MOTT MACDONALD

# Travel Hub Design Principles

## Final Report

February 2021

Mott MacDonald
22 Station Road
Cambridge CB1 2JD
United Kingdom

T +44 (0)1223 463500
mottmac.com

Greater Cambridge Partnership

# Travel Hub Design Principles

## Final Report

February 2021

# Issue and Revision Record

| Revision | Date | Originator | Checker | Approver | Description |
|---|---|---|---|---|---|
| A | 19/10/2020 | E Jackson | M Payne | M Payne | Draft for client review |
| B | 18/01/2021 | E Jackson | M Payne | M Payne | Revised draft for client review |
| C | 04/02/2021 | E Jackson | M Payne | M Payne | Final draft |
| D | 11/02/2021 | E Jackson | M Payne | M Payne | Final |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Document reference:** 377897 AH24 | 01 | D

**Information class: Standard**

# Contents



## Tables

## Figures

# 1 Introduction

## 1.1 Background

The Greater Cambridge Partnership (GCP) has been developing a number of multi-modal travel hubs around the Greater Cambridge area as part of a wider transport package, developing the sustainable transport offer for the city region, and facilitating the use of non-car modes for all or part of the journey.

The development of the emerging Cambridgeshire Autonomous Metro (CAM) scheme has provided additional impetus for the development of travel hubs and emphasised the 'network' aspect of travel hubs within a growing city region.

Multi-modal travel hubs will increasingly play a key role in travel in the Greater Cambridge area – particularly for a rural population with traditionally poor access to public transport.

## 1.2 Aims of this paper

This paper aims to provide some key principles for the design and development of travel hubs that will:

- Drive an integrated approach to the development of travel hubs, both in terms of their role as defined in the Cambridgeshire & Peterborough Local Transport Plan in improving access to the transport network, and improving connectivity in a local area / corridor as well as how they function as a network supporting access to Cambridge by sustainable modes;
- Ensure travel hubs are designed with the future in mind, setting out how they can be designed to be flexible and adaptable to future developments in technology and travel behaviours; and
- Demonstrate how the design and development of travel hubs can support City Deal and partner ambitions around modal shift, improving air quality and moving to net zero carbon.

Section 2 of the paper looks at the national and local context for travel hubs, the existing network of travel hubs across Greater Cambridge and how this is planned be enhanced through the development of further travel hub sites as part of current GCP projects.

Section 3 sets out design considerations that will enable the GCP travel hubs to be developed in a way that will ensure that they can provide the interchange facilities and services required, and can continue to do so as the transport network continues to evolve.

Appendix A looks at the future considerations for designing travel hubs, and Appendix B provides a review of travel hub examples from the UK and Europe.

# 2 Local and National Context

## 2.1 National Background

The Department for Transport's (DfT) Transport Investment Strategy (2017) recognises the need to "add new capability to the urban network" both to "transform travel in particular corridors" and "provide opportunities for the travelling public to make journeys in a new way". The DfT (2017) states that these "new opportunities" can be provided in several different ways, which are summarised below:

1. Creating new routes;
2. Investing to better integrate different parts of the network; and
3. Delivering step-changes in capacity by bolstering existing routes with stretches of new infrastructure.

The alignment of the principles of multimodal integration with points 2 and 3 above demonstrates that the development of new transport interchanges, where the private car is not the only mode of access, supports the DfT's agenda of sustainable transport investment. Multi-modal integration through the development of schemes such as travel hubs, thus has the potential to play a crucial role in improving the connectivity, accessibility and capacity of the transport network.

Several cities and city-regions have adopted travel hubs as a means of delivering this integration and providing the step-change in access to new and improved transport networks.

## 2.2 Local Context

### 2.2.1 Supporting the City Deal

The Greater Cambridge Partnership was formed as the delivery body for the Greater Cambridge City Deal, bringing investment to the area to support the creation of 44,000 new jobs and 33,500 new homes.

Part of the GCP's remit is to address the transport challenges faced by the region over the next decade and beyond. The GCP's (pre-pandemic) forecasts suggest that if action is not taken, then by 2031:

- Traffic in Cambridge will increase by over 30% in the morning peak;
- Traffic in South Cambridgeshire will increase by almost 40% in the morning peak; and
- The time spent in congestion will more than double.

To address these challenges the GCP is developing schemes to deliver public transport improvements on four key corridors – outlined below – as well as delivering an extensive network of cycle-ways. These improvements aim to keep the Greater Cambridge area well connected regionally and nationally, and connect people to homes, jobs, study and opportunity. Travel hubs will play a key part in improving access to these networks.

## 2.3 Travel Hubs in Greater Cambridge

### 2.3.1 Local Transport Plan Guidance

Locally, the Cambridge and Peterborough Combined Authority (CPCA) provides some guidance within the Local Transport Plan on what a travel hub might be expected to include:

> *A place of transport interchange providing easy access to the whole transport network with cycle parking, taxi call points and access to car club vehicles, drop off points and at larger locations park and ride facilities.*[1]

While this includes reference to specific modes of transport which may be included in a travel hub, the reference to easy access to the whole transport network encompasses the main aim of the sites.

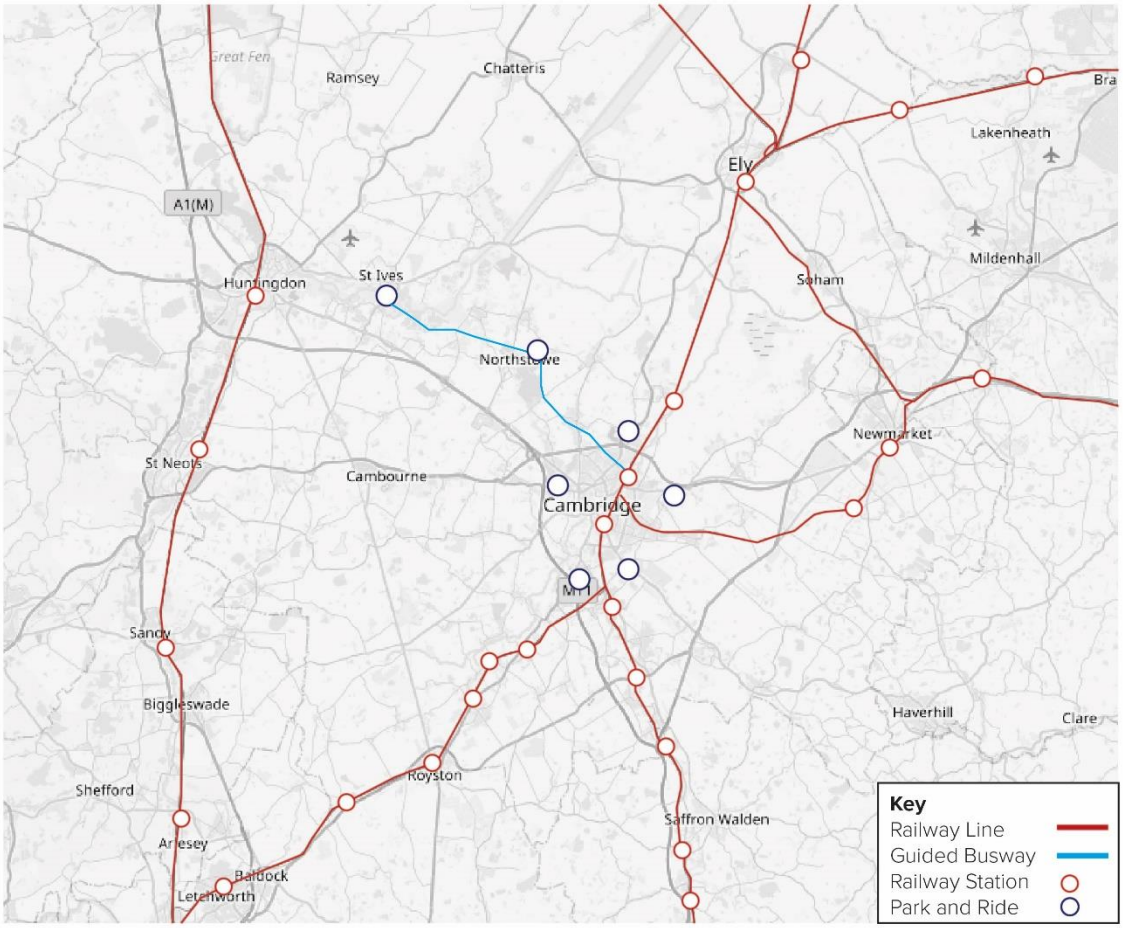
### 2.3.2 Existing Travel Hub Network

Figure 2.1 shows the existing network of Park & Ride sites[2] and rail stations across Greater Cambridge and the wider area.

[1] The Cambridgeshire & Peterborough Local Transport Plan, CPCA, 2020

[2] Park & Ride is used in this report to relation to existing Park & Ride sites and services and where Park & Ride is referred to in other plans and reports

**Figure 2.1: Existing Travel Hub Network**




### 2.3.3 Relevant Projects

Figure 2.2 identifies the key projects relevant to travel hub development in the CPCA Local Transport Plan area strategy for Greater Cambridge, including:

- Cambridgeshire Autonomous Metro
- East West Rail
- A10 Park & Ride, Waterbeach
- Waterbeach Station relocation
- Milton Park & Ride expansion
- Newmarket Road Park & Ride relocation
- Newmarket to Cambridge track doubling
- Granta Park Park & Ride (A11 Travel Hub)
- Cambridge South Station
- M11 Park & Ride additional capacity (Cambridge South West Travel Hub)
- Scotland Farm Park & Ride
- Longstanton Park & Ride additional capacity

**Figure 2.2: Local Transport Plan Summary of Key Projects in Greater Cambridge**


Source: The Cambridgeshire & Peterborough Local Transport Plan, CPCA, 2020

The Local Transport Plan advocates that:

> *Park & Ride sites will continue to provide sustainable options for those who do not have a feasible alternative to the car. These will be better integrated into surrounding local transport networks, acting as travel hubs with high-quality interchange between CAM and local bus and demand responsive services, together with the walking and cycling network*

Figure 2.3 shows the currently defined preferred route option area for the part of the Central Section of the East West Rail project within Greater Cambridge. East West Rail are currently developing options for a preferred route alignment within this area. Although the exact location is currently unknown, the proposal for a new rail station at Cambourne as part of this project is relevant to travel hub development.

**Figure 2.3: East West Rail Preferred Route Option Area**


Source: East West Rail

### 2.3.4 Current GCP Projects

The GCP is currently developing a number of travel hub sites, some in conjunction with the development of a public transport route, others in areas already well served by public transport where access to the network could be improved. The current GCP projects within which new travel hubs are proposed or are options under consideration are summarised below.

