



PART 3
KEY STRATEGIES

3.1 Shaping a Response

It is essential for the University to continue to grow which it has clearly demonstrated over a long period of time. The transparent nature of the campus needs to be maintained and the boundaries of the campus must allow the opportunity to grow and continue to contribute to the economic regeneration of the city.

Based on this organic growth there is a need to ensure through the public realm the arrival at campus for visitors, staff and students. Visitors must recognise that they have entered into the campus through wayfinding and a distinctive public realm.

The previous section described the challenges that need to be overcome, and opportunities that should be taken towards meeting the Strategic Objectives and delivering a transformational Masterplan for the University of Sheffield Campus.

The response to these challenges and opportunities is summarised as follows:



IDENTITY

The campus lacks identity. The Masterplan must offer strategies that give coherence, consistency and legibility to the visual identity of the campus built environment and external realm. These qualities apply at all scales: the hierarchy of public spaces, the palette of materials, and the furniture and fabric that allows people to settle. The University delivers excellence in education, research and employment, and it similarly aspires to excellence in the visual identity of the campus.

INTEGRATION

In parallel to establishing an identity, there is a need to create coherent thresholds and gateways at the perceived edges of the campus. These should balance the needs for both continuity in the external realm and a strong sense of arrival at the University Quarter. The extension of the City Gold Route provides an excellent opportunity for the University Quarter to integrate with the City Vision.

COHESION

The campus lacks cohesion. The Masterplan should look to consolidate its estate via a consistency in the external realm combined with an activation of facades to certain buildings. New buildings could potentially align more with a consistent architectural identity. First and foremost the campus can be knitted together by improving crossings on Upper Hanover Street and Western Bank.

GROWTH

The Masterplan demonstrates that there is room to grow, with a significant opportunity to be found in the Hounsfield Favell Site. The foremost requirement for expansion is with the Science Faculty. The positioning of this Faculty at the centre of the campus would help to consolidate the east and west campus.

POSITIVE MOVEMENT

The experience of walking or cycling around the campus is not a positive experience. Car movement prevails, and the Masterplan must give maximum priority to redressing this imbalance. There are also opportunities to improve access to all in the Hounsfield Site.

A SUSTAINABLE CAMPUS

The design of the external realm can help to improve the environmental performance of the University in many ways: from making it easier to walk and cycle to implementing creative methods for reducing rainwater run-off. All opportunities should be considered.

GREEN SPACE

The Masterplan should look to maximise the potential of the existing green spaces on campus, particularly St George's Green. It should also maximise opportunities for new green spaces and other forms of greening the urban environment to help promote learning, well being and healthy lifestyles.

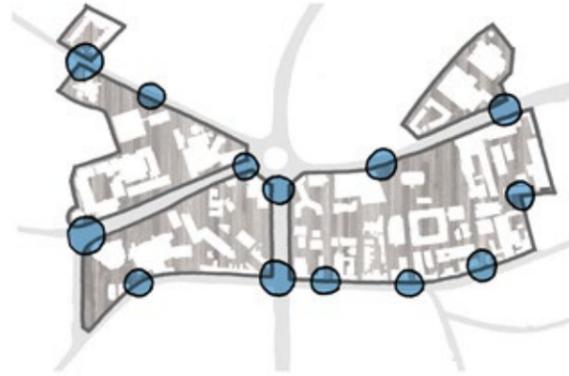
LEARNING SPACE

The campus external realm should comprise strategically located study-rich external environments, particularly to encourage cross-faculty interconnection. The character of these external study spaces can help to define what is unique about the University Quarter.



