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Bus Back Better Support Programme

Support Package 7
Rural hubs and integration technical advice note

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Transport for the South East, Transport East and England's Economic Heartland

Bus Back Better Support Programme

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1 Introduction

This technical note is one of a series produced as part of the joint project commissioned by three Sub-National Transport Bodies (STBs), England's Economic Heartland (EEH), Transport East (TE) and Transport for the South East (TfSE), to help support Local Transport Authorities deliver the government's National Bus Strategy for England ('Bus Back Better'). To deliver this strategy, the government has invited Local Transport Authorities (LTAs) and bus operators to formally collaborate and work with stakeholders and bus users to identify, and then implement, initiatives that will improve bus services and attract new users. It is envisaged that these improvements will be delivered through Bus Service Improvement Plans (BSIPs), Enhanced Partnership (EP) schemes, and franchising.

1.1 Background

The Department for Transport (DfT) has identified some additional funding to support its key priorities. There are four areas where Sub-National Transport Bodies (STBs) could undertake further work:

- **Decarbonisation:** Helping the DfT and Local Authorities (LAs) to implement the commitments made in the Transport Decarbonisation Plan.
- **Buses:** Helping LAs to deliver on the commitments in Bus Back Better and develop an effective intra-regional bus network.
- **Electric Vehicle (EV) Infrastructure Strategy:** Assisting LAs in the rollout of EV infrastructure, potentially through regional strategies.
- **Local Authority Capability:** Playing a role in building capability within resource- constrained LAs, to help them in the planning and delivery of local transport.

Three STBs, EEH, TE and TfSE, have joined forces to deliver a package of work to assist local transport authorities (LTAs) within the three regions with the delivery of their BSIPs and implementation of their EPs. The LTAs are:

- **England's Economic Heartland:** Bedford, Buckinghamshire, Cambridgeshire, Central *Bedfordshire**, *Hertfordshire**, *Luton**, Milton Keynes, North Northamptonshire, *Oxfordshire**, Peterborough, Swindon, West Northamptonshire.
- **Transport East:** *Norfolk**, Suffolk, Essex, Southend-on-Sea, Thurrock.
- **Transport for the South East:** Bracknell Forest, *Brighton & Hove**, *East Sussex**, Hampshire, Isle of Wight, *Kent**, Medway, *Portsmouth**, *Reading**, Slough, Southampton, Surrey, Windsor & Maidenhead, Wokingham, *West Berkshire**, *West Sussex**.

(indicates an LTA that has received BSIP funding)*

The project supports all the LTAs whether they have received DfT funding for their BSIP or not.

The project is split into two stages. The initial stage of the project – **triage and prioritisation** – ran from August to December 2022. It took stock of LTAs' current progress in delivering their BSIPs and scoped the work programme for future delivery activities. Online workshops were held in September 2022 and provided a forum for LTAs and bus operators to discuss their aspirations and explore themes, priorities, challenges and potential solutions. The project is ensuring that opportunities for technical pieces of work that would benefit multiple authorities are identified and progressed.

The second stage of the project – **implementation** – involves the delivery of support packages for the following topics that were identified during Stage 1:

- Support Package 1: Fares and Ticketing
- Support Package 2: Data Analysis, Monitoring and Evaluation
- Support Package 3: Low Cost and Quick Win Solutions
- Support Package 4: Building a Strong Case
- Support Package 5: Infrastructure and Road Space
- Support Package 6: Demand Responsive Transport
- Support Package 7: Rural Hubs and Integration
- Support Package 8: Funding Mechanisms
- Support Package 9: Collaborative Working
- Support Package 10: Marketing
- Support Package 11: Alternative Fuels and Low Emission Vehicles

Support will be delivered using a mix of channels, including webinars, toolkits and guidance, case studies and one to one support. It will also include establishing bus forums in each of the three STB areas to promote efficiency, avoid duplication of effort, share knowledge and best practice, and identify where joint working would be productive. The technical work will be undertaken to collate evidence and research. The emphasis will be on a regional approach so that common themes can be identified but localised assistance will be available to improve capacity in LTAs and provide specialist inputs regarding local issues.

1.1.1 Intended outputs and outcomes

Project Outputs: improved delivery of BSIPs and EPs, and support to LTAs who have not received government funding in the current round. This will include:

- Enhanced evidence base through research papers on prioritised knowledge gaps;
- Knowledge sharing within and between STBs and their constituent members and between the public and private sectors; and
- Better resourced LTAs through prioritised third-party support, provided in targeted areas.

Project Outcomes: these outputs will seek results in outcomes aligned to the National Bus Strategy including:

- Increased patronage;
- Enhanced accessibility and social inclusion;
- Reduced carbon emissions and improved public health; and
- More commercially sustainable bus networks.

TfSE is managing the project on behalf of the three STBs. A consultant consortium of Mott MacDonald and Arup is delivering the project. A Steering Group has been established, comprising the DfT, the three STBs, representatives from some of the LTAs, and Mott MacDonald and Arup.

1.2 Overview

Bus Back Better requires that each LTA's Bus Service Improvement Plan (BSIP) focuses on improving bus patronage by better integrating bus services for interchange and with other modes of transport. This Support Package will focus on providing advice to LTAs about how they can improve transport integration at various scales, particularly in rural settings where there is a more acute need to provide a higher-quality experience for passengers as services are often less frequent and more expensive due to lower demand. It is expected that by removing barriers to catching the bus in rural areas, such as poor availability of service information,

uncomfortable or inadequate waiting areas and shelters, and poor integration with other modes for onward travel, more people will make use of their local bus service.

Mobility hubs and interchange locations should make provision for multi-modal transfers. They should be highly visible and attractive places to wait with appropriate facilities provided for everyone. Effective multi-modal integration requires combined services information, timetabling, ticketing and, where possible, co-location with rail services.

Figure 1.1: Multi modal facilities at a COMO UK mobility hub.

While rural hubs and service integration did not form part of the focus of the BSIP programme, which focused on bus only improvements, the integration of existing and improved bus services into the wider transport network will be a key component of upcoming Local Transport Plans (LTP). This Support Package will help LTAs develop a strategic approach to key interchange hub proposals for their LTPs.

This Support Package provides guidance on developing the scope of rural hubs for different contexts, and case studies of effective examples of rural hubs and integration. It is anticipated that these can be used by LTAs to help inspire and inform the development of interchange hubs and adjustments to transport networks. It is intended that rail and major bus routes will be integrated with local transport such as walking networks, cycling networks, local buses, demand responsive transport (DRT), other taxis and vehicle share and commuter parking.

To help LTAs in their exploration of rural hubs, this note is set out as follows:

- **Section 2** provides an overview and discussion of typical requirements and specifications for rural hubs.
- **Section 3** looks at rural hub case studies at various scales and settings: small villages, large villages, market towns and coastal towns.
- **Section 4** considers the cost and risk impacts of introducing and implementing better amenities at rural bus hubs.

1.3 Further guidance

This note has been developed with inputs from a range of sources, including:

- *Mobility Hubs Business Case Guidance,* England's Economic Heartland, 2023
- *Future Mobility Hubs*, Arup and The Go-Ahead Group, 2021
- *Mobility Hub Design Guide,* Solent Transport, 2021

We recommend referencing these sources, in addition to this note, as you develop future initiatives incorporating rural mobility hubs.

2 Typical requirements and specifications

A mobility hub is a place where people can switch from one mode of transport to another with convenient facilities that encourage sustainable travel decisions. Currently, private vehicles are often the most convenient form of travel for people living in rural areas due to low service frequencies and sparsely-spaced routes on bus networks. The case for mobility hubs centres around reducing the compromises people need to make when deciding to switch to more sustainable transport modes, such as buses, by reducing barriers to catching the bus and introducing appealing incentives or motivators to using public transport.

2.1 Objectives and principles of a mobility hub

Mobility hubs aim to combine all modes (public, private, and shared mobility) to improve transport options and to improve the public realm.[1] There are six key objectives which should drive the design development and management of a mobility hub, which are shown in Figure 2.1, below.

Figure 2.1: Objectives of a rural mobility hub

Mobility hubs should be designed to enable efficient transfers between transport modes. [2]In addition, they can be developed to increase the use of sustainable modes of transport, to improve accessibility to transport, improve inclusivity, encourage active travel and to create a sense of place with improvements to a public space. [3]

When multiple mobility hubs are implemented within a region, the network of hubs connects people across this area and reduces the reliance upon cars by making it easy and appealing to use sustainable travel options such as public transport and active travel. This will have significant implications for meeting net zero targets, reducing pollution, improving access to employment and education for those who previously had poor access to public transport and for improving public health (especially when hubs facilitate active travel).

[1] Como UK. (2019) Mobility Hubs Guidance. Available from : 618d29b3d06c81de72c38fdc_CoMoUK Mobility hub guidance _Oct 2019.pdf (webflow.com)

[2] Solent Transport (2021) Mobility Hub Design Guide. Available from: https://www.solent-transport.com/hubguide.pdf

[3] ibid

When combined with even the smallest improvements to the public realm, mobility hubs can contribute to more liveable streets and vibrant neighbourhoods. These objectives can vary in importance depending on the local context. One of the key principles of a mobility hub is that there is no 'one size fits all' model, as each area will have different needs and spatial constraints.[4]

In a rural setting the execution of these objectives is likely to differ from a busy urban centre. Car usage is likely to be high in a rural area due to the lack of regular and reliable public transport, and so more emphasis will be placed on improving the public transport facilities to provide an alternative to a car. Many rural areas have a very low frequency bus service or poor infrastructure, including a lack of service information and bus shelters. This can give the impression to many people that using the bus is undesirable.

Rural mobility hubs can be developed to combat these problems and to make it easier and safer to take the bus. They can also provide a place to switch from one mode of transport e.g. a bike and then onto the bus for the rest of the journey.

At a rural hub it is important to consider the local context, the community, and existing public transport and shared mobility (e.g. bike share, car clubs etc) services. A mobility hub could be combined with other local services such as a village shop. Such shops are likely to be at the centre of the village and an ideal location for a hub. These shops or other local services could be supported by local interest groups, so that the community contributes to and benefits directly from the hub rather than the success being based solely on its quantitative commercial value. This could be through the community owning shares in the hub itself, where the local community contribute financially to the development of the hub and reap any financial revenues the hub produces. [5] Hubs could also be an opportunity for local 'friends of' organisations to look after the non-mobility features of the park such as the planters or pocket park. [6]

In turn the whole community benefits from an enhanced public space. By getting a community involved in the hub they are more likely to use it. This can help to develop a new 'community focal point', with new features and amenities for the community to enjoy.[7] By introducing a mobility hub within a local community, over time travel behaviours and attitudes are likely to change as more people use the hub and switch to sustainable transport modes. [8]

2.1.1 Design principles and characteristics of a mobility hub

There are three underlying principles which should inform the planning, design and implementation of rural mobility hubs:

1. Adaptability and function;
2. Identity and integration; and
3. Sustainable growth.

[4] Solent Transport. (2021) Mobility Hub Design Guide. Available from: Microsoft PowerPoint - Solent Transport Mobility Hub Design Guide Final Rev 2 (solent-transport.com)

[5] Loch Ness Hub. (2023) Business Plan and Community Share Rules. Available from: Share Offer Info & Rules (lochnesshub.com)

[6] Como UK. (2021) Mobility Hub Delivery Models. Available from: 618d298e5bbdb615db2f25da_CoMoUK Mobility hub delivery models_Oct 2021.pdf (webflow.com)

[7] Como UK. (2021) Mobility Hubs Toolkit. Available from: 618d2a1483ac3a158433e572_CoMoUK Mobility hubs toolkit_Oct 2021.pdf (webflow.com)

[8] Ibid.

2.1.1.1 Adaptability and function

Mobility hubs should be developed by considering the requirements of each individual hub and how it will be influenced by a range of local factors. However, they should still serve the same general function: integrate as many modes of transport as possible at the same location to provide seamless and adaptable journeys for all users.

That function can be fulfilled in many ways, and existing transport nodes often fit with the concept of a hub even if they are not branded as such. A bus stop located near to cycle hire and cycle parking is common, but the modes are still not perfectly integrated. Hubs can build on what is already provided at a transport node, improving the mobility offer and making transfer between modes easier and smoother.

The development of an existing bus stop, train station, or other transport interchange into a hub can occur in stages that are suitable for the context (see Section 2.4) depending on, for example, the funding and time frames available.

An initial stage could be the addition of live service information, bicycle parking, park and ride, and car sharing at a rural bus stop. Further stages could include improvements to bus shelters, addition of wi-fi and charging points, upgrades to key access routes to make them accessible, unified wayfinding to nearby destinations, parcel lockers, and toilets.

Hubs are also adaptable to the public realm that they sit in: a rural, suburban, and urban mobility hub will all look different and include different features, as they respond to different needs. However, regardless of the scale of investment or the situational context, a hub should be identifiable as such, for example by applying a consistent regional brand. Whatever they look like, a mobility hub should provide a focal point in a town, village or community centre.

2.1.1.2 Identity and integration

Mobility hubs are principally intended to better embed transport into the function of a town or rural area. Better transport connections, via a larger array of modes, are made possible by hubs, leading to improved journeys for everyone. As a result of the greater integration of transport, especially active and sustainable modes, the visibility of those modes increases. Especially for areas where cycling, walking and public transport are less well utilised, this can lead to positive behaviour change, as more people are able or willing to travel by other means.[9]

Hubs are able to influence travel behaviour and increase the use of sustainable transport both by making those modes more visible and by better integrating them into the public realm and into other connecting modes.

Hub design principles linked to that aim include:

- Facilitate multi-modal trips by co-locating different forms of transport in the same location;
- Provide first and last mile connections for longer-distance transport, e.g., micromobility options such as bike parking and bike or scooter hire at rural bus stops;
- Raise the profile and visibility of non-car transport options using clear and identifiable branding, in the form of pillar, totem or sign that signals the location as a hub;
- Integration of transport into the public realm by creating design features for the wider community in the form of green space or public facilities;
- Link into electric and shared vehicle facilities, reducing the need for private car usage;

[9] Como UK. (2021) Mobility Hubs Toolkit. Available from: 618d2a1483ac3a158433e572_CoMoUK Mobility hubs toolkit_Oct 2021.pdf (webflow.com)

- Coordination of timetables as far as possible, to allow seamless transfer between services and modes; and
- Integration of ticketing systems between operators and modes, including micromobility.

2.1.1.3 Sustainable growth

Mobility hubs also aim to promote the usage of sustainable transport modes, and aid in the transition to a low-carbon society. Hubs can do this by:

- Better enabling the use of walking and cycling to reach public transport nodes, thus encouraging car-free trips;
- Providing shared mobility options for cars, bicycles, and scooters, increasing transport options beyond the private car in rural and other areas;
- Including wider elements such as cycle repair, parcel lockers, and community hubs, improving the availability of services in rural areas;
- Building the use of public and active transport, reducing the need for car parking in suburban and urban areas;and
- Improving the overall transport offer and making each trip faster and easier, especially in rural areas

2.2 Mobility hub components in context

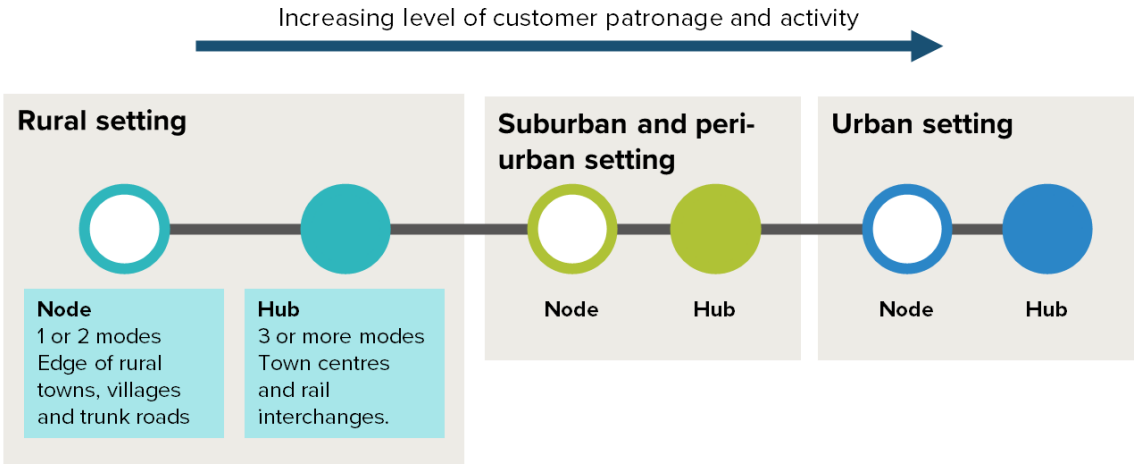
The location of a mobility hub will influence the components that should be included in its planning and design. Mobility hubs can exist in a variety of contexts: urban, suburban and peri-urban, and rural. Within these settings, functional requirements will further influence the scale and make up of the hub, and typically be categorised as either a **node** (where passengers are likely to enter or exit the main transport network) or as a **hub** (where passengers are likely to interchange between modes or access key destinations).

Rural nodes typically should support one or two modes and are situated in villages, at the edge of rural towns, and in isolated locations where they capture a dispersed population such as along trunk roads and at park and ride locations. They act as a “safe shelter” for bus passengers, and depending on the setting, could contain additional services and amenities beyond supporting basic interchange requirements.

Rural hubs typically should support three or more modes and are situated in town centres and at rail interchanges. They are typically co-located with, or near to, community services and amenities, such as rail stations, long-distance (inter-urban) coach stations, shops, parcel collection points, a community centre or library and other civic services.

Figure 2.2 shows the hierarchy of nodes and hubs across different contexts.

Figure 2.2: Different hub functions in different settings



These different settings are shown in the ARUP/Go Ahead Future Mobility Hubs. Figure 2.3 presents these settings.

Figure 2.3: Arup Mobility hubs. [10]

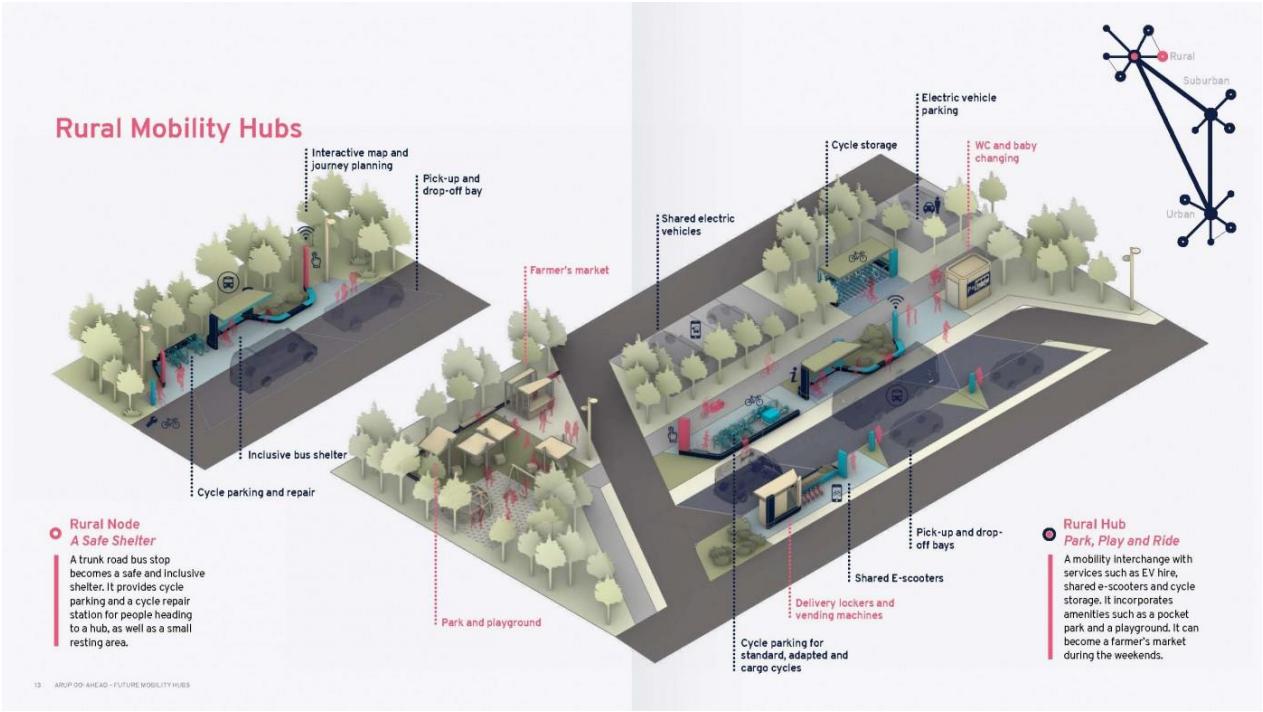


Table 2.1 shows the typical components that could be found at different types of rural hubs and nodes. Rows which are highlighted in blue are core components which should be included in any bus hub to provide a minimum level of service for passengers.

[10] Arup. (2021) Future Mobility Hubs. Available from: Future mobility hubs - Arup

Table 2.1: Components for different sized rural transport hubs, with core components for all hubs highlighted in blue.

Hub functionality	Component	Hubs		Nodes	
		Rural town centre	Rail interchange	Edge of rural town	Village
Relevant case study (See section 3)		North Walsham	St Erth	Swaveysey	Drumnadrochit
Public transport mobility	Local bus service	✓	✓	✓	✓
	Universal accessibility	✓	✓	✓	✓
	Demand Responsive Transport (DRT) bus service	✓	✓	✓	✓
	Regional rail service		✓		
	Taxi rank	✓	✓		
Non-public transport mobility	Car share	✓	✓	✓	✓
	Park and ride		✓	✓	✓
	Micromobility options (incl. E-scooters, bike shares etc)	✓	✓	✓	✓
Supporting mobility	Digital timetabling	✓	✓	✓	✓
	High quality bus shelter	✓	✓	✓	✓
	EV charging		✓		
	Bike parking	✓	✓	✓	✓
	Bike repair, pumps	✓			✓
	Wi-fi	✓	✓	✓	✓
	Phone charging	✓	✓	✓	✓
Placemaking and community	Improved public realm	✓	✓	✓	✓
	Traffic calming	✓			✓
	Safer crossing and street repairs	✓	✓	✓	✓
	High quality lighting	✓	✓	✓	✓
	Security	✓	✓	✓	✓
Community facilities	Toilets	✓	✓		✓
	Drinking water	✓	✓	✓	✓
	Package delivery lockers	✓	✓	✓	✓
	Co-working spaces	✓			✓
	Community space (e.g. seating areas, community garden)	✓			✓
	Post office	✓			✓
Other opportunities	Tourism hub (information, transit and tours)	✓	✓		
	Bike repair shop	✓			

2.3 Typical components of a rural mobility hub

Rural mobility hubs should be designed to fulfill their functional requirements:

- Mobility functions (public transport and non-public transport);
- Components supporting mobility functions;
- Placemaking and environmental functions (including branding and wayfinding); and
- Community functions and other opportunities.