**Foxton Travel Hub** is a proposed site adjacent to the existing rail station at Foxton, on the A10 corridor, and the Melbourn Greenway route. The plans for the site include access from the A10 active travel route, a new pedestrian route to the station at Foxton, secure cycle parking and 500 car parking spaces including EV charging and Blue Badge parking. Local bus services will serve the travel hub via relocated bus stops on the local road network.

**Cambridge South West Travel Hub** is a proposed site close to the junction of the A10 and M11, providing good access to the local transport network from these major routes. The plans for the site include an off-line bus route serving the site, providing services into the centre of Cambridge and the Cambridge Biomedical Campus, as well as an active travel route avoiding the M11 junction. The site will include secure cycle parking, bus terminal facilities and is intended to be the south west terminus of the future CAM network. 2,150 car parking spaces will be provided on-site, and facilities will include Blue Badge parking and solar car ports providing energy for EV charging. This project will deliver the “M11 Park & Ride additional capacity” identified as a key project in the Local Transport Plan.

The **Cambridge South East Transport** project will deliver a new public transport route between the A11 at Babraham and Cambridge. The proposed route runs from a new travel hub near the A11 Fourwentways junction to the Cambridge Biomedical Campus via Sawston, Stapleford and Great Shelford connecting to the planned Cambridge South Station and existing guided busway. This route is intended to become part of the future CAM network. The planned travel hub facilities include 350+ cycle parking spaces, a facilities building and active travel connections to the Babraham Research Campus and Granta Park, and up to 2,000 car parking

spaces. The proposed A11 Travel Hub will deliver the facility identified as “Granta Park Park & Ride” in the Local Transport Plan.

The **Cambourne to Cambridge** project is a potential public transport route to the west of Cambridge, serving the A428 corridor to Cambourne. The route is intended to become part of the future CAM network. The recommended preferred route included a new travel hub site at Scotland Farm, immediately to the north of the A428 Hardwick junction, as identified in the Local Transport Plan. Work on the project, other than preparation for the EIA, is currently paused pending an independent audit of the assumptions and constraints behind the development of the proposals.

The **Cambridge Eastern Access** project has recently consulted on options which include the relocation of the Newmarket Road Park & Ride to a larger travel hub site closer to the A14.

The **Waterbeach to North East Cambridge** project is currently consulting on options for a segregated public transport route in this corridor. This route is intended to become part of the future CAM network. Previous studies for this corridor have proposed a new A10 corridor Park & Ride site, north of Waterbeach, served by a public transport route to Cambridge and it is proposed to look at additional or relocated Park & Ride / travel hub capacity in a future stage of the project. “A10 Park & Ride, Waterbeach” is identified as a key project in the Local Transport Plan. There are separate plans for the relocation of Waterbeach rail station as part of the proposals for the New Town north of Waterbeach.

**Whittlesford Railway Station** was proposed in the Rural Travel Hubs feasibility study as a pilot site for the development of a Rural Travel Hub. The subsequent Whittlesford Station transport masterplan study has undertaken an in-depth look at the range of issues affecting access to the station, with a primary focus on improving sustainable transport options. The process has considered how best to meet an agreed vision to “create an accessible multi-modal travel hub which forms a strategically important interchange and gateway to facilitate sustainable local economic growth”. From this process a Transport Investment Strategy for the station area has emerged, comprising 33 proposed schemes which, collectively, are intended to achieve this vision.

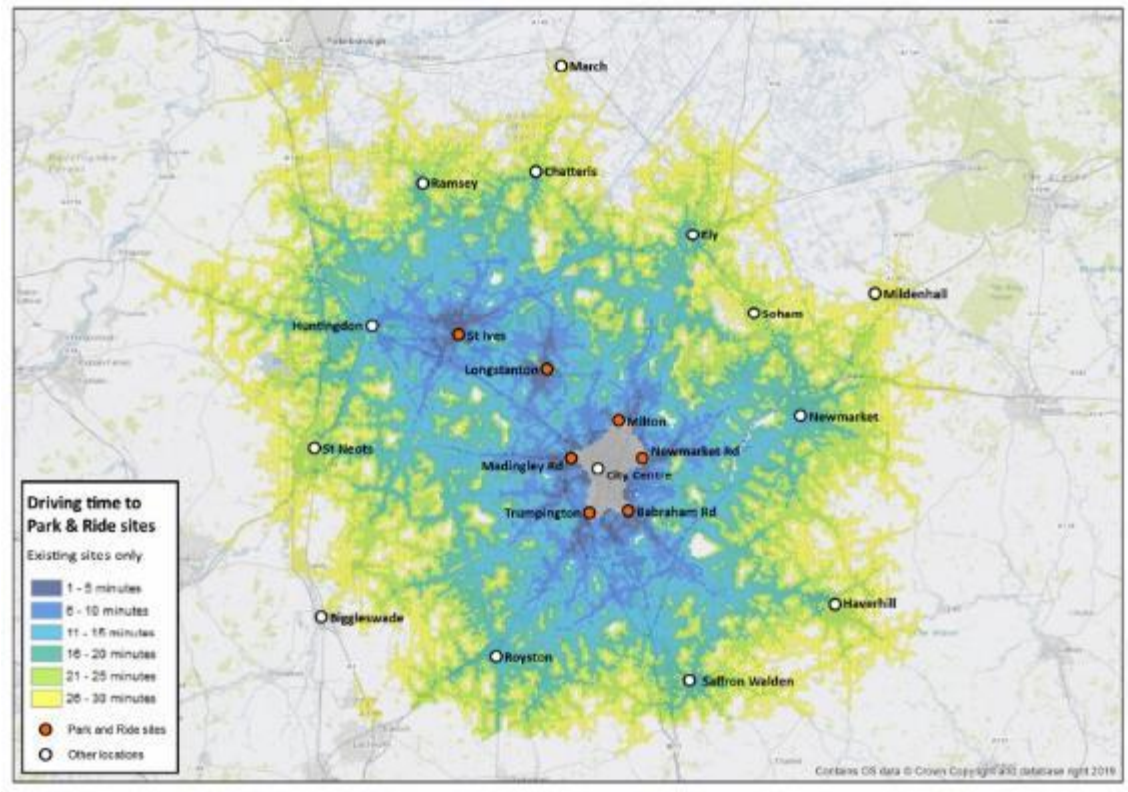
### 2.3.5 Park & Ride Catchments

Figure 2.4 and Figure 2.5, reproduced from the report ‘GCP Cambridge Bus Network Planning: Future Bus Network Concept’ (Systra, 2020), show the driving time, in 5 minute bands, to the nearest of the seven existing Park & Ride sites around Cambridge (Figure 2.1) and how this changes when the four proposed sites at Waterbeach, Scotland Farm, Barton and A11 / Granta Park considered by Systra are taken into account (Figure 2.5). It can be seen that the effect of the proposed sites is to reduce journey times to the nearest Park & Ride site along the corridors towards Saffron Walden, Haverhill, Ely and St Neots.

This analysis provides some insight into:

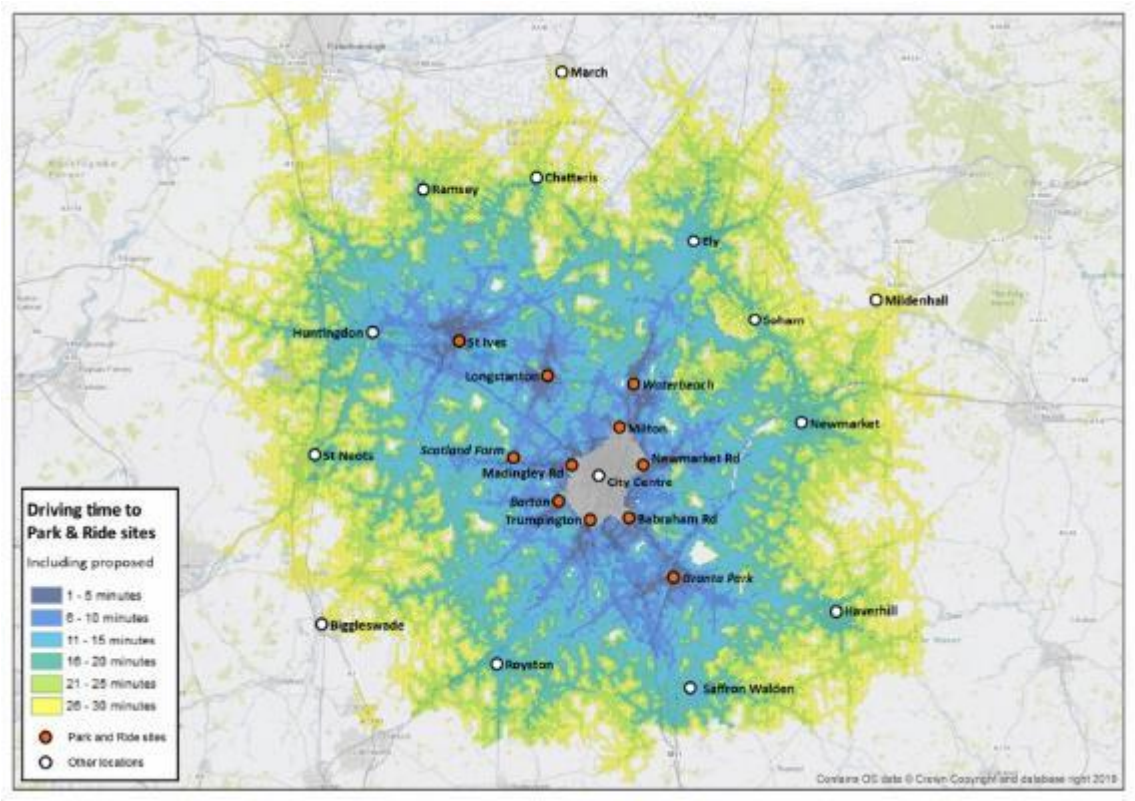
- How the development of Park & Ride / travel hub facilities at locations beyond the existing inner ring of five Cambridge Park & Ride sites can effectively extend catchments for Park & Ride; and
- The remaining areas not benefiting from good accessibility to Park & Ride / travel hub facilities assuming the proposed sites are delivered.

**Figure 2.4: Driving Time to Closest Park & Ride Site (Existing Sites)**




Source: GCP Cambridge Bus Network Planning, Future Bus Network Concept, Final Report, Systra, January 2020

**Figure 2.5: Driving Time to Closest Park & Ride Site (Existing and Proposed Sites)**




## 2.4 Interaction with the Wider Transport Network

### 2.4.1 Travel Hubs as a Network

A proven way in which travel hubs can act as a network is through common branding and marketing, for example the existing network of Cambridge Park & Ride sites. Network branding, supported by a consistent level and quality of services and facilities across the network, will encourage users familiar with one site within a network to use other sites.

The diverse nature of existing and planned travel hub sites within Greater Cambridge does impose some limitations to the wider adoption of common branding, notably at rail stations.

