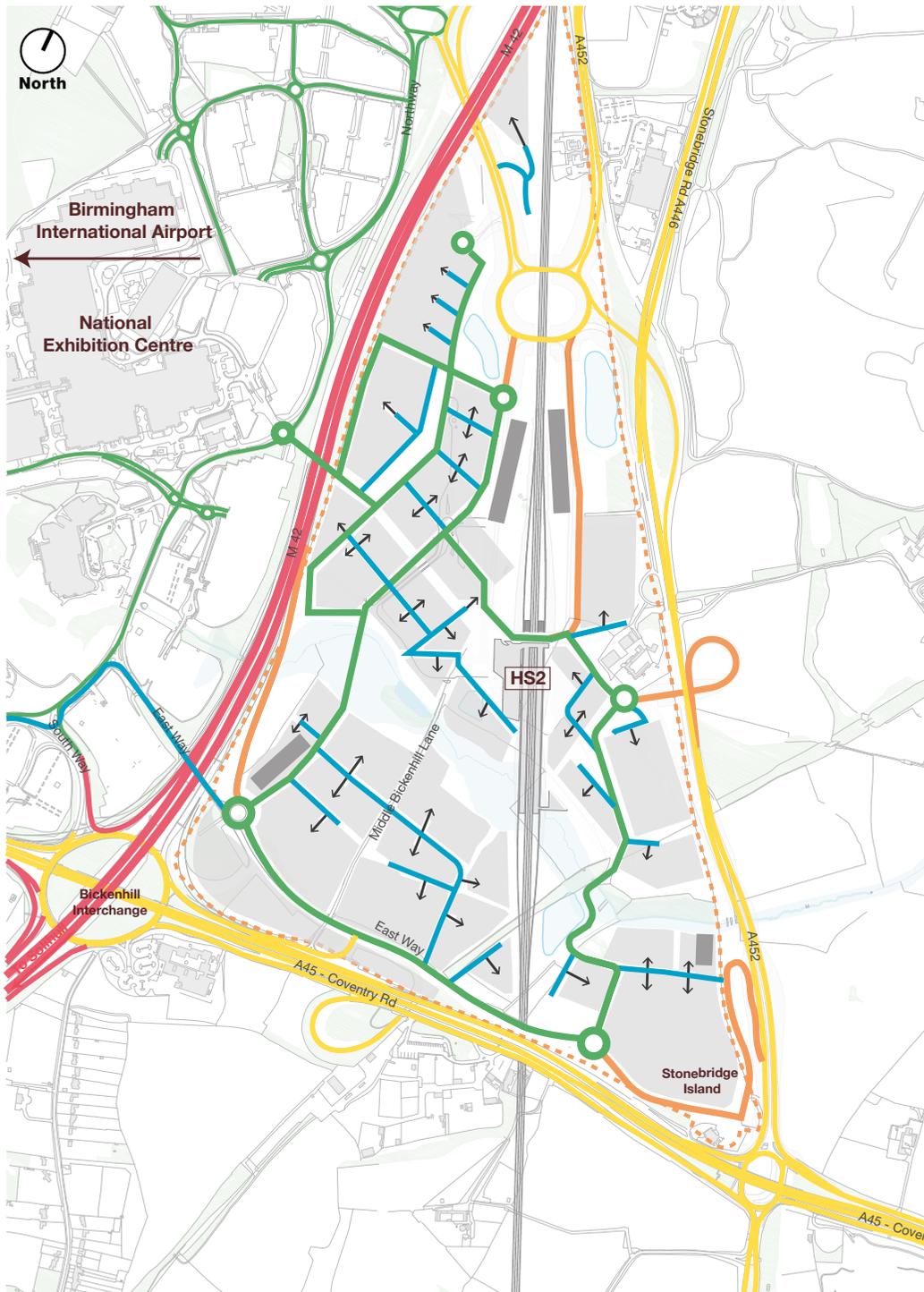
Multi-modal movement corridor



Residential streets



Mass transit corridors



HS2. Routes which take advantage of HS2 delivered connectivity across the new railway corridor, and integrated into new north-south movement corridors, will help to tie all parts of the Arden Cross site together. The 'future proofing' of movement corridors throughout the site has been considered, allowing for adaptation to future transport modes. This includes new connectivity across the Hollywell Brook landscape and adapting Middle Bickenhill to a dedicated public transport route.

PLAN KEY

- Main UK motorway
- Strategic regional highways
- Arden Cross site access roads
- Main site-wide movement corridors
- Local streets

Arden Cross integrated movement corridors

7. DELIVERY

Arden Cross is a multi-billion pound development opportunity that will be delivered over a 20 year period. The success of the scheme will be dependent on securing a delivery partner with the expertise, resources and ambition to realise the vision for Arden Cross.

Implementing a comprehensive approach to the site's development that integrates infrastructure along with phased delivery and occupation will underpin the creation of sustainable development.

Following the launch of this masterplan ACL will be working collaboratively with all partners to ensure that the development potential is maximised, HS2 is fully integrated and a funding package for site infrastructure and a delivery partner are in place.

Key principles for delivery and phasing of development at Arden Cross:

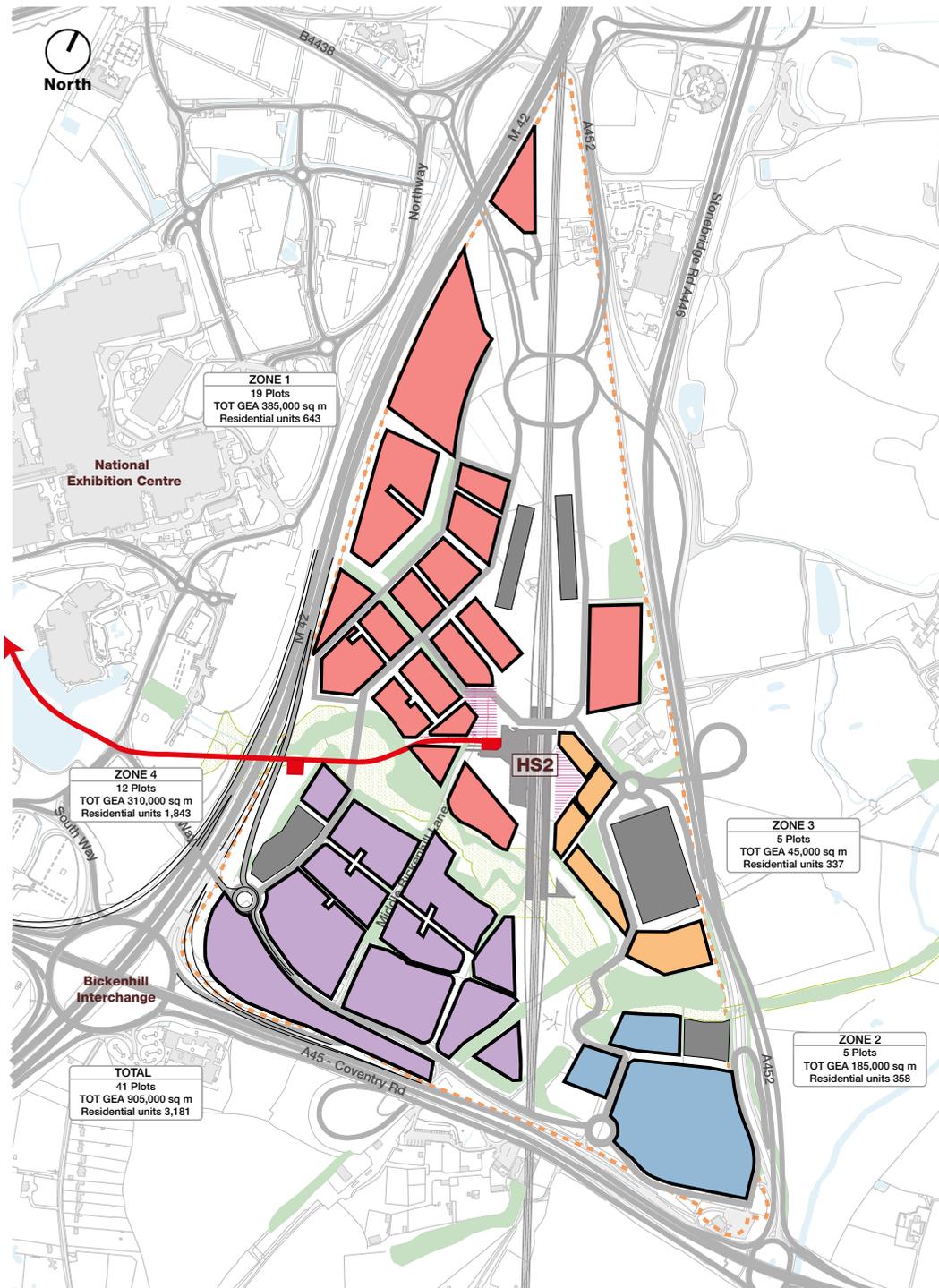
- Single entity/ unified landholding established through Landowner Agreement providing delivery confidence.
- An investment/ development partner will be sought to help deliver the vision for Arden Cross.
- It is anticipated that the development will be delivered over a period of 20 years.

- The masterplan sets out a framework and structure for development.
- Four distinctive development zones (phases) have been identified each with the potential to have its own character and mix of uses.
- Flexibility will be maintained throughout the programme and the scale, building typology, design and use of plots may change and adapt to demand.
- The aim will be to attract the most forward thinking nationally significant industries to the area and work with Government agencies to bring this forward.
- Attracting an anchor tenant and a large pre-let will be necessary to catalyse each development zone. The structure of the masterplan enables a single occupier (public or private) to take one of the zones with the potential to create a campus facility.

Development zones:

Zone 1 – development plots around the HS2 station will come forward first in order to establish a plaza around and a gateway to and from the new HS2 station. Delivering these sites first will also help to establish Arden Cross as a destination and encourage values to then disperse to other parts of the site. Utilities for the site will be introduced in this phase as well as upgrades to the East Way to unlock future development. Other key infrastructure required in this phase includes multi-storey car parking for HS2 P1 and MSCP to serve the development. This will be the nucleus of the site with high flows of people and activity and it is envisaged to be the largest phase. Both quantum and high design standards are required here to create a sense of place, develop character and feel and set the aspiration of future phases. A mix of uses is anticipated to help establish a new commercial and living hub – including research and development, retail and leisure, residential, hotels and hospitality, education facilities and advanced manufacturing.

Zone 2 – plots to the south east of the HS2 station. Key infrastructure required in this phase includes multi-storey car parking for HS2 P2 and MSCP to serve the development. Key uses could include research and development and residential. This zone could attract a single campus occupier as it provides a significant scale of development and the potential to integrate with the other zones or remain separate – with its own access.



Zone 3 – plots to the east of the HS2 station. Key infrastructure required in this phase includes the bridge connection to Zone 2 and MSCP to serve the development. This is a relatively small phase and could either be an extension to Zone 1 or operate independently. Key uses could include residential, further retail for the station/ the development and advanced manufacturing.

Zone 4 – plots to the south west of the HS2 station to be delivered as the last phase. Key infrastructure required in this phase includes the bridge connection to Zone 1, across the Hollywell Brook landscape and MSCP to serve the development. As the second largest phase – the uses here will ultimately be determined by the success of earlier phases. With the exception of the bridge, this phase will be low cost in terms of infrastructure and support high values which have matured through the earlier phases. The largest number of residential units is anticipated to come forward in this zone. By introducing this scale of residential development towards the end of the programme the place and the values will be established. Other uses in this zone could include research and development and advanced manufacturing.

A phased strategy of delivery

Image References

1) Rochetaillée banks of the Saone – from landezine.com

<http://landezine.com/index.php/2016/09/rochetailllee-banks-of-the-saone-by-in-situ/>

2) St Johannesplan & Konsthallstorget – from landezine.com

<http://landezine.com/index.php/2015/05/st-johannesplan-konsthallstorget-by-white-arkitekter/>

3) University of Melbourne plugs driverless shuttle into its urban transport lab – from imoveaustralia.com

<https://imoveaustralia.com/news-articles/personal-public-mobility/university-of-melbourne-driverless-shuttle-launch/>

4) Avon River Park Terraces + City Promenade – from landezine.com

<https://landezine-award.com/avon-river-park-terraces-city-promenade/>

5) Avon River Park Terraces + City Promenade – from landezine.com

<https://landezine-award.com/avon-river-park-terraces-city-promenade/>

6) Avon River Park Terraces + City Promenade – from landezine.com

<https://landezine-award.com/avon-river-park-terraces-city-promenade/>

7) Riverlight – from landezine.com

<https://landezine-award.com/riverlight/>

8) Trapéze – from landezine.com

<http://landezine.com/index.php/2012/10/redevelopment-of-the-trapeze-former-renault-site-by-aaupc/>

9) West Capitol Avenue Streetscape – from migcom.com

<https://www.migcom.com/walkable-communities>

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Supporting Information

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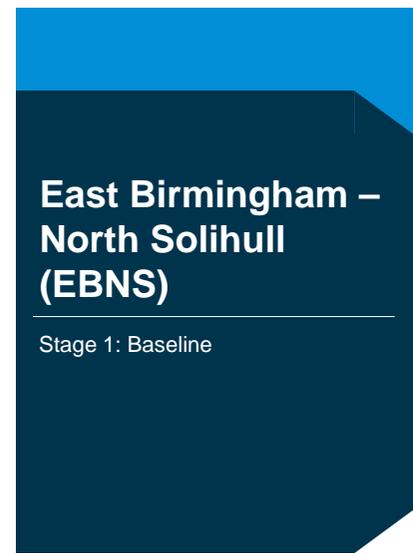
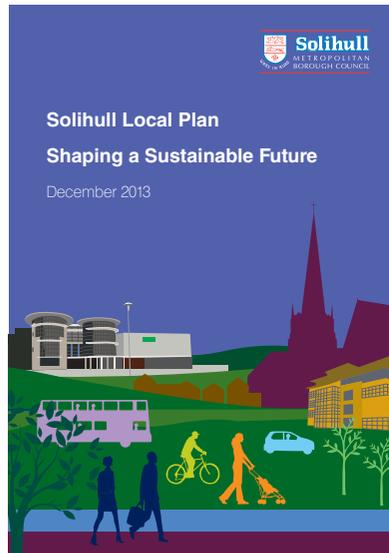
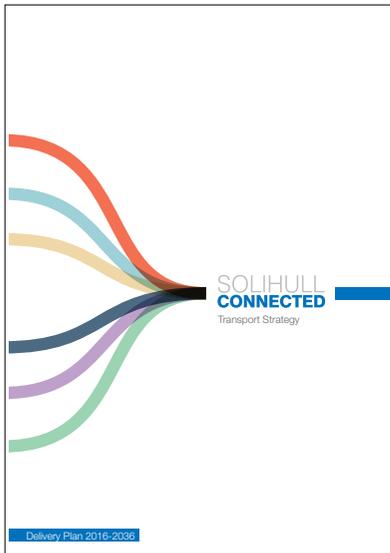
1. PROJECT BACKGROUND

The Arden Cross masterplan has been brought forward in collaboration with the Urban Growth Company (UGC) and Solihull Metropolitan Borough Council (SMBC), as an integral part of the wider socio-economic growth strategy and aspirations of the UK Central Hub.