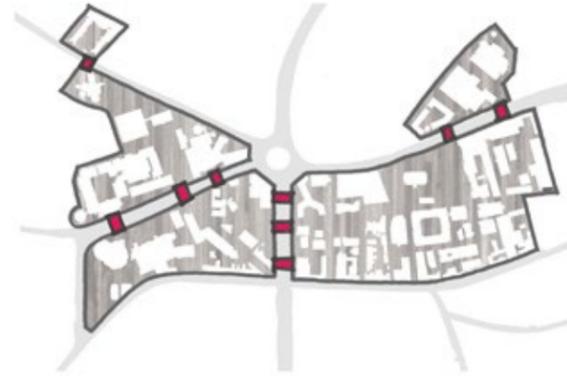
IDENTITY

A unified and identifiable external realm



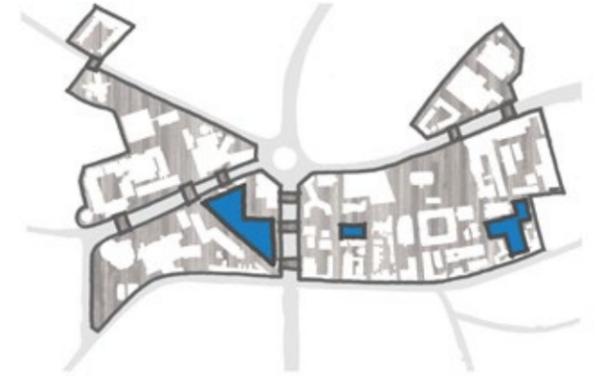
INTEGRATION

Positive gateways to the city



COHESION

Knitting together the campus



GROWTH

Defining development opportunities

POSITIVE MOVEMENT

Pedestrian and cyclist connectivity



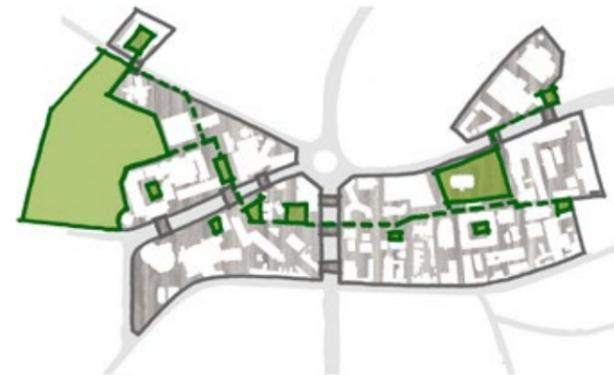
A SUSTAINABLE CAMPUS

A landscape character defined by sustainability



GREEN SPACE

A route defined by existing and new green spaces



LEARNING SPACE

Outdoor learning connecting teaching faculty



3.2 Concept

3.2.1 A LANDSCAPE LED APPROACH

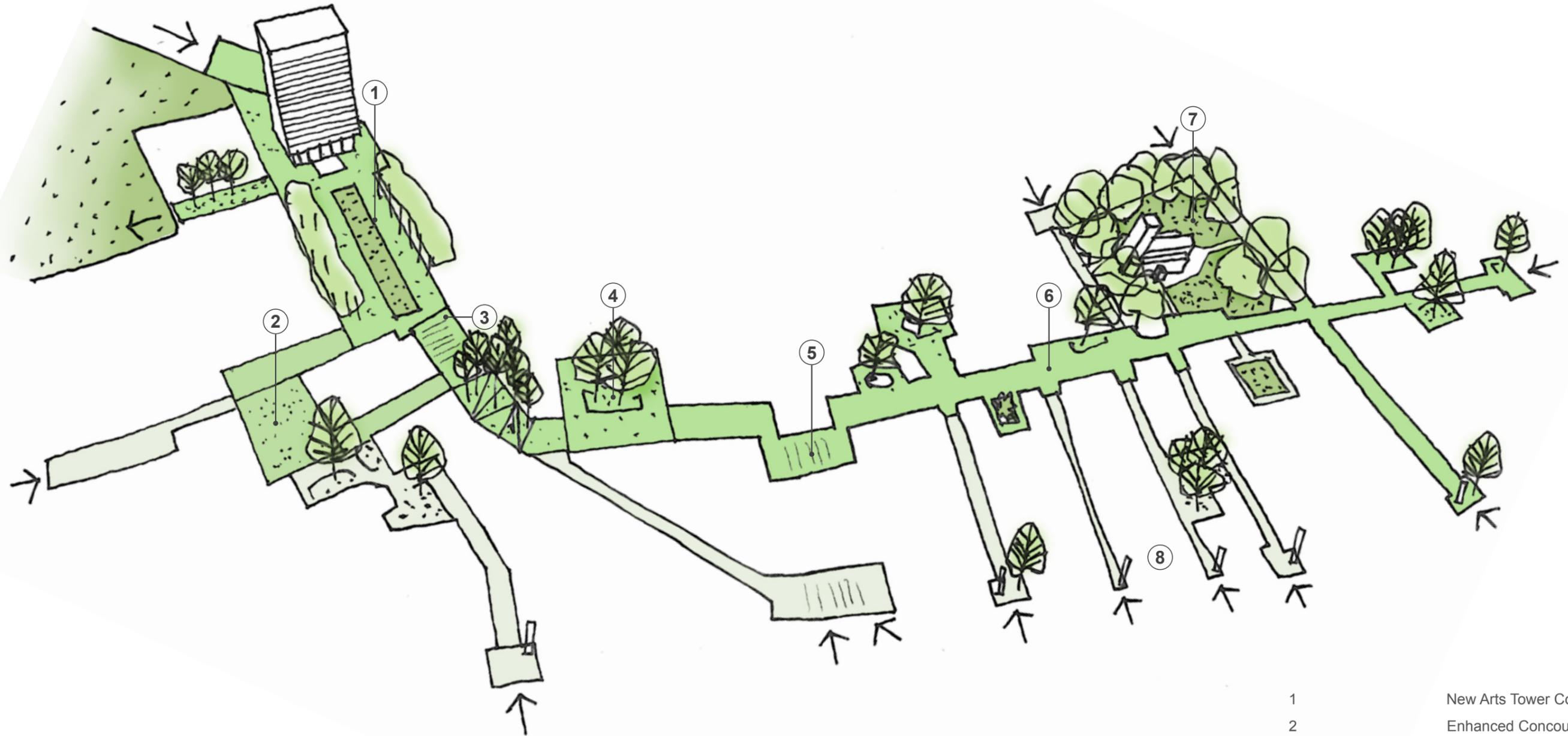
The Masterplan is underpinned by a landscape led approach which seeks to create a legible and coherent public realm – a seamless thread of streets, squares gardens and spaces – that will help to link together the east and west campus, and reveal the physical, cultural and lifestyle aspects of the University and to redefine the University experience for students, staff and visitors.

The concept is to better integrate the University with the city, to define a distinctive university quarter and to create one unified place providing a rich offer of high quality landscape and public realm to inspire learning.

The Masterplan strategies for the landscape have been developed to integrate the many factors that influence how public realm and infrastructure function and the benefits that they can bring to the University community and to Sheffield, to create a truly sustainable University neighbourhood which are fitting for their place. This Masterplan strengthens the urban environment through the creation of sustainable green spaces located across the campus.



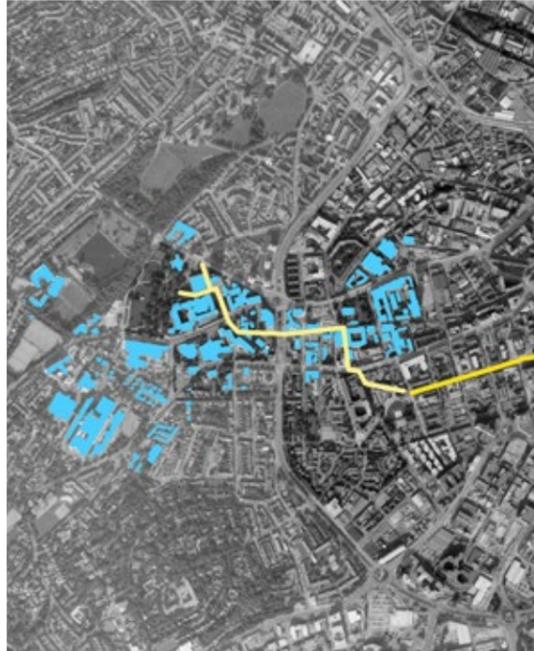
A SEAMLESS THREAD OF STREETS, SQUARES AND GARDENS
LINKING TOGETHER THE EAST AND WEST CAMPUSES



- 1 New Arts Tower Court
- 2 Enhanced Concourse
- 3 Crossings at Western Bank
- 4 New Public Space in Hounsfield Quarter
- 5 Crossing at Upper Hanover Street
- 6 Enhanced Leavygreave Road
- 7 Enhanced St George's Green
- 8 Enhanced secondary streets

3.2 Concept

3.2.2 KEY CONCEPT THEMES



UNIVERSITY GOLD ROUTE

To re-connect the east and west campus with an identifiable University Gold Route, running from St George's Church to the Arts Tower and Weston Park, continuing the principles of the City Gold Route and improving legibility of the campus.



PUBLIC SPACES

To create a sequence of coherent public spaces along the University Gold Route with a continuity of identity whilst also a variety of scale, character and activities. These spaces are essential within a research led university, creating the opportunity for serendipitous discussion between academics and researchers. This is particularly important where discoveries in research increasingly rely on interdisciplinary endeavour. Coffee bars, social spaces, places to meet are already provided within University buildings, but external spaces of this type simply do not exist on campus. These places also provide an opportunity to socialise, relax, study or just pause. The quality of the campus environment will be substantially improved with the provision of such spaces.



A SHARED SPACE

To consolidate the campus public realm as primarily a shared space, woven together by the Gold Route, with an emphasis on pedestrian and cycle movement. The public realm will be characterised by trees, planting, water, and sustainability, with strong thresholds marking the campus edge.



MATERIALS PALETTE

To unify the campus external realm with a consistent palette of landscape materials, furniture and lighting, that both identifies the University Quarter and integrates it with the wider City realm.

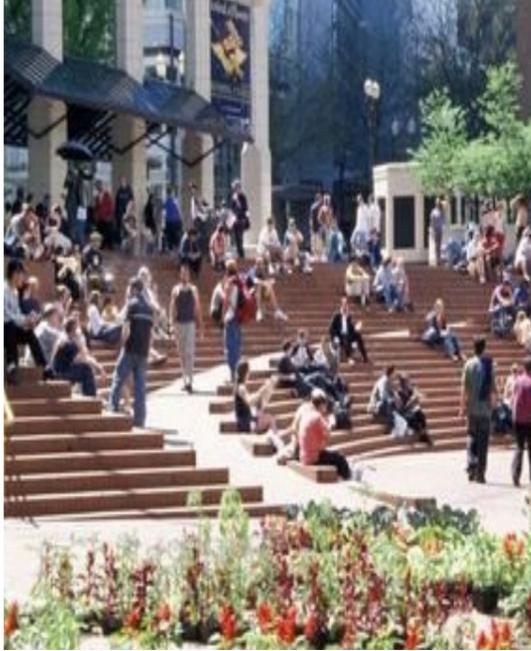


CONNECTIVITY

To create strategically located and visually prominent new crossings on Western Bank and Upper Hanover Street which enhance the Gold Route and improve cross-campus pedestrian and cycle routes.

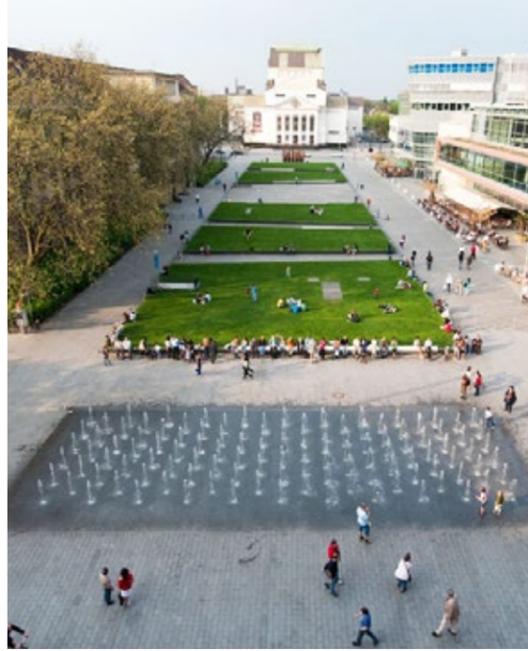
3.2 Concept

3.2.3 KEY SPACES



A CENTRAL CIVIC SPACE

To create a significant new public space that is central to the campus and on the Gold Route. The enclosure of new buildings will provide an activated edge to the space, optimum seasonal sunshine, shelter from wind and noise, and suitable floor area to meet University growth. This will be a key area for academics and students to meet and share interdisciplinary research ideas.