The individual components of rural mobility hubs which support these four functional requirements are described in further detail below.

Specific components which are considered an **essential minimum requirement** for a rural mobility hub are marked with a blue bus, as shown on the left.

2.3.1 Mobility functions

2.3.1.1 Local bus services

A local bus service is an essential, core feature at all rural hubs, and the hub should ideally be implemented around or close by an existing bus stop. [11] However, the bus frequency will depend on the location. A rural village hub will perhaps have a few different routes operating around it, which connect the village to other towns and villages in the area. Bus services at mobility hubs are essential for promoting a shift from private vehicles to sustainable transport modes such as buses.

Figure 2.4:Simple mobility hub design with bus stop, information point, and bike parking. [12]

[11] Solent Transport (2021) Mobility Hub Design Guide. Available from: https://www.solent-transport.com/hubguide.pdf

[12] Mamba. (2018) Mobility hubs as part of the mobility centre. Available from: Mobility Hubs as a part of the mobility center - Mamba Project

2.3.1.2 Universal accessibility

All bus hubs must be universally accessible. This means providing a transport interchange that can be used by all potential bus users, including people who are disabled.

Considerations for universal accessibility include:

- Kerb heights to allow for bus boarding ramps to reasonably meet the kerb. These should provide a ramp between the kerb and the bus which is no steeper than 1:8;
  - Kerb heights will also be influenced by whether the local bus fleet can "kneel" to provide this maximum ramp gradient or otherwise minimise the horizontal gap.
  - Kerbs should aim to be between 125mm and 140mm above road level, with a minimum height of 100mm and a maximum height of 150mm above road level.
- Layout of bus stops, minimising street furniture which may inhibit movement for those who use mobility aids such as wheelchairs or walking frames.
  - Bus stop layout and shelter design should also allow for people to freely pass the bus stop if they are travelling along the street.
- Service information for passengers who may be blind, deaf, or illiterate.
- Direct safe cycle access including dropped kerbs. Clear defined route provided to cycle parking

2.3.1.3 Demand Responsive Transport (DRT)

Demand Responsive Transport systems are a useful feature at rural hubs to fill the journey gap created by infrequent bus services, and the inability to walk or cycle. [13] It could include a minibus service which can be booked in advance with pick up/drop off at the hub. DRT could also be an important feature at hubs in tourist locations, suburbs with poor bus services, and in new housing developments. DRT can complement the existing services which alone are not sufficient. [14]

2.3.1.4 Park and ride facilities

Park and Ride facilities can feature at all scales. Wherever there is a car park alongside a mobility hub that has a bus stop, a park and ride can develop. This will enable people to drive to the hub and switch to the bus for the rest of their journey. This can be important for rural hubs as people may not live within walking or cycling distance of the hub, but a car park can enable them to drive part of their journey and complete the rest on the bus, a more sustainable transport mode.

2.3.1.5 Regional rail service

Mobility hubs are designed to enable the transfer from one mode to another and therefore having a hub close to a regional rail service would be hugely beneficial in delivering the aims and objectives of a hub. These rail services often already have existing bus stops close by as well as facilities that cannot necessarily be moved such as a cafés and bike parking. Consequently, they could provide a good base from which to improve the existing transport services through the development of a hub. However not all locations will have a rail service, especially rural settlements and new housing developments. It is therefore not an essential mobility aspect of a hub. Yet if these rail services do exist, they could be seen as a point of

[13] Como UK. (2019) Mobility Hubs Guidance. Available from: 618d29b3d06c81de72c38fdc_CoMoUK Mobility hub guidance _Oct 2019.pdf (webflow.com)

[14] Como UK. (2019) Mobility Hubs Guidance. Available from: 618d29b3d06c81de72c38fdc_CoMoUK Mobility hub guidance _Oct 2019.pdf (webflow.com)

opportunity to introduce a hub and connect existing transport infrastructure. These interchanges with multiple significant transport modes could be transformed into large mobility hubs.

Figure 2.5: Rural Mobility hub in the Netherlands with bike storage, a bus stop and rail service [15]

2.3.1.6 Taxi rank

A taxi rank could be implemented at a variety of hubs to provide an interchange point between private taxi services and public or shared modes of transport. This can be a pre-booked service and collaborate with existing local taxi services.

2.3.1.7 Car share scheme

A car club or car share scheme plays an important role in removing the need for a private vehicle at all scales. There is a greater opportunity for shared modes in urban centres, but smaller scale schemes can work in more rural locations. [16] Access to an on demand shared vehicle enables users to complete various trips which can require a car such as a food shop or moving bulky goods, without the personal cost and upkeep of owning their own car. [17] Sharing of vehicles also improves the efficiency of on street parking. Car schemes can be implemented at various types of hubs including at urban centres, suburban hubs and at new housing developments, and at a village hub, however the scale of these schemes may differ. The community should be involved in the hub development process to investigate if a car share

[15] UITP. (2022) Combining transport solutions to solve rural mobility challenges. Available from: || Combining transport solutions to solve rural mobility challenges | UITP ||

[16] Solent Transport (2021) Mobility Hub Design Guide. Available from: https://www.solent-transport.com/hubguide.pdf

[17] Arup and Go Ahead. () Future Mobility Hubs. Available from: https://www.arup.com/-/media/arup/files/publications/f/arup-future-mobility-hubs.pdf

scheme would be well received. Car shares require dedicated parking spots and potentially electric charging points.[18]

Figure 2.6: Two car share schemes at mobility hubs in Bremen, Germany and Exeter, UK. [19]

2.3.1.8 Micro-mobility schemes (E-bikes, E-scooters)

Micro-mobility features such as bikes, E-bikes and E-scooters can be implemented at mobility hubs to provide another sustainable transport mode. These facilities are often provided by an external operator and may just need a small designated parking, or a charging station as well depending on the type of equipment. [20] These micro-mobility features can also be bought and owned by the hub operator, who will then receive the revenue from them. [21] Micro mobility is useful for short and local journeys. E-scooters will be better suited to an urban environment, whereas E-bikes and bicycles are more versatile and can be used for longer distances and in rural areas. At a larger hub in a town centre, a mixture of micro-mobility options could be used to provide a range of shared transport services for different types of journeys.

Rental bikes, bike racks and bike storage at a mobility hub provide sustainable transport options. Bikes are useful for short-medium length trips. Bike storage and racks at a mobility hub enable part of a journey to be made by bike, and the rest another mode. It is important to have secure storage facilities such as in figure 2.9, to ensure that users can leave their bikes safely at the hub, which in the long run installs confidence and encourages travel behaviour change.

[18] Urbanism Next. (2023) Mobility Hub Elements. Available from: Mobility Hub Elements - The Nexus - Urbanism Next

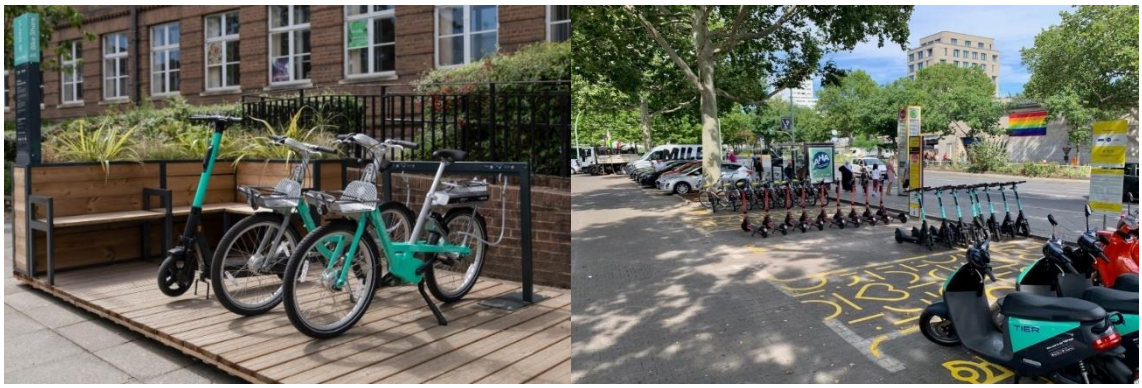
[19] Attwood, J. (2022) New Exeter mobility hub given award for adding transport options. Available from: New Exeter mobility hub given award for adding transport options | Move Electric and Como UK. (2019) What are mobility Hubs. Available from: Mobility hubs > Overview and benefits (como.org.uk)

[20] Solent Transport (2021) Mobility Hub Design Guide. Available from: https://www.solent-transport.com/hubguide.pdf

[21] Solent Transport (2021) Mobility Hub Design Guide. Available from: https://www.solent-transport.com/hubguide.pdf and Como UK. (2021) Mobility Hub Delivery Models. Available from: 618d298e5bbdb615db2f25da_CoMoUK Mobility hub delivery models_Oct 2021.pdf (webflow.com)

Figure 2.7: Bike storage at a mobility hub in Groningen, Netherlands. [22]

Figure 2.8: Micro-mobility bikes and scooters in the UK and Berlin. [23]



[22] SMARTA. (2023) Mobility Hubs. Available from:The SMARTA Project » Mobility hubs (ruralsharedmobility.eu)

[23] SMARTA. (2023) Mobility Hubs. Available from:The SMARTA Project » Mobility hubs (ruralsharedmobility.eu) Trafi. (2021) How mobility hubs increase MaaS usability. Available from: How mobility hubs increase MaaS usability – Trafi

Figure 2.9: Secure bike storage options. [24]

2.3.2 Supporting mobility elements

The success of a mobility hub is not only related to the transport modes provided. The passenger and waiting experience needs to be considered and improved to create a coherent and successful hub. The intention of developing a mobility hub is to expand upon the transport offer at a location, and to link into improvements to the urban realm and neighbourhood area.

Additional elements provided at a mobility hub not only help facilitate the use of the hub by passengers, but also provide a better environment for the wider community. These elements form two of the six 'success factors' laid out by CoMo UK in their guidance on creating successful mobility hubs: Visibility & Accessibility and Practical Facilities (non-transport facilities).[25]

2.3.2.1 High quality bus shelter

Provision of a high-quality shelter and waiting area is essential for buses to be seen as a positive choice for potential users' transport options. What constitutes a 'high quality' shelter will vary depending on the situational context of each hub but should always help create a good travel experience.

As a minimum, a safe, covered area should be provided. Bus shelters should be sized appropriately for the number of passengers using the hub, and provision made for modular expansion should passenger numbers increase.

Regardless of passenger numbers, though, a shelter of some form should be provided. This can look very different in a rural area and in the centre of a major city.

[24] Andre Stocker Design. (2017) Mobility stations Osnabruck and Mobility Stations Kiel. Available from: Home - André Stocker Design (andre-stocker.de)

[25] CoMoUK (2023) *Starting and running successful hubs*. Accessed 12 January 2023 at https://www.como.org.uk/mobility-hubs/starting-and-running-successful-hubs

Figure 2.10: Paris 'Bus stop of the future' - a high-quality urban bus shelter at a busy location[26]

2.3.2.2 Signage and branding

High quality signage and consistent, comprehensive branding is important to raise the visibility and awareness of hubs. This is especially true in rural areas where people may be less aware of the bus services available to them. Consistency in branding is required to ensure that a sense of familiarity is created for users, and hubs can be easily identified as such.[27] This could easily be achieved by the development of:

- Consistent signage, including logos and fonts
- Common colour scheme across all elements
- Identical materials for all hubs in the same area
- Matching equipment choices (e.g. seating, cycle hoops, shelter design)
- Distinctive surfacing or other elements to make the hub locations stand out

Branding could be provided at a city or region wide level, depending on the extent of a hub network. Ideally, hub branding should be separate from operator branding, especially where multiple operators exist in the same region.

[26] The Bus Stop of the Future (2012). Available from: https://soundlandscapes.wordpress.com/tag/paris-bus-stops/

[27] Solent Transport (2021) Mobility Hub Design Guide. Available from: https://www.solent-transport.com/hubguide.pdf

Figure 2.11: Clear 'hub' branding used for mobility hubs in the Dutch regions of Groningen and Drenthe[28]

2.3.2.3 Welcoming and comfortable waiting area

Alongside a safe shelter and clear signage, a good hub should have improvements to the wider public realm to create an inviting waiting area outside of the shelter itself. In many cases, this could include greenery. Planters, pocket parks, community gardens, and other installations not only make a better waiting experience for bus users, but also make the streetscape generally more inviting and welcoming for everyone.[29] Other elements that improve the passenger experience and also provide wider benefit to the community could include CCTV coverage, better lighting, and wider safety features such as natural surveillance, anti-ram bollards and secure bike parking.[30]

These components are covered in more detail in Sections 2.3.3 and 2.3.4.

2.3.2.4 Digital timetabling

A bus hub should provide accurate real-time information about bus arrivals. Especially in rural areas where frequencies and confidence in published schedules will be lower, real-time info is helpful in giving passengers comfort while they are waiting. Time spent waiting for transport is perceived as longer than time spent moving on transit, but that difference in perception is reduced when real-time info is provided.[31] A better overall journey experience can thus be offered to passengers when they are able to trust estimated bus

[28] Reisvia Hub (2023), *Hub facility in at junction in Borger (N34)*. Accessed 12 January 2023 at https://www.reisviahub.nl/hubs/ov-knooppunt-borger-n34/

[29] Arup and Go Ahead. (2021) Future Mobility Hubs. Available from: https://www.arup.com/-/media/arup/files/publications/f/arup-future-mobility-hubs.pdf

[30] Solent Transport (2021) Mobility Hub Design Guide. Available from: https://www.solent-transport.com/hubguide.pdf

[31] Mishalani, R G et al (2006), *Passenger Wait Time Perceptions at Bus Stops: Empirical Results and Impact on Evaluating RealTime Bus Arrival Information*, Journal of Public Transportation, Vol. 9, No. 2, 2006. Accessed 13 January 2023 at https://digitalcommons.usf.edu/cgi/viewcontent.cgi?article=1271&context=jpt#:~:text=The%20main%20hypothesis%20of%20this%20study%20is%20that,update%20the%20expected%20time%20while%20the%20passenger%20waits.

arrival times. New technologies such as low power e-ink displays can reduce the up-front installation costs of RTPI, especially in rural hub locations where an mains electricity connection would be difficult to achieve. Solar power or small scale wind power generation could also be an option where suitable, to provide the power needed for digital timetabling. Where real-time information cannot be provided, up-to-date physical timetables should be installed in accessible formats.

Figure 2.12: Electronic real-time information screens at a bus stop in Scotland showing estimated arrivals for all services[32]

[32] Diouri, Anita (2020), *New real-time bus timetables implemented at stops between Perthshire and Dundee*, The Courier. Accessed 12 January 2023 at https://www.thecourier.co.uk/fp/news/perth-kinross/1566772/new-real-time-bus-timetables-implemented-at-stops-between-perthshire-and-dundee/

Figure 2.13: E-ink style real-time information at a Transport for London bus stop[33]

2.3.2.5 Cycling and micromobility facilities

Alongside cycle hire and e-bike facilities, a mobility hub should provide ample cycle parking. Any cycle parking infrastructure should allow for safe and secure storage of cycles, including cycle lockers where appropriate in addition to covered sheffield stands. Reliable CCTV coverage of the area is also helpful in providing a perception of safety, but does not overcome the value of good natural surveillance and lighting. There should be sufficient parking space to allow for future growth, especially for rural hubs where cycling from nearby villages is expected. Additionally, any cycle parking should allow for different types of cycles to be stored securely (cargo bikes, e-bikes, recumbent bikes / arm-powered cycles). Cycle repair facilities should also be provided at a hub, particularly in rural areas where access to specialised cycle repair shops may be limited. At a minimum, an air pump and basic set of tools would benefit users.

[33] New Atlas (2015), *Transport for London tries out e-ink signage*. Available from https://newatlas.com/transport-for-london-e-ink-displays/41055/

Figure 2.14: Cycle repair stand included near large cycle parking at Paddington station in London.[34]

Figure 2.15: Simple mobility hub design in rural/suburban location enabling interchange between bicycles, scooters and bus [35]

[34] Cyclehoop. Public Bike Repair Stand (2023). Available from https://cyclehoop.com/product/public-bike-repair-stand/

[35] ALTA. (2022) Mobility Hubs Just aren't for big cities. Available from: Mobility Hubs Aren't Just for Big Cities | by Alta | Alta (altaplanning.com)

2.3.2.6 Wayfinding and interchange

Bus hubs should integrate with as many modes as possible. Co-location between buses, long-distance coaches, trams, rail, micromobility, car-sharing, and any other modes present provides the greatest benefit to all users. The closer that modes are to each other, the more positive the interchange experience will be. Alongside the distances between the actual modes (which should be as small as possible), clear wayfinding and signage is essential. Good wayfinding includes not only passengers' routes through the interchange point, but also access routes to and from the hub for the surrounding area. Walking and cycling routes should be clearly marked for local destinations and points of interest.

2.3.2.7 Other passenger facilities

While less necessary for the creation of a successful hub, many other amenities can be provided for passengers to further improve their experience. Wi-Fi and phone charging can be a quick benefit, particularly for rural areas where phone signal may be less consistent. These could be easily installed alongside an introduction of lighting / real-time information / etc. E-bike or E-scooter charging facilities should also be an aspiration, both for interchange opportunities and to benefit the wider community.

2.3.3 Placemaking

Developing mobility hubs is an opportunity for place-making in rural towns. It is essential that the spaces associated with sustainable transport options such as walking, cycling and catching the bus are inviting and pleasant, to not only make these transport options more appealing, but also to improve or maintain the wellbeing of those who are reliant on these modes of transport.

The *Healthy Streets* approach is built around this concept and uses 10 indicators to help assess and guide the design of streets to encourage walking, cycling and public transport use. These indicators can be used to help influence decisions around place-making components for bus hubs in rural areas. More information on the Healthy Streets approach can be found at https://tfl.gov.uk/corporate/about-tfl/how-we-work/planning-for-the-future/healthy-streets.

Figure 2.16: Healthy Streets indicators

2.3.3.1 Improved public realm

General urban design upgrades and improvements to the public realm are the easiest way to support placemaking around bus stops. This could include:

- Upgrading footpaths and plazas to tiled or paver surfacing to provide wider, flatter footways;
- Continuous footpath treatments across side roads to reduce vehicle speeds and prioritise pedestrians;
- Cycle parking with good cycle up access;
- Areas for people to relax, loiter or sit. These could be either permanent or “pop up”, like that shown in Figure 2.17;
- Shade and shelter to protect from the sun, wind and rain;
- Greening, with new trees, planter boxes, or in-ground planting; and
- Improved lighting, wayfinding and information signage (see sections 2.3.2.3, 2.3.2.6 and 2.3.3.4).

Figure 2.17: Village hub with cycle storage, bus stop and improvements to the public realm.[36]

2.3.3.2 Safer crossing and street repairs

Safer crossing points are an essential element of placemaking at rural hubs. Crossing points around bus hubs should easily allow for anyone to comfortably cross the road at a pace that is suitable for them. Typical considerations for safer crossing points include:

[36] CoMo UK. (2023) The design process-mobility hubs realised. Available from 630f763354842c66afddb22c_CoMoUK The design process - mobility hubs realised.pdf (webflow.com)

- Raised zebra crossings with good lighting and visibility;
- Reduced crossing distances through kerb build-outs;
- Where it is inappropriate to construct a zebra crossing, signalised Pelican crossings;
- Street maintenance and repairs, such as ensuring signage and pavement markers are clearly visible and well maintained;

Grade-separated crossings for pedestrians should be avoided. Not only are these significantly more expensive to construct, they prioritise vehicle movements over pedestrians by significantly increasing the amount of time, effort and distance it takes for a pedestrian to cross a road.

2.3.3.3 Traffic calming

Reducing and managing the speed of vehicles around bus hubs is important as it improves actual and perceived safety for people waiting and travelling to bus hubs. Roads with vehicles travelling at lower speeds are also likely to be quieter, increasing amenity for people using public spaces. Typical traffic calming measures around bus hubs include:

- Reduced speed limits, down to 20mph to reflect potentially higher levels of pedestrian and cyclist activity;
- Speed cushions and speed tables designed for buses;
- Chicanes;
- Lane and carriageway narrowing;
- Vehicle activated signage;
- Additional speed zone signage; and
- if appropriate due to local accident history, speed cameras.

2.3.3.4 High quality lighting

Effective evening lighting at rural bus hubs and on approach routes to hubs is essential to address real and perceived safety issues for people waiting at and travelling to or from bus hubs. Lighting should be planned in coordination with any wayfinding plan for rural bus hubs, providing a well-lit and clear route between the bus hub and nearby key origin or destination points.

Lighting for areas around bus hubs should be in line with *BS 5489-1:2020 Design of road lighting - Lighting of roads and public amenity areas*, as well as any local relevant technical guidance and Local Plans.

Lighting schemes will need to consider light spill and glare into nearby properties, onto adjacent roads, and how higher isolux levels might impact local wildlife.

2.3.3.5 CCTV and CPTED

Bus hubs should be situated and designed in line with the principles of crime prevention through environmental design (CPTED), so that passive surveillance of waiting passengers is possible from both the adjacent road carriageway and nearby properties. Bus hubs should not be placed in isolated locations away from properties that are unlikely to be continuously occupied.

In addition to this, CCTV systems should be included at all bus hubs to address real and perceived safety issues for people waiting at bus hubs, and those travelling to or from bus hubs. CCTV should not be considered as the single solution for passenger safety at rural bus hubs, and the development of any bus hub scheme should include a safety risk assessment that identifies the role of CCTV amongst other safety measures such as CPTED. CCTV systems at

rural bus hubs should also be incorporated into existing surveillance and monitoring systems to reduce cost to implement and increase viability of such as a solution.

The Department for Transport has published guidance around security at bus hubs with the Bus and Coach Security Recommended Best Practice (Third edition).

2.3.4 Community components and further opportunities

2.3.4.1 Toilets

At larger hubs with more facilities, or those that might have longer waits between services, it may be important to build public toilets. [37] If there are budgetary and/or spatial constraints it would be beneficial to have even just one accessible toilet at a hub. [38] However, in a small rural village or a housing development use will be less frequent whereas in a larger town a public toilet will be more important. In rural areas if there is already an existing public toilet in the area, having wayfinding and information about how to get to this point would be helpful.