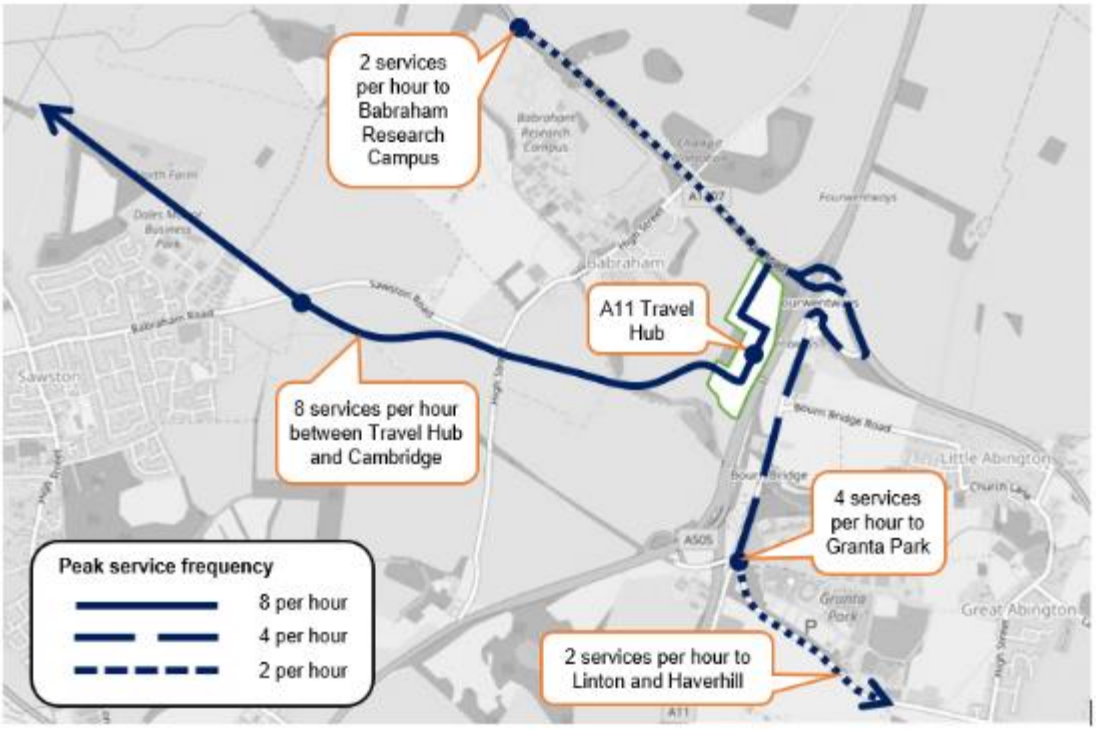
Multimodal integrated ticketing and journey planning would be required to support the use of travel hubs as a network by reducing barriers to transfer between modes and services.

The speed, frequency and quality of public transport links and choice of destinations available from the nearest travel hub and opportunities to avoid congestion and delays on the highway network are key to drawing people towards their nearest travel hub rather than the one closest to their destination. Opportunities should be sought to develop new public transport routes from existing travel hubs to nearby major employment sites to complement established links to central Cambridge. An existing example of this approach is the Trumpington Park & Ride site, from which buses operate to the Cambridge Biomedical Campus as well as the railway station and city centre.

The A11 Travel Hub being delivered as a key element of the Cambridge South East Transport project will further develop this approach by accommodating through public transport services

operating beyond the travel hub to Babraham Research Campus, Granta Park, Linton and Haverhill as shown in Figure 2.6.

**Figure 2.6: Proposed Public Transport Links from A11 Travel Hub**




The A11 Travel Hub is also located on the existing core bus route between Haverhill and Cambridge and in a location suitable to act as a terminus for rural feeder or demand responsive transport services, such as the rural connector service from Carlton, Brinkley, Weston Colville, West Wickham, West Wratting and Balsham proposed in the report 'GCP Cambridge Bus Network Planning: Future Bus Network Concept' (Systra, 2020).

The public transport network proposition for the Cambourne to Cambridge project includes services from the Scotland Farm Travel Hub to West Cambridge and the Cambridge Biomedical Campus. The Future Bus Network Concept includes a half hourly direct service from Haverhill to West Cambridge via the A11 Travel Hub and the Cambridge Biomedical Campus. This service would overlap with the proposed service from Scotland Farm Travel Hub to West Cambridge and the Cambridge Biomedical Campus.

Examples of cross-city bus services exist in Oxford and Norwich, where park and ride sites to the east/west and north/south of the city are linked via the city centre. However, such operations depend on appropriate bus priority measures within or on the approaches to the city centre to enable reliable operation and mitigate the impact of congestion at one end of the route leading to delays being imported to the other end of a cross-city route.

Any services developed to connect travel hubs directly would also need to serve other key trip attractors to avoid the need for journeys requiring multiple interchanges. However, as the commercial viability of orbital services is typically challenging, proposals for orbital connections between travel hubs should seek to minimise overlap between orbital services. Where there is a justification for overlapping services, timetables should be coordinated, and the combined level of service aligned with demand. The relative merits of enabling journeys to be made by a single

transfer between two high frequency services versus the provision of low frequency direct services should be considered in these circumstances.

Travel hubs on the network may be specialised in some ways by incorporating different elements within the travel hub components described in Figure 3.1 to allow them to take on specific functions. The functions will depend on the local conditions. For example, proximity to the motorway or trunk road networks may provide opportunities for an interchange with scheduled coach services, or a site closer to the city centre may provide greater opportunities for freight micro-consolidation and last mile deliveries by bike. Additional functions or local specialisms such as these will influence the elements required at the travel hub site.

Where travel hub sites are located in the Green Belt, planning policy and requirements are likely to restrict the choice of components to those which can be clearly identified as “local transport infrastructure”.

## 2.5 Other Relevant Studies

The **Future Bus Network Concept** study undertaken for GCP by Systra[3] has developed proposals for new and enhanced bus services that seek to maximise the potential of current and proposed public transport infrastructure, such as the first phase of CAM, railway stations and Park & Ride / travel hub sites. The proposals for the core network reflect the existing proposals for new travel hub sites at A11/Granta Park, Scotland Farm and Waterbeach. The concept for the rural network is to improve connections from outlying areas to key interchange hubs on the core network, with proposals that most rural services feed into key hubs/corridors on the periphery of Cambridge. The Systra proposals for the Cambourne and St Neots corridor also considered a further new Park & Ride site at Barton, close to M11 junction 12.

**Rural Travel Hubs Study** – a 2017 feasibility study commissioned by GCP and South Cambridgeshire District Council considered the potential for Rural Travel Hubs to be developed within South Cambridgeshire. Through a consultation and engagement process the study developed the following local definition of a ‘Rural Travel Hub’:

> *A transport facility that serves as an interchange, close to existing transport corridors (that are served by a reliable and relatively frequent public transport service), where residents in rural areas can walk, cycle or drive to and continue their onward journey using a sustainable mode of travel.*

This study concluded that the operation of Rural Travel Hubs in South Cambridgeshire is potentially viable and that they are likely to be supported by local communities, serving to encourage more use of sustainable travel for journeys into Cambridge from outlying parishes.

[3] GCP Cambridge Bus Network Planning, Future Bus Network Concept, Final Report, Systra, January 2020

# 3 Design Considerations

## 3.1 Introduction

This section introduces the main design issues to be considered in the development of travel or mobility hubs[4]. The components considered here reflect the broad aims of a travel hub, but each site will have local design considerations depending on the location, proximity to home and work locations, planning requirements and availability of transport modes.

## 3.2 Travel Hub Features

The interpretation of what constitutes a travel hub varies significantly, emphasising the importance of identifying and responding to local requirements and avoiding a 'one size fits all' approach. However, the principles of what constitutes a travel hub can be applied across the board.

CoMoUK – the UK based organisation promoting shared mobility – defines a travel hub as:

> *…a recognisable place with an offer of different and connected transport modes supplemented with enhanced facilities and information features to both attract and benefit the traveller.*

This definition places emphasis on the importance of 'place' in the design and function of a travel hub, but also outlines the importance of providing the connection between transport modes. Figure 3.1 shows the four broad components that might make up a travel hub. The components and individual elements that are included at each site will vary depending on local factors.

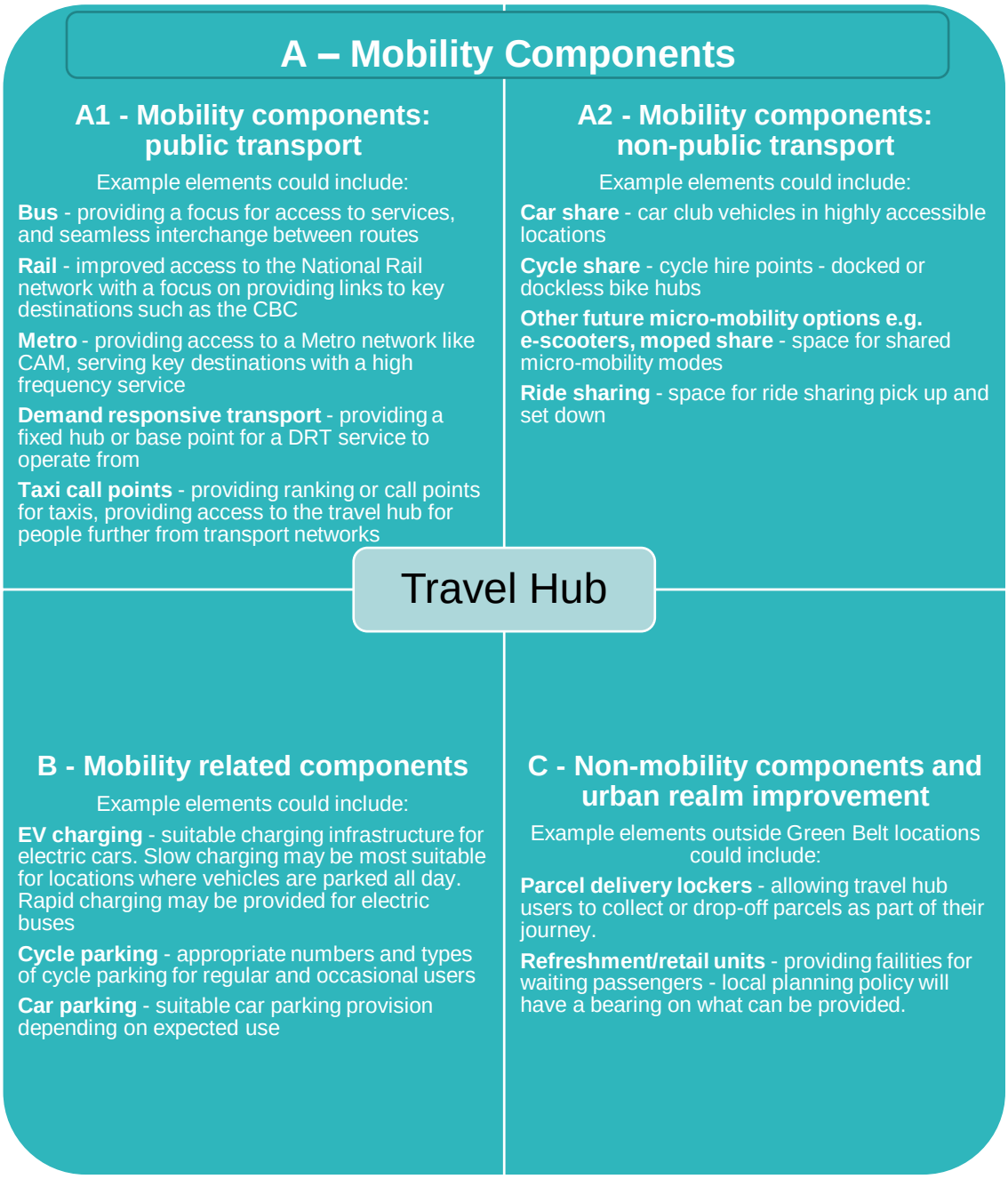
**A – Mobility components**: comprising two parts – public (A1) and non-public (A2) transport. These are the core functions of the travel hub, providing high quality interchange between modes. The individual elements of each mobility component will be defined on a case by case basis, depending on the local requirements, demand and environment.