ARTS TOWER COURT

To transform the Arts Tower car park into a landscaped court, or plaza, that creates a suitable destination space for the University Gold Route, and a fitting setting to the Grade II * listed Arts Tower and Western Bank Library. Essential to delivering this plan is the pre-enabling of a University multi storey car park.



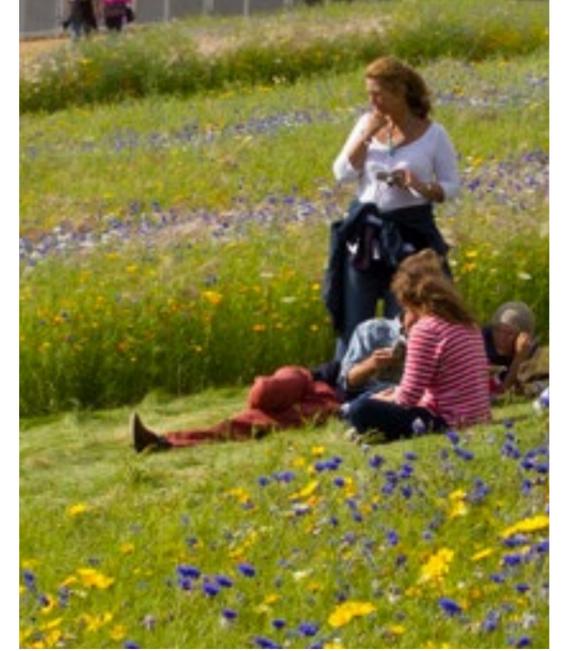
THE CONCOURSE

To substantially improve the public realm which experiences the highest pedestrian footfall across campus. Enhancing the public spaces underneath the flyover and celebrating the striking architectural features of the flyover to encourage this space to be utilised is essential. This space will enhance the connections to the University Gold Route by both a widened pedestrian route to the north of the Hicks Building and an activated ground floor frontage to the Alfred Denney Building.



LEAVYGREAVE ROAD (EAST)

To enhance the streetscape of Leavygreave Road by strengthening the building line with new buildings, introducing activated frontages, and creating focused public spaces along its route.



ST GEORGE'S GREEN

To maximise the benefits of the current St George's churchyard, the largest University owned green space, by improving protection from wind and road noise, and enhancing connectivity to Leavygreave Road and providing a public park which encourages use.

3.3 External realm character

3.3.1 IDENTITY / PAVING HIERARCHY

A consolidated and legible approach to paving will articulate the hierarchy of the public realm, reinforcing the distinct identity of the University whilst complementing the city public realm design.

The streets and spaces throughout the University estate differ in scale and function but the aim is to create a sense of unity through a common palette of hard materials and street furniture. The careful selection and use of all materials is essential to the success of the Masterplan and to reinforce a sense of place for the University Quarter. The proposed materials palette is intended to complement the guidelines and specifications outlined in the Sheffield City Council Urban Design Compendium whilst seeking to establish a unique identity for the University Quarter and to respond to environmental performance criteria.

The overall approach to the paving is to use a simple matrix of materials and colours. The application of this matrix shall reinforce the hierarchy and legibility of the University spaces, streets and routes, as well as work with the existing paving materials within the area. The design and layout of the public realm shall limit obstructions to pavements and routes by the removal of obsolete, duplicated or unnecessary items. The detailed implementation shall seek to co-locate items where appropriate and shall be managed to maintain a neat and uncluttered public realm.

Defining the key public spaces helps to focus the high quality materials in the Arts Tower Court, The Concourse, Firth Court and Hounsfield Square. The University Gold Route is treated as a key primary route, spanning from the east Leavygreave through the heart of the key public spaces towards the north west axis terminating at Bartolomé Court. A consistent backdrop of secondary routes helps to define the boundaries of the University identity whilst sensitively adjoining to the city boundaries.

It is proposed to use stone in a distinctive way to create a distinct identity to each space. For the key Public Spaces, special attention will be given to establishing a distinctive pattern of stone paving. Primary Routes will be treated with Yorkstone setts with granite kerbs and drainage channels. These will be of a high quality, muted character. Clay pavers with granite kerbs characterise Secondary Routes, whilst complementing the stone of the Primary Routes and Public Spaces.

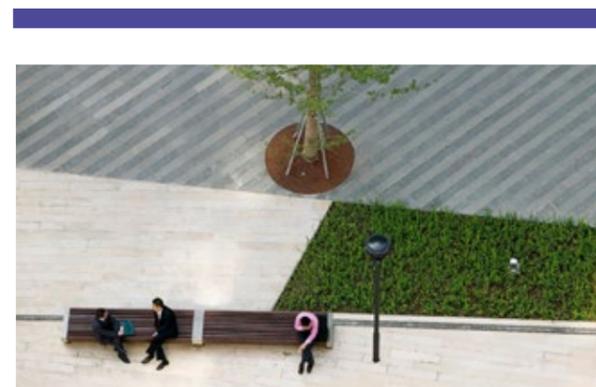
These principles will be detailed in a separate University Campus Design Compendium



KEY: PAVING HIERARCHY

- Public Spaces
- Primary Routes
- Secondary Routes

Public Spaces



Primary Routes



Secondary Routes



3.3 External realm character

3.3.2 IDENTITY / FURNITURE STRATEGY

Complementing the paving hierarchy, the furniture strategy seeks to provide unity and a distinct identity to the University Quarter.

To help reinforce the identity and distinctiveness of the University Quarter, a family of site wide furniture is proposed. The seats and benches are intended to be solid, simple and distributed round the campus in appropriate locations. All street furniture and signage shall be of a contemporary simple design that complements the overall University streetscape.

The Key Public Spaces are characterised by either a formal or playful approach. This helps to add richness to the spaces whilst responding to the particular character of the surrounding urban fabric. High quality yet understated site wide furniture will define the University Quarter without visually competing with its surrounding.

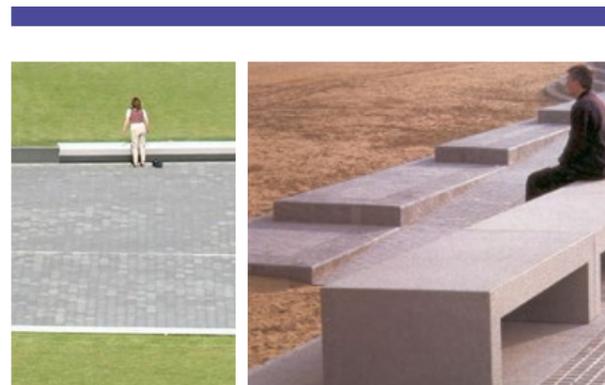
A palette of materials will be developed in order that the hierarchy of spaces can be defined across the campus.



KEY: FURNITURE STRATEGY

- Formal
- Playful - Social - Healthy
- Site Wide

Formal



Playful - Social - Healthy



Site Wide



3.3 External realm character

3.3.3 IDENTITY / THRESHOLDS AND GATEWAYS

The University benefits from its urban setting and connectivity to the city fabric. Thresholds between city and University are defined by key moves on both the ground plane and vertical elements.

The landscape is proposed to highlight the main thresholds to the University Quarter – the points at which you feel you have arrived. The thresholds are conceived as a hierarchy of entrances and comprise a combination of specimen tree planting, the use of a large paved table top with quality paving and street furniture.

A primary objective for the Masterplan is to create a more integrated campus with effective pedestrian links between the existing Arts Tower environs and the University buildings along Leavygreave Road. A variety of safe and comfortable routes are proposed around and through the campus public realm to allow for permeability and a variety of choice. The use of paving and tree and shrub planting is used to highlight the main pedestrian and cycle entrances to the campus.