2.3.4.2 Drinking water

Water fountains will provide customers with water on the go. Whilst not an essential feature it can improve a space, however consideration needs to be taken with how frequently this will be used, the pipework's and the local water company. [39]

Figure 2.18: Water fountain at the mobility hub in Grootegast, Netherlands. [40]

2.3.4.3 Package delivery lockers

Last mile journeys for deliveries contribute to congestion and pollution. Package delivery lockers provide an opportunity to remove this last mile, and instead customers can pick up their parcels

[37] Solent Transport. (2021) Mobility Hub design guide. Available from: Microsoft PowerPoint - Solent Transport Mobility Hub Design Guide Final Rev 2 (solent-transport.com)

[38] Ibid.

[39] Ibid.

[40] Google Streetview (2021), *100 Hoofstraat*. Available from: https://www.google.co.uk/maps/@53.2134413,6.2766912,3a,75y,106.07h,87.95t/data=!3m6!1e1!3m4!1sfL0g-XFisEOOIsCOHS0pmQ!2e0!7i16384!8i8192?hl=en-GB

at the transport hub. Parcel hubs therefore bring an indirect benefit for people living in the area, and a direct benefit as it is useful to be able to pick up parcels locally. Parcel hubs could also bring in revenue for the hub operator and help offset maintenance costs of the bus hub.

Technical considerations when implementing a parcel locker including the security of the locker, lighting, power supply and vehicle access for delivery and servicing. Parcel lockers can differ in size and type and are therefore flexible and could be used at a variety of different hub types and locations. However, they may be most suited to suburban hubs with a residential focus where many passengers pass through on their way home as part of their daily commute. [41] If implementing parcel lockers at a mobility hub, it is essential to ensure that there are suitable drop off locations for delivery and servicing vehicles.

Parcel lockers have been introduced at community hub locations across the UK in partnership with logistics and delivery companies, such as Amazon and InPost. These have been installed at rail stations, supermarkets and petrol stations. Bus stop parcel lockers are currently not common in the United Kingdom, however can be frequently found in countries like the Netherlands and Estonia.

Figure 2.19: Parcel locker at Buckhurst Hill London Underground Station in outer suburban London. [42]

2.3.4.4 Co-working spaces

A co-working space could be developed at a hub, providing a communal space to work away from home. This would require a suitable working-from-home population living within the vicinity of the hub, and potential usage could be tested with the local community. These could be

[41] Como UK. (2021) Mobility Hub delivery models. Available from:618d298e5bbdb615db2f25da_CoMoUK Mobility hub delivery models_Oct 2021.pdf (webflow.com)

[42] Dowey, M. (2022) Blog: introducing the mobility hub concept. Available from: CoMoUK News > Blog: Introducing the mobility hubs concept and De Buren. (2023) Sending and Returning Parcels. Available from: Sending and returning parcels - De Buren

developed at a hub next to a residential development as there would already be a large population here who would value the space and could get to the hub easily. [43] There is also a potential to gain a revenue from a co-working space.

2.3.4.5 Community space

A hub provides an opportunity to improve the public realm, and this can be achieved by creating a community space. This could be a shared garden, or simply with benches and planters. These features help to create a sense of place and something which belongs to the community. It also makes the hub a more attractive, green and healthy place. [44] This feature can vary in scale considerably depending on spatial constraints. These spaces are also an opportunity to involve the local community and local interest groups who could help maintain the community space. They can be implemented in rural hubs right up to hubs in an urban centre, with varying features accordingly. Additional community features which could be implemented such as a community notice board and book swap cupboards at bus stops.

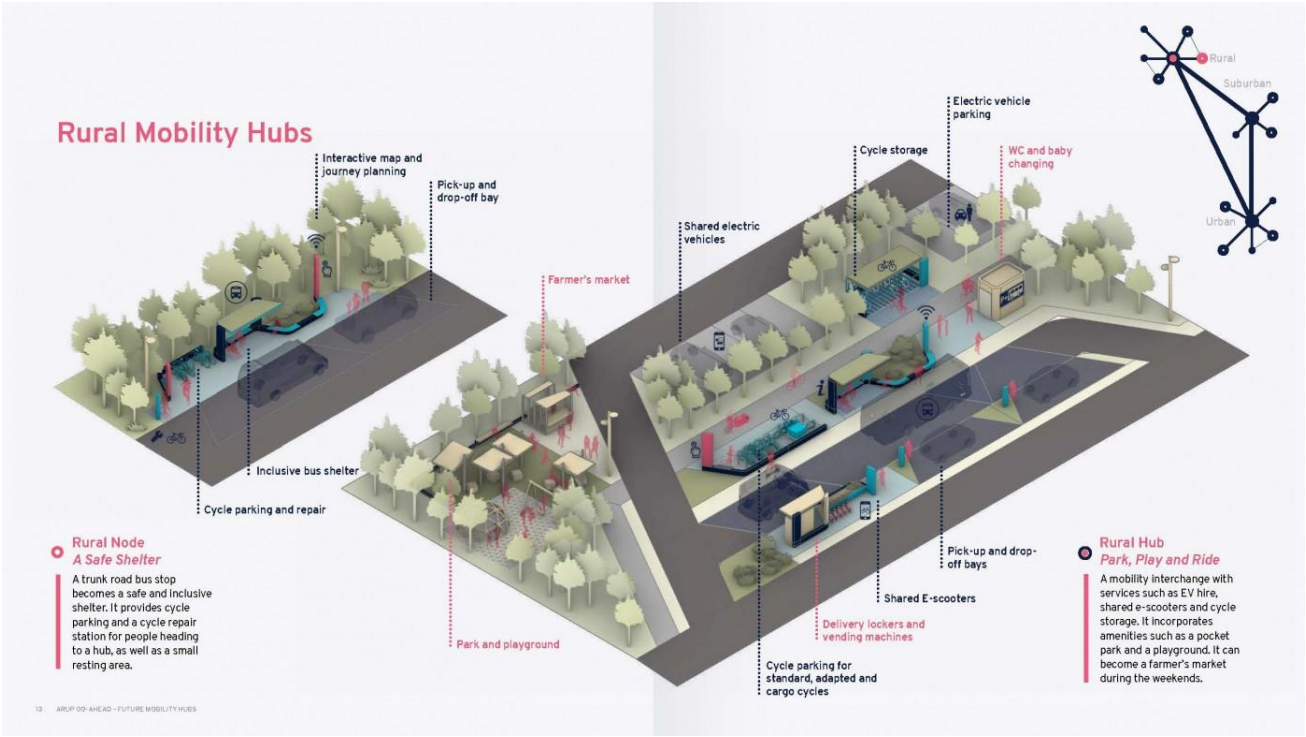
Figure 2.20: Community space at the mobility hub at Redbridge, London. [45]

[43] Como UK. (2021) Mobility Hub delivery models. Available from:618d298e5bbdb615db2f25da_CoMoUK Mobility hub delivery models_Oct 2021.pdf (webflow.com)

[44] Arup and RISE. (2020) Mobility hubs of the future. Available from: https://www.ri.se/sites/default/files/2020-12/RISE-Arup_Mobility_hubs_report_FINAL.pdf

[45] South Woodford Village Gazette. (2020) Redbridge's first mobility hub to be installed in south woodford. Available from: https://swvg.co.uk/2020/09/02/redbridges-first-mobility-hub-to-be-installed-in-south-woodford/

Figure 2.21: Future Mobility hub designs with community spaces such as farmers market and parks. [46]



2.3.4.6 Post office

A post office is a good place to build a hub, as they are often centrally located and support a local population. The post office facility at a hub enables users to combine travel with small daily errands. [47] If there is a post office in an appropriate location and with existing transport links, then it is worth considering whether a hub could be developed here. It is unlikely to be suitable at all types of hubs as it requires an existing facility, and many rural areas will not have a post office.

2.3.4.7 Recreational services and facilities

At larger hubs or at hubs where users are likely to spend more time, it could be important to provide facilities such as a café. This makes a hub and the travel experience 'more convenient and enjoyable' and contributes to creating a sense of place. [48] Existing local shops and cafes close by the hub could also work with the hub or have wayfinding information to the local services. By having other facilities like this at the mobility hub, the time the user spends at the hub will increase. Other types of users will also be attracted to the hub, and they may begin to use the transport facilities as well. [49]

[46] GS. (2021) The future is mobility hubs. Available from: https://www.guildfordsociety.org.uk/Arupbus.html

[47] Arup and RISE. (2020) Mobility hubs of the future. Available from: https://www.ri.se/sites/default/files/2020-12/RISE-Arup_Mobility_hubs_report_FINAL.pdf

[48] Arup and RISE. (2020) Mobility hubs of the future. Available from: https://www.ri.se/sites/default/files/2020-12/RISE-Arup_Mobility_hubs_report_FINAL.pdf

[49] ibid.

Figure 2.22: Facilities including a café at a future mobility hub. [50]

2.3.4.8 Tourism hub

These hubs focus on services for tourists and are likely to provide seasonal services. They should also aim to provide services for local residents as well. Tourist hubs can be integrated within the existing transport systems and ticketing systems. They are often likely to be in rural tourist areas where public transport is limited and the negative impacts of tourism such as congestion affect the local population. [51] Hubs in these locations can promote a shift to sustainable modes to alleviate these pressures and reduce congestion. Some of the features at a tourism hub would include e-bikes, bus services, DRT, car clubs, shuttle services and an information centre with local products for sale.

[50] Arup and Go Ahead. (2021) Future Mobility Hubs. Available from: https://www.arup.com/-/media/arup/files/publications/f/arup-future-mobility-hubs.pdf

[51] Como UK. (2019) Mobility Hub guidance. Available from:618d29b3d06c81de72c38fdc_CoMoUK Mobility hub guidance_ Oct 2019.pdf (webflow.com)

Figure 2.23: Loch Ness tourist mobility hub. [52]

2.3.4.9 Bike repair shop

Bike repair shops are a popular option for transport hubs, especially those which have bike storage and rental services. A bike repair shop can vary in scale from a lockable cycle shelter with tools, to a physical space with staff. A larger shop would be suitable at a hub in an urban centre whereas a shelter with tools would be better suited to a rural hub. [53] With cycle facilities it is important to consider the security options.

Figure 2.24: Bike repair facilities. [54]

[52] Visit Inverness. (2023) Loch Ness Hub. Available from: Loch Ness Hub | Visit Inverness Loch Ness

[53] Como UK. (2021) Mobility Hub delivery models. Available from: 618d298e5bbdb615db2f25da_CoMoUK Mobility hub delivery models_Oct 2021.pdf (webflow.com)

[54] Richardson, T. (2015) Forget Candy, Ride Saving Purchases get easier with smaller, wall mounting vending machine from fixation. Available from: https://bikerumor.com/forget-candy-ride-saving-purchases-get-easier-with-smaller-wall-mount-vending-machine-from-bike-fixtation/

2.3.4.10 Last mile cargo-bike logistics store

Cargo bikes are important for last mile deliveries, as they reduce congestion and produce less emissions than cars. These could be stored at mobility hubs to create 'micro-depots'.[55] These would be useful for a mobility hub in a suburban, residential area where traditional delivery methods cause disruption. The cargo bikes would therefore need to be placed at hubs with a local population which can be reached safely and quickly by bike.

Figure 2.25: eCargo bike store in Ilkley, UK. [56]

2.4 Implementing mobility hubs

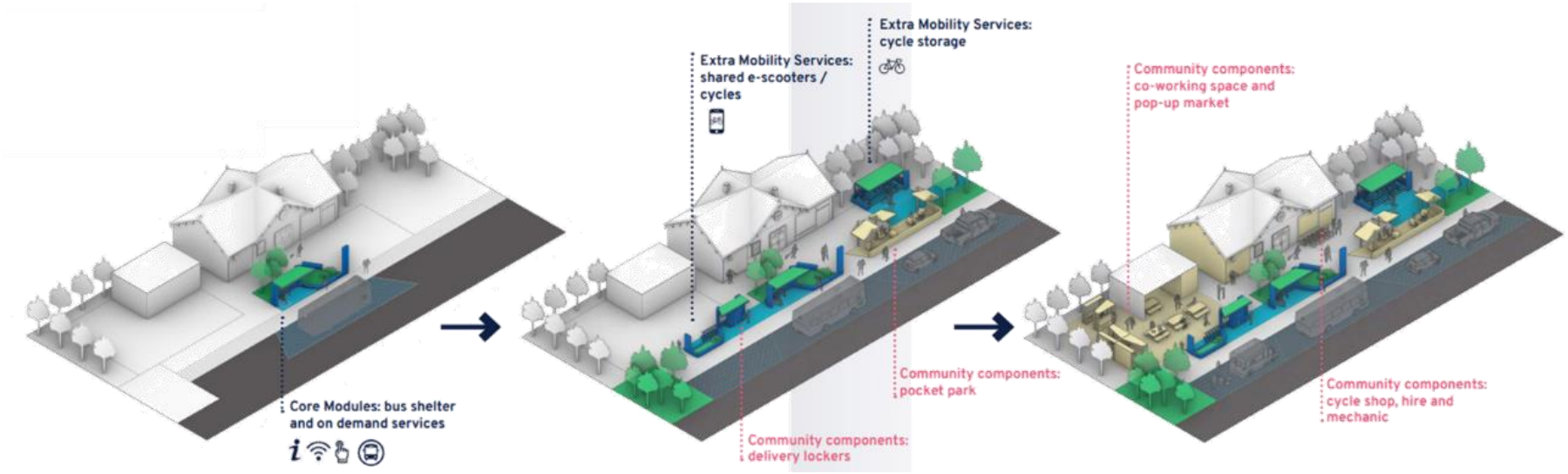
Mobility hubs are rarely implemented in one phase as a new construction. Rather, they build off existing transport infrastructure. Elements of the mobility hub 'kit of parts' are added, and a consistent branding applied, turning a typical transport node into a complete mobility hub. This can be broken down into a number of phases, as shown below. Public consultation should be carried out in the early stages of implementing mobility hubs. This ensures that the hubs are built around the needs of the local people, which will create a hub that the local community wants to use. Over time this will help to change local travel behaviour.

The level of public consultation will depend highly on the setting of the hub. A rural village with a small, local community could be a place to cater a hub to local needs and to work with local interest groups. These groups can be found through public consultation within the community.

[55] IAA. (2023) Micro-mobility: cargo bikes for the last mile. Available from: Micromobility: cargo bikes for the last mile | IAA TRANSPORTATION (iaa-transportation.com)

[56] Climate action Ilkley. (2023) Electric Cargo Bikes. Available from: CAI – Cargo Bikes – Tackling Climate Change together (climateactionilkley.org.uk)

Figure 2.26: Example three-stage implementation of a mobility hub, each step further developing existing infrastructure[57]



[57] Arup and Go Ahead. (2021) Future Mobility Hubs. Available from: https://www.arup.com/-/media/arup/files/publications/f/arup-future-mobility-hubs.pdf

2.4.1 Phase 1: Improvements to baseline

- Identify potential hub locations, based on strategic location and location of existing transport infrastructure;
- Implement some improvements to what is already present at the transport node. This could include the addition of or expansion of a bus shelter, provision of wi-fi, real-time information, or other services;
- Ensure that the location is fully accessible, both for boarding at the stop, as well as for access to and from the hub (clear and level access routes); and
- Begin introducing hub branding to the location and increase the visibility of available transport modes.

2.4.2 Phase 2: Additional modes and community integration

- Expand upon existing cycle parking, or install parking, as close as possible to the transport stop;
- Provide micromobility hire at the location if a system is available in the area (e-bikes, shared cycles, e-scooters, etc.);
- Integrate elements for the wider community to better integrate the transport hub into the public realm: parcel delivery lockers, pocket park, etc.; and
- Continue improving the passenger experience with more facilities.

2.4.3 Phase 3: Multifunctional hub

- Further extend intermodality with the addition of emerging technologies (DRT / other) and additional shared mobility (car club, cargo cycles, etc.);
- Integrate other community functions into the space to make the hub more of a destination in its own right (café, coworking, community centre); and
- Continue improving the passenger experience with more facilities.

Mobility hubs are adaptable and dynamic according to their specific location and conditions. There is no prescribed end result, nor process of developing a hub, so long as the main objective of facilitating multimodal journeys and improving passengers' experience is met.

3 Case studies: multi-modal rural interchanges

The following case studies will look at examples of multi-modal rural interchanges in a variety of rural settings and settlement types, namely small villages up to approximately 1,000 residents; large villages with between approximately 1,000 and 4,000 residents; market towns, with between approximately 4,000 and 8,000 or more residents; and coastal settlements of varying sizes, with typical geographical and demographic features such as seasonal population variations and catchments constrained by water or landmass changes.

The settlements identified for these case studies are:

- **Small villages:**
  - Drumnadrochit, Scotland
  - Dieverbrug, Netherlands
- **Large villages:**
  - Swavesey, Cambridgeshire
  - Siddeburen, Netherlands
- **Market towns:**
  - North Walsham, North Norfolk
  - Leek, Netherlands
- **Coastal settlements:**
  - St Erth, Cornwall
  - Leven, Scotland

3.1 Small Village

3.1.1 Drumnadrochit, Scotland

Drumnadrochit is a small village with an approximate population of 1130 people[58] located on the northwest shore of Loch Ness, approximately 30 minutes' drive from Inverness[59] in the Scottish Highlands. It is popular with tourists exploring the highlands and Loch Ness,[60] and is located on the 73-mile footpath the Great Glen Way. As a result, a large number of walkers visit the village.[61] Local buses run through Drumnadrochit to Drum and Inverness bus stations.[62] More services operate in the summer season when there are greater numbers of tourists. The village itself has lots of accommodation, cafes and restaurants as well as the Loch Ness Hub, a small building containing tourist information and a transport facility. The Loch Ness Hub is located in the main Drumnadrochit car park towards the south of the village, surrounded by a selection of shops and restaurants, as shown in Figure 3.1 and Figure 3.2.

Functionally, the bus hub in Drumnadrochit falls into the category of rural village bus hub.

[58] National Records of Scotland. (2020) Mid-2020 Population Estimates for settlements and localitites in scotland. Available from: Mid-2020 Population Estimates for Settlements and Localities in Scotland | National Records of Scotland (nrscotland.gov.uk)

[59] Inverness things to do. (2023) Drumnadrochit. Available from: Drumnadrochit Village Scotland | Inverness Things To Do

[60] Visit Scotland. (2023) Drumnadrochit. Available from: Inverness Visitor Guide - Accommodation, Things To Do & More | VisitScotland

[61] Undiscovered Scotland. (2023) Drumnadrochit. Available from: Drumnadrochit Feature Page on Undiscovered Scotland

[62] Stagecoach. (2023) 17 bus route and timetable. Available from: 17 Bus Route & Timetable: Inverness [Bus Station] - Drumnadrochit | Stagecoach (stagecoachbus.com)

Figure 3.1: Map of Drumnadrochit and the Loch Ness Hub.[63]

Figure 3.2: The Loch Ness Hub.[64]

Key features of the hub include e-bike hire, community e-bike trials, baggage and shuttle transfers, long distance coach pick-up and drop-off, and pick up and drop off for day tours to the Isle of Skye and Urquhart Castle.[65] Whilst there is not a public bus stop at the hub, the bus stop for the village is less than 100m away or a minutes' walk. This enables users from the public bus service and the travel hub to connect and use both services easily, as shown in Figure 3.3.

[63] Google Maps. (2023) Drumnadrochit. Available from Drumnadrochit - Google Maps

[64] Loch Ness Hub. (2023) Welcome to Loch Ness Hub. Available from: Loch Ness Hub - Loch Ness, Tourist Information, Transport Hub & Travel Centre

[65] Loch Ness Hub. (2023) Welcome to Loch Ness Hub. Available from: Loch Ness Hub - Loch Ness, Tourist Information, Transport Hub & Travel Centre

Figure 3.3: Bus stops location and the Loch Ness Hub[66].

3.1.1.1 Interchange facilities and functionality

Tourism in the area has increased recently, putting pressure on existing transport systems. The transport hub is a part of a scheme to improve infrastructure and is largely aimed at tourists.[67] As a result, most of the features at the hub operate seasonally are seasonal and are suited to

Design features include:

- Visitor information, tours, and tickets available for purchase at the hub.
- Toilets
- Baggage transfer for walkers
- Tours and coaches available to book
- Walking routes available from the hub
- Water re-fill station. [68]
- Wi-fi
- Free parking
- Electric vehicle charging point

[66] Open Street Map. (2023) OpenStreetMap. Available from: OpenStreetMap

[67] Urban Foresight. (2019) Glen Urquhart and Strathglass Transport Feasibility study. Available from: Glen-Urquhart-and-Strathglass-Study.pdf (soirbheas.org)

[68] Scottish Water. (2022) New top up tap marks completion of water network upgrade in Drum. Available from:- Scottish Water

E-bikes can be hired from the hub. However, a further improvement would be to include cycle racks. A summary of key transport interchange features at this hub are presented in Table 3.1 below.

Table 3.1: Key interchange features.

Feature	Availability	Notes
Pedestrian routes and wayfinding	✓	
Bus interchange	✓	One minute walk to bus stops
Rail interchange	-	The nearest train station is in Inverness a 30 minute drive away.
Scheduled coach services	✓	For tourist coach tours only
Community transport and DRT	-	
Taxis	-	
Private Hire Vehicles (PHV)	-	
Cycle parking	-	8 e-bikes available for hire
Micromobility hire	✓	
Park and ride facilities	-	Ability to park and ride for bus or tour, not local services
Car Park	✓	
Electric charging point	✓	

Place making

The transport hub has become an important part of Drumnadrochit, making the town a more attractive tourist destination. The car park where the hub is situated has benches and planters. It is also a minute's walk from the village green which has a picnic area and several cafés and shops. It has created a base from which further features can be added to make this hub more well-rounded and to serve local residents in addition to tourists. The transport hub will support hikers who are walking the Great Glen Way, the South Loch Ness and the Loch Ness 360 trail which are all multiday hikes. [69] They can get to transferred to the hub itself or have their baggage transferred here and onwards. The hub also promotes a walkable craft trail which starts from the hub and goes around the village and local area and highlights local art and craft. [70]Tourists can also reach Drumnadrochit by bus from Inverness and now connect to the hub. The hub also has a map with trails, cycle paths, key tourist sites and footpaths which all start from the hub available. [71]This will further develop Drumnadrochit into a popular tourist destination and stopover point for hikers.