**B – Mobility related components**: These components support the core mobility components described above and may be included to support the smooth running of the travel hub. The provision of these elements can elevate the travel hub from a simple interchange point to more of a true hub.

**C – Non-mobility components and urban realm improvements**: These components are outside the core requirements of a travel hub, but can – local conditions permitting – add significant value to the site and encourage use. The provision of any additional non-mobility components must be appropriate to the site and in accordance with national and local planning policy – for instance, under existing policy, sites in green belt particularly should not include uses that do not have a transport purpose.

[4] Travel hubs and mobility hubs are both terms used to describe similar facilities. The term travel hub is used in this report for consistency.

**Figure 3.1: Travel Hub Components**




Identifying these broad components, rather than specific modal elements reflect the key principle that travel hubs should be designed with flexibility in mind. As transport modes and technologies evolve, and working and social habits change over time, the travel hub should be able to evolve to maintain its role as part of the transport network.

The design principles set out in Table 3.1 aim to cater for current technologies and known emerging travel demand, while providing high levels of flexibility to allow future technologies and components to be incorporated as they are developed.

## 3.3 Design Principles

Table 3.1 sets out the design principles for the various components of a travel hub site as outlined in Figure 3.1, i.e.:

A. Mobility components – public and private
B. Mobility related components
C. Non-mobility components and urban realm improvements

The table sets out the design considerations for potential travel hub elements within these components, acknowledging that not all modes and elements will be relevant to all travel hub sites. The flexibility of space within the travel hub is key for maintaining the role of the travel hub in the future, so should be considered in the design for all transport modes, with particular consideration of the transition to future modes including CAM and other forms of autonomous transport.

The design considerations for different modes of transport are included along with links to further guidance and information on current design requirements.

## Table 3.1: Design Principles for Travel Hub Components

**A1 - Mobility Components: Public Transport**

| Mode | Design Considerations | Standards information/further guidance |
|---|---|---|
| Bus/CAM/Connected Autonomous Vehicles | For many travel hubs in the Greater Cambridge Area, the greatest public transport capacity will be provided by the local bus network, so clear, comfortable interchange with the bus network is a fundamental requirement.<br>At larger travel hub sites, such as Cambridge South West, bus services will usually enter the site itself, and should be accommodated reasonably centrally to minimise walk time from the local active travel networks and car parking within the site.<br>Smaller travel hubs – such as rural travel hub sites or those like Foxton which have a limited bus service may accommodate interchange adjacent to the site on the public highway. In these cases, clear wayfinding is necessary to ensure that the location of bus stops is clear to users.<br>Consideration should be given to the location of the travel hub in relation to the wider network, and whether the majority of services will be terminating at the travel hub, will be 'through' services or there will be a combination of terminating and through services with interchange between them.<br>Layover facilities should be provided for terminating services, considering how requirements for layover space may evolve with the implementation of future concepts for the bus network, such as rural feeder services to travel hubs.<br>Provision should be made for opportunity charging of electric buses at stops and during layover. This may be active provision where there are plans or commitments to introduce electric buses on routes serving a travel hub and the charging concept of operations and associated technology requirements have been defined, or passive provision as future proofing.<br>While the requirement for charging at layover facilities will evolve as vehicle technology changes, the provision of space for this to take place should be included to provide a resilient facility for operators.<br>Through services may require multiple bays or platforms, with clear wayfinding to and confirmatory signage at individual departure points.<br>Turning facilities for buses should be included in travel hub design, allowing for network resilience.<br>In the design development the principal interchange movements should be considered, and facilitated as much as possible, with walking times between relevant stops minimised.<br><br>**Future proofing for CAM**<br>Where a site is expected to form part of the CAM network in the future, design for buses should also accommodate the future CAM design requirements for infrastructure and vehicles. Based on collaborative working with the CAM project team through the GCP Technology Working Group to develop a draft List of Requirements and Assumptions for CAM, the current requirements for future proofing of travel hub sites for CAM are understood to be:<br>• Capacity at stops to accommodate a CAM service frequency of 12 vehicles per hour per direction | |

| | | |
|---|---|---|
| | • Infrastructure designed to be adaptable to accommodate CAM articulated vehicles up to 18.75m in length – the current legal maximum for road passenger vehicles authorised for use on public roads<br>• Provision for future installation of infrastructure required to support future CPCA ticketing strategy, including ticket barriers and smartcard readers at stops<br>• Stop platforms to be on straight sections of infrastructure and capable of accommodating two CAM vehicles simultaneously<br>• Stop platforms designed for level boarding of CAM vehicles<br>• Facilities for rapid opportunity recharging of CAM electric vehicles at route termini<br>• Potential to accommodate stabling area for CAM vehicles<br>• Space for local feeder services and coaches<br>Facilities for rapid opportunity charging of CAM vehicles are likely to be in the form of high power charging stations employing either overhead pantograph charging, or physical or wireless inductive charging infrastructure installed within the road surface. Overhead pantograph charging may employ either:<br>• The 'pantograph up' method of charging, with a pantograph mounted on the roof of each vehicle that is raised to connect with a slot on the charging station, or<br>• The 'pantograph down' method, with the pantograph mounted on the charging station and lowered to connect with charging rails on the vehicle.<br><br>Testing of Connected Autonomous Vehicles is at an early stage in Cambridge, with autonomous shuttles expected to be tested at the University's West Cambridge site in the near future. The design requirements for these vehicles are likely to evolve significantly, but are likely to include rapid charging facilities at travel hub sites if the technology is progressed. | |
| Rail | Interchange with the national rail network provides an excellent basis for the development of a travel hub as part of an existing transport network.<br>Rail stations have stringent design requirements to ensure their safe and efficient operation, which will need to be considered in the development of the travel hub.<br>The presence of a rail connection to the travel hub – such as at Foxton or Whittlesford – introduces a significant constraint to the design of the site, and element of severance to the site for people and vehicles. Sites should be designed to accommodate clear and accessible crossings of the railway, catering to the principal desire lines for travel hub users.<br>Where interchange facilities are provided at smaller rural locations, consideration should be given, through the Transport Assessment, of the impact of traffic and parking on local communities.<br>Where possible, the principles of accessible cross-platform interchange should be applied, allowing users to complete their interchange between rail and other modes with as little difficulty as possible. High-footfall interchanges, such as between rail and high frequency bus or CAM – should be prioritised. | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/918425/design-standards-accessible-stations.pdf |

| | |
|---|---|
| Coach | **Parking**<br>Depending on the location, interchange with scheduled express coach services can be accommodated at a travel hub. National Express coaches already serve some Park & Ride sites, including the Trumpington site in Cambridge, while National Express services between Great Yarmouth, Norwich and London operate on the A11 corridor, passing close to the proposed site of the A11 Travel Hub near the Fourwentways interchange. Coach stops at travel hubs easily accessed from the strategic road network have the potential to generate new business for operators and also provide existing customers with an alternative to travelling into congested urban areas to access the long-distance coach network.<br>The type of coach services to be accommodated should be considered at the design stage, as requirements will vary. The Local Transport Plan distinguishes between:<br>• **Regular services** – scheduled public coach services (e.g. National Express, Megabus) serving typically young adults and students.<br>• **Special regular services** – scheduled services for a specific group – e.g. workplace or school, not available to the general public.<br>• **Occasional services** – all other services, including tourist coaches, typically serving the leisure market.<br>Regular and special 'through' services will benefit from good integration with other modes at the travel hub, and should be treated largely in the same way as local bus services, although the longer dwell time associated with coaches should be considered – avoiding coaches sharing stops with high frequency buses.<br>Access to waiting facilities is particularly important for these types of coaches, with customers typically arriving earlier for longer distance and lower frequency services.<br>Occasional services are often coaches operating private charters, excursions and tours whose passengers would typically expect to be dropped off and picked up directly at the destination or attraction they are visiting, rather than having to transfer to local public transport.<br>Any policy decision to direct visitors to Cambridge by coach to travel hub sites from which they can access the city centre by clean public transport should be supported by a visitor management strategy to implement this model for visitor access, a key element of which should be enabling coach operators to purchase local public transport tickets in bulk at an attractive price and include this in their service. Without such measures there is a risk of Cambridge being perceived by the coach industry as a destination that is unfriendly to coaches, resulting in a negative impact on the local visitor economy.<br>Travel hub sites that are well located to intercept tourist coach movements and with excellent access from the motorway or trunk road networks will be best placed to fulfil this specific function and should be planned and designed accordingly. Sites not suitably located for transfer between tourist coaches and local public transport will not require provision for this.<br>In the absence of such policy interventions coach excursion and holiday customers will be unlikely to use the interchange facilities of a travel hub. Longer stay coach parking is likely to be a minimum requirement for these services – with coaches dropping passengers off at leisure sites and picking up later. For these services, the close proximity of the coach parking to the point of interchange is less of a consideration, however the security of the coach parking should be considered – with lighting and natural surveillance a requirement. Access to welfare facilities, including toilets and refreshments should be provided for drivers. |