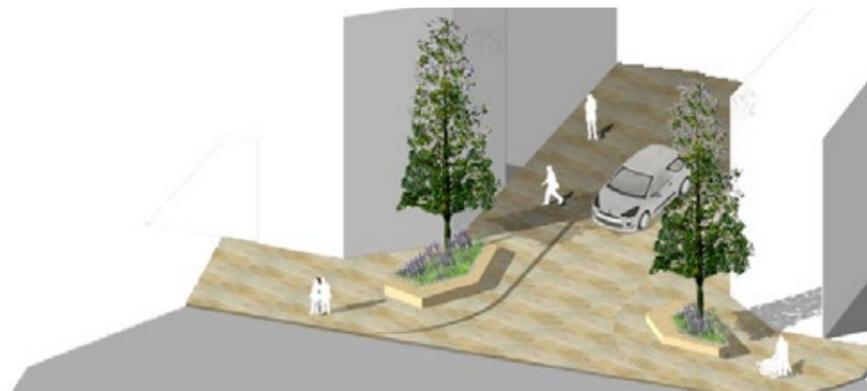
The Sheffield Gold Route is an important boundary edge along the east west northernmost axis of the University Quarter. The interface with Glossop Road is a key opportunity to announce the University interface. Spaces between buildings and road become points of orientation and wayfinding. Key Gateways define the outer boundaries of the campus and further emphasise the distinct character within the city fabric.

Strategic wayfinding shall be integrated into the streetscape to enable students, staff and visitors to orientate their way within the Quarter as well as aid an understanding of the relative distances to nearby open spaces, public transport and other destinations.



KEY: IDENTITY

-  **Gateway Markers (major and minor): Combination of Landmark Tree, Paving, Wayfinding**
-  **Threshold Articulation: Continuous Line of Tree**
-  **SCC Gold Route Extension**
-  **Vehicular Gateway Markers**



3.3 External realm character

3.3.4 IDENTITY / WATER

Celebrating the attenuation process of water in the urban environment is made visible and delightful.

The proposed surface water management strategy is integral to the Masterplan layout and function of the landscape and public realm. The proposed Sustainable Urban Drainage Systems integrates water collection, filtration, storage and distribution to maximise opportunities for reuse.

The key features at a Masterplan level include:

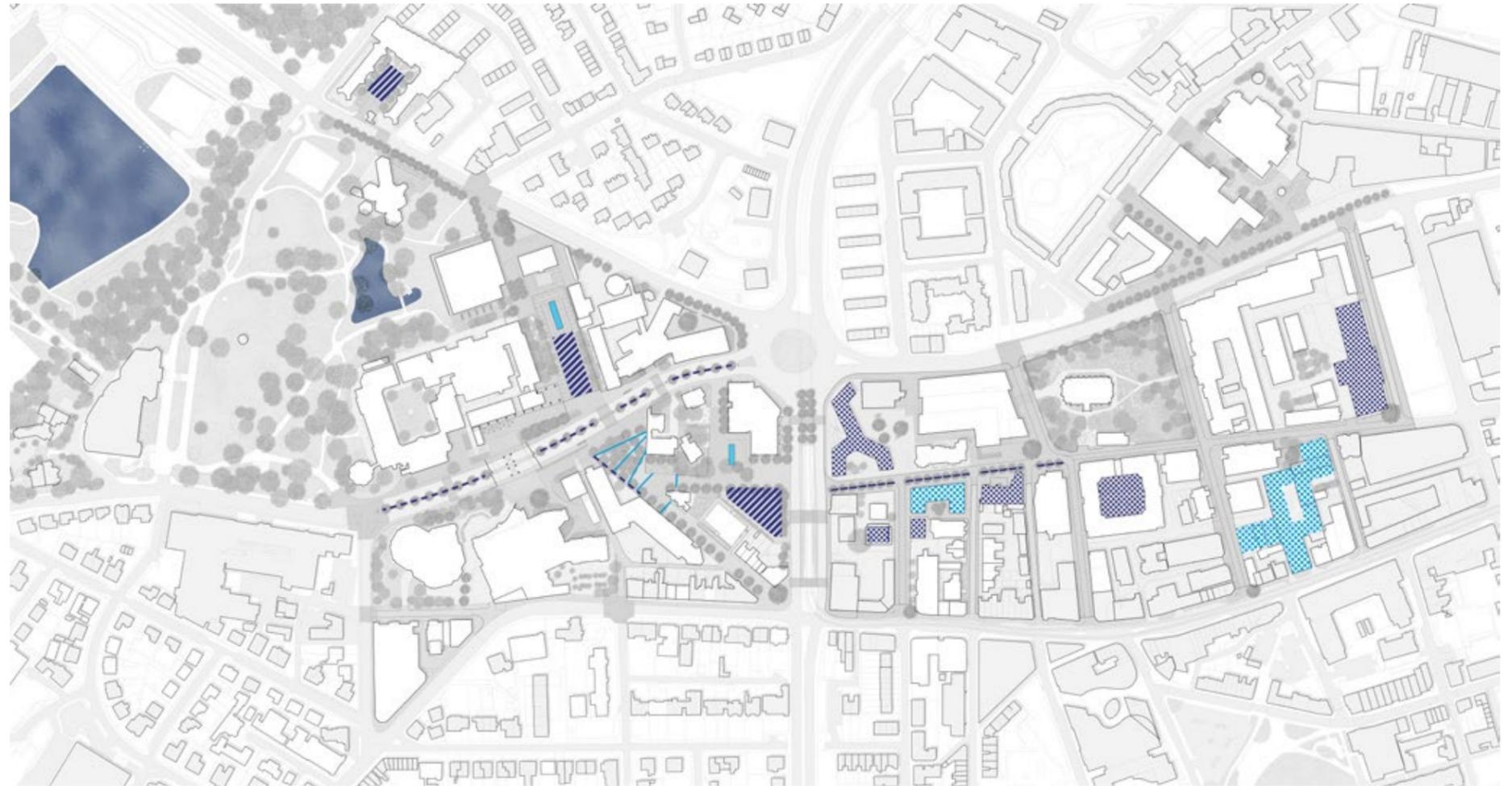
- Urban rain gardens and linear channels shall be incorporated within the public realm, particularly along Leavygreave Road and within the new University Square and Arts Tower Court, to increase the attenuation capacity of the streetscape and public realm. These features shall not be permanently filled with water but be planted to provide visual and habitat value to the public realm. Planting shall be selected to successfully establish within the wet-dry conditions that will occur.

- Porous paving shall be used where practically possible, typically under car parking bays in the general public realm rather than general highway. The siting of areas of porous paving shall be coordinated with existing utilities and trees. Porous paving may have to be tanked and allowed to discharge to the sustainable drainage system or sewer where the porosity of the soil is unsuitable.

- The use of vegetated roofs on any of the new development buildings of the Hounsfield Favell quarter to reduce the amount of run-off from the roofs.

- Formal water features are also a key ingredient in the public realm and an intrinsic part of Sheffield's steel industry heritage and identity, as well as bringing light, sound and life to a space. Amenity water features are conceived as being integral to each key public space with a variety of characters. These urban water features shall be designed to be robust, fit for their location and micro climate, and low maintenance. A static series of pools are proposed as a the focus to the new Arts Tower Court and an open recirculated rill is proposed to be integrated into the terraced public realm at the end of Hounsfield Road.

Collectively these systems form an important component of the landscape and public realm structure and also provide a potential learning resource and enhance the ecological value of the University estate.



KEY: WATER



3.3 External realm character

3.3.5 IDENTITY / PLANTING

The overall planting strategy will create a strong identity for the University Quarter, building on the title of ‘England’s Greenest City’ and making it a unique part of Sheffield, as well as bringing social, economic and environmental benefits to the University and city.

The groups of existing trees within the estate are recognised as an important and valuable asset of the University and the local visual amenity of the city. The Masterplan seeks to retain as many of the existing trees as possible and to integrate the trees positively within the overall layout. Trees of particular landscape value within the site are located in St. George’s Green as well as in the proposed Hounsfield Development Site. Redeveloping and redesigning the public realm will on occasions require the removal of existing trees. The University will commit to replacing at a minimum any removed trees on a like for like/number basis. It is more than likely that this number will be exceeded with the investment in park and public spaces as part of this Masterplan. New trees and shrub planting will compensate for the loss of any trees by greatly improving the diversity of age and species mix.