Centred around a high-speed, high-frequency transport hub, the design, delivery strategy and business case at Arden Cross have all been created to align with the area's growth aspirations and in partnership with the Central Hub key stakeholders, which include Arden Cross Ltd, HS2 Ltd, Birmingham Airport, NEC, Jaguar Land Rover, Highways England, and Birmingham Business Park.

The extensive evidenced-based publications which have fed into the development of the masterplan are set out on page 30.





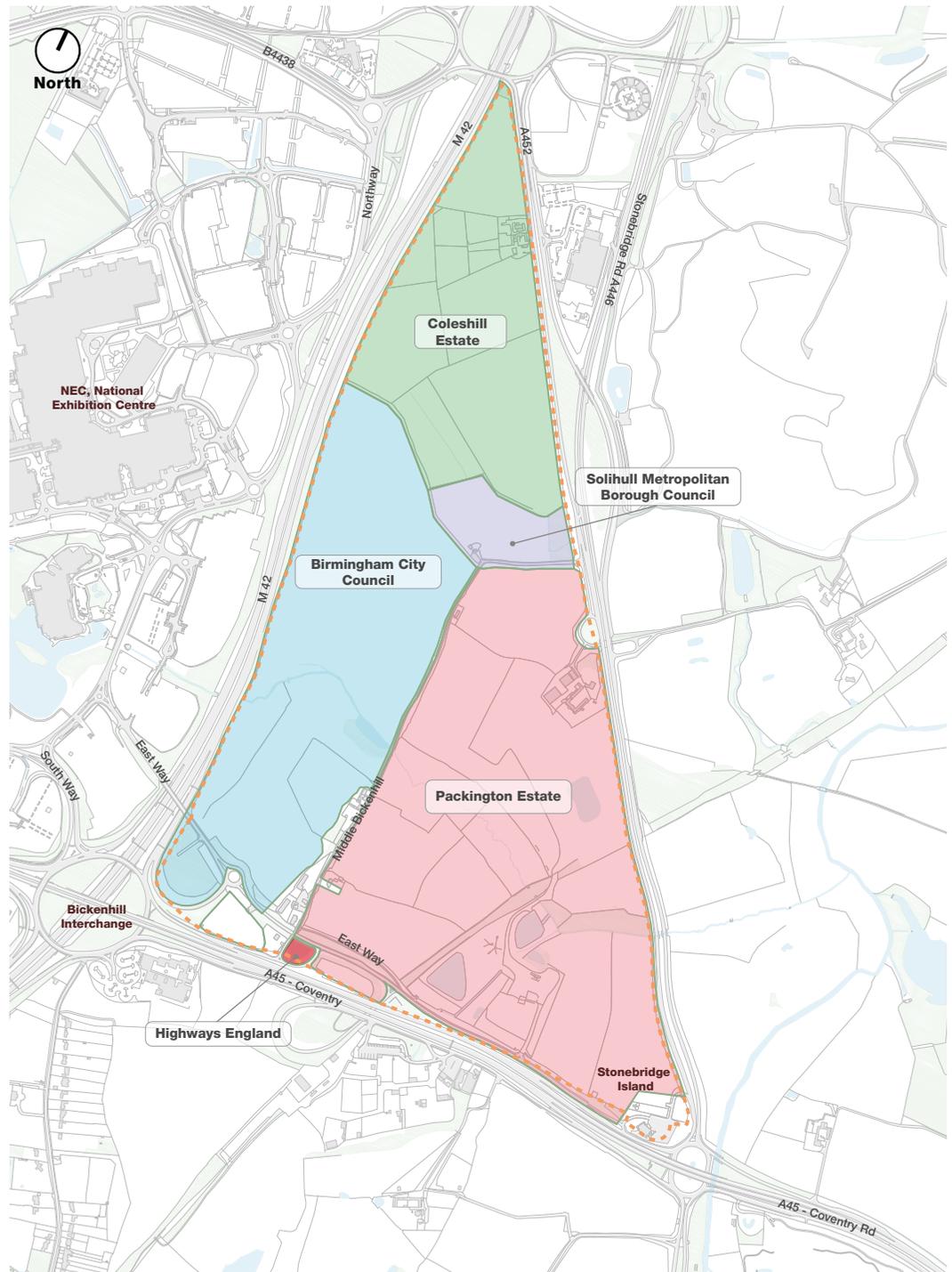
2. LAND OWNERSHIP

Arden Cross is a unique opportunity for investors, stakeholders and the local community to capitalise on the arrival of HS2 which will act as the catalyst to deliver significant economic and social benefits for the local and wider area as desired by Central, regional and local government.

The Arden Cross development will be delivered by Arden Cross Limited (ACL), a company wholly owned by the principal land owners; Birmingham City Council, Packington Estate and Coleshill Estate.

Key stakeholders in the project include HS2 Ltd, Highways England, Transport for West Midlands and the West Midlands Combined Authority, Solihull Metropolitan Borough Council and UGC.

Arden Cross is a key component in the wider regional economic growth initiative, UK Central, which includes Jaguar Land Rover, Birmingham Airport, Birmingham International Railway Station, the National Exhibition Centre and Birmingham Business Park.



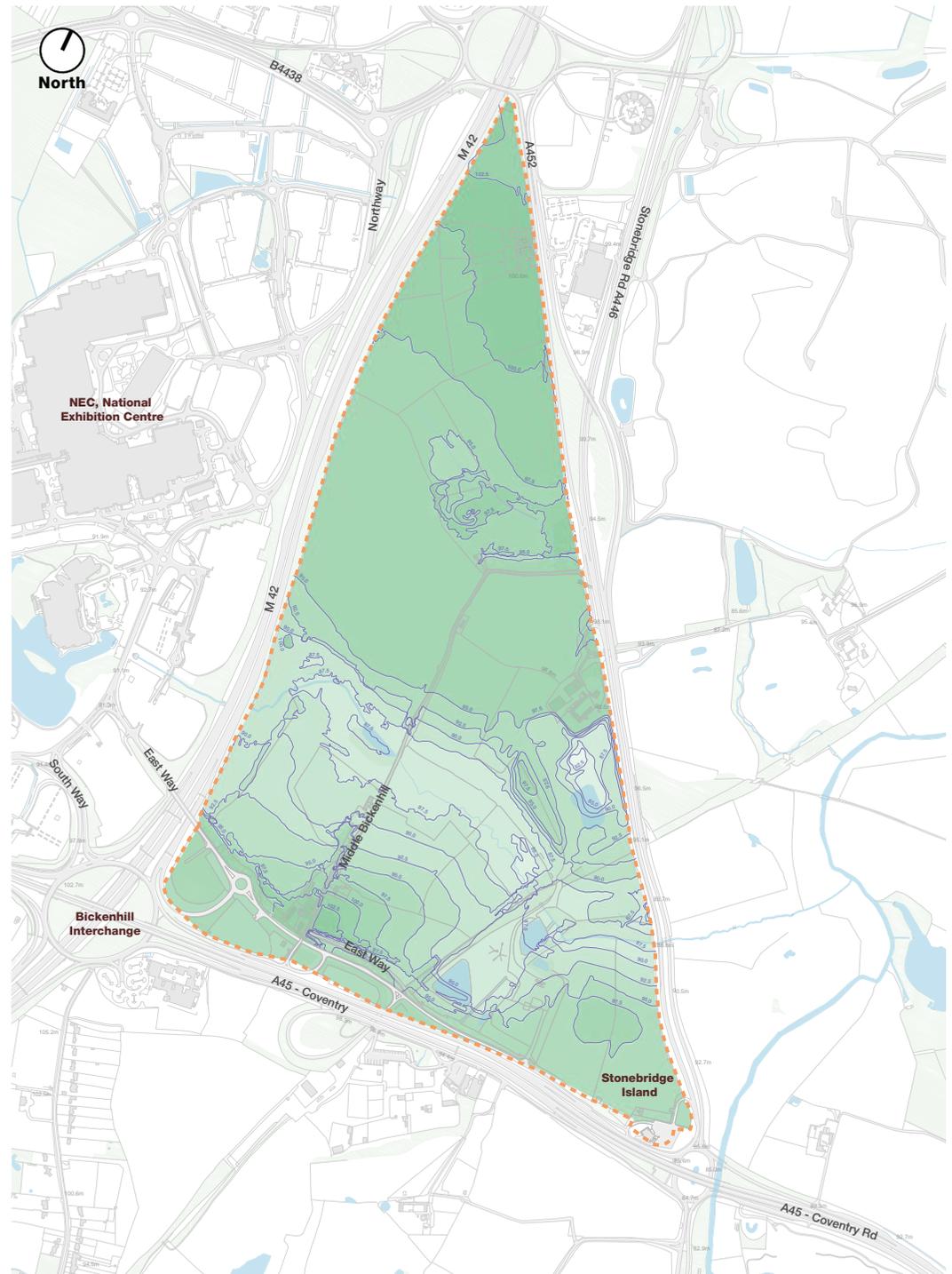
Key existing landscape features

3. SITE TOPOGRAPHY

The Arden Cross site is a gently undulating site, historically used for agricultural purposes and more recently mineral extraction.

HS2 railway infrastructure works will alter the site topography through new rail track cuttings and embankments, together with the proposed new highway works to access the site.

The Hollywell Brook is a key characteristic of the site and sits within a gently sloping valley to the south of the site, running in a west-to-east direction and connecting to the River Blythe to the east. There is approximately a 10 metre level change from the base of the valley to the top of the site which provides a perfect opportunity to redefine for future amenity and additional wildlife habitat value.



Current Arden Cross land form and topography

4. GREEN AND BLUE NETWORK

The historic rural landscape character at Arden Cross provides a unique setting on which to overlay an interconnected, sustainable, development.

The historic landscape features will provide key components on which to craft a new 'green & blue' landscape.

The Hollywell Brook runs through the site west-east, fed by Pendigo Lake located within the NEC site. Its natural flood plain and associated wet landscape components can be enhanced to provide amenity and wider biodiversity benefits.

Historic hedgerows and mature trees will be retained to provide a backdrop and landscape to the proposed development, which will allow for a strategy of connected green & blue spaces.

The new HS2 railway infrastructure allows for significant mitigation measures that will be integrated into the Arden Cross masterplan.

The development framework will aim to complement and enhance these HS2 initiatives throughout the Arden Cross site, promoting a connected network of biodiverse landscape corridors.

PLAN KEY

-  Landscape features
-  Water bodies
-  Flood zones



5. HERITAGE

Arden Cross has many heritage features which if harnessed can be used to instil a sense of place within the proposed development.

Retained hedgerows are interspersed with mature native trees, marking the boundaries of historic field patterns across the site.

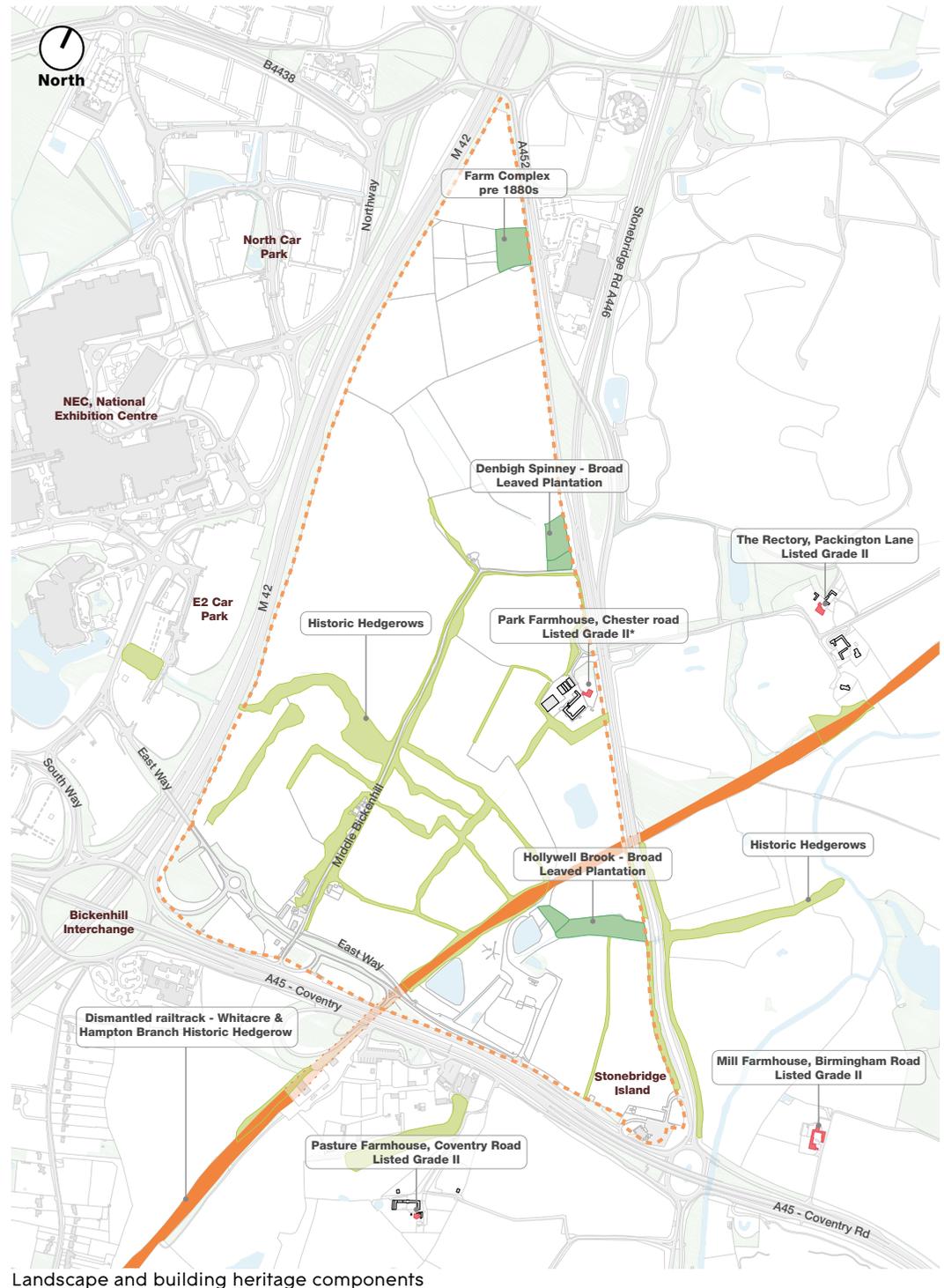
The development proposals will make allowances for the enhancement of existing and provision for new planting which will further enhance the development offer at Arden Cross.