[69] Walk highlands. (2023) Loch Ness. Available from: Fort Augustus and Drumnadrochit walks: Loch Ness (Walkhighlands)

[70] Highlands and Islands enterprise. (2023) Loch Ness Hub. Available from: Loch Ness Hub | Highlands and Islands Enterprise | HIE

[71] Soirbheas. (2023) Out and about. Available from: Out And About | Soirbheas

Figure 3.4: E bikes available at the Loch Ness Hub.[72]

[72] Loch Ness Travel. (2023) E-bike hire. Available from: e-Bike hire available from Loch Ness Hub, Drumnadrochit - Loch Ness Travel

Figure 3.5:The village green next to the Loch Ness hub and bus stop. [73]

3.1.1.2 Development and implementation

The hub was launched in 2020, in response to the *Glen Urquhart and Strathglass Transport Feasibility Study* and the *Drumnadrochit Local Energy Plan* (2018). The plans examined ways in which energy and carbon emissions could be reduced. It identified transport as one of the areas that could contribute to this aim. Local stakeholder engagement and interviews were undertaken to identify local needs and requirements for transport, [74] and the transport hub was developed using this feedback. The old tourist information centre was located in the car park in Drumnadrochit however after this closed, the community saw an opportunity to develop the hub here. It has been a collaboration between the local people, businesses, and the public sector, and is a community shareholder project. [75]When the hub was launched, it was intended that it would develop to include various features including park and walk, public transport information, community transport schemes and e-bike hire. In 2021 the hub bought Loch Ness Travel which enabled e-bike hire, bag transfers and shuttles from the hub. [76]

Some challenges identified in the development of the hub included ensuring that there is someone at the hub full time in the summer and part time in the winter. This role would grow as well as the hub developed. Another challenge included creating a 'master planner' or system which could be used by all transport modes from the hub to ensure cohesion. [77] Several other proposed solutions were developed through the feasibility study and are shown in Figure 3.6.

[73] Visit Scotland.(2023) Loch Ness Hub and travel. Available from: Drumnadrochit Area, Loch Ness Park development by R.HOUSE

[74] Urban Foresight. (2019) Glen Urquhart and Strathglass transport feasibility study. Available from: Glen-Urquhart-and-Strathglass-Study.pdf (soirbheas.org)

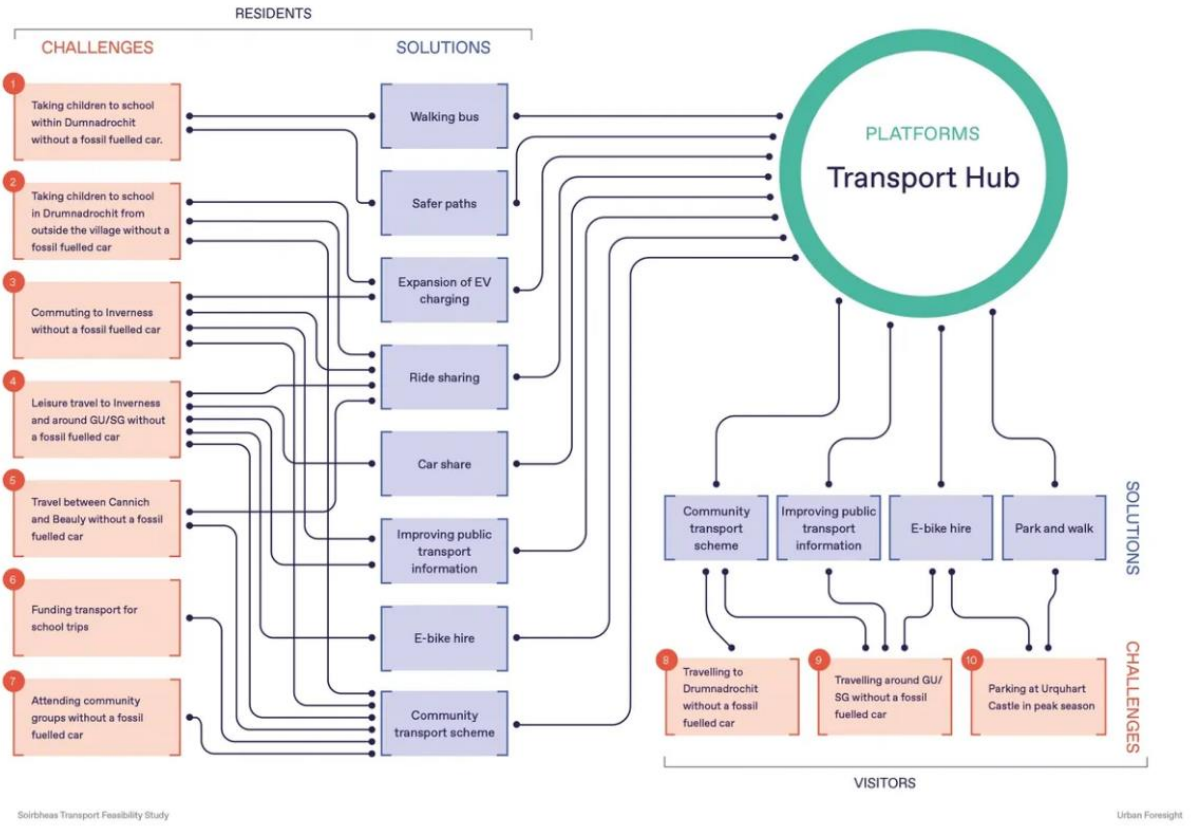
[75] Highlands and Islands enterprise. (2023) Loch Ness Hub. Available from: Loch Ness Hub | Highlands and Islands Enterprise | HIE

[76] Loch Ness travel. (2023) Welcome to Loch Ness Hub and Travel. Available from: Loch Ness and Highland Baggage transfer service - Loch Ness Travel

[77] Urban Foresight. (2019) Glen Urquhart and Strathglass transport feasibility study. Available from: Glen-Urquhart-and-Strathglass-Study.pdf (soirbheas.org)

The study also identified several sources of funding which could be used in this region such as the Open Fund which was supported by Transport Scotland. [78]

Figure 3.6: The Soirbheas Transport feasibility study outcomes.



The Transport hub is the central part of the study, and it is hoped that in the future it could support:[79]

- 19 permits for all community groups using the minibuses
- Central coordination and management for the mini-buses and the drivers
- Maintenance of the minibuses, e-bikes, and vehicles
- The management of a car share scheme
- Operate and provide information for public transport services
- Provide a park and ride scheme
- Provide a dial-a-bus service
- Coordinate a walking bus for school

Some of the identified costs for these features at the hub are:[80]

[78] Urban Foresight. (2019) Glen Urquhart and Strathglass transport feasibility study. Available from: Glen-Urquhart-and-Strathglass-Study.pdf (soirbheas.org)

[79] Urban Foresight. (2019) Glen Urquhart and Strathglass transport feasibility study. Available from: Glen-Urquhart-and-Strathglass-Study.pdf (soirbheas.org)

[80] Urban Foresight. (2019) Glen Urquhart and Strathglass transport feasibility study. Available from: Glen-Urquhart-and-Strathglass-Study.pdf (soirbheas.org)

Feature	Cost
1 rapid charger and installation	£35,000
Solar panels on the roof of the hub	£6250
Walking bus	£59 per volunteer including cost of PVG checks and high vis
Electric bike hire	Capital cost of £1000-1500
Community transport scheme	17 seat minibus for £39,525, Electric minibus for £170,000

3.1.1.3 Comparison to recommended functional requirements

This section provides a comparison of the functional components of the bus hub in Drumnadrochit to those recommended for a village bus hub.

Overall, the Drumnadrochit bus hub incorporates few of these elements due to its focus on tourism. In the future, it has planned to include a minibus service, a car share scheme, updated information for public transport and a park and ride scheme.

Table 3.2: Comparison of recommended functional elements to those found at Drumnadrochit bus hub.

Hub functionality	Component	Village	Drumnadrochit
Public transport mobility	**Local bus service**	✓	✓
	Inter-urban bus service		
	Demand Responsive Transport (DRT) bus service	✓	
	Regional rail service		
	Taxi rank		
Non-public transport mobility	**Car share**	✓	
	Park and ride	✓	
	Micromobility options (incl. E-scooters, bike shares etc)	✓	✓
Supporting mobility	**Digital timetabling**	✓	
	High quality bus shelter	✓	
	EV charging		✓
	Bike parking	✓	
	Bike repair, pumps		
	Wi-fi		
	Phone charging		
Placemaking and community	**Improved public realm**	✓	✓
	Traffic calming	✓	
	Safer crossing and street repairs	✓	
	High quality lighting	✓	
	Security	✓	

Hub functionality	Component	Village	Drumnadrochit
Community facilities	Toilets	✓	✓
	Drinking water		✓
	Package delivery lockers	✓	
	Co-working spaces	✓	
	Community space (e.g. seating areas, community garden)	✓	✓
	Post office	✓	
Other opportunities	Tourism hub (information, transit and tours)		✓
	Bike repair shop		

3.1.2 Dieverbrug, Netherlands

Dieverbrug is a small village located in the province of Drenthe, Netherlands. It has a population of approximately 310 residents.[81] The hub is part of the wider network of 55 hubs across the provinces of Drenthe and Groningen which vary in size. [82] Dieverbrug has a small rural mobility hub which is on the N371 road between Dieverbrug Road and De Wringen Road and adjacent to the Drentsche Hoofdvaart canal. Buses stopping at the hub operate to the nearby cities Assen, Steenwijk, Meppel, and Beilen.[83] The hub itself is centred around the bus stop and has facilities for buses and taxis. It also includes a covered bike storage area, free car parking, a parcel wall and wifi. [84] The hub is used by local people as well as tourists who walk, cycle and sail in the area.[85] The village of Dieverbrug has a small centre which runs alongside the canal. The hub and bus station are located here as seen on the map in Figure 3.7.

Functionally, the bus hub in Dieverbrug falls into the category of village bus hub.

[81] All charts. (2022) Information about borough Dieverbrug. Available from: AllCharts.info - Lots of information about borough Dieverbrug (update 2022!)

[82] Reisviahub. (2023) All hubs at a glance. Available from: Overview of all hubs - Reisviahub.nl

[83] Reisviahub. (2023) Dieverbrug. Available from: Looking for a hub facility in Dieverbrug? - Reisviahub.nl

[84] Reisviahub. (2023) Dieverbrug. Available from: Looking for a hub facility in Dieverbrug? - Reisviahub.nl

[85] Reisviahub. (2023) Dieverbrug. Available from: Looking for a hub facility in Dieverbrug? - Reisviahub.nl

Figure 3.7:Map of Dieverbrug and the Busstation (travel hub). [86]

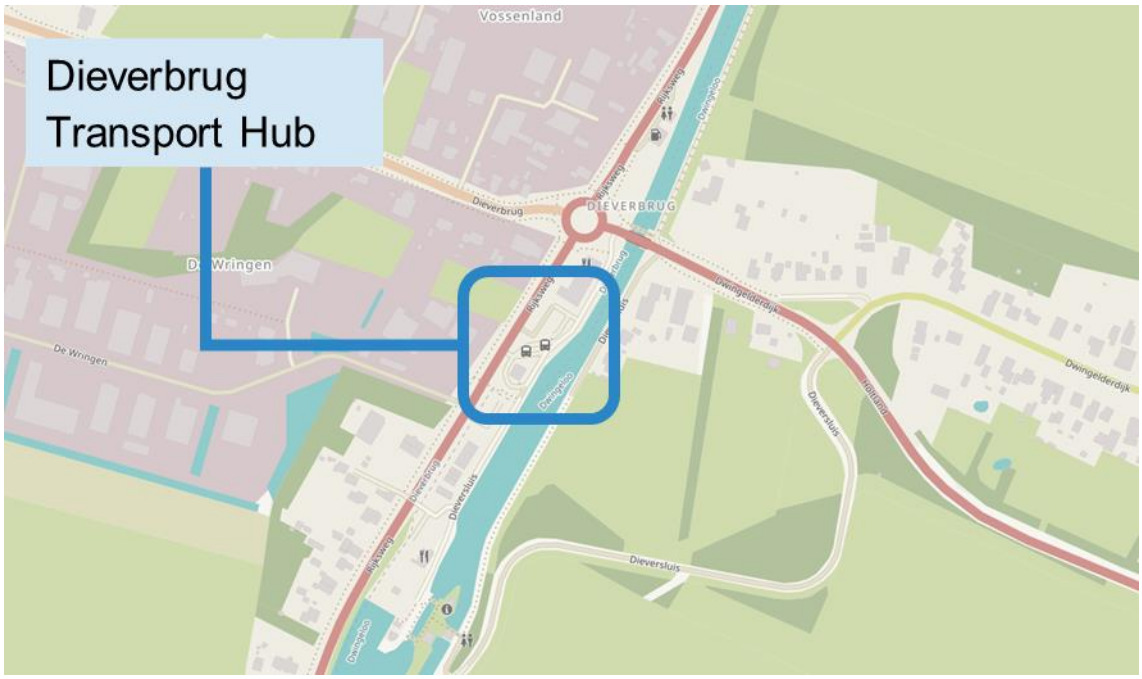


Figure 3.8 shows the bus stops (left), cycle parking (right) and parcel facility (centre) at the transport hub in Dieverbrug.

Figure 3.8: Travel hub in Dieverbrug[87]**.**

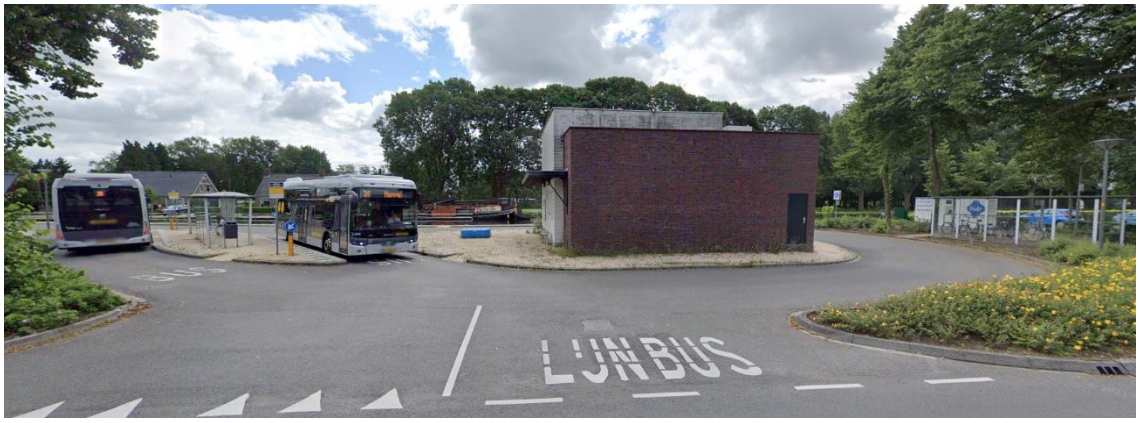


Figure 3.9 below shows the car park which is next to the bus stops.

[86] Google Maps. (2023) Dieverbrug. Available from: Dieverbrug, Busstation - Google Maps

[87] Google Maps. (2021) 36 Riijksweg. Available from: 36 Rijksweg - Google Maps

Figure 3.9: Car park and bus station at Dieverbrug. [88]

A selection of restaurants, a visitor centre, and shops are all within walking distance of the interchange. The area is popular with tourists, particularly walkers, as well as sailors using the adjacent canal. The features at the Dieverbrug hub are shown below in Table 3.3.

3.1.2.1 Interchange facilities and functionality

This is a small hub with limited facilities however many of the essential components of a village hub are available at this hub. Other features include:

- Taxi facilities
- Wi-fi
- Parcel wall
- Effective lighting

Table 3.3: Key interchange features.

Feature	Availability	Notes
Pedestrian routes and wayfinding	-	
Bus interchange	✓	3 platforms, all are accessible with raised kerbs, a covered bus stand and bench.
Rail interchange	-	
Scheduled coach services	-	
Community transport and DRT	-	
Taxis	✓	Hub Taxi is available for hire.
Private Hire Vehicles (PHV)	-	
Cycle parking	✓	35 covered bike spaces
Micromobility hire	-	
Park and ride facilities	✓	37 parking spots

Place making:

- Central location next to the canal
- Within proximity to visitor centre, local shops and restaurants.
- The restaurant next to the hub, Hui Mao shares the car park with the transport hub.

[88] Google Maps. (2021) 36 Riijksweg. Available from: 36 Rijksweg - Google Maps

- On the other side of the hub next to another car park there are lots of benches and picnic benches outside the tapas restaurant Casa Maya, all within a 1-minute walk from the hub.
- The hub is also connected to the bike trail, road and the footpath along the canal which is frequently used by walkers.
- The hub itself also has lots of seating and is next to the picturesque canal.
- The hub is clearly signposted and has the same branding as all 57 hubs across the region.

Figure 3.6: Hub branding in Groningen and Drenthe. [89]

Figure 3.10: View of the hub with the canal in July 2020.[90]

3.1.2.2 Development and implementation

In 2018 an existing bus stop was used to develop the hub. 15 car parking spaces were added as well as some cycle racks. In 2021 the parcel locker was incorporated. With this the hub had been 'completed'. [91] However, the hubs in this region are never seen as complete as they are always adjusting to the demands of the users. Since 2020 the most significant impact of the hub has been increased car accessibility and parking which enables users to park and ride from the hub. There are now 140 daily bus boardings from the Dieverbrug hub. [92]

[89] Reisviahub. (2023) All hubs at a glance. Available from: Overview of all hubs - Reisviahub.nl
[90] Kask, O (2021) A Node place analysis of 57 hubs in Groningen and Drenthe. SMiLES research report #1
[91] Kask, O (2021) A Node place analysis of 57 hubs in Groningen and Drenthe. SMiLES research report #1
[92] Kask, O (2021) A Node place analysis of 57 hubs in Groningen and Drenthe. SMiLES research report #1

3.1.2.3 Comparison to recommended functional requirements

This section provides a comparison of the functional components of the bus hub in Dieverbrug to those recommended for a village bus hub.

Overall, the Dieverbrug bus hub incorporates most of these essential elements. In the future, it is proposed to change depending on the ongoing needs of the community as the hubs in this region are not seen as complete and they can be updated and adapted as necessary.

Table 3.4: Comparison of recommended functional elements to those found at Dieverbrug bus hub

Hub functionality	Component	Village	Dieverbrug
Public transport mobility	Local bus service	✓	✓
	Inter-urban bus service		
	Demand Responsive Transport (DRT) bus service	✓	
	Regional rail service		
	Taxi rank		✓
Non-public transport mobility	Car share	✓	
	Park and ride	✓	
	Micromobility options (incl. E-scooters, bike shares etc)	✓	
Supporting mobility	Digital timetabling	✓	✓
	High quality bus shelter	✓	✓
	EV charging		
	Bike parking	✓	✓
	Bike repair, pumps		
	Wi-fi		
	Phone charging		
Placemaking and community	Improved public realm	✓	✓
	Traffic calming	✓	
	Safer crossing and street repairs	✓	
	High quality lighting	✓	✓
	Security	✓	
Community facilities	Toilets	✓	
	Drinking water		
	Package delivery lockers	✓	✓
	Co-working spaces	✓	
	Community space (e.g. seating areas, community garden)	✓	✓
	Post office	✓	
Other opportunities	Tourism hub (information, transit and tours)		
	Bike repair shop		

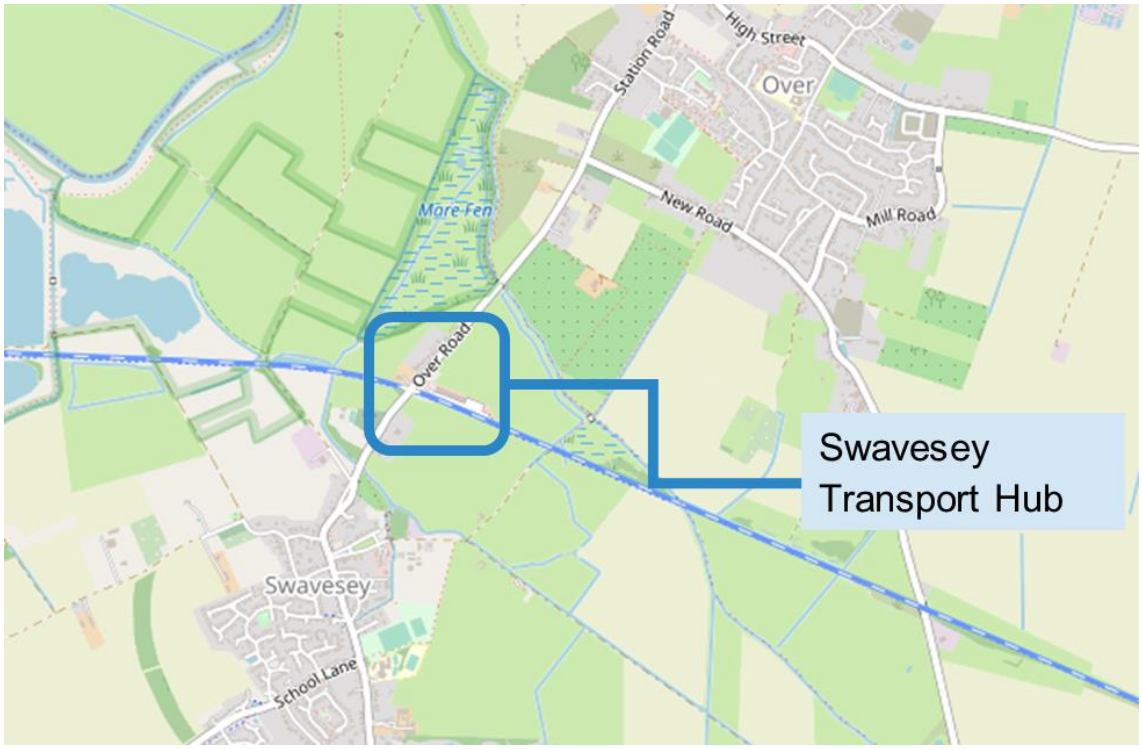
3.2 Large villages

3.2.1 Swavesey, Cambridgeshire

Swavesey is a village just north of Cambridge with approximately 2,500 residents. Swavesey has a few pubs, cafes, and shops, but no major employment or leisure facilities. Around 50% of the population commutes to Cambridge for work or school. The bus hub at Swavesey is a relatively informal one; it is not classed as such, but it does function as an intermodal hub for the surrounding villages and rural areas. Situated between the villages of Swavesey and Over, which has a population of approximately 2,800, the hub is on the route of the Cambridgeshire guided busway. Fast services along the busway, run towards Cambridge city centre eastwards and to St. Ives/Huntingdon westwards, at a frequency of approximately every 10 minutes during the day Monday to Saturday, dropping to 30 minutes in the evenings and all day Sunday. Connections from the bus hub are also available to local bus services through Swavesey village itself and to other surrounding villages, with a half-hourly frequency at peak times, and hourly frequency off peak weekdays and Saturday, with no Sunday service and no buses on any day after 8pm. Figure 3.11 below shows the situation of the bus hub in the context of Swavesey and Over villages. Figure 3.12 shows a general view of the bus hub and facilities available at Swavesey.