| | | |
|---|---|---|
| | **Coach Parking Dimensions**<br>The British Parking Association recommends coach bays of 5m x 15m to allow for door opening and loading. Smaller bays could be considered if used only for layover. Coach parking bays should be designed to minimise the requirement to reverse. | |
| **A2 - Mobility components: Non-public transport** | | |
| **Cycle routes** | The travel hub should be easily accessible from all directions for people arriving and leaving by bike. Consideration must be given to the different ways in which cyclists will use the travel hub – including arriving by bike and making an onward journey by public transport, arriving by car or public transport and making an onward journey by bike, or arriving on foot to collect a shared cycle.<br>This range of potential movements means that cycle movements in, out and around the travel hub should not be restricted to narrow corridors or specific routes.<br>Where cycle routes or bridleways pass through the site – the route should serve people making through journeys as well as those accessing the travel hub facilities – clear natural wayfinding should provide through cyclists with an obvious route through the site.<br>The NMU Policy Framework provides guidance on designing for cycling in the Greater Cambridge Area, and the Local Transport Note 1/20 outlines wider design considerations for cycle infrastructure. | More detail:<br>GCP NMU Policy Framework<br>Local Transport Note 1/20 |
| **Cycle Hire/Micro-mobility** | Space should be provided at the travel hub for cycle hire facilities to be provided by commercial operators. A system could be either through a docked bike system with fixed hire points (such as London's Santander Cycle Hire scheme) or a dockless system which does not require fixed locations (such as the systems run in several UK towns and cities by Mobike, Jump/Lime and Beryl).<br>The parking requirements of hire schemes vary significantly, but docked hire schemes will usually require bespoke parking spaces for the hire bikes. No specific infrastructure is usually required for dockless systems, but local authorities have increasingly aimed to specify preferred parking spaces for dockless bikes to reduce clutter and aid redistribution of the bikes to match demand. Power supply should be provided to the cycle hire area – docked schemes are likely to require power to the cycle stands and to a hire terminal. Dockless schemes may benefit from charging infrastructure if e-bikes are included in the hire fleet.<br>Regardless of the type of hire scheme, the space should be allocated close to traditional cycle parking as far as possible, and clear signage and marking of the cycle hire parking should be provided.<br>E-scooter hire systems are currently being trialled around the UK and may increasingly play a role in individual mobility. The space and infrastructure requirements for these schemes are broadly similar to those for cycle hire systems, but consideration should be given to allowing additional space for two or more future systems to operate alongside each other.<br>Space for bike or scooter maintenance could be provided at suitable travel hubs – this may include a small amount of workshop or storage space with basic facilities allowing hire companies to make basic repairs to the hire fleet and quickly return bikes or scooters to the system, as well as aiding with redistribution. | |

**Figure 3.2: Examples of Dockless (L) and docked (R) Cycle Hire Parking Areas**


Source: Stock Image

Dockless parking space can be shared with other forms of emerging micro-mobility, including e-scooters which are currently on trial in some UK cities. The parking requirements of e-scooters are broadly similar to those for cycles, in that signage and markings are the main requirement. Docked cycle parking requires more infrastructure but provides more formal parking.

| | |
|---|---|
| **Drop off/Pick up, Taxi, Private Hire and DRT** | Drop off/pick up space can be provided at an early stage of design, and can be allocated as appropriate during the design development, and easily reassigned as the transport requirements evolve.<br>**Pick up/Drop off**<br>Lay-by space close to the interchange can facilitate arrival and departure as a private car passenger.<br>The number of drop off bays will be agreed on a site by site basis to be informed by the forecast demand at the travel hub. Simple layby arrangements are most appropriate for drop-off, and should be located at a point with easy access to onward transport, accessible to people with restricted mobility.<br>Drop off bays can also be used by taxi and private hire vehicles dropping off passengers, although should not be designed to accommodate formal or informal ranking.<br>If space allows, it may be appropriate to provide short-stay parking to accommodate pick up by private car.<br>The provision of pick-up/drop-off spaces in convenient locations close to the interchange will minimise instances of ad-hoc drop-offs at potentially unsuitable locations within the travel hub.<br>In the future, it is possible that higher uptake of autonomous vehicles will significantly increase demand for pick-up and drop-off points and consideration should be given in design to how best to enable adaptation. |

| | | |
|---|---|---|
| | **Taxi**<br>While taxi use at a commuter-focused travel hub may not be particularly high, the importance of this mode increases for longer-distance trips which may be served by coach or rail, and taxis can play an important role in providing transport for people with restricted mobility. The LTP includes taxi and private hire call points as elements suitable for inclusion in a travel hub, so it may be appropriate to allocate some lay-by space to taxi ranking, subject to the individual location.<br>**DRT**<br>Scheduled DRT or "flexible" services - i.e. those with fixed core routes with some limited deviations - operated by conventional public transport vehicles should be accommodated reasonably centrally within larger travel hub sites and can share space within an area designed to accommodate local bus services. Co-ordination of services with other transport timetables will encourage interchange.<br>On-demand DRT services operated by small minibuses, people carriers or cars can use pick-up/drop-off spaces in convenient locations close to the interchange. The accessibility requirements of on-demand DRT vehicles should be considered in the design, with adequate space for loading via wheelchair ramps or lifts. If these areas are adequate in overall size it should not be necessary to provide dedicated space unless the scale of such services warrants this.<br>Future DRT services which might one day be operated by autonomous shuttle vehicles may require the provision of dedicated and segregated space. Whilst such demands cannot be predicted, it is desirable that a space close to the centre of the travel hub should be capable of eventually being repurposed if such demand materialises. | |
| **Car clubs** | A car club is a commercial pay-as-you-drive service offering club members access to a vehicle or range of vehicles without ownership.<br>The CPCA definition of a travel hub includes the provision of car club vehicles at these sites.<br>The provision of car club vehicles adds to the mobility options at a travel hub, and provides an onward journey option for destinations not served by other modes. Providing car club locations in areas with good accessibility from public transport and active travel modes increases the reach of the car club vehicles, and makes the sites more appealing to car club operators.<br>Dedicated spaces should be provided for car club vehicles, clearly signed for this specific use. The number of spaces should be agreed with operators on a case by case basis, considering existing local car club provision and demand.<br>The spaces should be easily identifiable, and easily accessible from the public transport and local active travel networks. Early engagement with car club providers is recommended to ensure that the location within the travel hub is suitable.<br>Active or passive provision of EV charging at the dedicated car club spaces would expand the opportunities for car club vehicle types and increase the adaptability of the space.<br>The provision of cycle parking close to the car club bays can encourage the use of active modes to access the car club. | https://como.org.uk/wp-content/uploads/2018/06/Car-Clubs-Parking-Carplus-Best-Practice-Guidance-2014.pdf |
| Car | **General Car Parking**<br>The number of general car parking spaces will be defined by the forecast demand and expected use of the site, and should be the subject of site-specific analysis. The full demand is unlikely to be realised in the first few years of the travel hub opening, so a phased delivery approach should be designed in. A 'fan' design facilitates the phased opening of the site according to | |

| | | |
|---|---|---|
| | demand, but may inhibit the effectiveness of solar car ports by requiring these to be oriented sub-optimally for energy generation. The car park layout could acknowledge local features, such as historic road layouts.<br>**Dimensions**<br>2.5m x 5m for standard vehicles, although provision may be necessary for wider and longer vehicles in the future if the recent trend towards larger vehicles continues[5].<br>**Flexible space**<br>As public transport accessibility increases, and if the predicted trend towards shared mobility continues, demand for private car parking may grow more slowly or decrease over time. Consideration should be given to alternative use of later phases of car parking space if it is not ultimately required. The use of space further from the transport interchange for alternative uses such as freight consolidation (see component C) may be an appropriate use of the space. | |
| | **Disabled and Priority car parking provision**<br>The proportion of disabled/Blue Badge car parking at travel hub locations is not stipulated by the Local Plan, but a small proportion of parking bays should be dedicated to Blue Badge users. The availability of disabled parking closer to key destinations should be considered when calculating the space requirement for disabled parking. The level of provision should also be informed by existing demand at comparable sites, with passive provision made for future variations in demand.<br>Parent and child parking could be considered at travel hubs to provide priority spaces for people travelling with small children, and encourage use of non-car modes for part of the journey. Additional space should be provided around these bays if possible, although the 1.2m hatched zone as required for disabled parking bays is not a requirement.<br>**Dimensions**<br>2.5m x 5m + 1.2m hatched zone for blue badge spaces. The hatched zone can be shared with the adjacent space.<br>**Location**<br>Disabled parking provision should be as close as possible to the principal points of interchange – minimising the transfer distance for disabled users. Parent and child parking should be as close to the points of interchange as possible without impacting on disabled parking bays. | |
| **B - Mobility related components** | | |
| **Cycle Parking** | The provision of high-quality cycle parking is fundamental to the accessibility of the travel hub by bike.<br>**Location**<br>Cycle parking should be prioritised and accommodated as close as possible to the points of interchange, with clear, safe routes in and out of the travel hub for people on bikes.<br>Strong consideration should be given to the local road network, acknowledging that cyclists will arrive and leave the travel hub in all directions, not just on designated cycle routes. | More detail:<br>GCP NMU Policy Framework |

[5] https://www.theaa.com/breakdown-cover/advice/parking-space-size

Cycle parking in an inconvenient place is likely to be ignored in favour of 'fly parking' on railings and street furniture. To avoid this, it may be necessary to disperse cycle parking around the travel hub, especially at larger sites. This can also minimise through cycle movements which may conflict with large pedestrian flows.

**Numbers and types of cycle parking**

The number of cycle parking spaces at a travel hub site should be agreed on a case by case basis, taking into consideration the forecast demand, but would as a minimum be at least 10% of the number of car parking spaces with this rising significantly for sites where the levels of interchange between cycling and other modes will require greater facilities. Current use of folding bikes at Park & Ride sites is high and this may also be a consideration in determining adequate parking.

Passive provision for an increase in cycle parking provision should be included, considering reallocation of space from car parking, if appropriate.

Consideration should be given to the way in which cycle parking will be used at the travel hub. In most cases, a combination of long and short-stay parking should be provided, with half the provision being secure long stay, and half easily accessible short stay parking.

Long-stay parking may consist of secure cycle boxes, providing covered, lockable spaces that are suitable for bikes to be kept overnight. In particularly high demand locations, a more substantial cycle parking 'hub' may be appropriate, which may include key fob entry and additional security measures – see Figure 3.3. As e-bikes increase in popularity, the ability to charge e-bikes at a secure cycle hub would be an advantage.

Short-stay parking should provide simple stands which allow users to lock both wheels and frame to the stand. The traditional Sheffield stand is a simple and low-cost solution, but other designs are available and may be more appropriate to the surroundings. Parking should be covered to provide basic protection from the elements.

Provision for non-standard cycles (e.g. cargo bikes, hand cycles etc) should be included at a proportion to be agreed, but typically 5% of the total number of cycle parking spaces.

Security of cycle parking is an important consideration, with natural surveillance providing the best deterrent to theft. CCTV coverage of cycle parking areas should be included at the travel hub.