Park Farmhouse, on the eastern boundary of the site, is a Grade II* Listed Gothic-style farmhouse, with associated farm buildings that have been converted to commercial use. There is an opportunity to enhance this existing asset to deliver a unique character area.

Whilst outside of the study site area, the proximity of Capability Brown's Arcadian landscape design, at the Packington Estate, will provide inspiration for the heritage landscape strategy at Arden Cross.

PLAN KEY

- Listed Buildings
- Historic Hedgerows
- Deciduous woodland



Landscape and building heritage components

6. EXISTING LAND USE

Understanding the wider context of the UK Central Hub will be vital to the success of a new community at Arden Cross.

There are clearly established land use clusters in the area, together with aspiration for growth and diversification.

Objectives for the NEC site include a greater variety of land uses including new homes, commercial offices, retail and leisure, and a film studio.

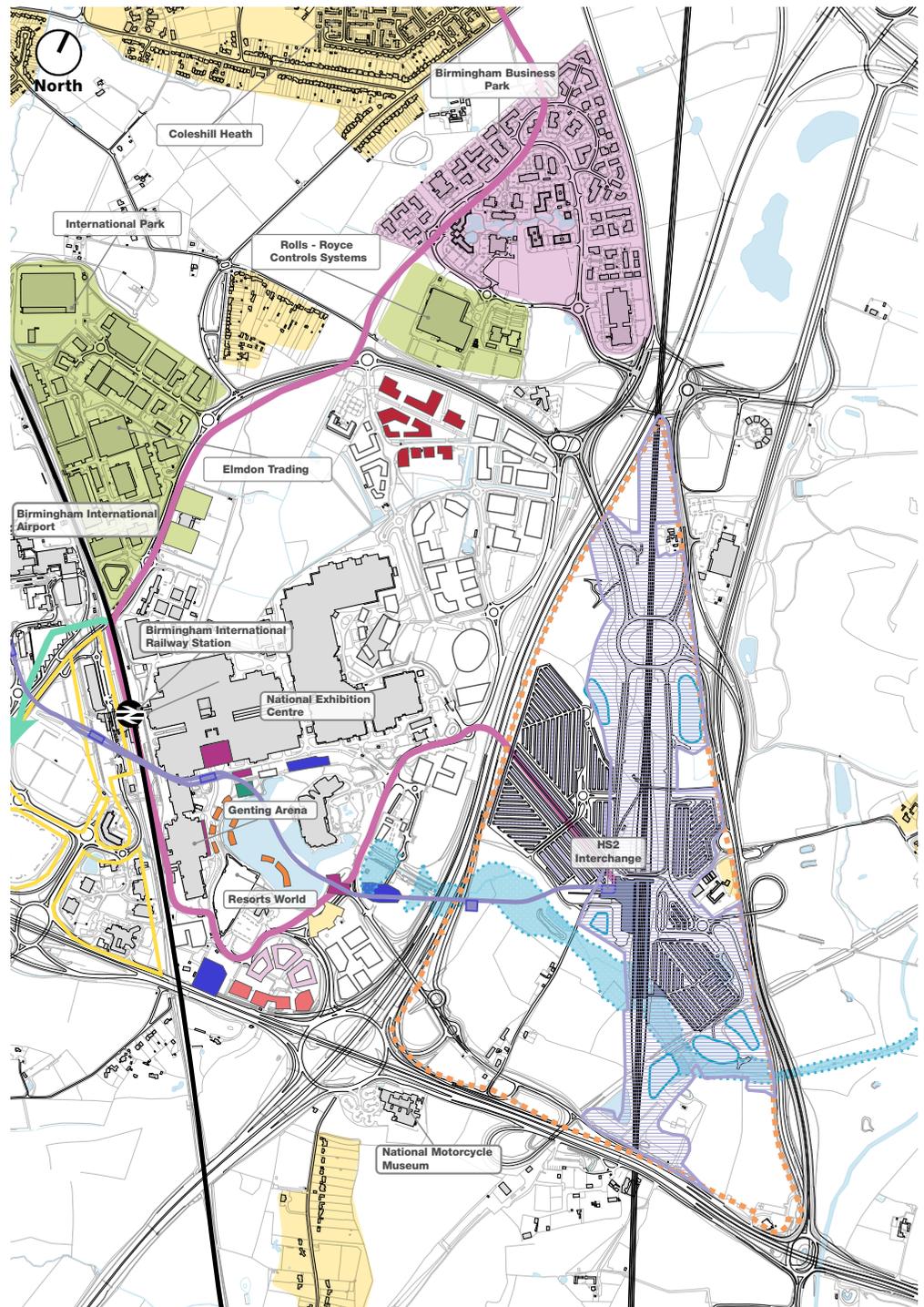
Similarly, Birmingham Airport has produced its own masterplan which includes air-side capacity improvements and integration with regional public transport initiatives.

To the north of Arden Cross, Birmingham Business Park has recently expanded with the addition of a substantial Rolls Royce manufacturing facility.

The development framework for Arden Cross should provide flexibility to respond and compliment the wider UK Central Hub economic goals.

PLAN KEY

	Existing Building
	Food and beverage
	Leisure
	Hotel
	Film Studio
	Multi Storey Parking
	Office
	Residential
	Industrial
	Mixed Uses
	Potential 'Metro' extension
	Airport Rapid Transit
	Automated People Mover (APM)
	BIA Potential Development Area



HS2 proposed land use together with NEC masterplan aspirations for new mixed use

7. HIGHWAYS

Arden Cross is currently well served by major strategic roads bounding the site that provide excellent regional connectivity.

The site is bounded by the M42 motorway to the west, the A452/A446 to the east and the A45 Coventry Road to the south.

The proposed upgrades to the network as a result of the HS2 enabling works and Highways England's improvement works to Junction 6 of the M42 will provide improved access from these strategic highways.

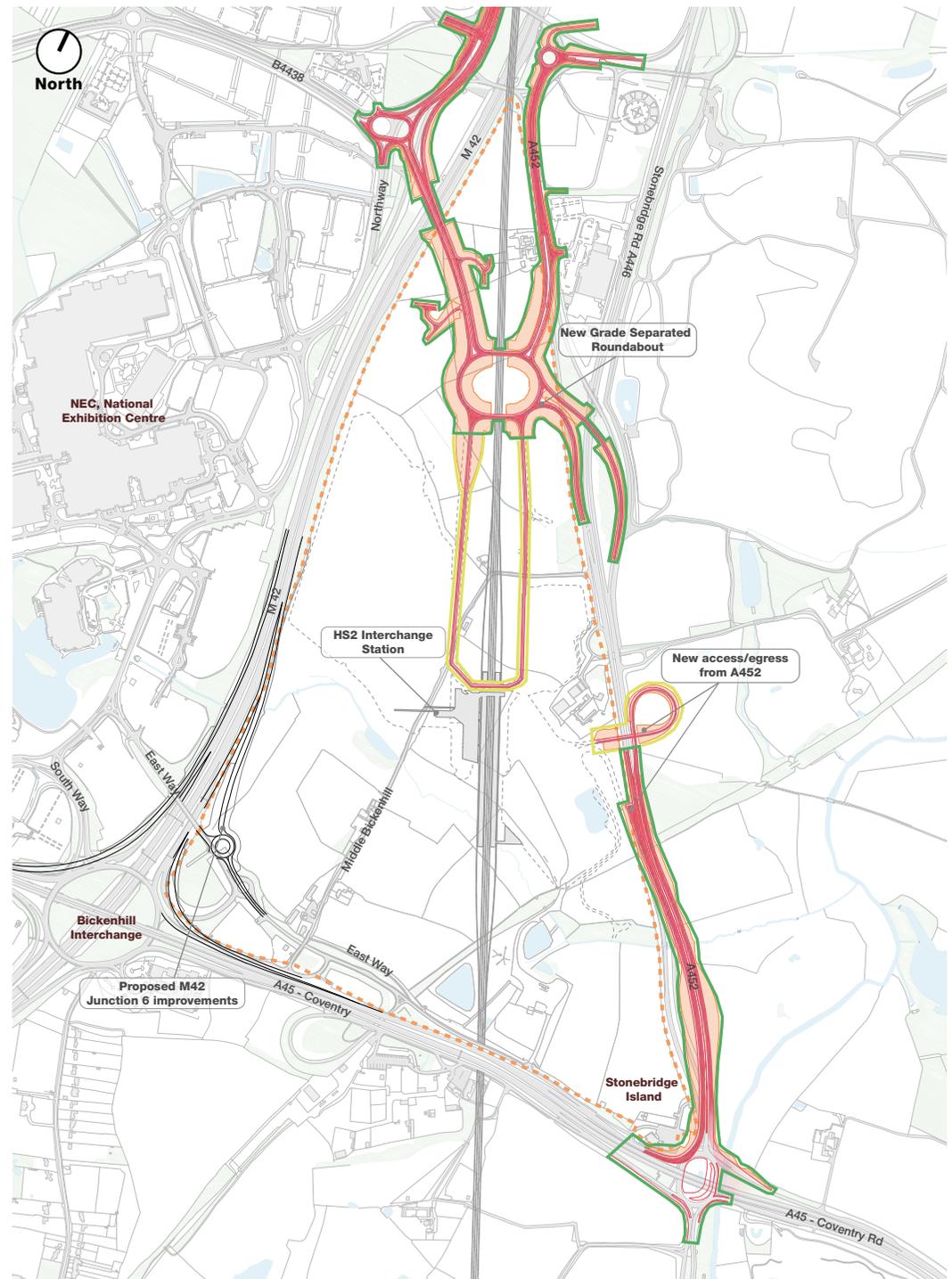
These initiatives include:

- A new grade-separated roundabout over the proposed railway corridor, with realigned A452/A446. This will provide new access roads east and west of the railway corridor.
- New access and egress slips from the A452/A446 east of the railway corridor.
- Highways England improvements to Junction 6 of the M42 will include a new south facing slip road to East Way.

Additional highway access from the south, along East Way, will allow potential development areas to be released, together with site egress to join the A45 Coventry Road.

PLAN KEY

- New/upgraded highways
- Delivered by Highways England
- Delivered by HS2



Current and proposed highways serving the Arden Cross site

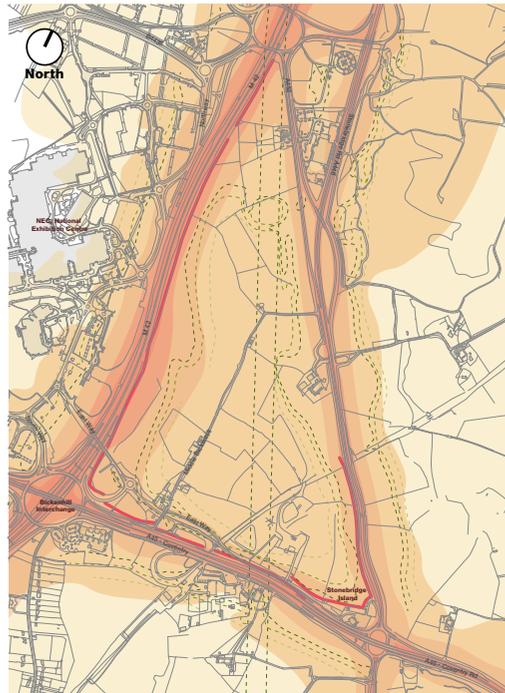
8. ENVIRONMENTAL CONSTRAINTS

The consequence of the excellent highways connectivity at Arden Cross is road noise and air pollution from vehicles travelling on the M42, A45 and A452/A446.

Previous technical studies have helped to map these constraints and provision within the masterplan allows for environmental mitigation, in the form of acoustic barriers and soft noise absorption planting strategies.

Similarly, the land use strategy for Arden Cross has considered appropriate location of uses which are less sensitive to environmental constraints.

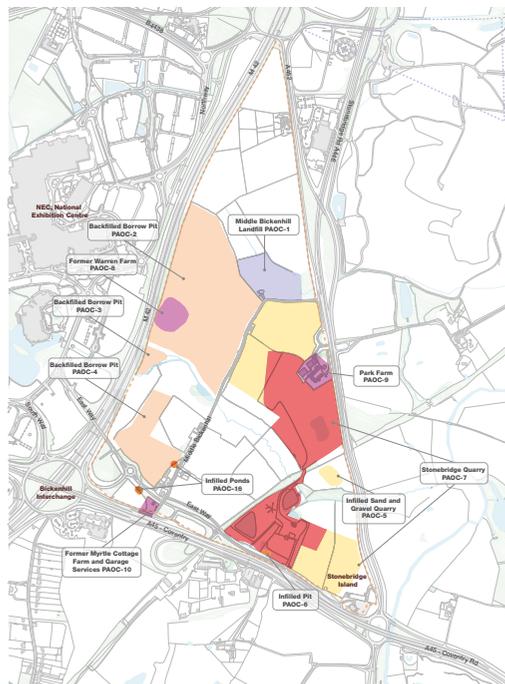
As vehicle propulsion technologies and 'smart' road surfaces advance, noise and air pollution issues will be less prevalent at Arden Cross; with rapid highways movement corridors becoming more environmentally sustainable.