Functionally, the bus hub in Swavesey is falls into the category of edge of rural town bus hub.

Figure 3.11: Location of Swavesey bus hub, at distance of 0.5 miles to Swavesey, and 1.2 miles to Over[93]



[93] Open Street Map (2023), Swavesey with standard map layers. Accessed 12 February 2023 at https://www.openstreetmap.org/search?query=swavesey#map=15/52.3023/0.0008

Figure 3.12: Overview of Swavesey bus hub[94]

3.2.1.1 Interchange features and functionality

In addition to the features indicated in Table 3.5, the Swavesey hub includes live departure information, ticket machines, timetable and local area information and CCTV coverage of the bus stop area.

Table 3.5: Key interchange features.

Feature	Availability	Notes
Pedestrian routes and wayfinding	✓	
Bus interchange	✓	Covered bus shelters with seating
Rail interchange	-	
Scheduled coach services	-	
Community transport and DRT	-	
Taxis	✓	
Private Hire Vehicles (PHV)	-	
Cycle parking	✓	110 bike spaces (covered and uncovered) with bicycle air pump
Micromobility hire	-	
Park and ride facilities	✓	Approximately 40 spaces

As the hub is currently not marketed as such, it is perhaps less well known and utilised than it could be. Additionally, the local bus service that connects to the main services along the busway is not at a high enough frequency to encourage transfer opportunities from the surrounding areas.

[94] Google Street View (2022) *Swavesey Bus Hub*. Accessed 17 January 2023 at https://www.google.com/maps/@52.3063774,-0.0007941,3a,32.9y,113.11h,88.17t/data=!3m6!1e1!3m4!1sJk_FfHazD4nKZwH3F7MZjw!2e0!7i16384!8i8192

Placemaking Features

Cycle route follows the guided busway route, offering quality multimodal options and visibility of bus services to other transport users in the area.

Signalised crossings and continuous shared pavement from villages to bus hub facilitating pedestrian and cycle access; the Swavesey bus hub is located in between two villages to wider public realm works and wayfinding to connect residents to the bus services are essential.

Clear 'destination' elements at the bus station, with extensive lighting, CCTV, off-road location, etc. all making the hub feel important and of high quality.

Park and ride allows for the bus station to be accessible more broadly, both to those who cannot get to the stop from the villages by other means, and for those who live further afield, widening the catchment area for the bus services.

3.2.1.2 Development and implementation

The Swavesey bus stop was not originally conceived as a bus hub for intermodal interchange. Initially it consisted of bus shelters and a limited number of cycle stands. In the decade since its opening, the stop has slowly been built up to reach its current form with increased cycle parking, better passenger facilities, and car parking.[95] Whilst no information is available for the cost and time taken to implement the hub at Swavesey, given its piecemeal development, a report commissioned by Cambridgeshire County Council suggests a current cost of around £200,000-£300,000 for a new hub with similar facilities.[96]

3.2.1.3 Comparison to recommended functional requirements

This section provides a comparison of the functional components of the bus hub in Swavesey to those recommended for an edge of rural town bus hub. Overall, the Swavesey bus hub incorporates most of these elements.

Table 3.6: Comparison of recommended functional elements to those found at Drumnadrochit bus hub.

Hub functionality	Component	Edge of rural town	Swavesey
Public transport mobility	**Local bus service**	✓	✓
	Inter-urban bus service		
	Demand Responsive Transport (DRT) bus service	✓	
	Regional rail service		
	Taxi rank		
Non-public transport mobility	**Car share**	✓	
	Park and ride	✓	✓
	Micromobility options (incl. E-scooters, bike shares etc)	✓	
Supporting mobility	**Digital timetabling**	✓	✓
	High quality bus shelter	✓	✓
	EV charging		

[95] Wikipedia (2023), *Swavesey*. Accessed 14 January 2023 at https://en.wikipedia.org/wiki/Swavesey

[96] Skanska for Cambridgeshire County Council (2017), *Rural Travel Hubs Feasibility Study Report*. Accessed 17 January 2023 at https://www.greatercambridge.org.uk/asset-library/Sustainable-Transport/Rural-Travel-Hubs/Rural-Travel-Hubs-Feasibility-Study-30-11-17.pdf

Hub functionality	Component	Edge of rural town	Swavesey
	Bike parking	✓	✓
	Bike repair, pumps		✓
	Wi-fi		
	Phone charging		
Placemaking and community	Improved public realm	✓	✓
	Traffic calming		
	Safer crossing and street repairs	✓	✓
	High quality lighting	✓	✓
	Security	✓	
Community facilities	Toilets		
	Drinking water		
	Package delivery lockers		
	Co-working spaces		
	Community space (e.g. seating areas, community garden)		
	Post office		
Other opportunities	Tourism hub (information, transit and tours)		
	Bike repair shop		

3.2.2 Siddeburen, Netherlands

Siddeburen is a village with a population of around 3,200 people in the province of Groningen in the Northeast of the Netherlands. The mobility hub in Siddeburen functions as a multipurpose community centre as well as transport hub, and is located centrally within the village, as shown in **Figure 3.13** below.

Siddeburen itself has a small centre, with a small number of shops, restaurants, and a supermarket. Buses run from the village towards larger towns and cities in the region, such as Appingedam and Delfzijl in the North and Groningen in the West. Services run approximately hourly in each direction throughout the day, with more frequent services during commuting periods. Connections are also available to a local service connecting surrounding rural areas into Siddeburen village. Figure 3.14 below shows the hub as it currently exists, integrated into the village streetscape. Access to the hub is facilitated by both clear walking and cycling routes from all directions.

Functionally, the bus hub in Siddeburen is falls into the category of village bus hub.

Figure 3.13: Map of Siddeburen with Bus Hub at centre[97]

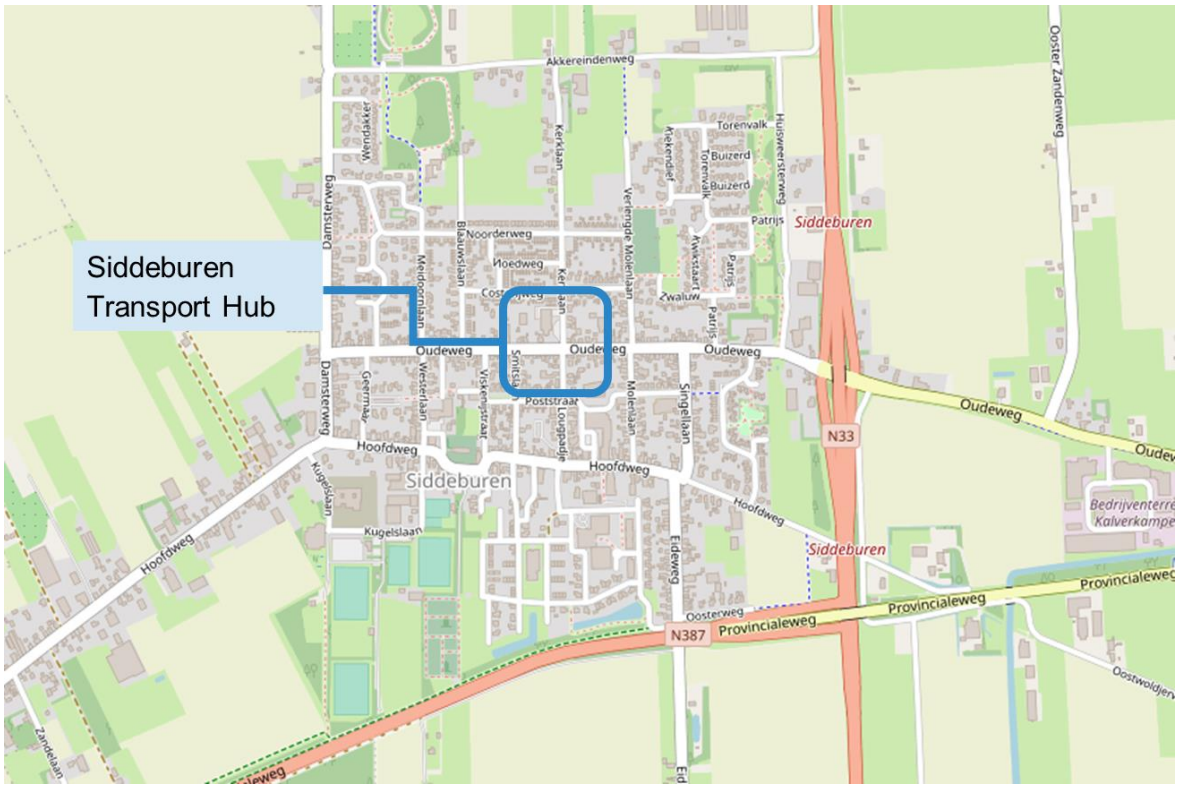


Figure 3.14: View of Siddeburen Bus Hub[98]

[97] Open Street Map (2023), *Siddeburen with standard map layers*. Accessed 20 January 2023 at https://www.openstreetmap.org/search?query=siddeburen#map=15/53.2503/6.8700

[98] Google Street View (2022), *53 Oudeweg*. Accessed 20 January 2023 at https://www.google.com/maps/@53.2495058,6.8673244,3a,75y,53.25h,86.11t/data=!3m6!1e1!3m4!1sIcgSS_5lGdWIZJKygh-xBQ!2e0!7i16384!8i8192

3.2.2.1 Interchange features and functionality

For a medium-sized village, the hub at Siddeburen has a limited but high quality range of features to facilitate and encourage easy use of buses. Currently, there is a shelter and real-time information screen on one side of the pavement, and relatively limited cycle parking. In addition to these, it has a water fountain, wi-fi, public toilets and live departure information.

Table 3.7: Key interchange features. [99]

Feature	Availability	Notes
Pedestrian routes and wayfinding	-	
Bus interchange	✓	Covered bus shelter with seating (one side of road only)
Rail interchange	-	
Scheduled coach services	-	
Community transport and DRT	-	
Taxis	✓	
Private Hire Vehicles (PHV)	-	
Cycle parking	✓	Covered and uncovered cycle parking
Micromobility hire	-	
Park and ride facilities	-	

Placemaking Features

The bus hub at Siddeburen has been designed and implemented to fit neatly within its village context. It is co-located with the village church, with annex now functioning as a multi-functional village hub. The bus hub is one of seven 'walk-through hubs' which are countryside nature walks that start/end at bus hubs across rural locations in the Netherlands.

The design of the bus hub is integrated into the village, located on a residential street and a quick walk to the commercial centre with multiple uses such as shopping, restaurants, and a supermarket.

3.2.2.2 Development and implementation

The hub and community centre was originally proposed in 2018, opening in 2021 at a cost of around €200,000, with funding from province of Groningen. Its construction aligned with a wider strategy within the province to better support village facilities by co-locating multiple facilities and functions in the same building / footprint. Sustainable design principles were used in its construction, including solar panels, heat pumps, and rainwater recycling. Further uses are intended to be added to the hub/centre in the coming years, including a library, health centre, café, and more. The actual direct cost of bus-related improvements was small compared to the overall cost of the building, although a distinct 'bus' cost is unavailable.[100]

[99] Reisvia Hub, *Siddeburen hub overview*. Accessed 10 January 2023 at https://www.reisviahub.nl/hubs/siddeburen-kerklaan/

[100] Groningen Province, *René Paas opens Multifunctional Center in Siddeburen*, September 2023. Accessed 10 January 2023 at https://www.provinciegroningen.nl/actueel/nieuws/nieuwsartikel/rene-paas-opent-multifunctioneel-centrum-in-siddeburen/

3.2.2.3 Comparison to recommended functional requirements

A comparison of the functional components of the bus hub in Siddeburen to those recommended for a village bus hub.

Overall, the Siddeburen bus hub incorporates all of these elements, and could be considered an exemplar bus hub for small villages.

Table 3.8: Comparison of recommended functional elements to those found at Siddeburen bus hub.

Hub functionality	Component	Village	Siddeburen
Public transport mobility	Local bus service	✓	✓
	Inter-urban bus service		
	Demand Responsive Transport (DRT) bus service	✓	
	Regional rail service		
	Taxi rank		
Non-public transport mobility	Car share	✓	
	Park and ride	✓	
	Micromobility options (incl. E-scooters, bike shares etc)	✓	
Supporting mobility	Digital timetabling	✓	✓
	High quality bus shelter	✓	✓
	EV charging		
	Bike parking	✓	✓
	Bike repair, pumps		
	Wi-fi		✓
	Phone charging		
Placemaking and community	Improved public realm	✓	✓
	Traffic calming	✓	✓
	Safer crossing and street repairs	✓	✓
	High quality lighting	✓	✓
	Security	✓	✓
Community facilities	Toilets	✓	
	Drinking water		✓
	Package delivery lockers	✓	
	Co-working spaces	✓	
	Community space (e.g. seating areas, community garden)	✓	✓
	Post office	✓	
Other opportunities	Tourism hub (information, transit and tours)		
	Bike repair shop		

3.3 Market towns

3.3.1 North Walsham, Norfolk

North Walsham is a historic market town in Norfolk with an approximate population of 12,800 people.[101] It is centred around a main market square that has been in use since the 16th century. The market still operates weekly. [102] The county town of Norwich is 15 miles to the south and the B1145 connects the two settlements. There is also a rail station at North Walsham. The station is located on the Bittern Line which runs between Norwich and the coast. There are also bus routes which run to the nearby towns of Cromer, Stalham, Holt and Sheringham.[103]

The transport hub in North Walsham was opened in August 2022 and is situated on New Road, next to the library and community centre, and just outside the historic town centre. It has been designed to enable buses to turn, drop off and pick up customers. [104] The aim of the hub is to encourage bus use to reduce congestion and pressures on and around the market square while also supporting the pedestrianisation of the heritage precinct in the town centre. The travel hub has new bus shelters, a toilet, seating, and green sedum roofs on the shelters. The project is part of a wider investment and regeneration project in the town to increase trade and footfall. [105] As well as the bus facilities there will also be a selection of bike facilities added to the hub and information about the walking and cycling routes in the area. The project also responds to concerns from the local community about congestion and the quality of the bus infrastructure. [106]

Functionally, the bus hub in North Walsham falls into the category of rural town centre hub.

Figure 3.15: The Hub at North Walsham[107]

[101] City Population. (2021) North Walsham. Available from: North Walsham (Norfolk, East of England, United Kingdom) - Population Statistics, Charts, Map, Location, Weather and Web Information (citypopulation.de)

[102] Visit North Norfolk. (2022) North Walsham. Available from: North Walsham - North Norfolk (visitnorthnorfolk.com)

[103] North Walsham Guide. North Walshams bus service is supplied by sanders coaches. Available from: Sanders North Walsham Bus Services | North Walsham Guide

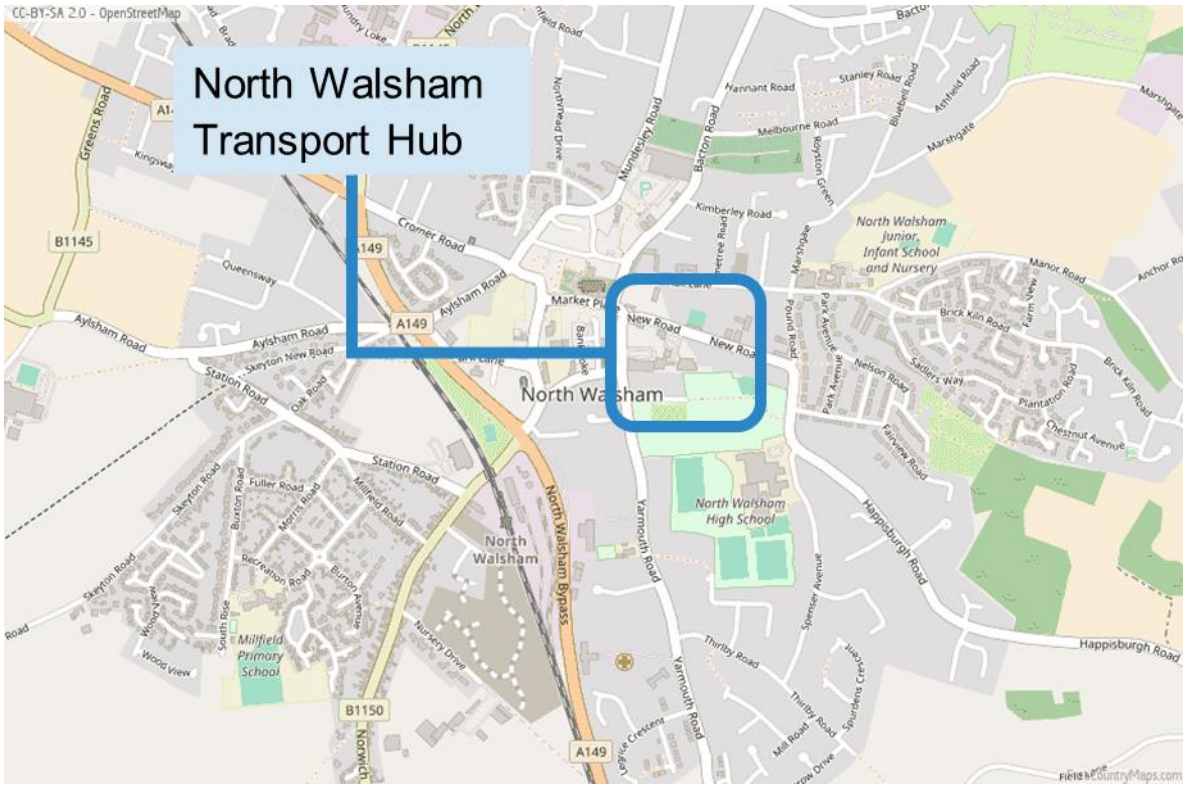
[104] North Norfolk district council. (2022) North Walsham's new travel hub to open August 1. Available from: Home | North Walsham's new travel hub to open August 1 (north-norfolk.gov.uk)

[105] ibid

[106] ibid

[107] ibid

Figure 3.16: Map of North Walsham. [108]



3.3.1.1 Interchange features and functionality

The hub has relatively limited features, and these are mostly targeted to support essential bus operations. However, in addition to the features indicated in Table 3.9, it has a public toilet, live departure information and support for visually impaired users.

[108] Free country Map. (2023) Map of North Walsham, England. Available from: North Walsham Map Great Britain Latitude & Longitude: Free England Maps (freecountrymaps.com)

Table 3.9: Key interchange features.

Feature	Availability	Notes
Pedestrian routes and wayfinding	✓	To be installed in the near future.
Bus interchange	✓	Turning circle for buses and covered seating for passengers
Rail interchange	-	
Scheduled coach services	-	
Community transport and DRT	-	
Taxis	-	
Private Hire Vehicles (PHV)	-	
Cycle parking	✓	To be installed in the near future.
Micromobility hire	-	
Park and ride facilities	-	
Toilets	✓	

Place making

The bus hub here is sited next to the community library and a new mural has been painted next to the hub by local children. [109] The hub is also a short walk to the market square in North Walsham. The hub and its proximity to the town centre will enable and encourage users to spend time and money here while reducing car usage and congestion. This will improve the town centre and the user experience.

3.3.1.2 Development and implementation

The hub was opened in 2022 and forms part of a larger project to improve the marketplaces in the town. The project is known as the High Street Heritage Action Zone (HSHAZ) Project.[110]

The project was delivered in a partnership between the North Walsham Town Council, North Norfolk District Council and Norfolk County Council. The town council contributed approximately £20,000 to pay for the capital costs of installing bus shelters, the district council provided the land for the interchange and upgraded the toilets, and remaining capital costs were covered through a contribution by the county council.[111]

3.3.1.3 Comparison to recommended functional requirements

This section forms a comparison of the functional components of the bus hub in North Walsham to those recommended for a rural town centre bus hub.

Overall, the North Walsham bus hub incorporates some of these elements with a strong focus on buses. In the future, it is planned to include cycle racks and wayfinding.

[109] North Norfolk district council. (2022) North Walsham's new travel hub to open August 1. Available from: Home | North Walsham's new travel hub to open August 1 (north-norfolk.gov.uk)

[110] North Norfold distict council. (2022) North Walsham Market Place improvement works-car park arrangements. Available from: Home | North Walsham Market Place improvement works - car park arrangements (north-norfolk.gov.uk)

[111] North Norfolk News. (2022) Bus interchange about to open in north Norfolk. Available from: https://www.northnorfolknews.co.uk/news/traffic/20677918.bus-interchange-open-north-norfolk/

Table 3.10: Comparison of recommended functional elements to those found at North Walsham bus hub.10

Hub functionality	Component	Rural town centre	North Walsham
Public transport mobility	Local bus service	✓	✓
	Inter-urban bus service	✓	✓
	Demand Responsive Transport (DRT) bus service	✓	
	Regional rail service	✓	
	Taxi rank	✓	
Non-public transport mobility	Car share	✓	
	Park and ride		
	Micromobility options (incl. E-scooters, bike shares etc)	✓	
Supporting mobility	Digital timetabling	✓	✓
	High quality bus shelter	✓	✓
	EV charging		
	Bike parking	✓	
	Bike repair, pumps	✓	
	Wi-fi	✓	
	Phone charging		
Placemaking and community	Improved public realm	✓	✓
	Traffic calming	✓	
	Safer crossing and street repairs	✓	
	High quality lighting	✓	✓
	Security	✓	✓
Community facilities	Toilets	✓	✓
	Drinking water		
	Package delivery lockers	✓	
	Co-working spaces	✓	
	Community space (e.g. library)	✓	✓
	Post office	✓	
Other opportunities	Tourism hub (information, transit and tours)	✓	
	Bike repair shop	✓	

3.3.2 Leek, Netherlands

Leek is a small town in the province of Groningen in the Netherlands, with a population of 11,400. [112] Buses from Leek run to the nearby villages and towns of Assen, Oosterwolde, Marum, Groningen and Grootegast. There is also a night bus which runs to Groningen. The hub

[112] All Charts. (2022) Information about borough Leek. Available from: AllCharts.info - Lots of information about borough Leek (update 2022!)

in Leek is part of a wider network of 55 bus and transport hubs in the regions of Groningen and Drenthe, with this particular hub known as the Leek Centrum Hub. The Groningen-Drenthe hub network has been developed to provide equitable and inclusive access, ensuring that people of all abilities can use the facilities. [113] One key aim of the network is to ensure that there is a hub within 15km of all locations within the region. [114] All the hubs are built around some form of existing transport facilities. The Leek Centrum Hub was built around the existing bus stops.

Functionally, the bus hub in Leek falls into the category of rural town centre hub.

The facilities provided for Leek Centrum Hub on either side of the road are shown in Figure 3.17 and Figure 3.18[115] below.