**Figure 3.3: Secure Cycle Hub at Selly Oak**

Source: Broxap Ltd

| | |
|---|---|
| **Pedestrians** | Pedestrian access to the Travel Hub is important for access to the local area, and for nearby residents and workers to benefit from the Travel Hub facilities.<br>Pedestrian routes from principal local trip attractors should be clear and direct, with paths catering to desire lines, and good natural wayfinding, allowing people accessing the travel hub on foot to easily navigate to all available onward modes.<br>Personal security for pedestrians is a major consideration, as large sites could be relatively isolated. Good lighting, natural surveillance and using Secured by Design principles to avoid secluded pedestrian areas will help provide good access for people on foot.<br>Severance should be considered in the travel hub design in order to avoid overly circuitous pedestrian routes to the site caused by the modes serving the travel hub - particularly rail lines, major roads or metro infrastructure. |
| **Electric Vehicle Charging** | The UK Government intends to halt the sale of conventional engine vehicles by 2030, with pressure from several groups to bring this forward, meaning that the provision for charging of electric vehicles is expected to become increasingly important in the next 15 years. |

| | |
|---|---|
| | The proportion of parking spaces equipped with charging facilities must be decided on a case by case basis, but current travel hubs are being developed to include active provision for 5% of the spaces.<br>Given the relatively high cost of installation and maintenance of charging facilities, passive provision for installation of additional charging points in line with demand is an essential element of future-proofing the travel hub design. A 2019 survey[6] showed that 64% of drivers cited a lack of charging infrastructure as a barrier to EV use, so reliable access to charging at facilities like travel hubs is likely to be fundamental to the local shift to EV in the medium term.<br>The LTP demonstrates support for the prioritisation of EV parking above general parking provision, so EV facilities for long-stay parking should be accommodated as close to the point of interchange as possible. As the car fleet turns over to include increasing numbers of EVs, the importance of prioritising EV bays is likely to diminish, but the clear designation of EV parking/charging points will remain an important element of the travel hub.<br>For long-stay parking a fast 7KW charging facility is likely to be most appropriate. These chargers can typically fully charge a vehicle battery in 4-6 hours – suitable for charging parked vehicles while their drivers are at work during the day. Note that separate, rapid charging technology is likely to be a requirement for commercial vehicles, taxis and buses that will only stop at the travel hub site for a short time.<br>The type and availability of EV charging facilities should be carefully considered in relation to the location of the travel hub and the typical distance travelled by EV users to reach it, considering that commuter users making relatively short trips between their home and a travel hub, and not using their vehicle during the working day, will not need to connect to a charger on every visit. Care should be taken to avoid attracting private car users in into the travel hub site solely to use the charging facilities, and as battery technology improves, vehicles will require less-frequent charging. It is unlikely that all spaces in the travel hub site would be fully equipped with EV charging infrastructure in the future.<br>Public EV charging is generally a commercially-run facility and the business model for provision should be considered in the development of Commercial Case of the travel hub business case. |
| **Information** | The clear provision of information at the travel hub is important for users to have confidence in the system. As travel hubs provide multi-modal travel opportunities, a clear and easily useable repository of information on modes, routes and travel information is important for their use by the whole population.<br>The provision of digital connectivity at the travel hub is also important to enable users to access travel information via personal mobile devices. Increasingly the latter will replace the majority of in-situ information.<br>Ticket sales are increasingly undertaken online, but automated ticket vending machines are still likely to be required in the short to medium term– particularly for travel hubs including rail, where ticketing needs are more complex. Integrated ticket vending machines have the potential to provide travel hub users with all required ticketing through a single point – see Figure 3.4:. |

[6] https://www.smarttransport.org.uk/news/lack-of-ev-infrastructure-cited-as-the-biggest-barrier-to-adoption

**Figure 3.4: Integrated Ticket Vending Machine**


Source: Cammax Ltd/SYPTE

Travel hub sites may have a staff presence on site, depending on local requirements, but where this is the case it is unlikely to be a 24 hour presence. Access to information and emergency help can be provided remotely through help points situated in prominent locations. These points can provide a video link, and if required, be linked to security, public address and lighting systems, giving a remote operator some control over facilities at the site.

Information services will increasingly be provided online, which will change the functional requirements of on-site information points, but increase the need for good internet connectivity and freely available internet access.

| **C - Non-mobility and urban realm improvement** | |
|---|---|
| Freight | **Freight Consolidation**<br>Freight consolidation can minimise the numbers of goods vehicles accessing urban centres, with goods dropped at a consolidation centre close to the strategic road network, and consolidated into a smaller number of vehicles for efficient delivery. |

| | |
|---|---|
| | Policy 3.4.4 of the LTP supports the use of sites with high levels of parking for the use of freight consolidation or click and collect facilities. The development of a freight consolidation system would require additional research to identify an appropriate site with the required freight access – likely to be close to the motorway network. A single freight consolidation centre should be sufficient to serve Cambridge and concentration of consolidation activities for larger freight movements at a single site may be necessary to establish a viable service. Micro-consolidation – with the last mile completed using cargo bikes could be considered for travel hubs closer to the city centre, or high demand areas like the CBC.<br>Co-ordinated freight consolidation is relatively new to the UK, but can significantly reduce the numbers of freight vehicles travelling into urban centres, and can allow the use of smaller, often zero emission vehicles, or cargo bikes for local deliveries. A trial in Paris showed a reduction in goods vehicles into the city centre by 20%.[7]<br>Any investment in freight consolidation facilities should be supported by policy measures to generate and sustain local demand for freight consolidation. Early UK experiments with freight consolidation for city centre deliveries have demonstrated that freight consolidation centres are unlikely to succeed in the absence of restrictions on deliveries directly to the city centre and incentives for freight operators to use a consolidation centre that are sufficient to offset transhipment costs.<br>A feature of freight consolidation is a relatively large number of goods vehicles accessing the site. For a site close to the strategic road network this would need to accommodate heavy goods vehicles in order to be effective. Appropriate HGV access, parking, loading and turning facilities should be provided to ensure that the facility can operate without impacting on the travel hub's core operation.<br>Given the high pedestrian footfall around the travel hub, a high degree of separation between the passenger facilities and the freight consolidation operation should be considered in the design – avoiding pedestrians and NMUs sharing space with HGVs.<br>Additional Requirements<br>• Covered space for loading<br>• Secure area for temporary storage<br>• Charging facilities for zero emission vehicles<br>• Access to staff welfare facilities<br>• Appropriate lighting |
| Buildings and structures | **Size and function**<br>Buildings on travel hub sites should be appropriate to the size and function of the hub. Where significant numbers of people are likely to be waiting for services, an appropriately sized space should be provided to allow waiting in comfort. Lighting, shelter and shade should be provided – accessible even when the building may not be open.<br>Smaller sites, or where there is existing shelter elsewhere – for example at Foxton, where people are likely to wait on the station platform – may require only a small building or enclosed shelter for relatively small numbers of people to wait. |

[7] PBA and WYG (2018) Draft London Freight Consolidation Feasibility Study

Where longer passenger wait-times might be expected, more substantial waiting facilities should be provided - Thornhill Park and Ride in Oxford (Figure 3.5) is an example of a site providing more substantial waiting facilities due to its role as a long-distance coach hub as well as local park and ride site.

Consideration must be given to the location of the travel hub site – where the site is in a sensitive location or green belt, the size and materials used must be appropriate to the surroundings.

**Figure 3.5: Larger Waiting Facilities at Oxford Thornhill Park and Ride**

**Type**

To ensure the adaptability of the travel hub to future use, buildings of lightweight or modular construction should be preferred, allowing future removal or redesign at relatively low cost.

A modular facilities building would offer a significant cost saving relative to a traditional building of similar size constructed in-situ. It would also be possible to remove this for reuse elsewhere if no longer required or to move this within the site if required to reconfigure the travel hub layout.

Modular buildings can be provided as a full turnkey package by the supplier. These can be of bespoke design, as at Temple Green Park & Ride in Leeds (Figure 3.6:). In this example the building is 132 $m^2$ in size with a feature clock tower and wood cladding in Western Red Cedar. Facilities provided are a fully heated passenger waiting area with ticket machines and seating, staff office and welfare facilities with secure ticket window, toilet and baby change facilities. The building was manufactured off-site and installed by crane in a single day, demonstrating the practicality of moving such buildings within the site or elsewhere if required.

**Figure 3.6: Temple Green Park & Ride Modular Building**


**Facilities**

Where people are expected to be waiting for any length of time, toilet facilities should be provided for the public, ensuring equal access to the facilities for all users. The scale of provision should be greater at sites planned to accommodate transfer between tourist coaches and local public transport

A café or kiosk may be appropriate at hubs with high footfall.

In some locations co-working and meeting space has the potential to generate a revenue stream to help fund facilities management and building maintenance costs and would also generate footfall to support a café or kiosk. However, where the site is in the green belt, there will be policy barriers to the development of facilities that do not fall within the definition of 'local transport infrastructure'

At public transport termini, and where taxi ranks or coach parking are provided, toilet and refreshment facilities for drivers are likely to be required, even if public facilities are not.

| | |
|---|---|
| Photovoltaic (PV or Solar) Panels | The power demand for a travel hub site will primarily come from the lighting and building requirements, plus the EV charging points. Forecasts for the CSWTH site suggest that the EV charging will represent the greatest power demand – with demand peaking in the morning as cars arrive and are actively charging simultaneously. |

The provision of PV panels at the site can provide additional, clean power generation for the travel hub site, providing a proportion of the site's power demand, and in some circumstances, feed excess power back to the national grid. Batteries may be housed on site to store excess power for local use when solar yields are low.

Power yield from PV panels varies depending on site conditions and the technology employed, so a detailed assessment of the site is necessary to establish whether the installation is viable. An assessment of the potential for PV panels at Foxton suggests that up to 50% of the site's power needs could be met by PV panels.

If there are commercial opportunities to generate power in excess of that required for the site, and to directly distribute this locally, these should be explored in collaboration with appropriate partners.

The preferred style of PV panels proposed for GCP travel hub sites is a solar car port arrangement, which makes use of the space above car parking bays to provide shade and shelter for vehicles, as well as generating power.

The optimal site arrangement will vary, and it is likely that a balance will need to be struck between the optimal arrangements from a transport and functional perspective, and for a power yield perspective. Planning restrictions should be considered, especially in green belt locations.

The potential for glint and glare from the solar panels should be assessed, particularly in relation to the impact on air traffic.

If the site falls within the Lord's Bridge Telescope Restricted Area, the potential impact of solar panel installation on the observatory should be assessed prior to development of the design.