Current site noise contours

PLAN KEY

-  Current noise profile
-  Potential 4m noise barrier
-  Up to 1 storey (4m) SOAEL noise effect for assumed noise barrier
-  2 storey (7m) SOAEL noise effect for assumed noise barrier
-  3 storey (13m) SOAEL noise effect for assumed noise barrier



Historic quarrying and landfill areas

9. UTILITIES

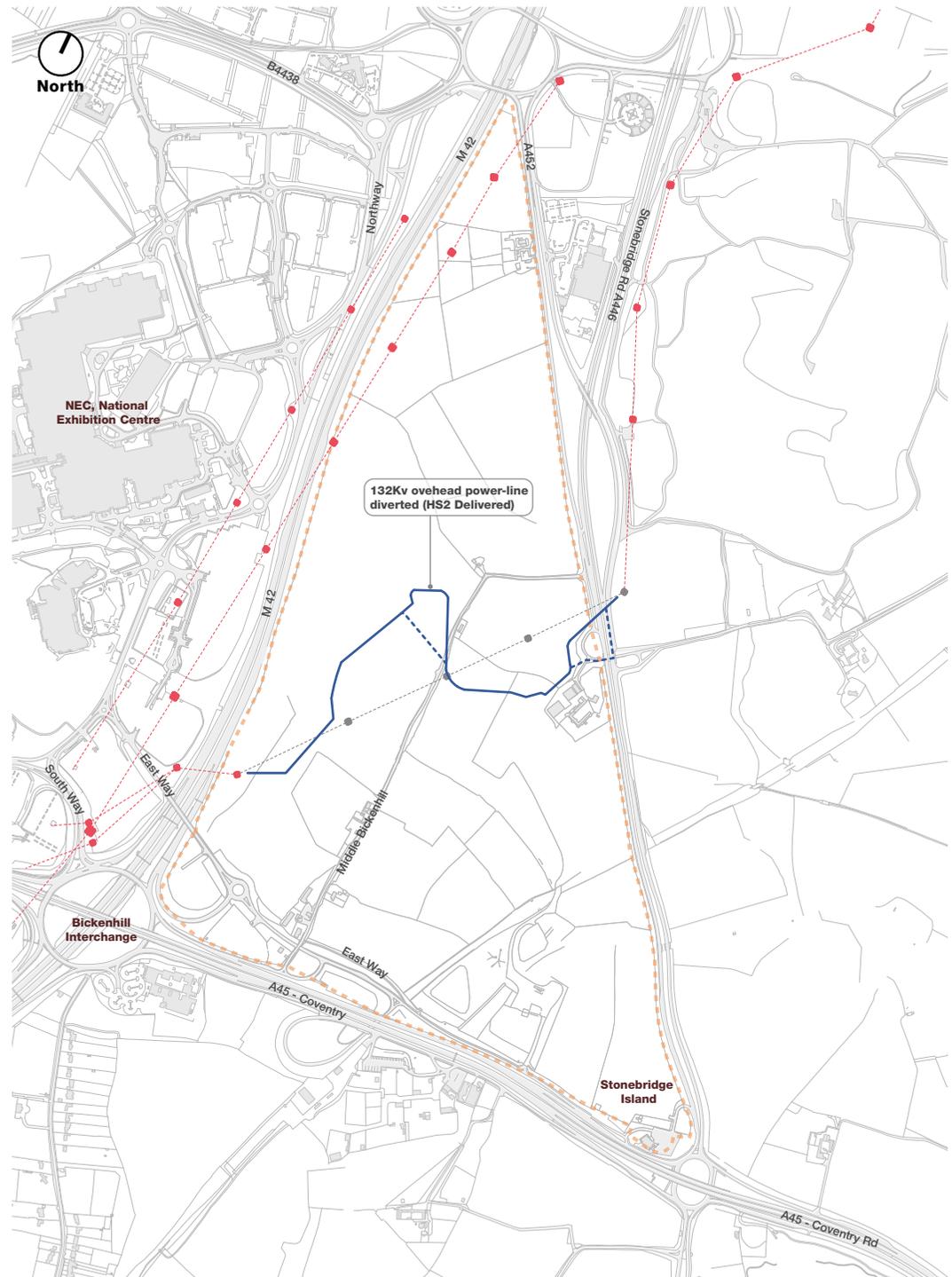
The key constraints of existing utilities at Arden Cross are high voltage overhead power lines currently crossing the site running east-west and north-south.

As part of the enabling works for the HS2 project, the 132kV East-West power line is being under-grounded, aligned with the proposed new HS2 site road networks. In the north, the existing electricity pylons have been realigned.

Similarly, new potable/foul water, electricity and gas supplies are to be provided for the HS2 station, and will be aligned with the new site road network.

The alignment of all key utility runs at Arden Cross have been carefully considered and integrated into development frameworks proposals.

ACL is working with regional stakeholders to identify constraints in respect of the existing utility provision and identifying where reinforcement/upgrades are required to enable regional growth.



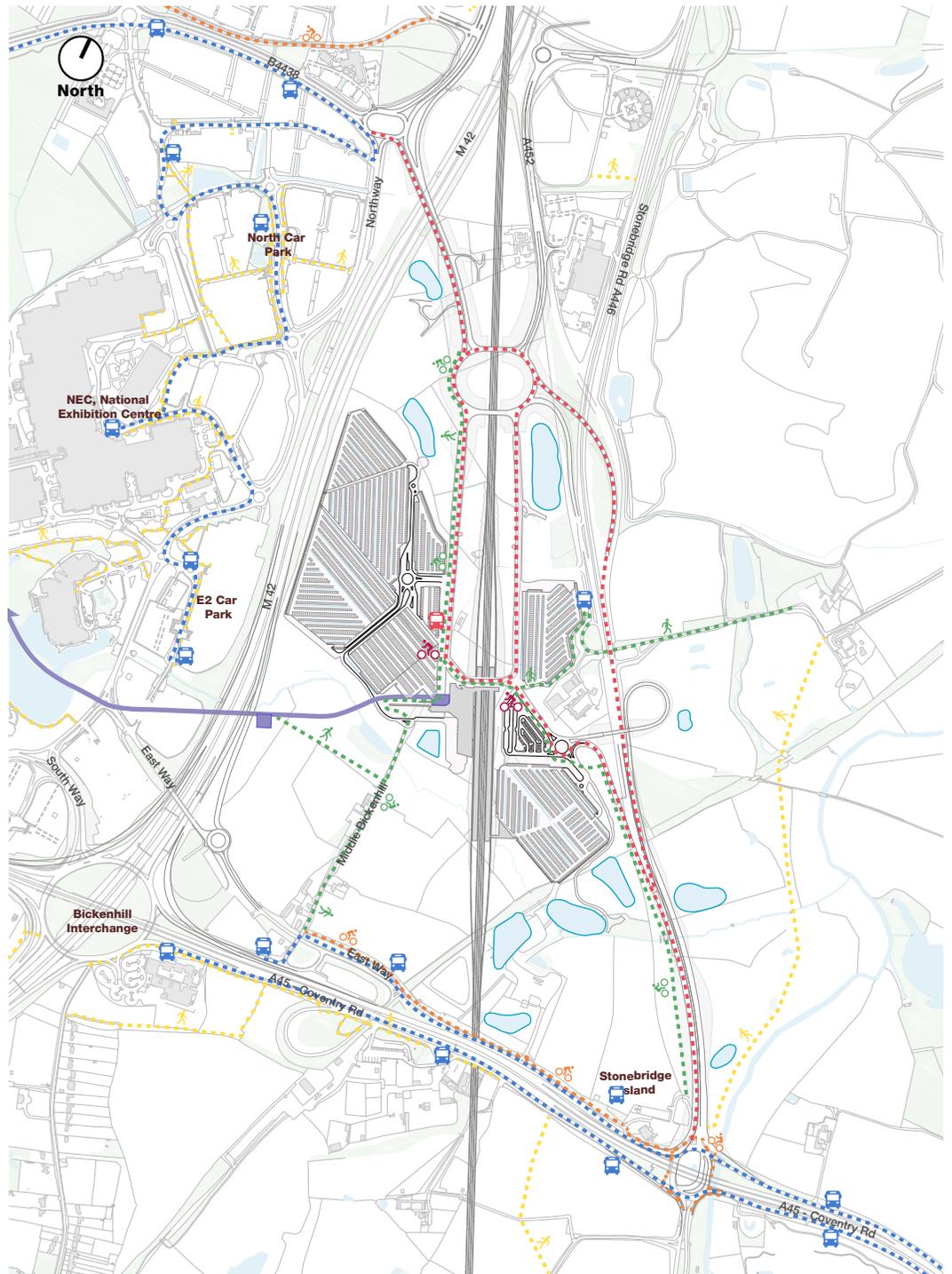
Current pylons and overhead power lines (proposed under-grounding of E-W route shown in grey)

10. PUBLIC TRANSPORT

Current public transport provision around the Arden Cross site is limited, with bus stops on the A45 Coventry Road to the south offering frequent services. With the arrival of HS2, the onward travel strategy for the HS2 Interchange Station provides further public transport provision in the form of:

- An Automated People Mover (APM), connecting the HS2 station with Birmingham Airport, the NEC and Birmingham International Railway Station.
- New local bus routes entering the site from the new A452/A446 grade-separated roundabout and southern slip road.
- A network of new cycle and pedestrian routes, connecting with established paths around Arden Cross.
- The masterplan at Arden Cross will make provision to safeguard routes for the extension of the Midlands Metro tram from the NEC to a terminus stop at the HS2 Interchange Station.

The proposed development framework at Arden Cross will aim to build on these Public Transport commitments and extend to ensure the whole site is well integrated and convenient to use and will actively encourage people to choose public transport over and above private automobiles.



Plan showing current and proposed HS2 public transport provision at Arden Cross

11. HS2 BASE SCHEME

The HS2 railway corridor bisects the Arden Cross site on a north-south axis, with the railway trace in-cutting at the station building location.

This additional severance to the site is mitigated through a vehicular road bridge over the railway, together with a pedestrian overbridge connecting the station concourse to the east of Arden Cross.

Additional landscape modelling will result from new highways access to the site, as well as surface water attenuation ponds.

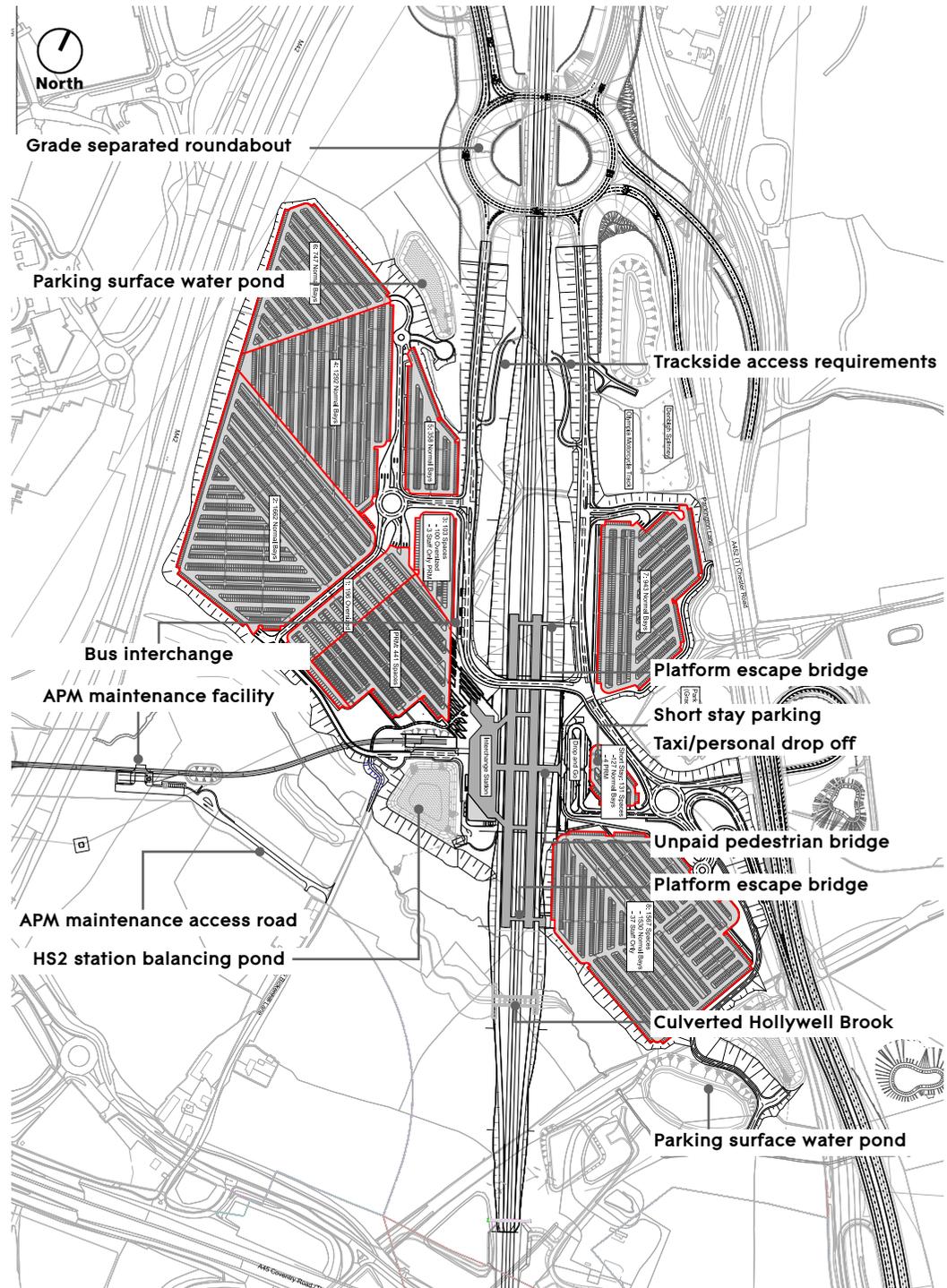
The key public transport/onward travel components at the HS2 station will provide the basis for an integrated movement strategy around the site, together with local connectivity.