Figure 3.17: Leek Mobility Hub

Figure 3.18: Leek Centrum mobility hub

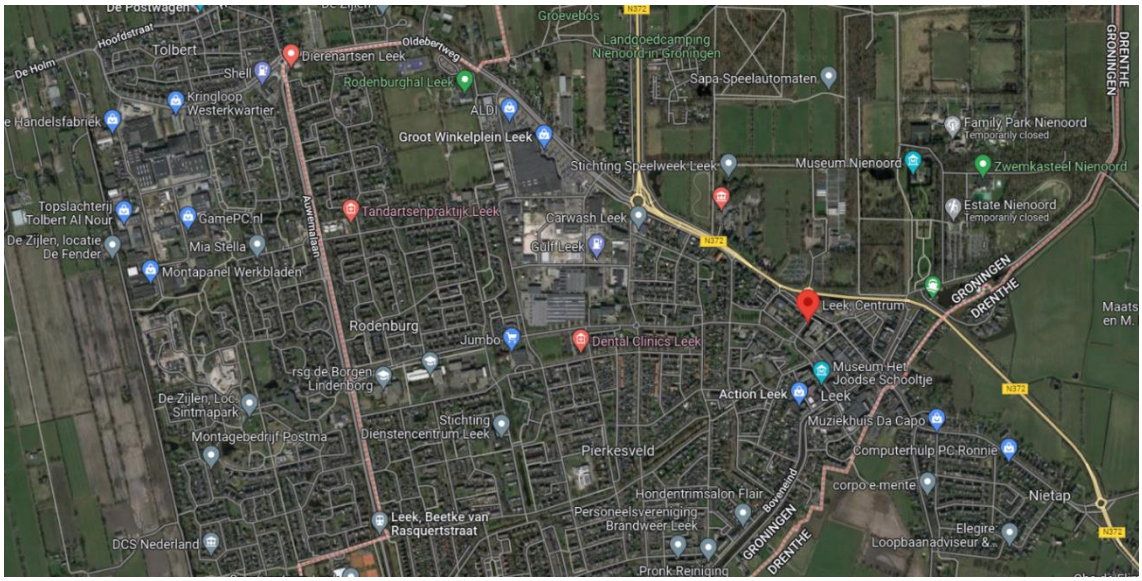
Figure 3.19 shows the location of the mobility hub in Leek.

[113] Mpact. (2021) Video report mobility hubs Groningen and Drenthe. Available from: Drenthe.NL/ Video report mobility hubs Groningen and Drenthe - YouTube

[114] ibid

[115] Google maps. (2022): Leek. Available from: 12 Oosterheerdtstraat - Google Maps

Figure 3.19: Map of Leek, showing location of Leek Centrum Hub



3.3.2.1 Interchange features and functionality

While not connected to a rail system, this hub provides the user with the ability to interchange between bus, bike and car, and store their bicycle securely. The Leek Centrum Hub is north of the town centre of Leek. In addition to the features indicated in Table 3.11, the hub is equipped with wi-fi and a drinking water fountain.

The town centre is only a short walk from the bus stops and has a variety of shops, a museum, and restaurants. The mobility hub itself is located next to apartments, a bike shop and a selection of other small shops.

Table 3.11: Key interchange features.

Feature	Availability	Notes
Pedestrian routes and wayfinding	✓	Connections to cycle paths and walking routes
Bus interchange	✓	Two bus stops on either side of the road with raised kerbs
Rail interchange	-	
Scheduled coach services	-	
Community transport and DRT	-	
Taxis	✓	Hub-Taxi is available here and is intended for those who cannot get to the hub in another way. It can be hired from or to the hub by requesting at least an hour in advance. [116]
Private Hire Vehicles (PHV)	-	
Cycle parking	✓	100 uncovered bike parking spaces
Micromobility hire	-	
Park and ride facilities	✓	66 parking spaces provided

Place making

The hub is distinctly marked and branded and enables local people to easily connect with different transport modes to travel around Leek and to the surrounding town such as Groningen. It is popular with hikers who can take the bus and then start their walking route from the hub in Leek. [117] The routes which are linked to the hub are signposted at the hub as this is start point and the routes are also provided online with a map and instructions. [118]

Figure 3.20:Walking routes from Leek transport hub. [119]

The hub is close to the town centre, it is open, clear and visible and close to the main roads which go in and out of Leek. Its connections to walking and cycling routes enable a seamless transition between transport modes in Leek. These cycling routes are also provided online, and

[116] Publiek Vervoer. (2023) Information about the hubtaxi. Available from: Information about the hub taxi (publiekvervoer.nl)

[117] Kask, O (2021) A Node place analysis of 57 hubs in Groningen and Drenthe. SMiLES research report #1

[118] Reisviahub. (2023) Hubs and hiking. Available from: Walk via hub - Reisviahub.nl

[119] Routbureau Groningen. (2023) Walk via hub: from castle to borg nienoord. Available from: Wandelroutes - Routes in Groningen

signage is due to be added soon. [120] The hub is also open to entrepreneurs who are interested in development a business at or near the hub. [121]

3.3.2.2 Development and implementation

This hub which was completed in 2022 as part of the Leek HOV transport project. [122] This hub is also part of the wider Groningen and Drenthe multimodal hub project which began in 2018. [123]Once the hubs were implemented a node place analysis has taken place to understand how the project has impacted travel. At this hub the results show that there has been significant increases in comfort at the hub, improvements in safety and also increased bicycle accessibility and parking.

There are also now 250 daily bus boardings from the travel hub. [124] Lessons learned from this hub, and the rest of the Groningen-Drenthe project are that hubs need to be planned and designed with specific consideration given to their location. Importantly, it has been noted that the hubs will need to develop and adapt to the demands of the users as patronage and usage change over time. [125]

3.3.2.3 Comparison to recommended functional requirements

A comparison of the functional components of the bus hub in Leek to those recommended for a rural town centre bus hub is presented below.

Overall, the Leek bus hub incorporates most of the essential components for a rural town centre hub and several non-essential components. In the future, it is planned/proposed to change depending on the ongoing needs of the community as the hubs in this region are not seen as complete and they can be updated and adapted as necessary.

Table 3.11: Comparison of recommended functional elements to those found at Leek, NL bus hub.12

Hub functionality	Component	Rural town centre	Leek
Public transport mobility	**Local bus service**	✓	✓
	Inter-urban bus service	✓	✓
	Demand Responsive Transport (DRT) bus service	✓	
	Regional rail service	✓	
	Taxi rank	✓	✓
Non-public transport mobility	**Car share**	✓	
	Park and ride		✓
	Micromobility options (incl. E-scooters, bike shares etc)	✓	
Supporting mobility	**Digital timetabling**	✓	✓
	High quality bus shelter	✓	✓

[120] Reisviahub. (2023) Hubs and bikes. Available from: Cycle via hub - Reisviahub.nl

[121] Reisviahub. (2023) Doing business. Available from: Doing business - Reisviahub.nl

[122] Reisviahub. (2023) Leek. Available from; Hub facility in the center of Leek (center) - Reisviahub.nl

[123] Kask, O (2021) A Node place analysis of 57 hubs in Groningen and Drenthe. SMiLES research report #1

[124] ibid

[125] Mpact. (2021) Video report mobility hubs Groningen and Drenthe. Available from: Drenthe.NL/ Video report mobility hubs Groningen and Drenthe - YouTube

Hub functionality	Component	Rural town centre	Leek
	EV charging		
	Bike parking	✓	✓
	Bike repair, pumps	✓	
	Wi-fi	✓	
	Phone charging		
Placemaking and community	Improved public realm	✓	✓
	Traffic calming	✓	
	Safer crossing and street repairs	✓	
	High quality lighting	✓	✓
	Security	✓	
Community facilities	Toilets	✓	
	Drinking water		✓
	Package delivery lockers	✓	
	Co-working spaces	✓	
	Community space (e.g. seating areas, community garden)	✓	
	Post office	✓	
Other opportunities	Tourism hub (information, transit and tours)	✓	
	Bike repair shop	✓	

3.4 Coastal towns

3.4.1 St. Erth, Cornwall

St. Erth is a small village in southwestern Cornwall, with a population of around 1,400. It is located about a mile inland from the north coast. Its location allows for good connectivity to St. Ives (population 11,300) and the wider St. Ives Bay area, which are major tourist destinations. These connections mean that St. Erth functions as a coastal hub even though it is not directly on the coast itself.

The bus hub at St. Erth has been named the St. Erth Multimodal Transport Hub and is co-located with the pre-existing St. Erth railway station, which is the busiest railway station in Cornwall taking into account the number of services per day. Situated on the Cornish Main Line and at the south-eastern inland end of the St. Ives Bay Line, the station is an important interchange hub in itself, offering transfers from longer-distance services to Penzance, Plymouth, and London, to the seaside towns on St. Ives Bay.

Buses from the St. Erth Multimodal Hub extend the reach of the public transport network in the area, offering wider and more local connections. Before the construction of the multimodal hub, buses stopping at St. Erth station used roadside stops on the A30. Although these were only a short walk away from the station, it was not inviting to make the transfer, whether between buses or from bus to rail. Under the new arrangements, buses stop immediately outside the railway station entrance, the co-location improving transfer opportunities and mutually increasing the visibility of each mode.

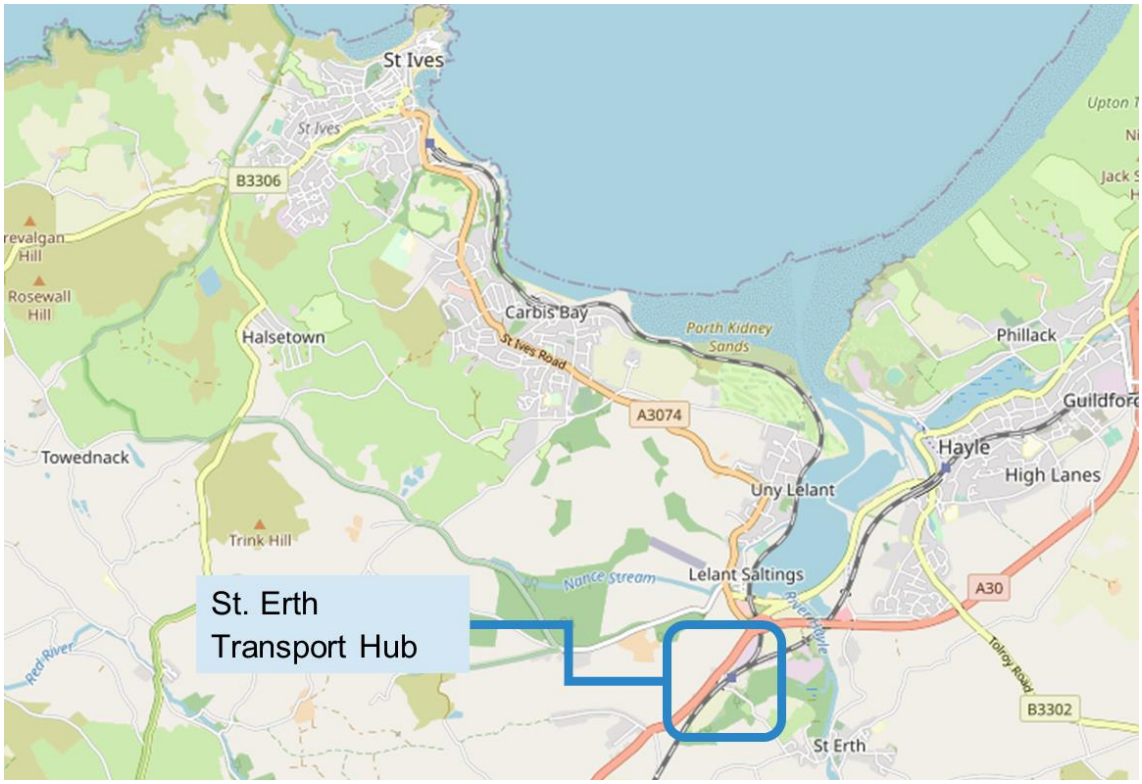
Much of the impetus for the hub at St. Erth came from a wider requirement for a new park and ride location for West Cornwall. There was already a large park and ride serving St. Ives only, but this did not offer connections to the main railway line through Cornwall. The aim of the St. Erth hub was not only to offer better travel experience for public transport users, but also to increase longer-distance travel by train.[126]

Figure 3.21 shows the location of the multimodal hub in the area around St. Erth, with St. Ives at top left, the A30 trunk road in yellow, and the Cornish Main Line railway generally following the trace of the A30.

Figure 3.22 shows the bus stop at the multimodal hub, showing its proximity to the railway station building and platforms behind, and with the automatic parking capacity board clearly labelling the site as a park and ride opportunity.

Functionally, the bus hub in St. Erth is falls into the category of rail interchange bus hub.

Figure 3.21: Location of St. Erth Multimodal Hub within the wider St. Erth / St. Ives region[127]



[126] Cornwall Council (2012), *West Cornwall Transport Interchange key messages.* Accessed on 15 January 2023 at https://www.scribd.com/document/121597380/West-Cornwall-Transport-Interchange#fullscreen&from_embed

[127] Open Street Map (2023), *St Erth with standard map layers*. Accessed on 15 January 2023 at https://www.openstreetmap.org/#map=13/50.1794/-5.4317

Figure 3.22: Bus stop location at the St. Erth Multimodal Hub[128]

3.4.1.1 Interchange features and functionality

In addition to the features indicated in Table 3.13, it has a public toilets within the station building, security surveillance, lighting, customer help points, wi-fi and live departure information for passengers. The park and ride facility has provision for expansion in the future should demand increase.

[128] Cornwall and Isles of Scilly Growth Programme (2023), Projects: St Erth Multi Modal Hub. Accessed 15 January 2023 at https://www.cornwallislesofscillygrowthprogramme.org.uk/projects/st-erth-multi-modal-hub/

Table 3.13: Key interchange features.

Feature	Availability	Notes
Pedestrian routes and wayfinding	✓	Improved wayfinding as part of hub development
Bus interchange	✓	Single bus stand with covered and enclosed shelter
Rail interchange	✓	Improved railway station facilities as part of hub development
Scheduled coach services	✓	
Community transport and DRT	-	
Taxis	✓	
Private Hire Vehicles (PHV)	-	
Cycle parking	✓	10 covered bike spaces
Micromobility hire	-	
Park and ride facilities	✓	550 parking spaces for both rail and bus park and ride. Daily rates apply. Electric car charging spaces available.

Placemaking

The St Erth Multimodal Hub has contributed to placemaking as it:

- Reduces traffic through local villages towards St. Ives by encouraging modal shift
- Improves the attractiveness of public transport in the region by making it more visible and accessible
- Includes public realm improvements were as part of the project, both through infrastructure improvements and the introduction of new greenery
- Supports general refurbishment of the railway station, which had been verging on disrepair

3.4.1.2 Development and implementation

The St. Erth Multimodal Hub was completed in 2019 at a total cost of £10.5 million. That cost had been split almost evenly between the European Union Regional Development Fund and Cornwall Council.[129] It is important to note, however, that because this was such a large project, much of that cost was not directly related to the bus element of the hub. Main cost drivers were the new car parks and railway station improvements.

Operation of the hub since its inception has been greatly successful for the region. Traffic flows on the main A30 trunk road have been improved, both through the introduction of a signalised junction, as well as the relocation of bus stops to the station area. Bus services have benefitted from co-location with the railway station and improvements to passenger facilities. Train services have experienced a 40% growth in passenger numbers since the opening of the hub.[130] Overall, the West Cornwall hub has been hugely successful.

[129] Ibid.

[130] Cornwall and Isles of Scilly Growth Programme (2023), Case studies: A sustainable multi-transport hub at the heart of West Cornwall. Accessed 15 January 2023 at https://www.cornwallislesofscillygrowthprogramme.org.uk/case-studies/st-erth-multi-modal-hub/

3.4.1.3 Comparison to recommended functional requirements

A comparison of the functional components of the bus hub in St Erth to those recommended for a rail interchange bus hub is presented below.

Overall, the St Erth rail interchange bus hub incorporates few/some/most/all of these elements.

Table 3.14: Comparison of recommended functional elements to those found at Drumnadrochit bus hub.

Hub functionality	Component	Rail interchange	St Erth
Public transport mobility	Local bus service	✓	✓
	Inter-urban bus service	✓	
	Demand Responsive Transport (DRT) bus service	✓	
	Regional rail service	✓	✓
	Taxi rank	✓	✓
Non-public transport mobility	Car share	✓	
	Park and ride	✓	✓
	Micromobility options (incl. E-scooters, bike shares etc)	✓	
Supporting mobility	Digital timetabling	✓	✓
	High quality bus shelter	✓	✓
	EV charging	✓	✓
	Bike parking	✓	✓
	Bike repair, pumps		
	Wi-fi		✓
	Phone charging		
Placemaking and community	Improved public realm	✓	✓
	Traffic calming		
	Safer crossing and street repairs	✓	✓
	High quality lighting	✓	✓
	Security	✓	✓
Community facilities	Toilets	✓	✓
	Drinking water		
	Package delivery lockers		
	Co-working spaces		
	Community space (cafe)		✓
	Post office		
Other opportunities	Tourism hub (information, transit and tours)		
	Bike repair shop		

3.4.2 Leven, Scotland

Leven is a medium-sized coastal settlement in Fife, between Kirkcaldy and St. Andrews, with a population of approximately 9,500 people. Currently, Leven is only accessible by bus, although the railway line is set to re-open in 2024 with direct services to Kirkcaldy and on to Edinburgh.

The wider Levenmouth conurbation has a population of nearly 40,000 people, and was previously a major coal mining district. Since the collapse of the local coal mining industry, along with the railway closure in 1965, the local economy has suffered, with the only remaing major employers being the Diageo bottling plant and the distillery nearby at Cameron Bridge.

Leven remains a tourist attraction. It has several caravan parks, and is situated on the Fife Coastal Path. Only 39% of the working population of Levenmouth work within the area, with the rest commuting outside of the area. Kirkcaldy and Glenrothes are the most common destinations, with some residents commuting as far as Edinburgh. Therefore, there is a large number of daily trips into and out of Leven, but only around 7% of those journeys are currently completed by public transport. Inter-regional destinations (St Andrews, Kirkcaldy, Glenrothes) have the highest rate of bus usage, with bus patronage for local trips lower.[131]

The bus interchange in Leven is centrally located within the town, directly at the end of the high street and within a short walk of the coastal promenade. Leven acts as an interchange point for many routes in eastern Fife, as well as local routes around Levenmouth.

Figure 3.23 below shows the Leven bus interchange, situated at the base of the main shopping street in the town centre. All local and regional bus routes start, end or pass through the central interchange, offering ample transfer opportunities across the area. Figure 3.24 shows the exterior and context of the bus interchange.

Functionally, the bus hub in Leven falls into the category of rural town centre bus hub.

[131] Peter Brett Associates (2018), Levenmouth Sustainable Transport Study Initial Appraisal: Case for Change. Accessed 16 January 2023 at https://www.transport.gov.scot/media/43659/initial-appraisal-case-for-change-report-levenmouth-sustainable-transport-study.pdf

Figure 3.23: Location of Level multimodal hub within the town area[132]

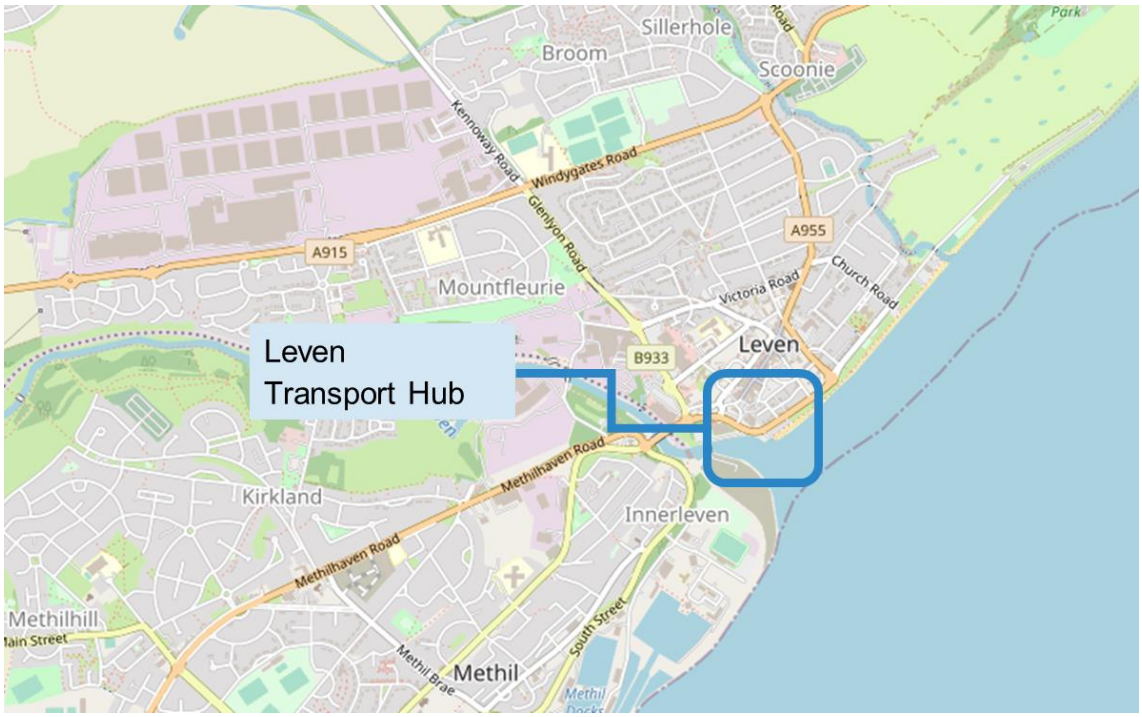


Figure 3.24: Leven Bus Interchange from Branch Street[133]

3.4.2.1 Interchange features and functionality

Almost all of the main functional elements of an ideal bus hub are present at the Leven Interchange in some form, although many could be improved upon. For example, although there are a large number of uncovered Sheffield stands provided, there are only four secure cycle

[132] Open Street Map (2023), *Leven with standard map layers*. Accessed 16 January 2023 at https://www.openstreetmap.org/#map=14/56.1948/-3.0129

[133] Google Street View (2018), *1 Branch Street*. Accessed 16 January 2023 at https://www.google.com/maps/@56.193482,-2.9993563,3a,40.7y,136.91h,90.97t/data=!3m6!1e1!3m4!1sj9UgJdTwV8R3zYvRk4DFVA!2e0!7i16384!8i8192

lockers are provided at present. The hub also includes CCTV coverage inside of the bus interchange building as well as over the outdoor areas, defibrillator point, public toilets (including disabled toilets and baby changing facilities), enclosed and heated waiting area, staff 7 days a week and left luggage facilities.