A key component of the redefined streets and new spaces for the University will be the planting of strategically placed specimen trees in key locations through the campus. Trees will be selected to enhance the skyline and create new landmarks for Sheffield. Groves and individual trees shall be incorporated within squares and at key locations through the estate to break up the urban grain and act as local features and points of reference. These distinctive tree groves / individual specimen trees will create a strong identity to the external spaces offering shelter, a meeting or seating space and educational opportunity. Where possible, the presumption shall be to plant forest-scale trees inspired by the wider Peak District landscape of Sheffield. ‘Forest-scale’ refers to large scale trees that are suitable for an urban context and representative of local climax woodland species. This approach will maximise the tree canopy cover and shade provided by trees in the area, as well as an overall greater provision of ecosystem services.

Living roofs shall be encouraged on any new development for user access and visual amenity, as well as a good resource for invertebrates, birds and bats.

The intent is that all public realm areas should support the greatest variety and quality of habitat types that are both viable and appropriate, to create an overall integrated green aesthetic and provide significant urban wildlife habitat and other ecosystem services.



KEY: TREES, PLANTING & VEGETATED ARCHITECTURE

- | | | |
|--|---|--|
|  Existing Trees |  Lawn |  Vegetated Walls (climbers) |
|  Avenue and Street Trees |  Shrubs and Flowering Plants |  Proposed Green Roofs |
|  Flowering Trees |  Seasonal Meadow Planting |  Existing Green Roofs |
|  Landmark Tree Groves |  Storm Water Planters | |
|  Tree Clusters and Groves | | |

3.3 External realm character

3.3.5 IDENTITY / PLANTING



AVENUE AND STREET TREES

Avenue trees help create a unified and distinct character to key routes: Western Bank and Leavygreave (Gold Route Extension).



FLOWERING TREES

Flowering trees are strategically placed within the key public spaces to bring an element of colour and seasonality.



LANDMARK TREE GROVES

Landmark trees help to punctuate the thresholds and gateways into the University by their scale and character.



TREE CLUSTERS & GROVES

A key opportunity to establish a striking grove of trees emerging from a stepped access up to Western Bank will help frame the Arts Tower whilst strengthening its axis and desire line.



LAWNS

To create strategically located and visually prominent new crossings on Western Bank and Upper Hanover Street which enhance the Gold Route and improve cross-campus pedestrian routes.



SHRUBS & FLOWERING PLANTS

An opportunity to create identity to areas of green public realm, allowing for seasonal interest and structure.



SEASONAL MEADOW PLANTING

The opportunity to build upon the Landscape Department's work in meadow planting is particularly suited to St. George's Green.



STORM WATER PLANTERS

To consolidate the Concourse and Students' Union spaces, and give them enhanced connections to the University Gold Route by both a widened pedestrian route to the north of the Hicks Building and an activated ground floor frontage to the Alfred Denny Building.



VEGETATED WALLS (CLIMBERS)

If green walls are feasible they will provide an opportunity to introduce green space in vertical environments where planting is particularly constrained



GREEN ROOFS

The existing green roof provision will be further strengthened by future development as this Masterplan is developed out.

3.4 Transport and Infrastructure

3.4.1 INTEGRATED TRANSPORT

Key to resolving transport and infrastructure challenges is an integrated design approach, taking into account the complexities and overlapping needs of the University Campus.

The aim of the Masterplan is to transform the University campus to a pedestrian / cycle friendly space whilst maintaining the historical elements of the campus. It is proposed that vehicular access through certain areas of the University is to be limited, with non motorised vehicle routes making up a vital part of the infrastructure through the campus.

An integrated approach to transport has taken a holistic view of the existing opportunities and constraints on campus. Broadly, these can be summarised in the following categories:

1. Understanding pedestrian and cycle flows and concentration points on campus
2. Understanding the public transport links
3. Resolving the divide created by the two highways bisecting the campus and creating a positive pedestrian environment. Each of these highways have their own particular set of challenges to resolve and opportunities to exploit, however, both will as a principle share the following elements:

- Prioritising pedestrian movement
- Dedicated pedestrian crossings at key locations anticipating an increase in pedestrian footfall related to current and future developments
- Alignment of crossing points to be direct and generous, eliminating staggered crossings
- Reduction of clutter to enhance clarity and heighten driver responsibility
- Widened pavements where the opportunities to do so exist
- Breaking down the scale of the highways with vertical elements
- Unified material selection to help define the main pedestrian routes
- Integrated material strategy with the city for road surfaces



KEY: BUS ROUTES

EXISTING PUBLIC TRANSPORT

- █ Bus no. 10
- █ Bus no. 52
- █ Bus no. 51
- █ Bus no. 95
- █ Bus no. 70, 120
- Supertram

PROPOSED PUBLIC TRANSPORT

- Bus no. 95 Proposed Option
- Bus no. 51 and 52 Proposed Option

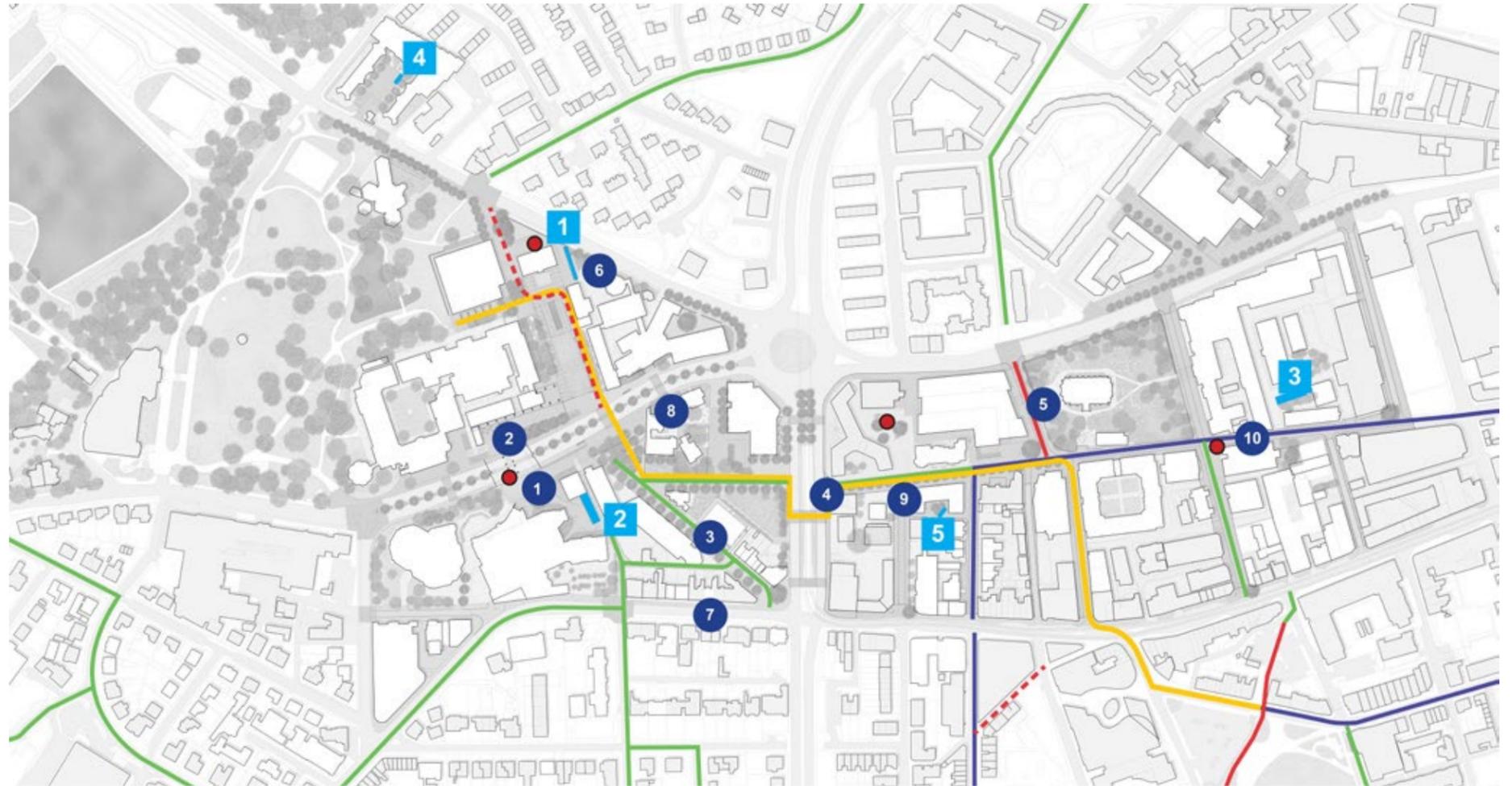
3.4 Transport and Infrastructure

3.4.1 INTEGRATED TRANSPORT

4. Identifying opportunities for development and public realm within current surface car parks

5. Integrated cycle strategy and cycle storage

The greatest opportunity to improve the experience of the campus relates directly to pedestrian access improvements. Current crossings are often overloaded. Safety is a significant concern as well as the improvement required to make the campus a better experience.