- Cycle storage facilities
- Bus interchange
- Taxi collect and drop off
- Automated People Mover (APM), connecting HS2 with the NEC, Airport and Mainline railway station
- Personal vehicle collect and drop off
- Coach service collect and drop off
- Car parking (7400 spaces) including Blue Badge facilities close to the station concourse.

Whilst all of the key railway infrastructure elements have been considered when developing the masterplan framework, the surface car parking provides the most challenging to the creation of a successful new community at Arden Cross.



HS2 station and arrivals plaza



HS2 Interchange site layout and key development framework influencing components (Jan 2020)

12. GVD, LOD, LLAU & DCO

To undertake construction, operations and provide environmental mitigation measures of the HS2 railway infrastructure project a substantial amount of land is required.

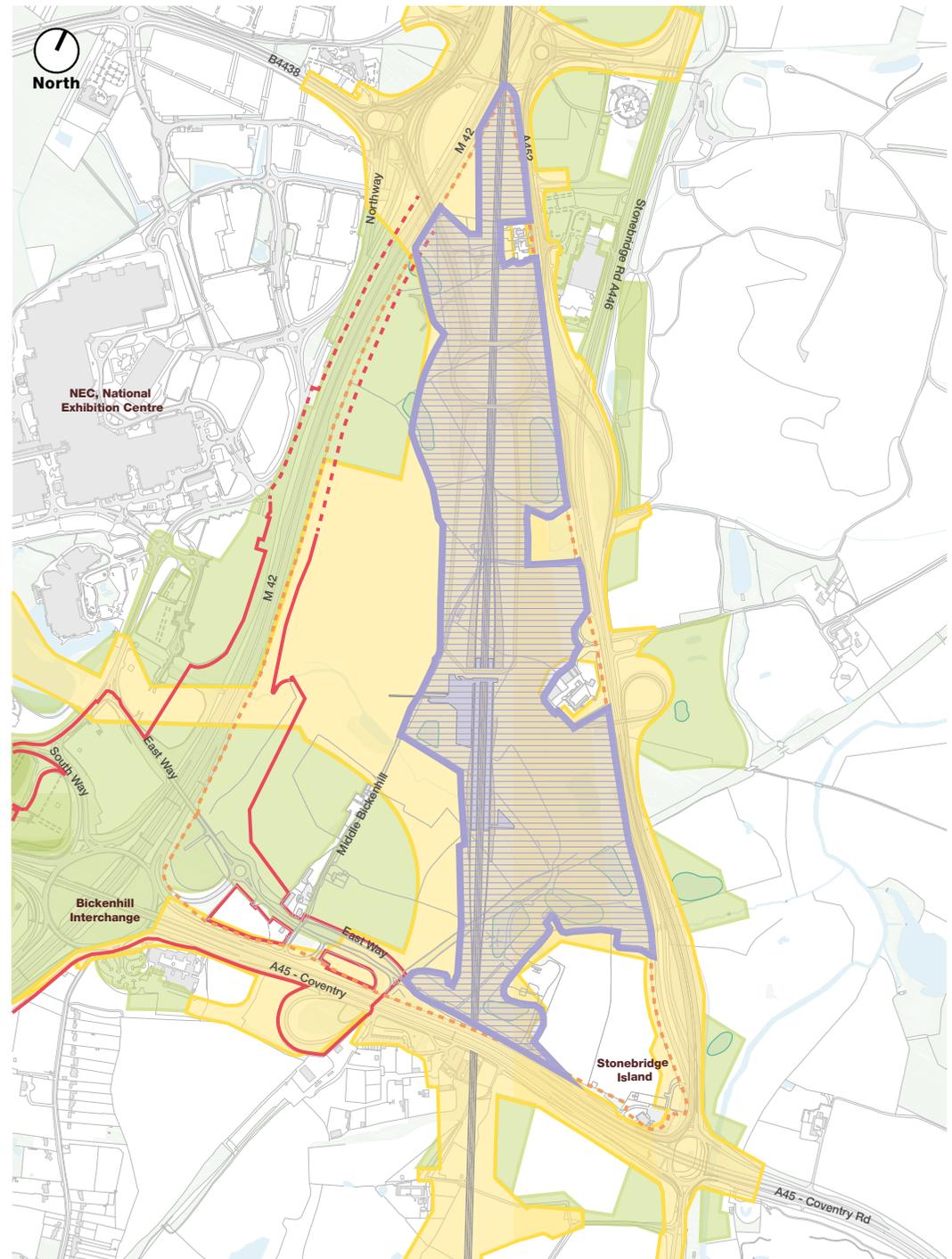
Under Parliamentary Acts, various land boundaries have been identified at Arden Cross:

- Limits of Deviation (LOD) - These are areas in which the HS2 infrastructure project can be constructed.
- Limits of Land to be Acquired or Used (LLAU) - Additional areas which may be required to maintain the HS2 project or for ancillary works such as environmental mitigation purposes.
- General Vesting Declaration (GVD) – was served in 2019 which is the first phase of land acquisition under Compulsory Purchase powers to buy land for the delivery of the infrastructure project. Additional land for the creation of the surface car parks will follow further acquisition under Compulsory Purchase powers.

The plan opposite illustrates the substantial land take at Arden Cross for the HS2 project. Similarly, Development Consent Order (DCO) land required for Highways England to undertake upgrade works to Junction 6 of the M42 is outlined in red.

PLAN KEY

-  LOD
-  LLAU
-  GVD
-  Junction 6 M42 DCO Boundary



Arden Cross site plan indicating current HS2 land boundary areas

13. DEVELOPABLE AREAS (with surface car parking)

Given the existing site constraints and HS2 Hybrid Bill land requirements, potential development areas at Arden Cross have been established. Key considerations in respect of these development sites include accessibility and the development typology that could be associated with site constraints.

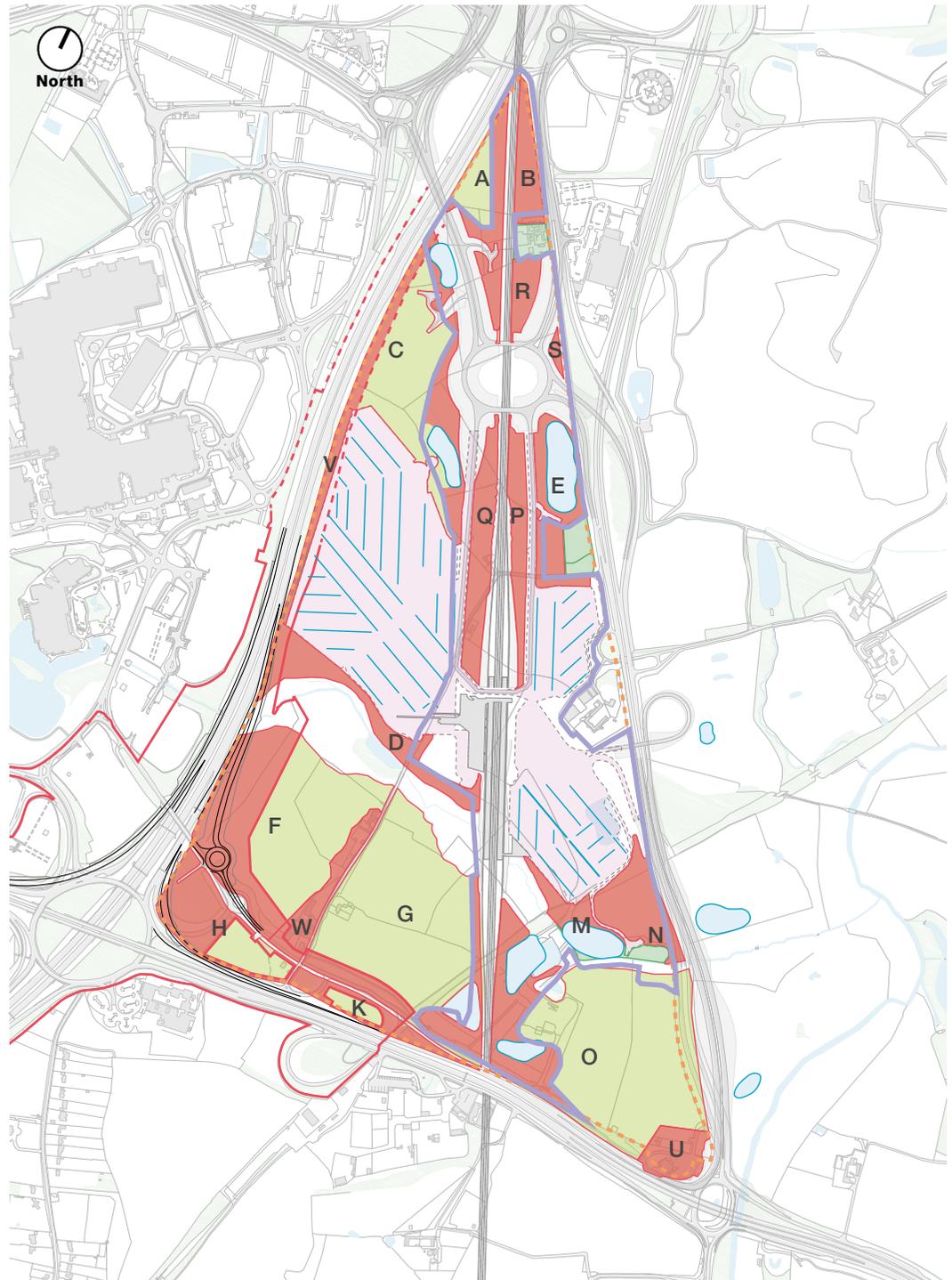
Development plots in the north of the site are dictated by the highways alignments and associated grade-separated road embankments that define the future potential to development.

Similarly in the south, additional enabling highways, outside of HS2 delivered components, will impact the deliverability of development plots.

Sensitivity of different development uses to environmental constraints (such as noise) have been considered and land take requirements factored in for landscape mitigation.

Consideration must also be given to the Airport height restrictions, when considering development height and massing. The Birmingham Airport 'Inner Horizontal Surface' limits development to 45m maximum above the runway level.

The diagram illustrates initial development zones, which have subsequently been modified as additional land take has been required by HS2 to provide environmental mitigation measures.



Potential developable areas (green) after overlaying site and transport infrastructure constraints

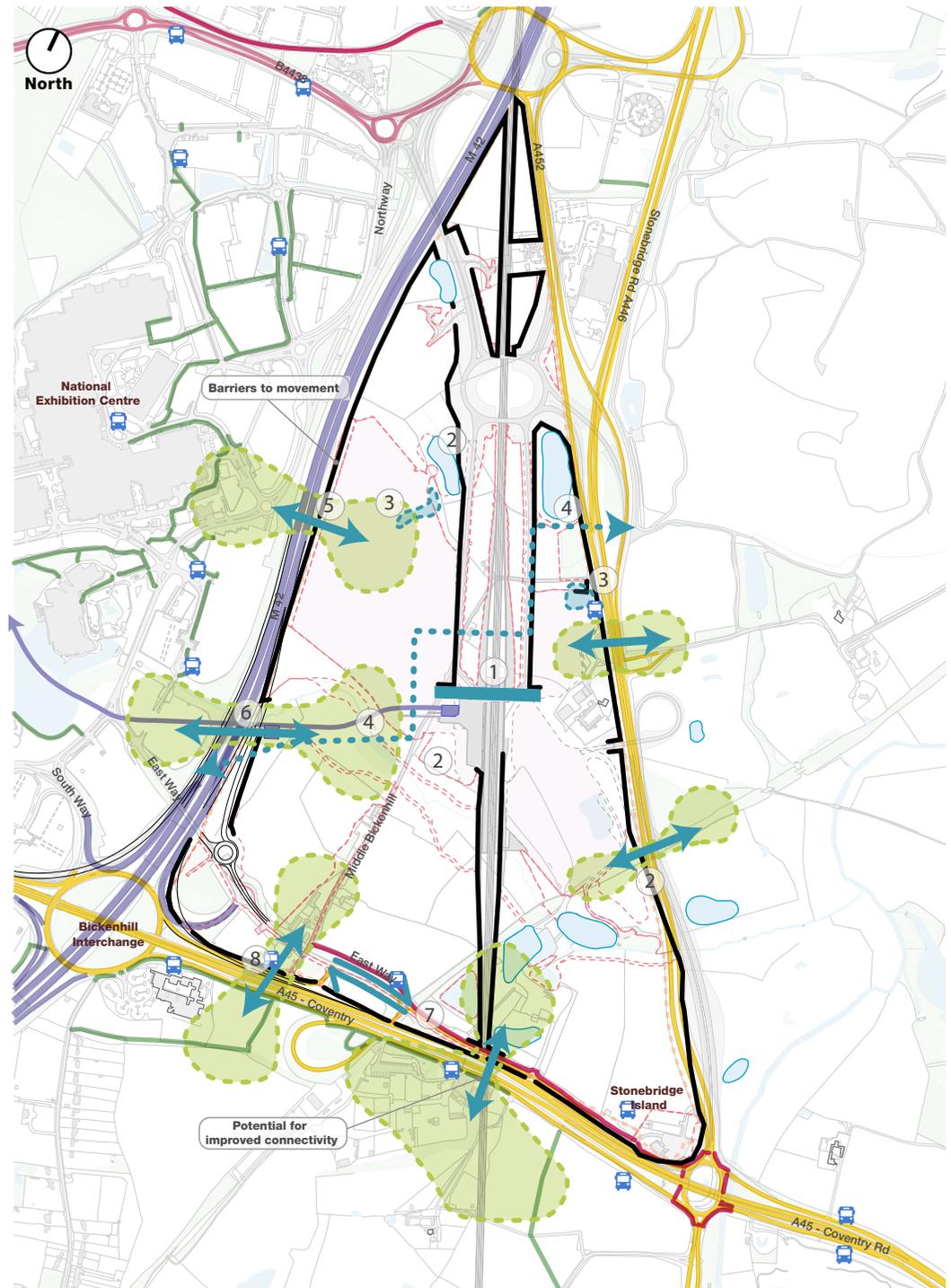


Initial 'best case scenario' areas identified for potential development around the HS2 Base Case station layout