Table 3.15: Key interchange features.

Feature	Availability	Notes
Pedestrian routes and wayfinding	✓	Local area maps available inside and outside of the station providing directions from the bus interchange to the town centre.
Live Departure info	✓	
Bus interchange	✓	9 covered bus stands with raised kerbs/level boarding, and are accessible
Rail interchange	✓	Rail line and station due to commence operations in 2024.
Scheduled coach services	✓	Long distance services to Edinburgh
Community transport and DRT	-	
Taxis	✓	
Private Hire Vehicles (PHV)	✓	
Cycle parking	✓	Limited (4) secure covered bike parking spaces, but larger number of uncovered bike racks
Micromobility hire	-	
Park and ride facilities	✓	

Placemaking Features

The interchange contributes to placemaking in Leven in the following ways:

- Bus interchange is a clear focal point of the town, at the base of the high street and visible from all directions
- Clear signage on the outside indicating its importance to the town
- Station integrated into the wider town area, with level paving allowing clear and seamless pedestrian paths into the centre
- Situated near to multiple uses: shopping, leisure and swimming centre, restaurants, supermarkets/superstore, leisure destinations (promenade)

3.4.2.2 Development and implementation

The bus interchange was opened in 2007 at a cost of £1.5 million (£2.3 million adjusted for inflation), with funding coming from the Scottish Government.

No design issues seem to have been encountered, with the land currently used for the bus station previously existing as the former bus interchange. Under the previous configuration, no hub features existed apart from bus interchange, with only a series of bus shelters provided for passenger services.

Actual patronage numbers cannot be obtained, but SESTrans numbers suggest that the opening of the new bus station in 2007 resulted in an improvement to local opinion of bus travel,

and an overall increase in bus passenger levels. However, service levels were not increased in conjunction with the bus hub's opening and this was received poorly by the local community.[134]

3.4.2.3 Comparison to recommended functional requirements

A comparison of the functional components of the bus hub in Drumnadrochit to those recommended for a rural town centre bus hub.

Overall, the Leven bus hub incorporate all of the essential components. In the future, it is planned to reopen the Levenmouth rail line and construct a new station adjacent to the bus hub.

Table 3.16: Comparison of recommended functional elements to those found at Drumnadrochit bus hub.

Hub functionality	Component	Rural town centre	Leven
Public transport mobility	Local bus service	✓	✓
	Inter-urban bus service	✓	✓
	Demand Responsive Transport (DRT) bus service	✓	
	Regional rail service	✓	✓*
	Taxi rank	✓	✓
Non-public transport mobility	Car share	✓	
	Park and ride		✓
	Micromobility options (incl. E-scooters, bike shares etc)	✓	
Supporting mobility	Digital timetabling	✓	✓
	High quality bus shelter	✓	✓
	EV charging		
	Bike parking	✓	✓
	Bike repair, pumps	✓	
	Wi-fi	✓	
	Phone charging		
Placemaking and community	Improved public realm	✓	✓
	Traffic calming	✓	
	Safer crossing and street repairs	✓	✓
	High quality lighting	✓	✓
	Security	✓	✓
Community facilities	Toilets	✓	✓
	Drinking water		
	Package delivery lockers	✓	
	Co-working spaces	✓	
	Community space (leisure centre, shopping area)	✓	✓
	Post office	✓	

[134] Scott Wlson (2008), *Levenmouth Sustainable Transport Study: STAG Part 1 Appraisal Report*. Available from https://sestran.gov.uk/wp-content/uploads/2017/01/Levenmouth-Sustainable-Transport-Study_STAG-Part-1-Appraisal-Report-Appendices.pdf

Hub functionality	Component	Rural town centre	Leven
Other opportunities	**Tourism hub (left luggage lockers, tourist information)**	✓	✓
	Bike repair shop	✓	

4 Cost and economic effectiveness

One of the key principles of rural bus hubs is adopting a cost effective approach to developing multi-modal rural interchanges and integrating rural transport services. This section will set out expected capital and operational costs of implementing rural hubs, as well as key considerations in developing a case for bus hubs, such as identifying benefits and attaching these to capital investment and any risks

This section sets out expected costs for developing rural hubs at a component level, meaning that local authorities can identify low cost or quick interventions to begin developing their bus hubs. For further information on low cost interventions, please refer to Support Package 3: Low cost and quick wins.

4.1 Capital costs

Unit cost estimates for different key components of rural hubs are presented in Table 4.1.

Please note that these cost estimates are valid as of March 2023 and can be highly variable. The unit cost estimate presented is the median price. These estimates should be used to guide a high level estimate only.

A more detailed build-up of costs is contained in Appendix A.

Table 4.1: Unit costs for typical components of rural hubs.

Hub functionality	Component	Unit cost estimate	Unit of measure	Notes
Public Transport Mobility	Electric double decker bus - Allowance	£440,000.00	Per bus	
	Hydrogen Fuel cell-powered double decker bus - Allowance	£599,500.00	Per bus	
	Electric single decker - Allowance	£374,000.00	Per bus	
	Taxi Rank Space	£428.50	Per space	White lining on existing surfacing only required. Taken that 5nr spaces per white lining shift can be achieved. Does not include cost of purchasing land and Traffic Regulation Orders (TRO).Please note the TRO could be up to £7,500 if required
	Taxi Rank non-illuminated sign	£267.81	Per sign	To be assessed per taxi rank
Non-Public Transport Mobility	Car share Space	£214.25	Per Space	White lining on existing surfacing only required. Taken that 10nr spaces per white lining shift can be achieved. Does not include cost of purchasing land and Traffic

Hub functionality	Component	Unit cost estimate	Unit of measure	Notes
				Regulation Orders (TRO).Please note the TRO could be up to £7,500 if required
	Non-illuminated sign	£267.81	Per small sign on post	To be assessed per site
	Park and ride	£9,230.34	Per space (based on 25m2 each)	Does not include cost of purchasing land. Current site at grade and no major earthworks required. Cost doesn't include for lighting or specialist items
	E-scooter docking and charging station	£2,620.05	Per E-scooter docking Station	Based on 2nr charging stations minimum. Nearby DNO supply with sufficient capacity to incorporate these items into. Ongoing running cost excluded
	Bike docking and charging station	£2,620.05	Per bike docking Station	Based on 2nr charging stations minimum. Nearby DNO supply with sufficient capacity to incorporate these items into. Ongoing running cost excluded
Supporting Mobility	Real time service information: digital screen only	£6,878.72	Per screen	Does not include supporting infrastructure such as computer servers, cabling and internet connection etc.
	Real time service information: digital screen plus supporting infrastructure	£9,171.63	Per screen	Include supporting infrastructure such as supporting computer servers, cabling, internet connection, etc. Power supply taken as existing and nearby
	e-link screen-Excluding infrastructures, internet cabling etc	£2,828.08	Per screen	Does not include supporting infrastructure such as supporting computer servers, cabling, internet connection, etc.
	e-link screen-Including infrastructures, internet cabling etc.-complete	£6,312.12	Per screen	Include supporting infrastructure such as supporting computer servers, cabling, internet connection, etc. Power supply taken as existing and nearby
	3mx1.5m Low- Bus shelter	£15,067.90	Per shelter	For typical 3x1.5m shelter with seating

Hub functionality	Component	Unit cost estimate	Unit of measure	Notes
	5mx3m Bus Shelter	£51,562.50	Per Shelter	For typical 3x1.5m shelter with seating
	EV charging: Slow: Dual 7kw street charge	£9,125.00	Per Charging unit	Existing power supply nearby
	EV charging: 22KWH Dual socket	£14,872.42	Per Charging unit	Existing power supply nearby
	Bike parking: Sheffield bike stand	£416.00	nr	Per hoop including foundations
	Bike parking: Individual locker	£1,916.05	Per unit	
	16 Cycles Capacity	£12,497.84	Per cage	Incl. Sheffield cycle rack
	48 Cycles Capacity	£34,361.91	Per cage	Incl. Sheffield cycle rack
	Bike repair stand and pumps	£2,225.78	Per unit	
	Public wi-fi	£1,103.02	Per router/year	Includes cost of service per year
	Phone charging (Wireless charging pad)	£141.41	Per unit/year	excludes cost of electricity supply per year
Placemaking and Community	PCC Tactile	£176.42	Per m2	Excavation (invert) same as cross section depth
	80mm Block paving	£181.30	Per m2	Excavation (invert) same as cross section depth
	100x100x80mm Granite Set on mortar bed with mortared joints	£402.89	m2	150mm of sub-base required and excavation (invert) same as cross section depth
	900x600x50mm Granite paving slab on mortar bed with mortared joints	£313.28	m2	150mm of sub-base required and excavation (invert) same as cross section depth
	300x200x75mm Yorkstone slab on mortar bed with mortared joints	£465.77	m2	150mm of sub-base required and excavation (invert) same as cross section depth
	Improved public realm: Garden bed/landscaped verge	£31.44	Per m2	Topsoil, grass seed and planting
	Improved public realm: Tree planting	£967.76	Per tree	Typical tree type:
	Improved public realm: Continuous footpath treatment	£173.76	Per m2	Based on Marshalls Tegula paving

Hub functionality	Component	Unit cost estimate	Unit of measure	Notes
	Improved public realm: High quality benches or seating	£1,240.15	Per unit	Based on 4 seat enhanced benches in public realm
	Improved public realm: Wayfinding signage/totem	£4,366.74	Per unit	
	Traffic Calming: Speed Humps	£8,593.75	Per unit	TRO May be required at an additional cost of £7,500. Attached link suggests £20,000 for 4 humps is appropriate, not sure exactly what this covers
	Traffic calming: Speed hump (Engineering Brick)	£8,047.34	Per unit	Engineering brick, undertaken during normal working hours
	Traffic calming: Speed hump (200mm Surfacing)	£7,625.52	Per unit	100mm above existing road surface. Undertaken during normal working hours
	Traffic Calming: Speed Cushions	£4,082.03	Per unit	TRO May be required at an additional cost of £7,500 for all items. Attached link suggests £19,000 for 4 pairs humps is appropriate., not sure exactly what this covers but taken as 1.7m x 1.7m speed cushion
	Speed cushion 900x900mm (Engineering Brick)	£681.79	Per unit	Engineering brick, undertaken during normal working hours
	Speed cushion 900x900mm (200mm surfacing)	£592.37	Per unit	100mm above existing road surface. Undertaken during normal working hours
	Rubber Black Speed cushion 2000mx1800m	£2,148.44	Per unit	Undertaken during normal working hours
	Signs for typical Rubber Speed Cushion	£535.73	Per speed hump	Undertaken during normal working hours. Quantify on project by project basis
	Traffic calming: Chicanes	£20,625.00	Per chicane	Based on cost in link of £12000 per chicane, not sure exactly what this covers and this is top of the range

Hub functionality	Component	Unit cost estimate	Unit of measure	Notes
	Traffic calming: Lane narrowing	£41,250.00	Per lane narrowing interventio n	Realign kerb, widen footway 0.5m. Taken no works to drainage or existing services required. Attached link suggests £24,000 is appropriate for a new Lane Narrowing intervention, not sure exactly what this covers
	Realign Kerb/New kerbs	£95.47	m	Remove existing HB2 kerb or equivalent and replace with new. Includes allowance for making good. Work can be undertaken in normal working hours
	Widening footpath - footpath construction	£98.24	m2	Typical footpath construction. Work can be undertaken in normal working hours
	Traffic calming: Vehicle activated speed warning signage - cost for basic sign	£10,312.50	Per unit	Electric signs which displays a message when triggered by vehicles. Allowance of £6k
	Traffic calming: Vehicle activated speed warning signage - cost for complete sign including power supply	£30,078.13	Per unit	Electric signs which displays a message when triggered by vehicles. Allowance of £17.5k
	Traffic calming: Speed camera	£34,375.00	Per unit	Includes supporting infrastructure such as computer servers, internet connection, cabling and power supply, etc. Allowance of £20k, not sure exactly what this includes for
	Safer crossing and street repairs: zebra crossing	£19,942.43	Per unit	Includes Belisha Beacons and signs. Existing power supply nearby. All works can be undertaken during normal working hours with TM
	Safer crossing and street repairs: raised zebra crossing	£26,183.51	Per unit	As above but with some pavement construction
	Safer crossing and street repairs: Signalised pedestrian crossing	£40,078.15	Per unit	Includes traffic signals and signs. Existing power supply nearby. All works can be undertaken during normal working hours with TM

Hub functionality	Component	Unit cost estimate	Unit of measure	Notes
	Safer crossing and street repairs: Road resurfacing	£86.69	Per m2	Mill out 100mm and replace with 60mm binder and 40mm surface course. Including renewed line marking
	6m galvanised steel lighting	£7,651.92	Per light post	Includes for duct and cabling. Tyoical lighting specification priced. Existing power supply can be utilised
	8m galvanised steel lighting	£8,205.79	Per light post	Includes for duct and cabling. Tyoical lighting specification priced. Existing power supply can be utilised
	10m galvanised steel lighting	£9,171.08	Per light post	Includes for duct and cabling. Tyoical lighting specification priced. Existing power supply can be utilised
	Security – CCTV camera on column	£13,555.04	Per camera	Does not include cabling and connection to monitoring system. Does/does not include operating costs.
	Security – CCTV camera on column	£17,345.36	Per camera	Includes cabling and connection to monitoring system. Does/does not include operating costs.
	Security – Help point: excluding connections etc.	£3,600.53	Per unit	Does not include connection to monitoring system. Does/does not include operating costs.
	Security – Help point: Incl Connections etc	£10,092.35	Per unit	Does include connection to monitoring system. Does/does not include operating costs.
Community Facilities	Toilets	£3,738.99	Per m2	Does not include land acquisition, assume nearby water connection
	Drinking water	£2,620.05	Per fountain	
	Package delivery lockers	£3,487.34	Per unit	6 Door nest locker per unit
	Community space: Parklet or similar modular seating and garden unit	£8,620.96	Per unit	Assumed to be prefabricated parklet approximately the same size as one to two parking spaces.

Hub functionality	Component	Unit cost estimate	Unit of measure	Notes
Other Opportunities	Tourism hub (information, transit and tours)	£4,366.74	Per m2	Includes building and fit-out

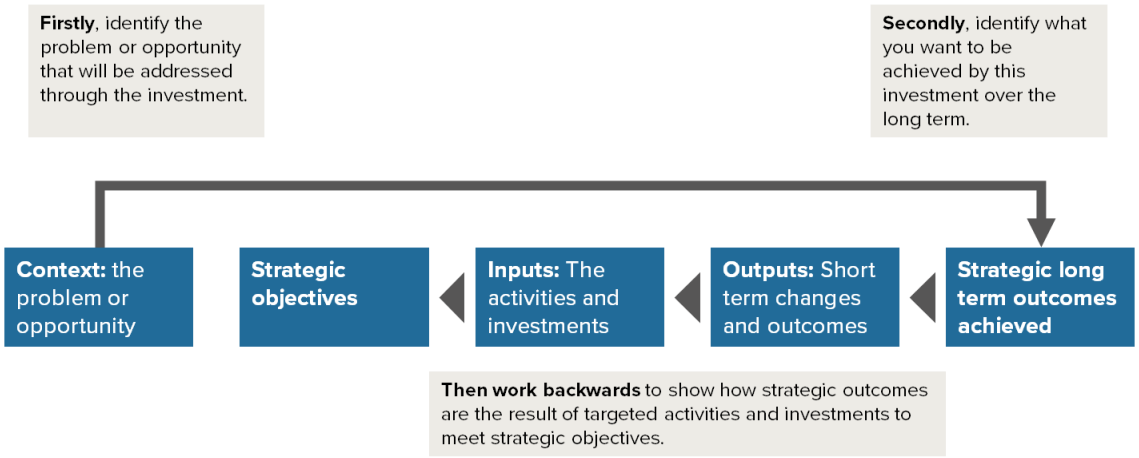
4.2 Assessing direct and wider economic benefits

Traditional approaches to assessing the benefits of new or improved bus services quantify benefits across the full service in operation, allowing for minor benefits across the length of the route to accumulate and in turn justify the cost. Service improvements often form a significant part of benefits that can be quantified and captured, and so when considering isolated and minor environmental improvements, such as upgrading individual bus stops in rural areas, quantifying the benefits in terms of cost is difficult and often meaningless.

Improvements to journey quality, such as comfort, safety, ease of access and landscaping upgrades are therefore best assessed from a strategic perspective. Logic mapping is a useful tool to help associate or attach benefits and outcomes to investments where it may be difficult, impractical, or not possible to quantify these in a financial amount, and in particular captures wider economic benefits that are more strategic in nature.

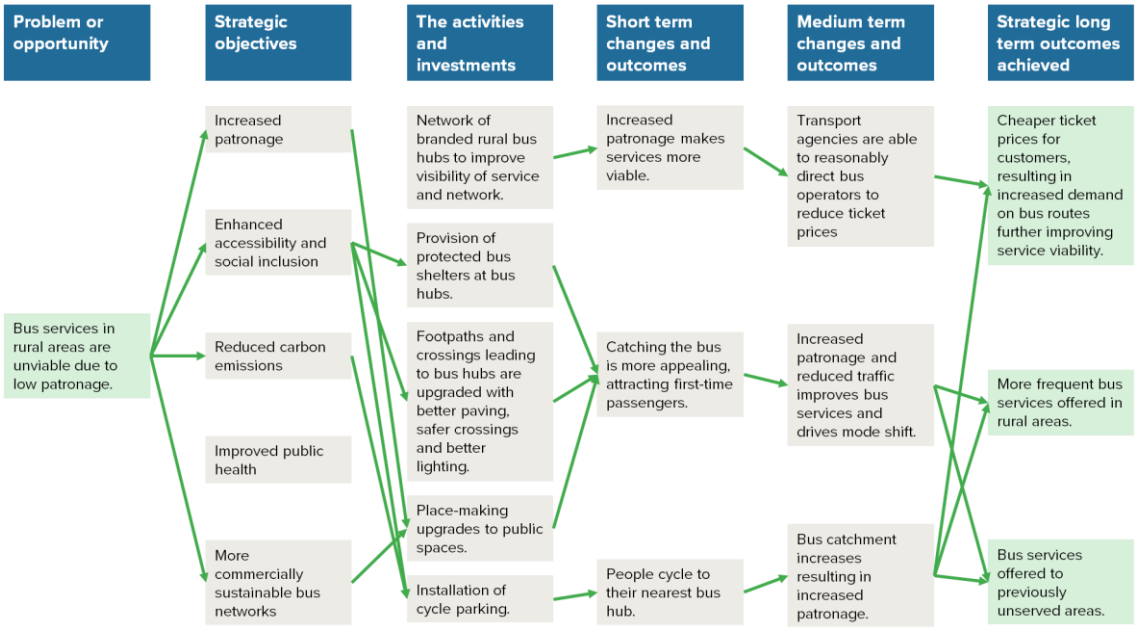
When mapping the benefits of investments such as bus hub upgrades, it needs to be clearly defined what is being assessed and what is not. Improvements to bus services, such as new, more frequent or extended routes, for example, should not be assessed as part of bus hub improvements unless the improved service is explicitly linked to the hub upgrades.

Developing a logic map will typically consist of the following steps:



An example of a logic map evaluating a bus hub upgrade in the context of a BSIP is presented in Figure 4.1.

Figure 4.1: Logic map showing links between existing problems, strategic objectives, investments and outcomes.



4.3 Regulatory considerations

In preparing for a programme of rural hub upgrades and installations, the following elements should be considered[135]:

- Programme: time will be required within the development programme to allow for all relevant consents to be submitted and approved prior to commencement of the works on site.
- Fees: in general each of the consents applications will have a fee associated with them or there may be a need to appoint a specialist consultant to prepare designs prior to the application being made.
- Planning
  - Outline Planning Application?
  - Full Planning Application?
  - Permitted Development rights
- Other legal agreements to bescoped out with the Local Authority
  - Listed building consent
  - Planning permission for relevant demolition in a conservation area
  - Advertisement consent
  - Section 38 Common Land Application
  - Regulatory Control and Regulatory Change
  - Building Regulations Approval
  - Highways Section 278 Agreement
  - Specific Regulatory Control and Regulatory Change
  - Tree Preservation Orders
  - Scheduled Monument – Historic England

[135] Solent Transport. (2021) Mobility Hub Design Guide. Available from: Microsoft PowerPoint - Solent Transport Mobility Hub Design Guide Final Rev 2 (solent-transport.com)

  - Sites of Special Scientific Interest (SSSI)
  - Traffic Regulation Orders
- Infrastructure requirements
  - Statutory Authority consultation and approval
  - Electrical Supply Connections
  - Water Supply Connections
  - Drainage Connections
  - Landline/Internet Connections

Appendices

A. Detailed cost estimate register

Note: the **Point estimate** as at 1Q 2023 is the recommended cost estimate that should be used, and incorporates various overheads and construction costs in addition to the capital cost for the infrastructure.

A.1 Assumptions

1. Estimate is based at 1Q23
2. No Inflation has been added beyond this base date.
3. For Specific assumptions and exclusions please see individual priced spreadsheets.
4. Various allowances have been included in the costings, these items have not been defined at this stage so the values may vary significantly when more information becomes available.
5. An assessment of indirect costs have been included in the MIN, POINT ESTIMATE and MAX values. The MIN and MAX values also include for Risk Contingency. The percentage uplifts applied are identified to the right of the main table.
6. All works can be undertaken during midweek days with simple traffic management measures in place if required
7. Where costs have not been included for an item, a reasonable cost estimate was not available.

A.2 Documentation used in the preparation of the estimate

1. Wirral Mass Transit
2. My London news, Zone 1
3. West Yorkshire Combined Authority
4. Project costs for Foxton Travel Hub
5. Civil and Highway Quotes Estimating Team Site - Civils and Highways Quotes
6. Project costs for A1037 Cambridge South East
7. Traffic Choices UK

A.3 Exclusions

1. 3rd party compensation costs
2. Planning and approval charges
3. Land purchase or rental
4. Costs associated with Statutory Fees (e.g. HMRI, Local Authority, etc.)
5. Costs associated with taxes, levies and licences
6. Costs associated with changes in legislation and any form of applicable standards
7. Allowances for unforeseen ground conditions / provisions for ground stabilisation unless specifically identified
8. Environmental mitigation works unless specifically identified
9. Archaeological digs
10. Utilities diversions and/or protection
11. Optimism Bias
12. Inflation beyond the base date of the estimate 1Q23.
13. VAT
14. TRO Costs
15. Re-location of affected businesses
16. Road Diversions
17. Maintenance, renewals and operational costs unless specifically identified.