**Figure 3.7: Indicative Solar Car Port Installation at Travel Hub Site**


Source: GCP

| | |
|---|---|
| Sustainable materials | Previous work for GCP has considered the potential for the use of permeable surfacing materials for travel hub sites.<br>Stone-filled ground reinforcement grid units were identified as a solution suitable for the construction of temporary parking areas with an operational life of ten years or less. They may also be suitable for peripheral parking areas within travel hubs that are used less intensively than those located closer to the point of interchange.<br>The key advantages of permeable ground reinforcement systems as a design solution for temporary parking areas are:<br>• They are normally laid on a free-draining stone base, eliminating the requirement for drainage pipework and returning storm water to the water table. |

| | |
|---|---|
| | • They are compliant with sustainable drainage best practice.<br>• Products manufactured from 100% recycled Low Density Polyethylene (LDPE) are available. These can be further recycled after being taken up and removed from a temporary site, offering a sustainable solution and avoiding the cost of disposal to landfill.<br>The main disadvantages of such systems are:<br>• They require more regular inspection and maintenance than a permanent bound surface.<br>• They may not be suitable for the construction of disabled parking areas.<br>Permeable surfacing solutions are also available for permanent parking areas. |
| Security | To ensure a safe environment for travel hub users, the travel hub should follow the principles of security by design, avoiding isolated sections of the site, and promoting natural surveillance. CCTV should be included as a standard design feature. Active monitoring of CCTV may be required to allow safe 24 hour operation of the travel hub - particularly for those using the cycle facilities – and deter overnight stays.<br>Lighting will be a key element of ensuring security to ensure that the travel hub is safe, and feels safe to use all year round. An assessment of the required lighting will be required to ensure that the proposals meet the requirements for security, without significantly impacting wildlife or local population. |
| Community facilities | With the development of travel hubs at highly accessible sites there is the opportunity for the provision of additional facilities to benefit the local community, add value to the site, and in some cases, provide a revenue stream to support the site.<br>Facilities considered will be subject to local conditions and demand, but could include flexible community spaces such as village halls and exhibition spaces, or recreation areas such as sports pitches or playgrounds. Where the site is in a sensitive location or green belt, there will be policy barriers to the development of facilities that do not fall within the definition of 'local transport infrastructure' and it is likely that there will be other more appropriate locations in urban areas or village centres. Otherwise, there is no limitation in principle on the facilities that could be included on a travel hub site, but the operation of the facilities should not impede the core function of the travel hub. |

# 4 Summary

The development of multi-modal travel hubs is a major focus for the Greater Cambridge Partnership (GCP) as part of the efforts to support the creation of 44,000 new jobs and 33,500 new homes in the region.

New travel hubs will support GCP's work to improve access to transport networks, ease congestion, keep the Greater Cambridge area well connected to the regional and national transport network, make it easier to travel by greener modes and improve journey times.

The Cambridgeshire & Peterborough Local Transport Plan supports the development of travel hubs and advocates that these should act as gateways to the public transport network.

A travel or mobility hub typically includes elements sitting within three component areas:

A. Mobility components – public and private (e.g. bus, rail, cycle hire facilities)
B. Mobility related components (e.g. cycle and car parking, electric vehicle charging)
C. Non-mobility components and urban realm improvements (e.g. community facilities)

The combination of elements included at individual travel hubs will vary from site to site, and take account of local conditions, including the size of the site, access provision and transport modes serving the location.

National and European examples of travel hubs show this variation in facilities depending on the location – with hubs located more centrally with urban areas typically providing more future and shared mobility options – with smaller hubs acting as a network, whereas urban fringe sites tend to provide more private car parking and can exist in isolation, or as part of a network. Several elements – including good security and passenger information provision tend to be common across all types of travel hub.

The travel hubs developed by GCP will incorporate a range of multimodal elements within the components outlined in Figure 3.1. The individual elements will be driven by the local conditions, planning considerations and role of the site as part of the network, but will seek to provide increased access to the transport network in the Greater Cambridge area, promoting ease of interchange between modes at the site. Travel hubs on the urban fringe and in rural areas can increase access to bus routes and high quality walking and cycling networks for the local areas they serve. The increased access to active and sustainable transport networks will help generate mode shift, and through supporting sustainable modes will contribute to the decarbonisation of transport.

Within the GCP area, travel hubs should aim to operate as a network, encouraging users to travel to their local travel hub rather than driving to the hub nearest their destination. This can be encouraged through the co-ordination of services as well supporting factors including the development of integrated ticketing and branding.

The design of travel hubs should aim to accommodate changing demands for transport and mobility – particularly with a possible increase in the uptake of new transport options and demand for flexible working patterns. The design principles outlined in Section 3 provide guidance on how to effectively accommodate the current demands on travel hubs – and how space can be designed flexibly to pivot quickly to changing requirements. The development of the Cambridgeshire Autonomous Metro (CAM) system, which is proposed to serve several of

the travel hubs currently in development is a good example of the requirement to design for future technologies and networks.

Some design principles will remain consistent – particularly those with regard to security and pedestrian access – these should be embedded in the design of all travel hubs.

# A. Future Travel Hub Development

## A.1 Changing Role in the Future

A key requirement of a travel hub is flexibility in access to the transport network – providing access to multiple modes, and easy interchange between them. To maintain their important position within a strategic framework, travel hubs must also adapt to a changing transport landscape.

Even before the COVID-19 pandemic disrupted the way people travel for work and for leisure, the way in which transport is used was changing rapidly, driven largely by the increased capability of transport technologies, and increased access to these technologies.

This has led to a changing system of mobility, with a trend away from fixed systems, where assets are owned, and services are provided on fixed routes, towards a more flexible system where users are increasingly using shared services, as and when required.[8] Increased access to real time information on transport services allows transport users to choose what might be the 'best' mode of transport for their journey, rather than just the modes and routes they know already. Access to the various modes of transport through interchange facilities such as travel hubs is likely to become increasingly important to the travelling public.

The COVID-19 pandemic has disrupted working patterns in 2020/2021, with increases in home and flexible working. The longer term impacts of the disruption will require further research post pandemic - specifically the implications for Cambridge with a significant proportion of the population either in industries such as health, education, hospitality, and leisure where flexible working is difficult, or the hi-tech industries where flexible working may have already been well established.

### A.1.1 New Modes of Transport

The changing access to technology has allowed new modes of transport to develop. Ride-hailing services such as Uber have disrupted the traditional taxi and private hire markets and new forms of micro-mobility, including e-bikes and e-scooters have emerged as potential disruptors to the transport industry. Locally, the CAM system is intended to use new technology to provide a clean and efficient mass-transit system.

A clear national government policy direction means that in the future, it appears highly likely that the use of electric vehicles will increase. The trajectory of take-up of autonomy and vehicle-sharing is less predictable, with the market for these technologies at an earlier stage of development.

### A.1.2 The Impact on Travel Hubs

This desire for flexibility in working, and these emerging and evolving modes of transport demonstrate the importance of designing adaptable spaces in travel hubs. As demand for transport evolves, the travel hub space should be able to evolve to continue to meet the needs of users.

To do this the travel hub should be designed to evolve, catering to the current technologies – bus, rail, car and active travel, but also able to accommodate new modes – such as CAM and

[8] Mobility as a Service (MaaS) in the UK: change and its implications, Foresight, Government Office for Science (2018)

demand responsive autonomous shuttles – with relative ease as they come online. This will require consideration of:

- **Designing in flexible space** – for example ensuring that spaces and stops that will be used by buses in the short to medium term can be adapted to the CAM vehicle specification without wholesale redesign. For example, features such as mature trees and balancing ponds should be situated in a way which does not prevent eventual reconfiguration.
- **Identifying current and future modes that can share space** – such as different forms of bus service – and those requiring dedicated and segregated provision.
- **Identifying areas for change** – such as earmarking private car drop-off bays for future use as Demand Responsive Transport bays. If planning conditions and local circumstances allow, interim uses of space could be considered before long term uses are developed. For example, space for future public transport vehicle charging could be allocated as a freight micro-consolidation space for electric vans or cargo bikes. Space for micro-mobility – such as e-scooter hire – which may not yet be fully defined could be designed into the travel hub by allocating space accessible to pedestrians and with access to active travel routes and facilities so that micro-mobility facilities can be retro-fitted as required. Cabling, or at least ducting, to enable provision of basic charging facilities to this space should be considered. Similarly, car club spaces can be provided with little or no additional infrastructure above that needed for a typical parking space, although dedicated EV charging and space for expansion should be considered, and the allocated spaces should be highly visible from the centre of the travel hub.
- **Digital connectivity** – The requirement and desire to work more flexibly has raised expectations of connectivity at locations like travel hubs for both travel and work needs. Travel hubs should provide suitable facilities for users to locate, book and pay for onward travel through their own device. This is particularly relevant for locations where shared mobility is provided, to allow new and occasional users with the confidence to use these modes without prior planning. Robust digital connectivity for flexible working will require suitable spaces for casual work. Provision will be informed by the local conditions – including planning policy (facilities at Green Belt sites will be more limited), service frequencies and alternative local facilities – but may include appropriate seating, work surfaces and power supplies for mobile working. Power requirements for flexible working facilities, electric bike charging and other non-mobility components such as freight consolidation hubs should be considered at an early stage of design, even if not required in the opening year.
- **Futureproofing power supplies** – Provision for appropriate power supply to the right areas of the travel hub will be an important element of managing an uncertain future demand. Flexibility in the supply – including the ability to provide rapid charging for electric mass transit services and slower EV charging for long stay car parking are likely to be the main near-future requirements. The ability to adapt the travel hub for public transport vehicles using different fuel technologies – such as hydrogen – should be considered in the design, and care should be taken to avoid investment in significant charging facilities which may be rendered redundant by the rapidly evolving battery sector.
- **Using modular or semi-permanent materials** – Use of modular or lightweight construction techniques to allow the easy and relatively low-cost reconfiguration of buildings as demand changes.

# B. Examples

## B.1 Travel Hub Examples

This section provides examples of travel and mobility hubs of various scale around the UK and Europe. The examples do not necessarily represent best practice for GCP travel hub projects, but demonstrate a range of examples with varying facilities appropriate to the location.

### B.1.1 Plymouth Mobility Hubs

**Scheme name**: Plymouth Mobility Hubs

**Promoter**: Plymouth City Council (PCC)

**Summary**: PCC aim to provide up to 50 mobility hubs across Plymouth. The aim of the scheme is to strategically connect existing public transport networks across Plymouth. The Mobility Hubs will provide low carbon mobility for last mile journeys, intercity travel or to areas not covered by public transport.

**Funding**: Transforming Cities Fund (TCF) grant


Source: Plymouth.gov.uk

**Characteristics**

The proposed multi-modal mobility hubs will be designed to be flexible in order to meet the requirements of local communities and may include the following components shown in Table B.1.

**Table B.1: Plymouth Mobility Hub Features**

| Mobility components (A1 and A2) | Mobility related components (B) | Non-mobility and urban realm improvements (C) |
|---|---|---|
| Access to existing public transport services | Electric vehicle (EV) charging points | Security (lighting, CCTV) |
| Car club hubs | Solar carports | Lockers for delivery and storage |
| Shared e-bikes and cargo bikes | Cycle parking | Live travel information boards |
| | Cycle repair stations | Smart booking systems for shared bikes and cars |

### Relevance to Greater Cambridge

A UK example showing how travel hubs can provide appropriate facilities on smaller sites. Elements here could inform any future proposals for smaller travel hubs in the Greater Cambridge area.