HS2 BASE SCHEME IMPROVEMENTS

(Previous ACL/UGC HS2 Change Requests)

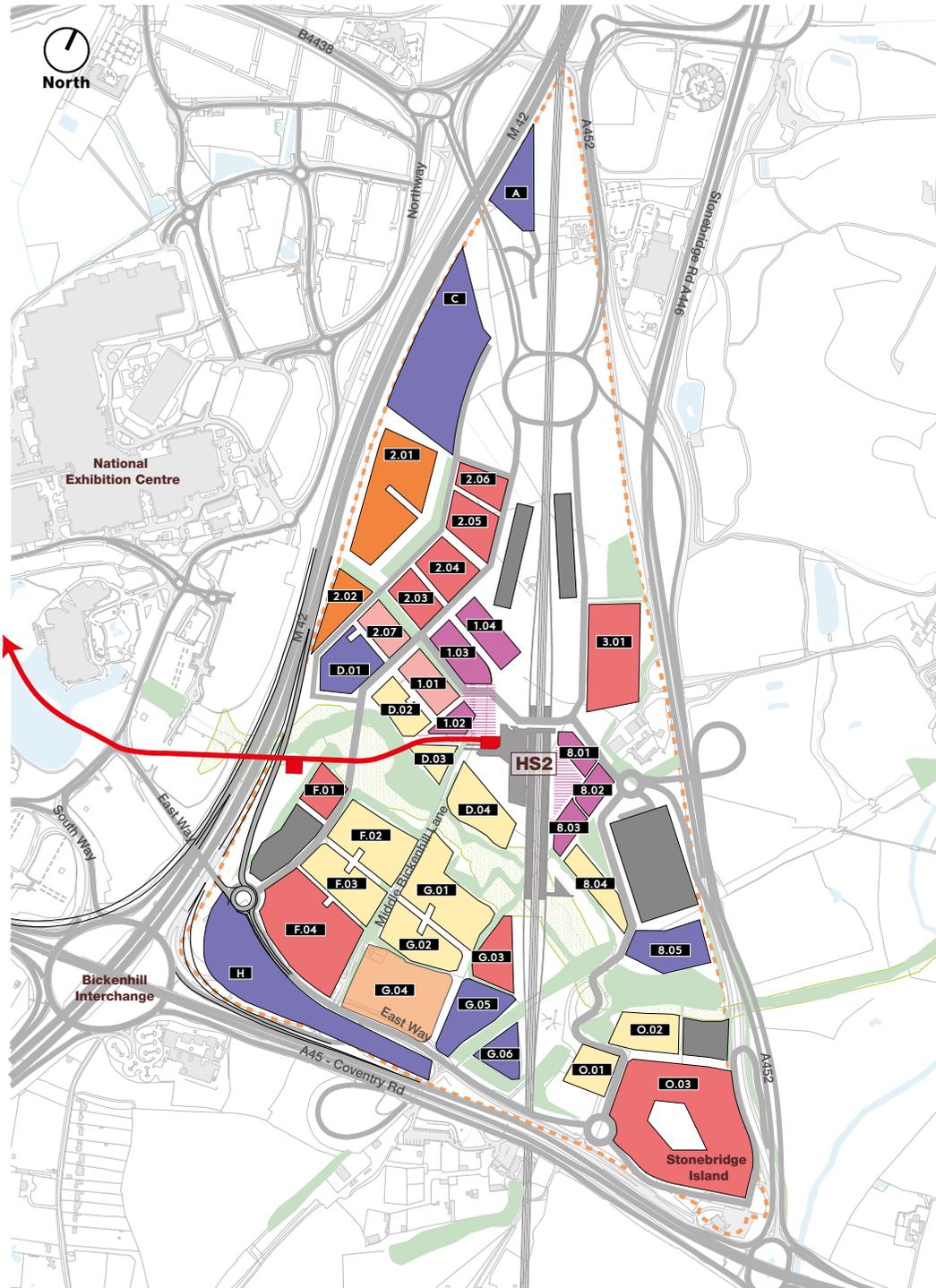
- 1 - HS2 road bridge relocated
- 2 - Balancing ponds integrated with landscape
- 3 - Car Park balancing ponds replaced by swales
- 4 - Undergrounding of HV cables
- 5 - Potential multi-modal bridge over M42
- 6 - Pedestrian link on APM M42 bridge
- 7 - 2-way East Way vehicular movement
- 8 - Highway capacity for HS2/AC development



Potential connectivity improvements to overcome site severance around Arden Cross

14.

DEVELOPMENT SCHEDULES (assuming multi-storey car parking)



Development Areas

Plot	Ha
A	1.18
C	4.63
D	3.68
F	4.80
G	9.50
O	8.29
Area 1	3.00
Area 2	7.86
Area 3	2.60
Area 8	6.46
H	4.30

TOTAL	59.90
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PLAN KEY

- Research And Innovation
- High value manufacturing & Production
- Residential communities
- HS2 Arrival Amenities & Grade A Offices
- Hotels & Hospitality
- Academic campuses
- Personal parking zones
- Landscape & Public Realm
- APM

A diverse land use strategy for the creation of a new community

Plots	Hectare
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Development Area A

A-p. 01	1.18
---------	------

Development Area C

C-p. 01	4.63
---------	------

Development Area D

D-p. 01	1.13
D-p. 02	0.76
D-p. 03	0.46
D-p. 04	1.33

Development Area F

F-p. 01	1.13
F-p. 02	0.76
F-p. 03	0.46
F-p. 04	1.33
MSCP	1.12

Development Area G

G-p. 01	2.18
G-p. 02	1.32
G-p. 03	0.98
G-p. 04	3.03
G-p. 05	1.34
G-p. 06	0.65

Development Area H

H-p. 01	4.30
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Development Area O

O-p. 01	0.80
O-p. 02	1.09
O-p. 03	5.77
MSCP	0.63

Development Area 1

1-p. 01	0.84
1-p. 02	0.38
1-p. 03	0.94
1-p. 04	0.84

Development Area 2

2-p. 01	2.87
2-p. 02	0.81
2-p. 03	0.81
2-p. 04	1.07
2-p. 05	0.92
2-p. 06	0.64
2-p. 07	0.74

Development Area 3

3-p. 01	2.60
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Development Area 8

8-p. 01	0.41
8-p. 02	0.47
8-p. 03	0.46
8-p. 04	0.85
8-p. 05	1.42
MSCP	2.85

Plot Area

%	29%	28%	31%	4%	3%	5%	100%
Land Use	Office	Industrial	Residential	Retail/ Leisure	Hotel	Education	TOTAL
(sqm)	160,370	154,840	171,430	22,120	16,590	27,650	553,000
(sqft)	1,726,208	1,666,684	1,845,257	238,098	178,573	297,622	5,952,442

Building Footprint

44%

Land Use	Office	Industrial	Residential	Retail/ Leisure	Hotel	Education	TOTAL
(sqm)	70,563	68,130	75,429	9,733	7,300	12,166	243,320
(sqft)	759,532	733,341	811,913	104,763	78,572	130,954	2,619,075

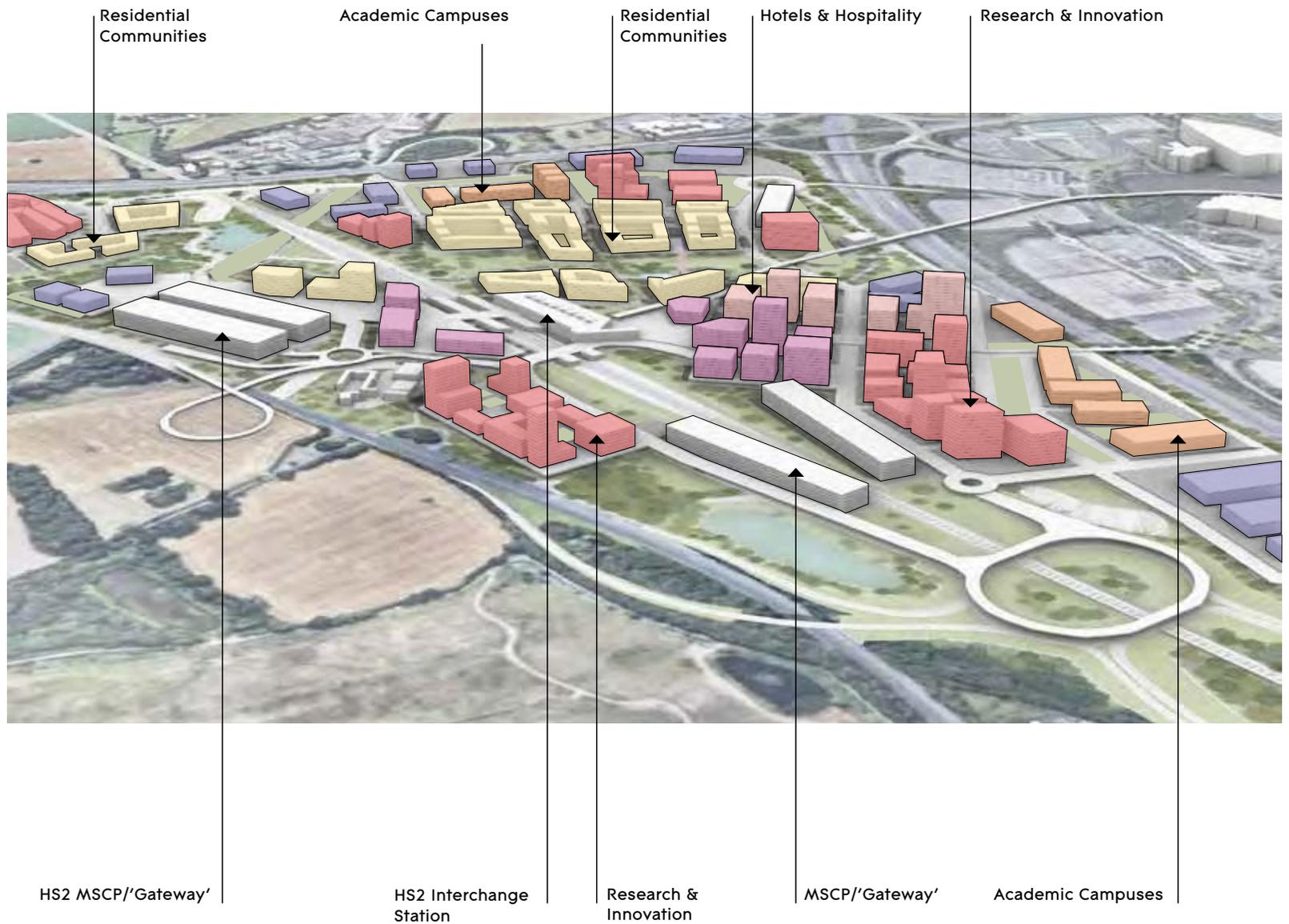
GEA

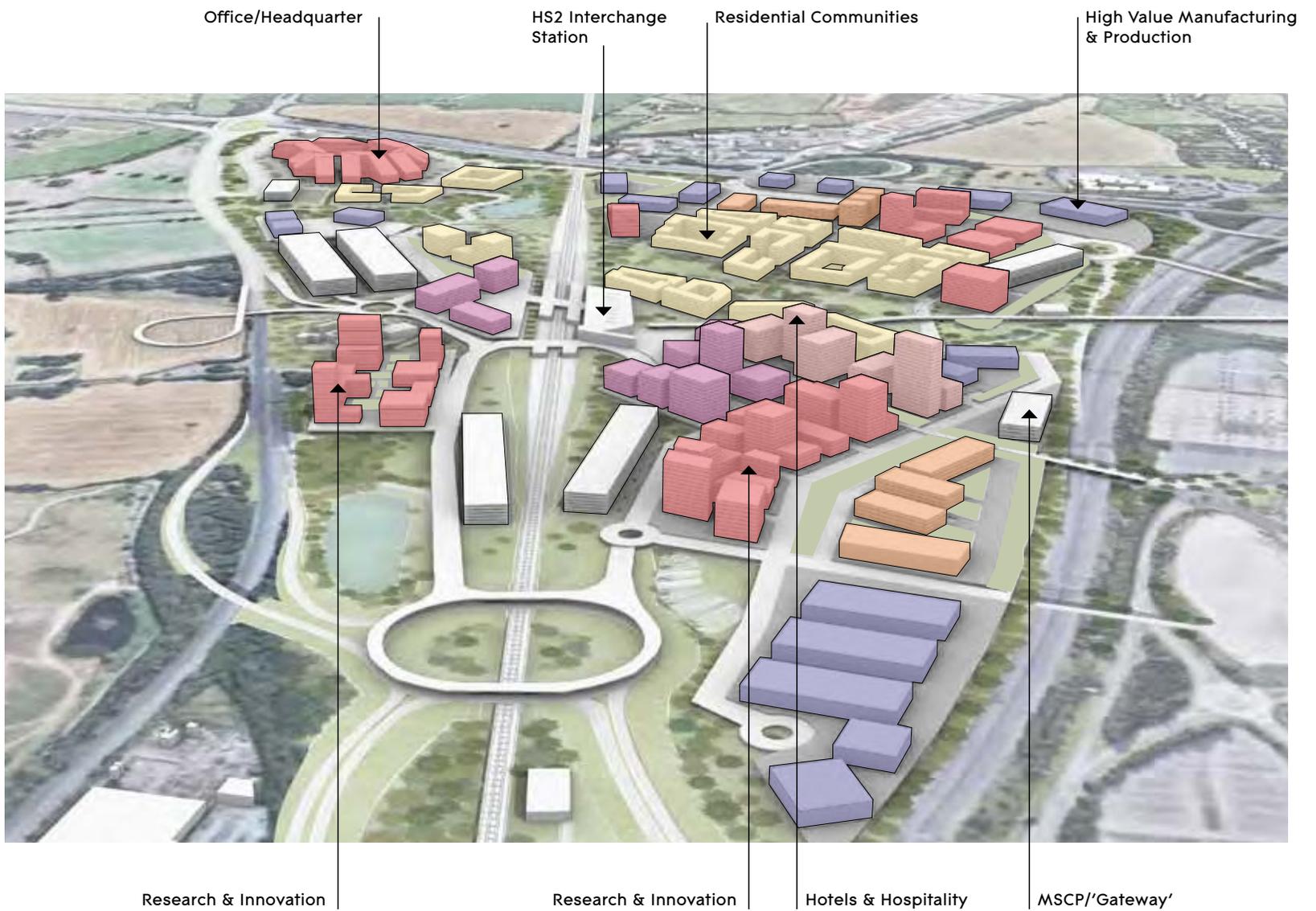
Storeys	6	1	4	4	6	4	
Land Use	Office	Industrial	Residential	Retail/ Leisure	Hotel	Education	TOTAL
(sqm)	423,377	68,130	301,717	38,931	43,798	48,664	924,616
(sqft)	4,557,190	733,341	3,247,652	419,052	471,433	523,815	9,952,483