Hub functionality	Component	Min at 1Q 23	Point estimate at 1Q 23	Max at 1Q 23	Unit of measure	Notes	Construction / purchase	Prelims 25%-construction	Ovehead s and profit 10%	Total construction cost	Client cost 10%	Design 15%	Point estimates total	Risk contingency		Cost range estimate	
														Min	Max	Min	Max
Public Transport Mobility	Electric double decker bus - Allowance	£396,000.00	£440,000.00	£633,600.00	Per bus		£400,000.00			£400,000.00	£40,000.00		£440,000.00	-10%	44%	£396,000.00	£633,600.00
	Hydrogen Fuel cell-powered double decker bus - Allowance	£539,550.00	£599,500.00	£863,280.00	Per bus		£545,000.00			£545,000.00	£54,500.00		£599,500.00	-10%	44%	£539,550.00	£863,280.00
	Electric single decker - Allowance	£336,600.00	£374,000.00	£538,560.00	Per bus		£340,000.00			£340,000.00	£34,000.00		£374,000.00	-10%	44%	£336,600.00	£538,560.00
	Taxi Rank Space	£385.65	£428.50	£617.04	per space	White lining on existing surfacing only required. Taken that 5nr spaces per white lining shift can be achieved. Does not include cost of purchasing land and Traffic Regulation Orders (TRO).Please note the TRO could be up to £7,500 if required	£249.31	£62.33	£31.16	£342.80	£34.28	£51.42	£428.50	-10%	44%	£385.65	£617.04
	Taxi Rank non-illuminated sign	£241.03	£267.81	£385.65	per sign	To be assessed per taxi rank	£155.82	£38.95	£19.48	£214.25	£21.42	£32.14	£267.81	-10%	44%	£241.03	£385.65
Non-Public Transport Mobility	Car share Space	£192.82	£214.25	£308.52	Per Space	White lining on existing surfacing only required. Taken that 10nr spaces per white lining shift can be achieved. Does not include cost of purchasing land and Traffic Regulation Orders (TRO).Please note the TRO could be up to £7,500 if required	£124.65	£31.16	£15.58	£171.40	£17.14	£25.71	£214.25	-10%	44%	£192.82	£308.52
	Non-illuminated sign	£241.03	£267.81	£385.65	Per small sign on post	To be assessed per site	£155.82	£38.95	£19.48	£214.25	£21.42	£32.14	£267.81	-10%	44%	£241.03	£385.65
	Park and ride	£8,307.31	£9,230.34	£13,291.69	Per space (based on 25m2 each)	Does not include cost of purchasing land. Current site at grade and no major earthworks required. Cost doesn't include for lighting or specialist items	£5,370.38	£1,342.60	£671.30	£7,384.27	£738.43	£1,107.64	£9,230.34	-10%	44%	£8,307.31	£13,291.69
	E-scooter docking and charging station	£2,358.04	£2,620.05	£3,772.87	Per E-scooter docking Station	Based on 2nr charging stations minimum. Nearby DNO supply with sufficient capacity to incorporate these items into. Ongoing running cost excluded	£1,524.39	£381.10	£190.55	£2,096.04	£209.60	£314.41	£2,620.05	-10%	44%	£2,358.04	£3,772.87

Hub functionality	Component	Min at 1Q 23	Point estimate at 1Q 23	Max at 1Q 23	Unit of measure	Notes	Construction / purchase	Prelims 25%-construction	Ovehead s and profit 10%	Total construction cost	Client cost 10%	Design 15%	Point estimates total	Risk contingency		Cost range estimate	
														Min	Max	Min	Max
	Bike docking and charging station	£2,358.04	£2,620.05	£3,772.87	Per bike docking Station	Based on 2nr charging stations minimum. Nearby DNO supply with sufficient capacity to incorporate these items into. Ongoing running cost excluded	£1,524.39	£381.10	£190.55	£2,096.04	£209.60	£314.41	£2,620.05	-10%	44%	£2,358.04	£3,772.87
Supporting Mobility	Real time service information: digital screen only	£6,190.85	£6,878.72	£9,905.36	Per screen	Does not include supporting infrastructure such as computer servers, cabling and internet connection etc.	£4,002.16	£1,000.54	£500.27	£5,502.98	£550.30	£825.45	£6,878.72	-10%	44%	£6,190.85	£9,905.36
	Real time service information: digital screen plus supporting infrastructure	£8,254.46	£9,171.63	£13,207.14	Per screen	Include supporting infrastructure such as supporting computer servers, cabling, internet connection, etc. Power supply taken as existing and nearby	£5,336.22	£1,334.05	£667.03	£7,337.30	£733.73	£1,100.60	£9,171.63	-10%	44%	£8,254.46	£13,207.14
	e-link screen-Excluding infrastructures, internet cabling etc	£2,545.27	£2,828.08	£4,072.44	Per screen	Does not include supporting infrastructure such as supporting computer servers, cabling, internet connection, etc.	£1,869.81	£467.45	£233.73	£2,570.98	£257.10	£0.00	£2,828.08	-10%	44%	£2,545.27	£4,072.44
	e-link screen-Including infrastructures, internet cabling etc.-complete	£5,680.91	£6,312.12	£9,089.45	Per screen	Include supporting infrastructure such as supporting computer servers, cabling, internet connection, etc. Power supply taken as existing and nearby	£3,672.51	£918.13	£459.06	£5,049.70	£504.97	£757.45	£6,312.12	-10%	44%	£5,680.91	£9,089.45
	3mx1.5m Low- Bus shelter	£13,561.11	£15,067.90	£21,697.78	Per shelter	For typical 3x1.5m shelter with seating	£8,766.78	£2,191.70	£1,095.85	£12,054.32	£1,205.43	£1,808.15	£15,067.90	-10%	44%	£13,561.11	£21,697.78
	5mx3m Bus Shelter	£46,406.25	£51,562.50	£74,250.00	Per Shelter	For typical 3x1.5m shelter with seating	£30,000.00	£7,500.00	£3,750.00	£41,250.00	£4,125.00	£6,187.50	£51,562.50	-10%	44%	£46,406.25	£74,250.00
	EV charging: Slow: Dual 7kw street charge	£8,212.50	£9,125.00	£13,140.00	Per Charging unit	Existing power supply nearby	£5,309.09	£1,327.27	£663.64	£7,300.00	£730.00	£1,095.00	£9,125.00	-10%	44%	£8,212.50	£13,140.00
	EV charging: 22KWH Dual socket	£13,385.18	£14,872.42	£21,416.29	Per Charging unit	Existing power supply nearby	£8,653.05	£2,163.26	£1,081.63	£11,897.94	£1,189.79	£1,784.69	£14,872.42	-10%	44%	£13,385.18	£21,416.29
	Bike parking: Sheffield bike stand	£374.40	£416.00	£599.04	nr	Per hoop including foundations	£242.04	£60.51	£30.25	£332.80	£33.28	£49.92	£416.00	-10%	44%	£374.40	£599.04
	Bike parking: Individual locker	£1,724.44	£1,916.05	£2,759.11	Per unit		£1,114.79	£278.70	£139.35	£1,532.84	£153.28	£229.93	£1,916.05	-10%	44%	£1,724.44	£2,759.11
	16 Cycles Capacity	£11,248.05	£12,497.84	£17,996.88	Per cage	Incl. Sheffield cycle rack	£7,271.47	£1,817.87	£908.93	£9,998.27	£999.83	£1,499.74	£12,497.84	-10%	44%	£11,248.05	£17,996.88
	48 Cycles Capacity	£30,925.72	£34,361.91	£49,481.15	Per cage	Incl. Sheffield cycle rack	£19,992.38	£4,998.10	£2,499.05	£27,489.53	£2,748.95	£4,123.43	£34,361.91	-10%	44%	£30,925.72	£49,481.15
	Bike repair stand and pumps	£2,003.20	£2,225.78	£3,205.13	Per unit		£1,295.00	£323.75	£161.88	£1,780.63	£178.06	£267.09	£2,225.78	-10%	44%	£2,003.20	£3,205.13

Hub functionality	Component	Min at 1Q 23	Point estimate at 1Q 23	Max at 1Q 23	Unit of measure	Notes	Construction / purchase	Prelims 25%-construction	Ovehead s and profit 10%	Total construction cost	Client cost 10%	Design 15%	Point estimates total	Risk contingency		Cost range estimate	
														Min	Max	Min	Max
	Public wi-fi	£992.72	£1,103.02	£1,588.35	Per router/year	Includes cost of service per year	£792.68	£118.90	£91.16	£1,002.74	£100.27	£0.00	£1,103.02	-10%	44%	£992.72	£1,588.35
	Phone charging (Wireless charging pad)	£127.27	£141.41	£203.63	Per unit/year	excludes cost of electricity supply per year	£101.63	£15.24	£11.69	£128.56	£12.86	£0.00	£141.41	-10%	44%	£127.27	£203.63
Placemaking and Community	PCC Tactile	£158.77	£176.42	£254.04	Per m2	Excavation (invert) same as cross section depth	£102.64	£25.66	£12.83	£141.13	£14.11	£21.17	£176.42	-10%	44%	£158.77	£254.04
	80mm Block paving	£163.17	£181.30	£261.08	Per m2	Excavation (invert) same as cross section depth	£105.48	£26.37	£13.19	£145.04	£14.50	£21.76	£181.30	-10%	44%	£163.17	£261.08
	100x100x80mm Granite Set on mortar bed with mortared joints	£362.60	£402.89	£580.16	m2	150mm of sub-base required and excavation (invert) same as cross section depth	£234.41	£58.60	£29.30	£322.31	£32.23	£48.35	£402.89	-10%	44%	£362.60	£580.16
	900x600x50mm Granite paving slab on mortar bed with mortared joints	£281.96	£313.28	£451.13	m2	150mm of sub-base required and excavation (invert) same as cross section depth	£182.27	£45.57	£22.78	£250.63	£25.06	£37.59	£313.28	-10%	44%	£281.96	£451.13
	300x200x75mm Yorkstone slab on mortar bed with mortared joints	£419.19	£465.77	£670.70	m2	150mm of sub-base required and excavation (invert) same as cross section depth	£270.99	£67.75	£33.87	£372.61	£37.26	£55.89	£465.77	-10%	44%	£419.19	£670.70
	Improved public realm: Garden bed/landscaped verge	£28.30	£31.44	£45.28	Per m2	Topsoil, grass seed and planting	£18.30	£4.57	£2.29	£25.16	£2.52	£3.77	£31.44	-10%	44%	£28.30	£45.28
	Improved public realm: Tree planting	£870.99	£967.76	£1,393.58	Per tree	Typical tree type:	£563.06	£140.77	£70.38	£774.21	£77.42	£116.13	£967.76	-10%	44%	£870.99	£1,393.58
	Improved public realm: Continuous footpath treatment	£156.38	£173.76	£250.21	Per m2	Based on Marshalls Tegula paving	£101.10	£25.27	£12.64	£139.01	£13.90	£20.85	£173.76	-10%	44%	£156.38	£250.21
	Improved public realm: High quality benches or seating	£1,116.14	£1,240.15	£1,785.82	Per unit	Based on 4 seat enhanced benches in public realm	£721.54	£180.39	£90.19	£992.12	£99.21	£148.82	£1,240.15	-10%	44%	£1,116.14	£1,785.82
	Improved public realm: Wayfinding signage/totem	£3,930.07	£4,366.74	£6,288.11	Per unit		£2,540.65	£635.16	£317.58	£3,493.39	£349.34	£524.01	£4,366.74	-10%	44%	£3,930.07	£6,288.11
	Traffic Calming: Speed Humps	£7,734.38	£8,593.75	£12,375.00	per unit	TRO May be required at an additional cost of £7,500. Attached link suggests £20,000 for 4 humps is appropriate, not sure exactly what this covers	£5,000.00	£1,250.00	£625.00	£6,875.00	£687.50	£1,031.25	£8,593.75	-10%	44%	£7,734.38	£12,375.00
	Traffic calming: Speed hump (Engineering Brick)	£7,242.61	£8,047.34	£11,588.17	per unit	Engineering brick, undertaken during normal working hours	£4,682.09	£1,170.52	£585.26	£6,437.87	£643.79	£965.68	£8,047.34	-10%	44%	£7,242.61	£11,588.17

Hub functionality	Component	Min at 1Q 23	Point estimate at 1Q 23	Max at 1Q 23	Unit of measure	Notes	Construction / purchase	Prelims 25%-construction	Ovehead s and profit 10%	Total construction cost	Client cost 10%	Design 15%	Point estimates total	Risk contingency		Cost range estimate	
														Min	Max	Min	Max
	Traffic calming: Speed hump (200mm Surfacing)	£6,862.97	£7,625.52	£10,980.75	per unit	100mm above existing road surface. Undertaken during normal working hours	£4,436.67	£1,109.17	£554.58	£6,100.42	£610.04	£915.06	£7,625.52	-10%	44%	£6,862.97	£10,980.75
	Traffic Calming: Speed Cushions	£3,673.83	£4,082.03	£5,878.13	per unit	TRO May be required at an additional cost of £7,500 for all items. Attached link suggests £19,000 for 4 pairs humps is appropriate., not sure exactly what this covers but taken as 1.7m x 1.7m speed cushion	£2,375.00	£593.75	£296.88	£3,265.63	£326.56	£489.84	£4,082.03	-10%	44%	£3,673.83	£5,878.13
	Speed cushion 900x900mm (Engineering Brick)	£613.61	£681.79	£981.78	Per unit	Engineering brick, undertaken during normal working hours	£396.68	£99.17	£49.58	£545.43	£54.54	£81.81	£681.79	-10%	44%	£613.61	£981.78
	Speed cushion 900x900mm (200mm surfacing)	£533.14	£592.37	£853.02	Per unit	100mm above existing road surface. Undertaken during normal working hours	£344.65	£86.16	£43.08	£473.90	£47.39	£71.08	£592.37	-10%	44%	£533.14	£853.02
	Rubber Black Speed cushion 2000mx1800m	£1,933.59	£2,148.44	£3,093.75	per unit	Undertaken during normal working hours	£1,250.00	£312.50	£156.25	£1,718.75	£171.88	£257.81	£2,148.44	-10%	44%	£1,933.59	£3,093.75
	Signs for typical Rubber Speed Cushion	£482.16	£535.73	£771.46	per speed hump	Undertaken during normal working hours. Quantify on project by project basis	£311.70	£77.93	£38.96	£428.59	£42.86	£64.29	£535.73	-10%	44%	£482.16	£771.46
	Traffic calming: Chicanes	£18,562.50	£20,625.00	£29,700.00	per chicane	Based on cost in link of £12000 per chicane, not sure exactly what this covers and this is top of the range	£12,000.00	£3,000.00	£1,500.00	£16,500.00	£1,650.00	£2,475.00	£20,625.00	-10%	44%	£18,562.50	£29,700.00
	Traffic calming: Lane narrowing	£37,125.00	£41,250.00	£59,400.00	per lane narrowing intervention	Realign kerb, widen footway 0.5m. Taken no works to drainage or existing services required. Attached link suggests £24,000 is appropriate for a new Lane Narrowing intervention, not sure exactly what this covers	£24,000.00	£6,000.00	£3,000.00	£33,000.00	£3,300.00	£4,950.00	£41,250.00	-10%	44%	£37,125.00	£59,400.00
	Realign Kerb/New kerbs	£85.92	£95.47	£137.47	m	Remove existing HB2 kerb or equivalent and replace with new. Includes allowance for making good. Work can be undertaken in normal working hours	£55.54	£13.89	£6.94	£76.37	£7.64	£11.46	£95.47	-10%	44%	£85.92	£137.47
	Widening footpath - footpath construction	£88.41	£98.24	£141.46	m2	Typical footpath construction. Work can be undertaken in normal working hours	£57.16	£14.29	£7.14	£78.59	£7.86	£11.79	£98.24	-10%	44%	£88.41	£141.46

Hub functionality	Component	Min at 1Q 23	Point estimate at 1Q 23	Max at 1Q 23	Unit of measure	Notes	Construction / purchase	Prelims 25%-construction	Ovehead s and profit 10%	Total construction cost	Client cost 10%	Design 15%	Point estimates total	Risk contingency		Cost range estimate	
														Min	Max	Min	Max
	Traffic calming: Vehicle activated speed warning signage - cost for basic sign	£9,281.25	£10,312.50	£14,850.00	Per unit	Electric signs which displays a message when triggered by vehicles. Allowance of £6k	£6,000.00	£1,500.00	£750.00	£8,250.00	£825.00	£1,237.50	£10,312.50	-10%	44%	£9,281.25	£14,850.00
	Traffic calming: Vehicle activated speed warning signage - cost for complete sign including power supply	£27,070.31	£30,078.13	£43,312.50	Per unit	Electric signs which displays a message when triggered by vehicles. Allowance of £17.5k	£17,500.00	£4,375.00	£2,187.50	£24,062.50	£2,406.25	£3,609.38	£30,078.13	-10%	44%	£27,070.31	£43,312.50
	Traffic calming: Speed camera	£30,937.50	£34,375.00	£49,500.00	Per unit	Includes supporting infrastructure such as computer servers, internet connection, cabling and power supply, etc. Allowance of £20k, not sure exactly what this includes for	£20,000.00	£5,000.00	£2,500.00	£27,500.00	£2,750.00	£4,125.00	£34,375.00	-10%	44%	£30,937.50	£49,500.00
	Safer crossing and street repairs: zebra crossing	£17,948.19	£19,942.43	£28,717.10	Per unit	Includes Belisha Beacons and signs. Existing power supply nearby. All works can be undertaken during normal working hours with TM	£11,602.87	£2,900.72	£1,450.36	£15,953.95	£1,595.39	£2,393.09	£19,942.43	-10%	44%	£17,948.19	£28,717.10
	Safer crossing and street repairs: raised zebra crossing	£23,565.16	£26,183.51	£37,704.25	Per unit	As above but with some pavement construction	£15,234.04	£3,808.51	£1,904.25	£20,946.80	£2,094.68	£3,142.02	£26,183.51	-10%	44%	£23,565.16	£37,704.25
	Safer crossing and street repairs: Signalised pedestrian crossing	£36,070.34	£40,078.15	£57,712.54	Per unit	Includes traffic signals and signs. Existing power supply nearby. All works can be undertaken during normal working hours with TM	£23,318.20	£5,829.55	£2,914.77	£32,062.52	£3,206.25	£4,809.38	£40,078.15	-10%	44%	£36,070.34	£57,712.54
	Safer crossing and street repairs: Road resurfacing	£78.02	£86.69	£124.83	Per m2	Mill out 100mm and replace with 60mm binder and 40mm surface course. Including renewed line marking	£50.44	£12.61	£6.30	£69.35	£6.94	£10.40	£86.69	-10%	44%	£78.02	£124.83
	6m galvanised steel lighting	£6,886.73	£7,651.92	£11,018.77	Per light post	Includes for duct and cabling. Tyoical lighting specification priced. Existing power supply can be utilised	£4,452.03	£1,113.01	£556.50	£6,121.54	£612.15	£918.23	£7,651.92	-10%	44%	£6,886.73	£11,018.77
	8m galvanised steel lighting	£7,385.21	£8,205.79	£11,816.34	Per light post	Includes for duct and cabling. Tyoical lighting specification priced. Existing power supply can be utilised	£4,774.28	£1,193.57	£596.78	£6,564.63	£656.46	£984.70	£8,205.79	-10%	44%	£7,385.21	£11,816.34

Hub functionality	Component	Min at 1Q 23	Point estimate at 1Q 23	Max at 1Q 23	Unit of measure	Notes	Construction / purchase	Prelims 25%-construction	Overheads and profit 10%	Total construction cost	Client cost 10%	Design 15%	Point estimates total	Risk contingency		Cost range estimate	
														Min	Max	Min	Max
	10m galvanised steel lighting	£8,253.97	£9,171.08	£13,206.35	Per light post	Includes for duct and cabling. Tyoical lighting specification priced. Existing power supply can be utilised	£5,335.90	£1,333.97	£666.99	£7,336.86	£733.69	£1,100.53	£9,171.08	-10%	44%	£8,253.97	£13,206.35
	Security – CCTV camera on column	£12,199.54	£13,555.04	£19,519.26	Per camera	Does not include cabling and connection to monitoring system. Does/does not include operating costs.	£7,886.57	£1,971.64	£985.82	£10,844.03	£1,084.40	£1,626.60	£13,555.04	-10%	44%	£12,199.54	£19,519.26
	Security – CCTV camera on column	£15,610.83	£17,345.36	£24,977.32	Per camera	Includes cabling and connection to monitoring system. Does/does not include operating costs.	£10,091.85	£2,522.96	£1,261.48	£13,876.29	£1,387.63	£2,081.44	£17,345.36	-10%	44%	£15,610.83	£24,977.32
	Security – Help point: excluding connections etc.	£3,240.48	£3,600.53	£5,184.76	Per unit	Does not include connection to monitoring system. Does/does not include operating costs.	£2,094.85	£523.71	£261.86	£2,880.42	£288.04	£432.06	£3,600.53	-10%	44%	£3,240.48	£5,184.76
	Security – Help point: Incl Connections etc	£9,083.12	£10,092.35	£14,532.99	Per unit	Does include connection to monitoring system. Does/does not include operating costs.	£5,871.91	£1,467.98	£733.99	£8,073.88	£807.39	£1,211.08	£10,092.35	-10%	44%	£9,083.12	£14,532.99
Community Facilities	Toilets	£3,365.09	£3,738.99	£5,384.15	Per m2	Does not include land acquisition, assume nearby water connection	£2,175.41	£543.85	£271.93	£2,991.20	£299.12	£448.68	£3,738.99	-10%	44%	£3,365.09	£5,384.15
	Drinking water	£2,358.04	£2,620.05	£3,772.87	Per fountain		£1,524.39	£381.10	£190.55	£2,096.04	£209.60	£314.41	£2,620.05	-10%	44%	£2,358.04	£3,772.87
	Package delivery lockers	£3,138.61	£3,487.34	£5,021.78	per unit	6 Door nest locker per unit	£2,029.00	£507.25	£253.63	£2,789.88	£278.99	£418.48	£3,487.34	-10%	44%	£3,138.61	£5,021.78
	Community space: Parklet or similar modular seating and garden unit	£7,758.87	£8,620.96	£12,414.18	Per unit	Assumed to be prefabricated parklet approximately the same size as one to two parking spaces.	£5,015.83	£1,253.96	£626.98	£6,896.77	£689.68	£1,034.52	£8,620.96	-10%	44%	£7,758.87	£12,414.18
Other Opportunities	Tourism hub (information, transit and tours)	£3,930.07	£4,366.74	£6,288.11	Per m2	Includes building and fit-out	£2,540.65	£635.16	£317.58	£3,493.39	£349.34	£524.01	£4,366.74	-10%	44%	£3,930.07	£6,288.11