KEY: CYCLE ROUTES

PROPOSED CYCLING

3 Covered Cycle Storage

University Gold Route

EXISTING CYCLING

Signed Cycle Route

Advisory Cycle Route

Traffic Free Route

Pedestrian Area

9 Ranking of Cycling Statistics*

*Source: University of Sheffield Draft Travel Plan Strategy

Existing Cycle Storage

3.4 Transport and Infrastructure

3.4.2 CAMPUS PARKING

The release of surface car parking on campus unlocks the potential for the creation of new public realm spaces. Creating a pedestrian priority environment is key to the Masterplan.

In order to create space within the University domain for public amenity space, a key objective of the Masterplan is to consolidate and rationalise the surface car parking across the campus together with the on-street parking. The overarching objective is to reduce the dominance of cars and to turn roads into shared space with an integrated approach to traffic management and to create a pedestrian priority environment.

The **University of Sheffield Draft Travel Plan Strategy** (June 2013) acknowledges the importance of reducing the amount of car parking spaces over time:

'As part of the University Development Masterplan a number of car parks have been identified as potential development sites, and also some leased properties with car parks attached will be returned to the landlords. It is predicted that in the short/medium term 130 to 160 B spaces will be lost from Glossop Road, Favell Road and Victoria Street area. The Travel Plan Strategy policies within will be necessary to manage this reduction in capacity.(2.7 p.5)'

The reduction in parking spaces follows from the trend of a progressive decrease of car driving as a mode of transport from 2004 to 2012 and the projected continued decrease up to 2018. In addition a key part of the strategy is the planned implementation of the Durham Road car park with a total of 500 spaces, currently planned for completion by 2016.

The planned multi-storey car park will allow for car parking across the core areas of the Campus to be consolidated and therefore for existing areas to be released for alternative uses. It is proposed that the equivalent number of surface car parking spaces could be released to make way for strategic developments and public realm sites, subtracting the existing provision and Hospital requirements, leaves 355 spaces.

Diagram 3.4.2.1 illustrates the existing car parks on campus and their associated capacity. The zone in red highlights the first phase of a target area for the release of surface car parks with a total of 339 spaces. The diagram excludes the current on street parking. The lower diagram shows the Durham Street car park and a 'catchment' area highlighting average walking distances to different areas within the campus.

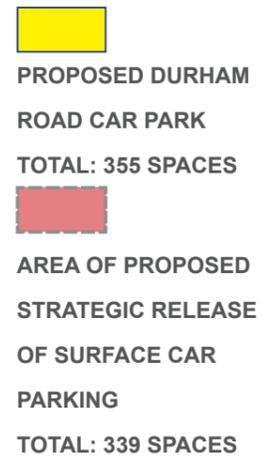


DIAGRAM 3.4.2.1: EXISTING UNIVERSITY OWNED CAR PARKS AND CAPACITY

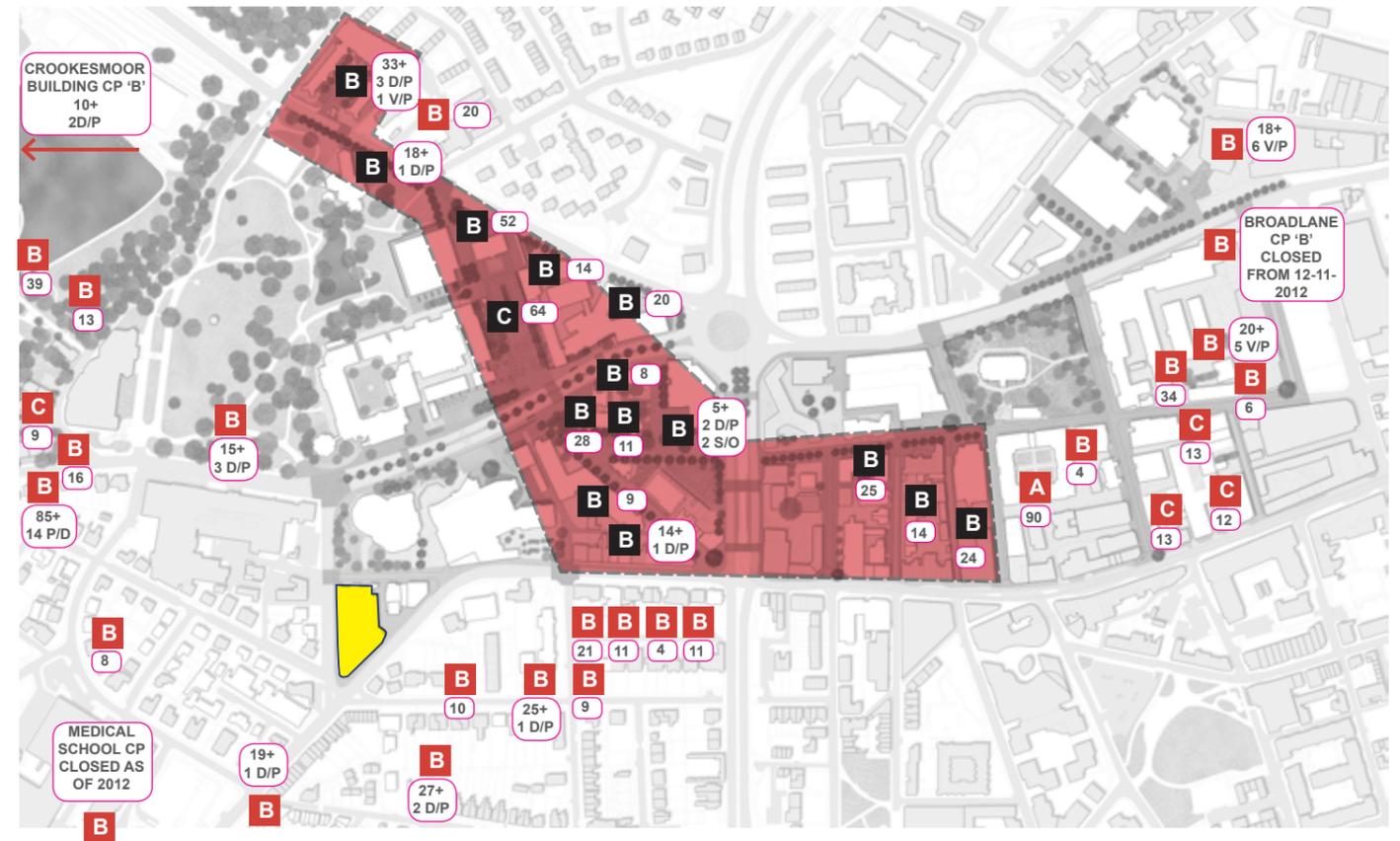
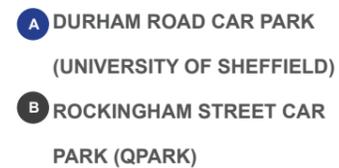
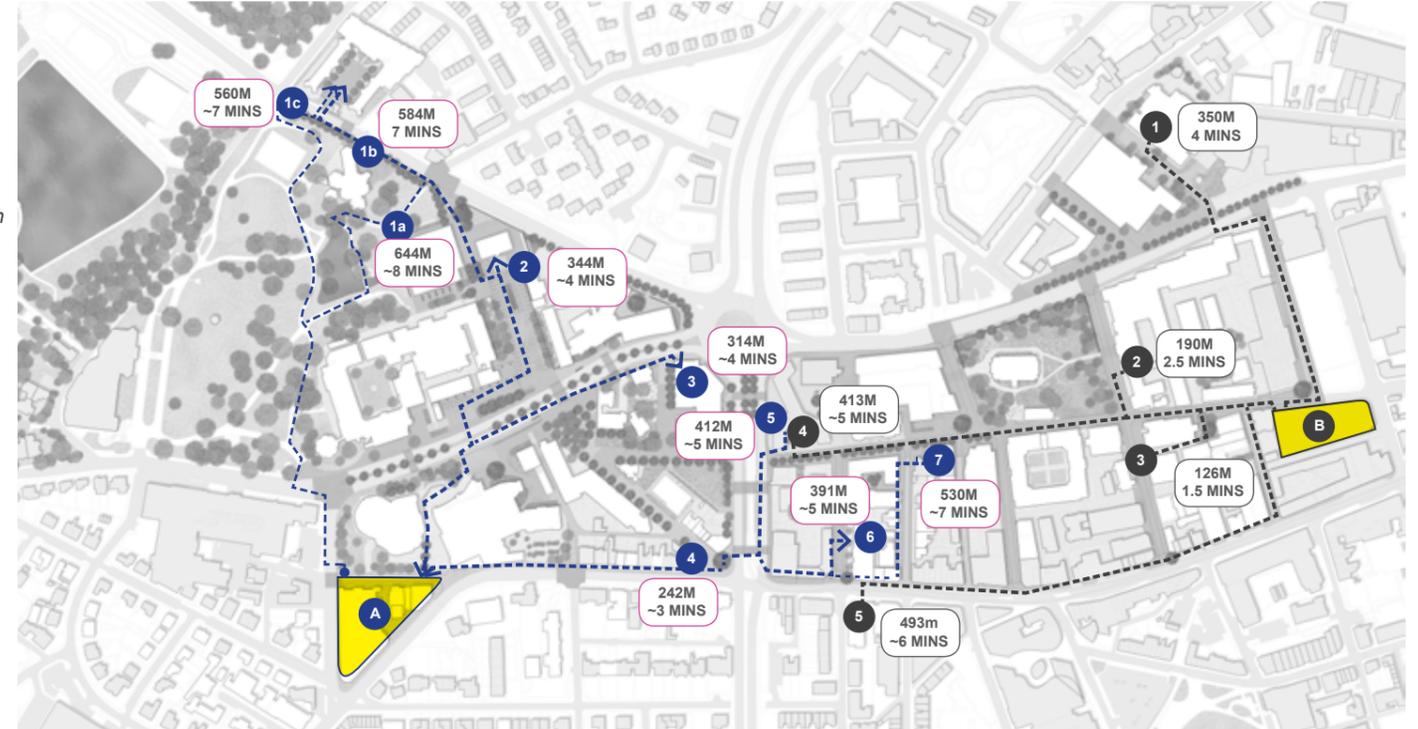