Units per Use

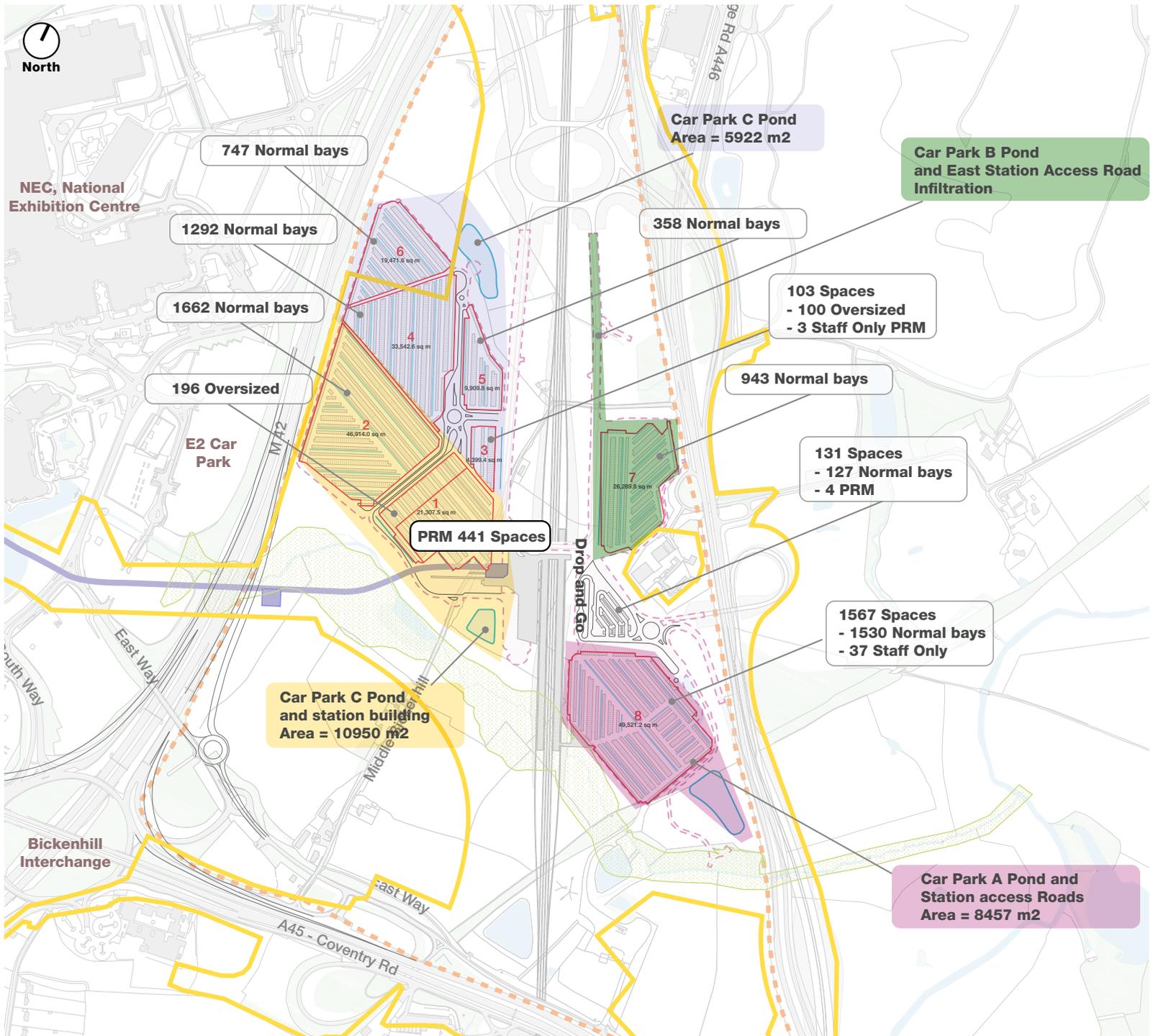
Unit size sqft	55,000	20,000	1,000	5,000	1,500	1,500	
Land Use	Office	Industrial	Residential	Retail/ Leisure	Hotel	Education	TOTAL
Units	83	37	2.5-3k	84	314	349	4,114
%	2%	1%	79%	2%	8%	8%	100%

14. SCHEDULES





15. HS2 PARKING STRATEGY



HS2 Base Case surface car parking layout

The HS2 Base Case scheme provides for approximately 7,400 surface car parking spaces, east and west of the railway corridor.

These facilities are accessed off new highway junctions to the north via a grade separated roundabout over the railway corridor, and to the east via new slip roads to/from the A452/A446.

The maximum walking distance to the HS2 station has been set at approximately 10 minutes, for Long Stay bays from the station concourse. Short Stay and Blue Badge parking are provided closer to the station building.

The total surface car parking area is approximately 27Ha with further requirements for drainage ponds integrated into the landscape strategy.

To allow for the creation of a new community centred around the HS2 station, a series of alternative car parking strategies have been tested.

Utilising a phased-delivery, multi-storey car parking solution, substantial land areas can be released for development.

Utilising land near to the railway corridor (being less desirable for development), high value plots around the station arrivals plazas could be developed out at early phases of the framework.

The proximity to HS2 platform escape overbridges could also allow for direct access to the platforms for Blue Badge parking users; utilising lift facilities built into the bridges.

Initial studies have considered multi-storey facilities sized to approximately that at Birmingham International Railway Station: 1,200 spaces on a six level facility.

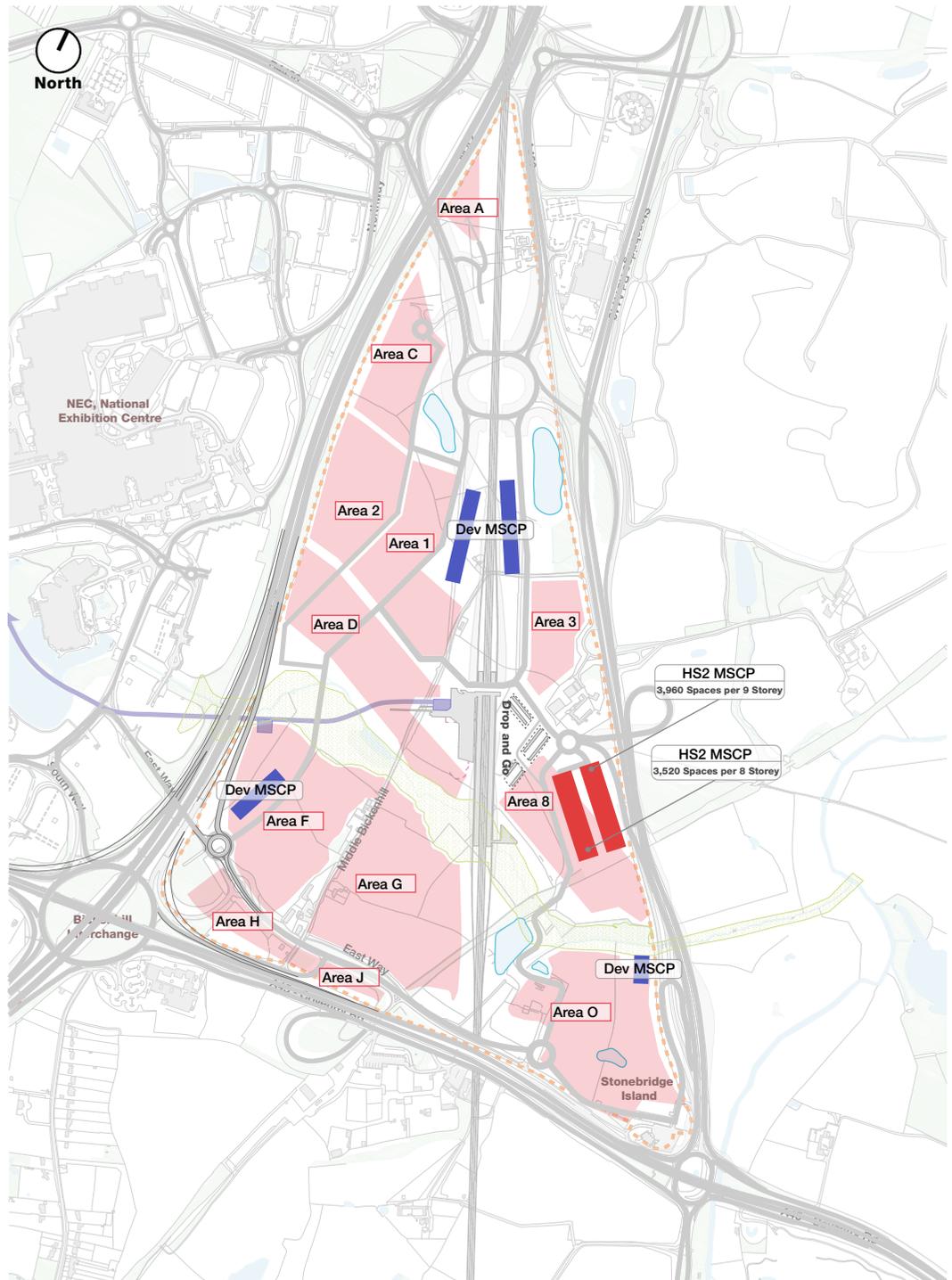
16. ALTERNATIVE PARKING STRATEGIES

In addition to freeing up land for development around the station, an alternative multi-storey car parking solution could facilitate a personal 'car-free' environment at Arden Cross.

By locating parking facilities at key access points from the surrounding strategic roads, personal vehicles can be removed off the streets of the new development.

Multimodal hubs can then be positioned close to these parking structures, providing onward bus travel, site-wide autonomous vehicles, electric scooters etc, all travelling on dedicated mass-transit routes.

A strategy of shared parking facilities, between HS2 station use and Arden Cross development, could be explored, helping to reduce the number of vehicle parking structures throughout the site.



An idealised car parking strategy for both HS2 station use and Arden Cross development

PLAN KEY

- MSCP for HS2 Station
- Arden Cross Development MSCP

17. ACCESSIBILITY

Accessibility severance issues to the site are defined by the current boundary strategic highways. The M42 to the West, A452/A446 to the East and A45 to the south.

New site access points, being delivered as part of the HS2 works, include a realigned A452/A446 with a grade-separated roundabout in the north and new access/egress slips to the south-east.

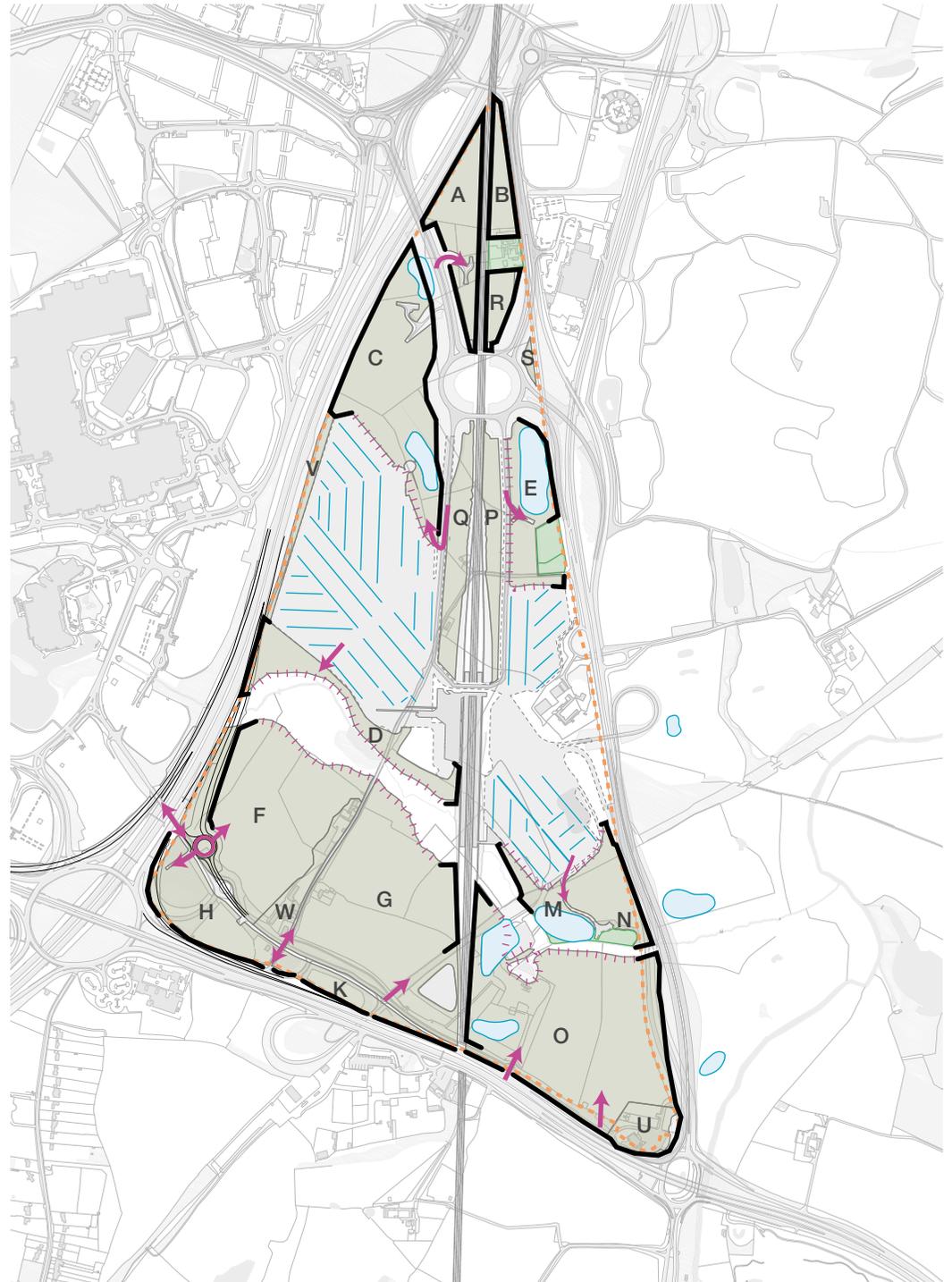
Upgrades to Junction 6 of the M42 will also provide more efficient vehicular access to the southern sites at Arden Cross.