## B.1.2 Bremen Mobility Hubs, Germany (mobil.punkt)

**Scheme name**: Bremen Mobility Hubs

**Promoter**: Municipality of Bremen

**Summary**: The Municipality of Bremen has created a network of 40 mobility hubs across the city. This is formed of 10 centralised hubs, and 30 smaller hubs designed to connect less 'switched-on' areas. The Municipality aim to expand the network by 8-10 local hubs per year, with each hub being developed to meet the social and business needs of the community.



### Characteristics

The Bremen mobility hubs are designed to reduce the reliance on the private vehicle, by making sustainable transport options widely available and convenient. The hubs also have a clear urban realm focus, aiming to reduce the space taken up by private cars and improve conditions for pedestrians and cyclists. The hubs typically include the components described in Table B.2: Bremen Mobility Hub Features .

**Table B.2: Bremen Mobility Hub Features**

| Mobility components (A1 and A2) | Mobility related components (B) | Non-mobility and urban realm improvements (C) |
|---|---|---|
| Access to existing public transport services | Electric vehicle (EV) charging points | Wayfinding information |
| Car club (with a focus on compact and low emission vehicles) | Solar carports (at larger sites) | Live travel information boards |
| Shared bikes | Car club hubs (across all sites) | Cafes |
| E-bikes (at certain locations) | Cycle parking | Children's play areas |
| | Cycle repair stations | App-based booking systems for bikes and cars |

**Achievements**

- Bremen has achieved a 64% sustainable mode share, including 25% cycle mode share.
- Bremen has dramatically reduced its congestion level (time lost in transport) to 25 hours per citizen per year; the German average is approximately 39 hours (2014).
- Bremen now has 60,000 car-share users (>10% of the city's population) across 60 car share stations (of which 40 based at mobility hubs).
- 66% of car share users who previously owned a car, no longer do.

**Relevance to Greater Cambridge**

A European best practice example that has demonstrated positive impacts on congestion and mode share by operating as a network.

### B.1.3 Oxford Parkway Railway Station and Park & Ride

**Scheme name**: Oxford Parkway

**Promoter**: Chiltern Railways

**Summary**: A new railway station delivered in 2015 located adjacent to the existing Water Eaton Park & Ride site. Water Eaton Park & Ride already provided 757 car parking spaces and a dedicated bus service, route 500, serving Oxford Railway Station and the City Centre in one direction and Blenheim Palace and Woodstock in the other direction. The site was renamed Oxford Parkway Park & Ride and the combined car parking capacity totals 1,558 spaces.

**Funding**: Project Evergreen 3 – funding from DfT and Network Rail to upgrade the Chiltern Main Line

**Figure B.1: Oxford Parkway Station and Cycle Parking**

Source: Google Maps

**Figure B.2: Oxford Parkway Park & Ride Bus Stops and Facilities Building**


Source: Google Maps

### Characteristics

Once built, the original Park & Ride site was renamed Oxford Parkway Park & Ride and now Oxford Parkway and Oxford Parkway Park & Ride coexist on the same site with two adjacent car parks controlled by different operators (although users can use either). Facilities at the site are shown in Table B.3: Oxford Parkway Features .

**Table B.3: Oxford Parkway Features**

| Mobility components (A1 and A2) | Mobility related components (B) | Non-mobility components and urban realm improvements (C) |
|---|---|---|
| Access to dedicated express bus services to Oxford City Centre and Blenheim Palace | Free designated Blue Badge parking | Security (lighting, CCTV) |
| Access to rail services towards Oxford, Bicester and London Marylebone | Cycle parking (190 covered spaces across two locations) | Facilities building with enclosed waiting area |
| Coach parking | Taxi rank | Coffee shop |
| | Pay-and-display car parking (1,558 spaces) | Public toilets and baby changing |
| | | ATM machine |
| | | Industrial recycling bins for household recycling and an adjacent unloading area for vehicles to park |
| | | Live travel information boards |

### Relevance to Greater Cambridge

A larger site comparable to some Greater Cambridge travel hub examples, providing for interchange between bus and rail, as well as catering for park and ride trips by both modes.

### B.1.4 Liverpool South Parkway Station

**Scheme name**: Liverpool South Parkway

**Promoter**: Merseyrail

**Summary**: A flagship Merseyrail station with local and regional rail services providing interchange with the Northern Line, and integrated transport links to Liverpool John Lennon Airport. The site includes an award-winning building (see Figure B.3: Liverpool South Parkway Station Building) that includes several sustainable features including solar panels and rainwater harvesting.

**Funding**: Merseytravel

**Figure B.3: Liverpool South Parkway Station Building**


Source: Network Rail Media Centre

#### Characteristics

Liverpool South Parkway incorporates car parking and true multi-modal interchange in a well-designed site. Bus services access the site directly to provide public transport links to the airport, and the Merseytravel GO scheme provides regular commuters with access to secure cycle storage on site.

**Table B.4: Liverpool South Parkway Features**

| Mobility components (A1 and A2) | Mobility related components (B) | Non-mobility components and urban realm improvements (C) |
|---|---|---|
| Merseyrail Metro services | GO Cycle secure cycle parking – 40 secure spaces | Staffing |
| Regional rail services | 24 standard cycle racks | Security (CCTV, lighting) |

| Mobility components (A1 and A2) | Mobility related components (B) | Non-mobility components and urban realm improvements (C) |
|---|---|---|
| Local bus services including to the airport | 311 car parking spaces | Customer help points |
| | 14 designated Blue Badge parking spaces | Integrated travel card sales |
| | | Public toilets |
| | | Live travel information |
| | | Catering |

**Relevance to Greater Cambridge**

A well-established travel hub site which caters for significant interchange between bus and metro rail services. The award-winning building incorporates sustainable design features and provides more services for passengers than most sites.

### B.1.5 Edinburgh Trams – Ingliston Park & Ride

**Scheme name**: Edinburgh Trams

**Promoter**: Transport for Edinburgh

**Summary**: The Edinburgh Trams network links the centre of Edinburgh with the airport, and includes several interchange stops along its route, providing access to the National Rail network and local bus networks.

**Funding**: Transport for Edinburgh

**Figure B.4: Ingliston Park & Ride, Edinburgh**

Source: Google Maps

### Characteristics

Ingliston Park & Ride is located off the A8, close to the airport. The site includes 1,085 free car parking spaces, a staffed terminal building and waiting area. Cycle hire and interchange with local bus services are available on site.

**Table B.5: Ingliston Park & Ride Features**

| Mobility components (A1 and A2) | Mobility related components (B) | Non-mobility and urban realm improvements (C) |
|---|---|---|
| Regular tram services – including to the airport | 16 Cycle hire stands | Staffed terminal building |
| Bus interchange with Lothian Buses | 7 EV charging points | Security (CCTV, lighting) |
| | 1,085 free car parking spaces | Customer help points |
| | 46 designated Blue Badge parking spaces | Public toilets |
| | Secure cycle parking lockers | |

### Relevance to Greater Cambridge

Providing interchange with bus and light rail on the edge of the city, this site also features more typically urban components, such as cycle hire docks – providing high levels of connectivity even outside the city itself.

## B.1.6 Nottingham Express Transit – Hucknall Park & Ride

**Scheme name**: Nottingham Express Transit (NET)

**Promoter**: Nottingham City Council

**Summary**: NET consists of two tram lines that cross Nottingham; the Toton branch which runs east-west to the west of the city centre and the Clifton branch which runs north-south through the city centre into suburbs and satellite suburbs. In total there are seven Park & Ride sites associated with the NET network.

**Funding**: Nottingham City Council (via Private Finance Initiative and partly the Workplace Parking Levy)

**Figure B.5: Hucknall Park & Ride**


Source: Google Maps

### Characteristics

Hucknall Park & Ride is located approximately 10km to the north of Nottingham City Centre, at the same site as Hucknall railway station and a bus interchange.

**Table B.6: Hucknall Park & Ride Features**

| Mobility components (A1 and A2) | Mobility related components (B) | Non-mobility and urban realm improvements (C) |
|---|---|---|
| Regular tram services | Citycard Cycle Parking – a network of secure, covered, lit cycle parking hubs charged at £5-7 a year | Security (CCTV, lighting) |
| Regular train services | EV charging points | Customer help points |
| Bus interchange | 439 free car parking spaces | Integrated travel card sales |
| | 24 designated Blue Badge parking spaces | Public toilets |
| | | Live travel information |

### Relevance to Greater Cambridge

Interchange with bus, rail and tram at the tram terminus – this site has fewer facilities than other examples with similar levels of transport connectivity, and has more limited bus services, but the high frequency of the tram service means that waiting times for the dominant mode of onward travel are likely to be low.

## B.2 Summary

The examples in this section demonstrate the differing range of facilities provided at travel and mobility hubs in areas around the UK and Europe. The examples show the range of interpretation of the required components, responding to local needs. The provision varies from the relatively basic facilities at urban fringe sites providing park and ride facilities for the Nottingham Express Transit, to the more central, less car-centric hubs in Bremen and Plymouth which incorporate more future mobility elements.

The more central examples must be more space-efficient, and the number of these hubs is significant (50 in Plymouth, 40 in Bremen) as they act effectively as a network, rather than major interchange hubs. These urban examples cannot provide car parking for most users but rely much more on the use of shared mobility to access the sites.

The Liverpool South Parkway example shows the potential for travel hubs as major points of interchange between public transport modes, while incorporating good access for private transport. The inclusion of Ingliston Park & Ride in the Edinburgh cycle hire scheme shows that some more typically urban travel hub elements can be successfully incorporated into sites on the edge of the city.

These urban fringe sites are more able to accommodate private car parking, with larger areas available. Electric vehicle charging provision is not provided at many of the sites reviewed – neither Oxford Parkway nor Liverpool South Parkway provide charging points currently, despite their capacities and – in Oxford Parkway's case – relatively recent development.

Solar panels are not a major feature of the larger – out of town travel hub sites reviewed here, but are included in the smaller, more urban travel hub sites. This is likely to be a function of the relatively small cost of installation for a smaller site compared to a large travel hub rather than an indication of electricity generation performance. The falling cost of solar generation technology and policy drivers to deliver sustainable and low carbon solutions are leading to its adoption for larger travel hub projects currently at the planning stage. The inclusion of solar panels in more isolated locations may present challenges if proposed in green belt locations, but could be beneficial in terms of power self-sufficiency for the site.

While sites vary in their facilities, a common theme across all examples is the provision of at least basic security and help features to ensure a safe and pleasant environment for users. These features are of particular importance at urban fringe sites which may have little or no natural surveillance or passing traffic.