DIAGRAM 3.4.2.2: SAMPLE WALKING JOURNEYS FROM MULTISTOREY CAR PARKS



NOTE: Walking times are based on the average walking speed of 5km per hour



3.4 Transport and Infrastructure

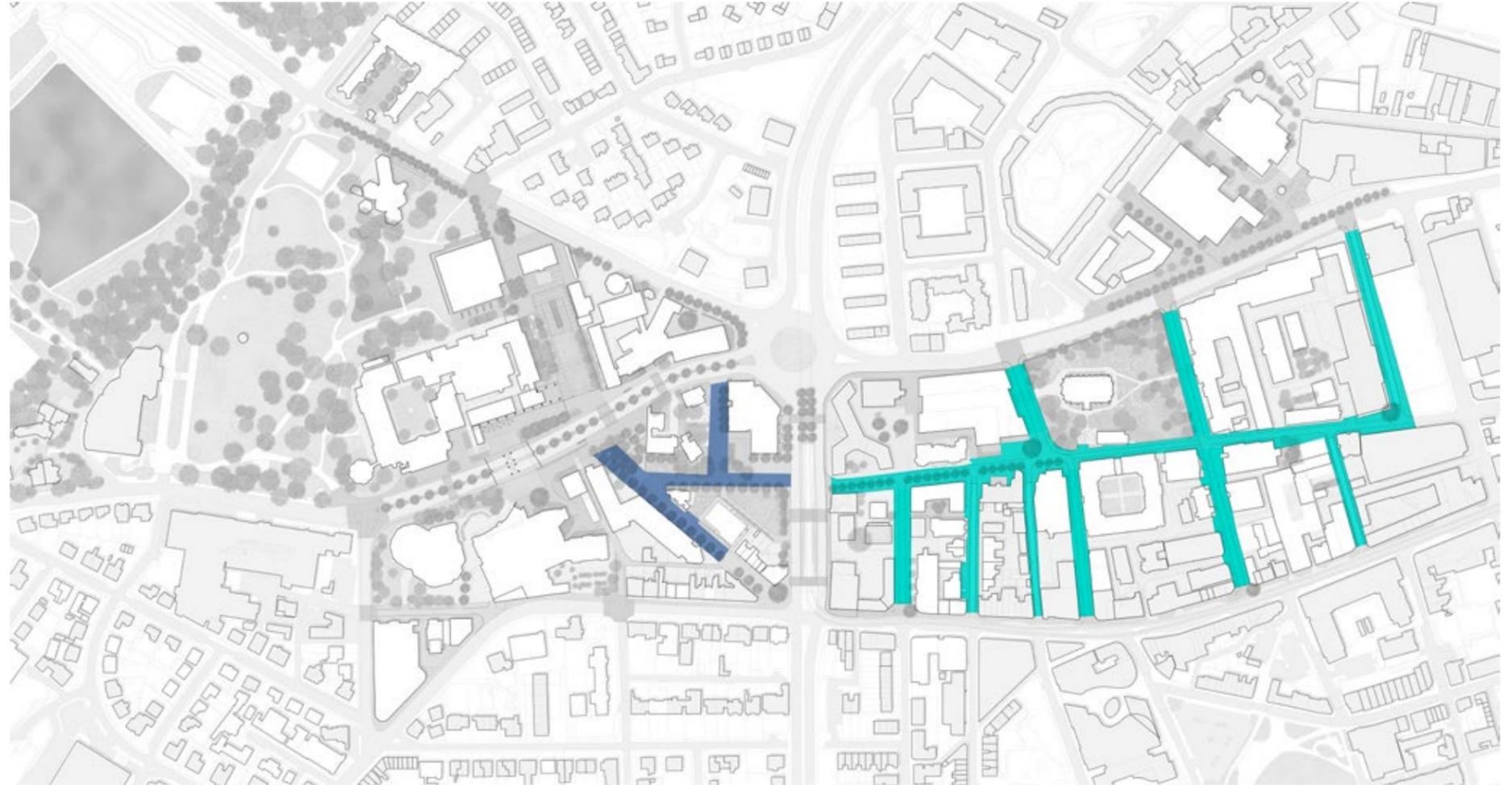
3.4.3 SHARED SPACE

To support and promote a pedestrian priority campus, a clear strategy for on street parking is required.

The routes shown are all under 8 minutes walk, indicating the potential for promoting and implementing a pedestrian prioritised university campus. In addition to the Durham Road car park to the west the parking for the campus to the east can be serviced by the Rockingham Street multi-storey car park (QPark).

On-street parking is controlled by the Sheffield City Council and as such is not shown in the adjacent diagrams. It is acknowledged that in order to release areas for public realm improvements, loss of on-street parking will result. Initial consultation with Sheffield City Council has confirmed that the loss of revenue from on-street parking will be offset by the reduction in maintenance costs in these areas and the enhanced improvements of the quality of public realm environment. It is also recognised that the change of priority in the area to pedestrians will encourage more pedestrian users and therefore over time reduce the demand for parking within this area.