The Hollywell Brook valley causes severance between the north and south sites. Two vehicular crossings currently exist, at Middle Bickenhill Lane and to the east of the proposed HS2 rail corridor (quarry access and haul road).

Identified land areas to the north have constrained access due to the proposed grade separated roundabout and realignment of the A452/A446. High road embankments will require access and egress along the proposed car parking boundary to the north (under a HS2 base case scheme).

Changes to the East Way, including two-way traffic along the full length, would allow for increased site access to the south; with consideration given to new site egress onto the A45.

Given these accessibility constraints a phased strategy of enabling highways infrastructure has been tested to unlock key development plots around the Arden Cross site.



Site severance and accessibility opportunities

18. ENABLING INFRASTRUCTURE

In order to release the full potential at Arden Cross, essential movement and connectivity corridors have been identified. Whilst Arden Cross is bound by regional strategic highways, providing workable access points to the site is challenging.

Highways infrastructure, delivered as part of the HS2 works, will improve accessibility to the Arden Cross site, however joining up the identified developable areas will require additional on-site measures.

Early phases of development, south of the Hollywell Brook, could be realised early if additional highways enabling works were provided for.

These additional works are not reliant on HS2 committed site infrastructure and comprise the following:

- Upgrades to the proposed M42 Junction 6 roundabout (FO1).
- Upgrades to Middle Bickenhill Lane to allow for new public transport routes (2). This includes improvements to the existing bridge over the Hollywell Brook (O0.2) and junction with the East Way.
- East Way improvements, including extended two-way traffic (1), junctions/roundabout access to the development sites (G0.1 O0.1) and new egress onto the A45 (O0.3).
- Provision for an upgraded bridge over the HS2 rail corridor (T0.1) which will allow for two-way traffic and a dedicated cycle lane and footpath (note: the HS2 scheme allows for the upgrading of this bridge under the Act).

KEY INFRASTRUCTURE COMPONENTS

F0.1 - Upgraded roundabout/New junction

G0.1 - New junction with East Way

G0.2 - Upgraded bridge over Hollywell Brook

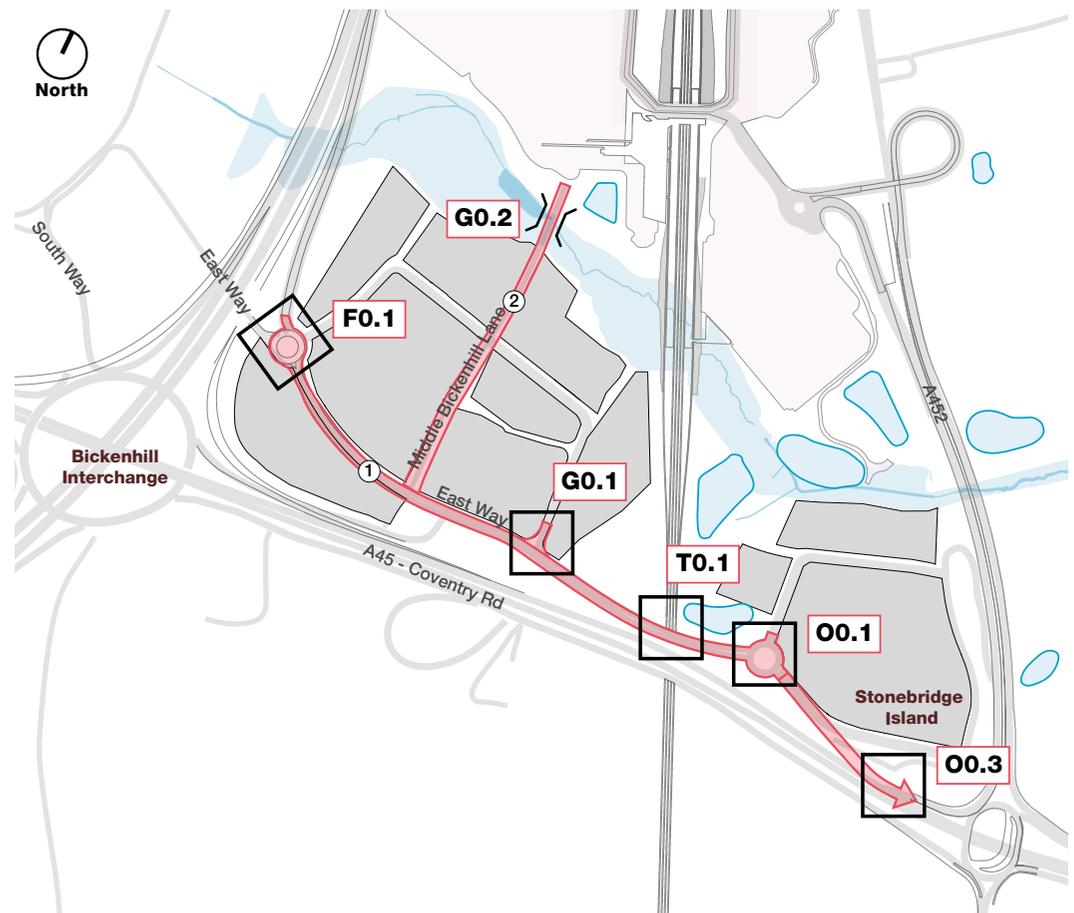
T0.1 - Upgraded East Way bridge over the railway corridor

O0.1 - New roundabout

O0.3 - New site egress to the A45 Coventry Rd

1 - Upgraded East Way (Approx. 920m length)

2 - Middle Bickenhill Upgrade



Under an alternative car parking strategy for the HS2 station, and part of the wider aspirational development opportunities at Arden Cross, additional site movement corridors/components have been identified to include:

- An additional bridge over the Hollywell Brook, west of the railway corridor (D0.1) allowing increased pedestrian/cycle connectivity north-south.
- An upgraded vehicular bridge (O0.2) east of the railway corridor to facilitate new site-wide public transport connectivity.
- New/upgrades to the proposed HS2 site roads (2), facilitating dedicated public transport lanes and future connectivity over the M42.
- Redesigning the station plaza (1) to allow for additional inter-modal components, including the Midland Metro and additional bus service provision (Sprint).

KEY INFRASTRUCTURE COMPONENTS

F0.1 - Upgraded roundabout/New junction

D0.1 - New pedestrian bridge over the Hollywell Brook

G0.1 - Egress from East Way

T0.1 - Upgraded East Way over the rail track

O0.1 - New roundabout

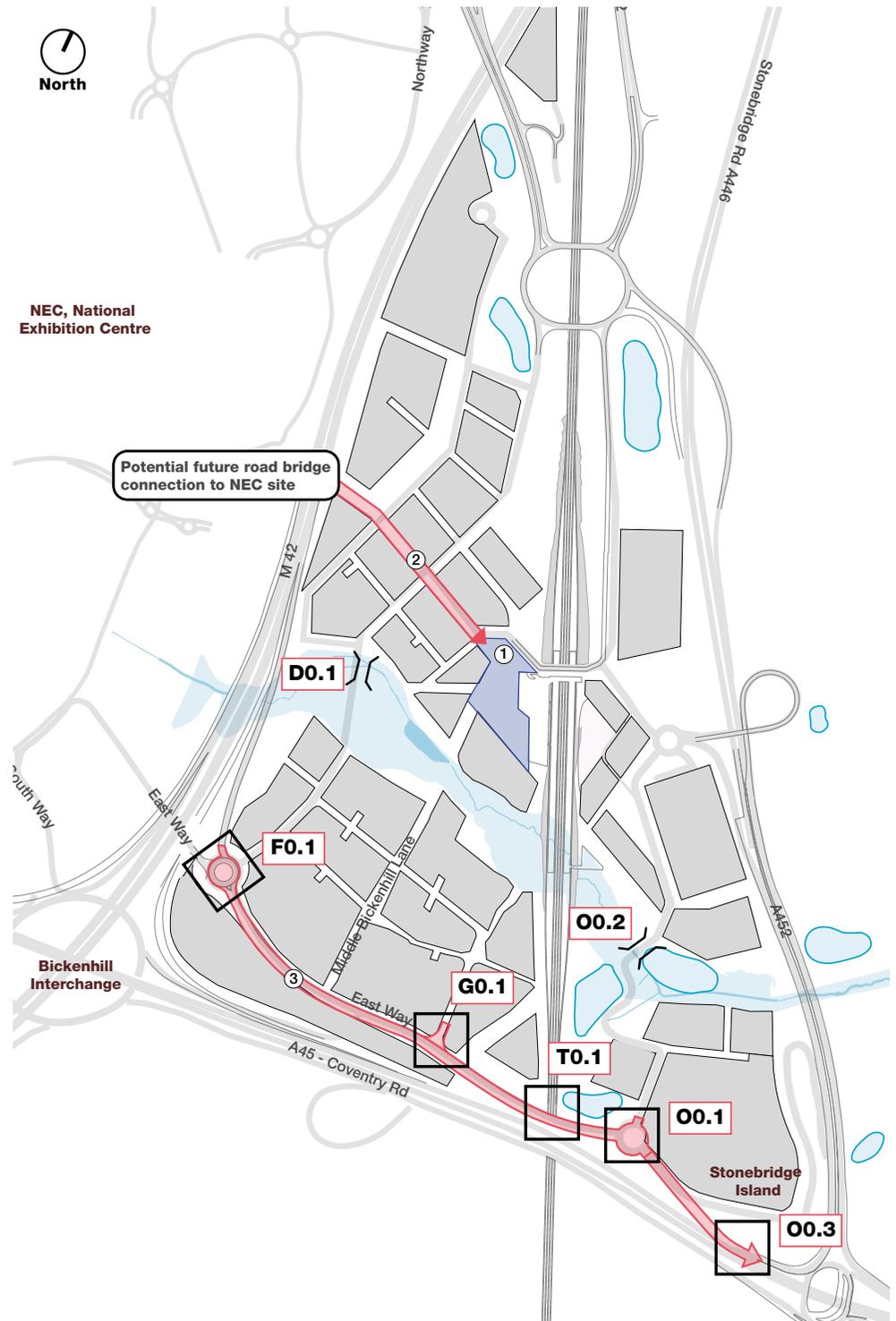
O0.2 - Upgraded vehicular bridge over the Hollywell Brook

O0.3 - New site egress to the A45 Coventry Rd

1. Upgrades to HS2 station plaza for improved intermodal provision

2. Multi-modal Street (Approx. 500m length, 32m width)

3. Upgraded East Way (Approx. 920m length)



19. EVIDENCE BASED PUBLICATIONS

Title	Author / Source	Date of Issue
HS2 Phase One Environmental Statement	High Speed Two (HS2) Limited	Nov-13
High Speed Two Information Paper - HS: Birmingham Interchange Station	High Speed Two (HS2) Limited	Feb-17
M42 Economic Gateway Masterplan Report	Solihull MBC	Jun-13
UK Central - The Hub Preliminary Concept Masterplan	Arup for Solihull MBC	Aug-14
The Midlands HS2 Growth Strategy	GBSLEP	Jul-15
The West Midlands Strategic Transport Plan	WMCA	Dec-15
UKC Interchange Revised Masterplan Final Report, including appended:	Arup for UK Central*	Aug-16
<ul style="list-style-type: none"> Assumptions Log 		
<ul style="list-style-type: none"> Preliminary Noise Study 		
<ul style="list-style-type: none"> Preliminary Air Quality Study 		
<ul style="list-style-type: none"> Preliminary vertical road alignment 		
Solihull Draft Local Plan	SMBC	Dec-16
Solihull New Transport Strategy	SMBC	Dec-16
UKC Interchange SIFT Report Issue 2	Arup for UK Central	Aug-16

The Hub Framework Plan	Arup for UGC	Feb-18
The Hub Framework Plan Appendices, including:	Arup, Amion, C+W and PBA for UGC	Oct-17
<ul style="list-style-type: none"> Constraints baseline 		
<ul style="list-style-type: none"> Constraints assessment 		
<ul style="list-style-type: none"> Proposed Access and Highways Works 		
<ul style="list-style-type: none"> Infrastructure Investment Appraisal - executive summary 		
Midlands Connect: Final Transport Strategy	Midlands Connect	Mar-17
UK Arden Cross Requested Changes Document	Arup for UGC	Jun-17
UK Central Hub Utilities Report – Summary	Peter Brett Associates	May-18
The UK Central Hub Growth and Infrastructure Plan	Arup for UGC	Jan-18
Birmingham Airport Masterplan: Towards 2030	BHX	
Topographic and mineral extraction mapping	Greenfield Associates	Various
Preliminary A452 access review for Arden Cross consortium	Arcadis	May-17
Green Belt and Policy P1 report	Turleys	2019
Cushman and Wakefield Development Trajectory		2019
Cushman and Wakefield Development appraisal for Arden Cross		2017
HS2 DAL reports from the parallel design process		
PJA technical reports to support the development of the Rot and Longabout highway schemes		