The benefits in the improved public realm environment are significant, encouraging healthy lifestyles, community interaction and general enjoyment of the campus grounds.



KEY: PROPOSED ROAD CLOSURES

-  Long term: Existing adopted street to be unadopted and transferred to the University campus public realm. Upgraded high quality shared space public realm with service and disabled vehicle access only. Existing parking spaces removed.
-  Existing street upgraded to high quality space street design principles. Existing parking spaces removed.

3.5 A Sustainable Campus

The University's Masterplan aims to make a positive contribution to the city's sustainable development through investment in high quality architecture and built environment, creating facilities that are robust and adaptive.

Although Sheffield is the greenest city in the UK, the University campus is a city centre location which is challenged in terms of space and promoting biodiversity. Despite these constraints, the Masterplan aims to reduce the impact of traffic with a view to improving pedestrian and cycle access and movement. Key strategic developments that consolidate and minimise demand for parking will liberate valuable external spaces and routes that are at the heart of the campus. Quality green infrastructure will be used to create stronger place identity and affinity for the campus open spaces.

These enhanced spaces present a unique opportunity to begin to address some of the challenges imposed by climate change. Providing planting and water features within the campus will positively contribute to this agenda which is so important to both the University and to the world we live in. They will help to reconnect established green spaces, minimise hard, impermeable surfaces and increase habitat diversity and storm water attenuation. New plantings will be designed to help the University deliver on its biodiversity action plan.

As one of the country's leading research intensive universities, the creation of public spaces which support the social needs of the University's diverse community is vital. Developing and investing in our campus biodiversity and green space promotes environmental and institution performance as well as providing a welcome to the wider community.

The University is dedicated to meeting the HEFCE 2020 carbon reduction targets. The University's 2012 Energy Strategy sets out how a reduction of 19,000 Tonnes, nearly 50% of total emissions, can be achieved by 2020 via self-generation, building design and behaviour programmes.

The University campus is an urban community and should embody all the characteristics of a truly sustainable community. Energy use is at the core of this; however the design of the campus external realm can and will significantly contribute to the overarching sustainability of the campus.

The eight 'pillars' of a sustainable community can be described as follows:

1. Climate Change and Energy

The University has a commitment to achieving the HEFCE carbon emission reduction targets of 43% by 2020, and 83% by 2050, based on a 2005 baseline. The 2012 Energy Strategy by Arup recommends a delivery framework to achieve these targets and implementation is ongoing. Central to this framework is the delivery of:

- CHP Energy Centres, with maximum benefits to be found from connection to the Veolia District Heat Network
- Off-site wind turbines and building integrated solar photovoltaic implemented in a pragmatic and appropriate manner

Within the design of the external realm there are many opportunities to both adapt to and reduce climate change. Section 3.4 of this report describes opportunities for reducing flooding via water attenuation in the design of sustainable drainage systems (SuDS), green roofs and other drainage features.

2. Community

In social, commercial and cultural terms, the University is a thriving and sustainable community underpinned by learning and research. The positive aspects of mixed-use communities, with social interaction supporting social economy and structure, are already in abundance. The University is also a permeable and wide reaching community that benefits the wider community of Sheffield City and vice versa. The Masterplan looks to build on these foundations, promoting more mixed uses in the heart of the campus, and improved physical, social and cultural links to the city.

3. Place Making

A sustainable community needs spaces that are inclusive, adaptable, secure and create wellbeing. These spaces need to reflect and express the identity of their community so that their users feel both a sense of belonging and ownership. In doing so, these spaces promote social ease and connectivity which is at the heart of all successful communities. First and foremost this Masterplan is intended to make such places: to relax, play, learn and be social.

4. Buildings

The BREEAM assessment is the building industry standard for benchmarking the environmental and sustainable performance of new and refurbished buildings. The wide range of performance criteria includes energy and water consumption, renewables, management, health and wellbeing, waste and pollution, material sourcing, transport and lifecycle costing. The University has a commitment to achieve BREEAM excellent

for all new buildings and significant refurbishment projects. It is inevitable that the University will need to consider new building opportunities, alongside rationalisation of existing buildings, to meet future growth in student entries and research activity. The design of new buildings should look to reduce both the energy embodied in their construction, and the energy consumed in their operation. Refurbishment projects should look to improve lighting, heating, cooling, ventilation and the thermal performance of the building fabric. Both new build and refurbishment projects offer opportunities to challenge existing practices in terms of spatial use and efficiency; for example maximising opportunities to share facilities rather than unnecessarily duplicate them.

5. Transport and movement

The focus of the Masterplan is to create a University campus environment designed around the pedestrian and cyclist experience, served by well-located public transport links. This can in part be achieved by creating shared spaces in Leavygreave, Hounsfeld and Favell by replacing vehicles and parking with serviceable pedestrian streets and more open public space. More critical perhaps to encouraging pedestrian movement across the campus, and between the campus and city, is the transformation of pedestrian crossings on Western Bank and Upper Hanover Street. The Masterplan hinges on the need to shift priority on these roads from vehicles to pedestrians by implementing wide, direct and continuous crossings on both.

6. Ecology

The University published the Biodiversity Action Plan in January 2013, which aims to protect and enhance the biodiversity value of the University's estate. The Masterplan should be read in conjunction with this comprehensive document in the development of more detailed proposals for the external realm and new buildings. The ecology of a sustainable, urban community should be conserved, enhanced and celebrated. The campus is generally perceived as a green quarter of the city, and the Masterplan looks to enhance and extend this identity across all of the campus. Section 3.4 of this report illustrates recommendations for trees, green ground and green architecture, and how the varied palette of these existing and new elements will define the varied campus spaces. Detail design of certain spaces might consider opportunities for food growing which is becoming increasingly popular in student communities elsewhere in the UK.

3.5 A Sustainable Campus

7. Resources

In a sustainable community all resources should be regarded as scarce. The key relevance to this Masterplan is that lean-thinking should be applied to the sourcing of materials and use of water in both the construction, and operation, of buildings and landscape. Materials should be specified responsibly from sustainable sources, should have an embodied energy that is balanced appropriately with their life-cycle, and should wherever possible be recycled, either whole or in their constituent parts. The design of the external realm should also contribute to work being done by the University on reducing waste and promoting recycling, with sorting bins located strategically across the campus.

8. Economy

A sustainable community needs a strong, local, self-sufficient mixed-use economy. The primary industry of the University community is the provision of learning and research, which is inherently robust in commercial terms. In terms of a holistic sustainability, the University community is all the more robust for its continuing interaction with local industry, business, retail, service and leisure activities. The Masterplan supports a balance of academic and other mixed uses in the campus, and the mutual benefit of trade with the wider community.

Energy Strategy 2102 by Arup

This report should be referred to directly for its detailed analysis and recommendations. In terms of the Masterplan, the following recommendations are made with regard co-ordinating the external realm and building works with implementing the Energy Report recommendations.

The implementation of external realm improvements creates an ideal opportunity to reduce the cost and disturbance of infrastructural projects recommended in the Arup 2012 Energy Strategy; by essentially undertaking the below ground works whilst the external surfaces are being replaced. These works may include extending the Veolia District Heat Network to more University buildings, the introduction of a District Cooling network, or other network and service upgrades. The external works projects provide an opportunity to strategically review systems for accessing and upgrading existing below-ground services, towards minimising cost and disruption from future servicing and upgrades.

The Arup report also makes recommendations for future CHP installations across the campus (as shown on the adjacent campus plan) with maximum benefits gained from connecting these to the Veolia District Heat Network. As above there is an opportunity to coordinate the implementation of these energy centres with works to the external realm and the delivery of new buildings.



- Buildings on Veolia District Heating Network
- University Buildings not on etwork
- B CHP Energy Stations
- * Proposed:
- A. Goodwin Centre Car Park
- B. Management School Car Park
- C. Chemistry Building Car Park
- D. Site Adjacent to Information Commons
- E. Site to West of ICoSS
- F. North Campus Car Park
- Existing:
- G. Broad Lane Boiler House

