Definition

The Natural England Commissioned Report NECR181, Green Bridges (July 2015) defines a green bridge as an “Artificial structure over road or rail infrastructure which is either vegetated or provides some wildlife function”. This definition is being adopted for the Cambourne to Cambridge Better Public Transport Project.

Green bridges have the potential to:
• Better integrate transport infrastructure into their surrounding landscape and reduce visual impact by retaining, replacing or restoring continuity of important landscape features.
• Mitigate the severance impacts of road and rail networks on walkers, cyclists and horse riders and enhance the user experience by making crossings more attractive.
• Mitigate the severance impacts of road and rail networks on wildlife by providing crossing points for a range of species including mammals, birds and invertebrates.
• Be a receptor site for translocation or mitigation of biodiversity/habitat lost elsewhere along the project.
• Reduce health and safety risk associated with roadkill.
• Be a wildlife home/habitat in their own right through the incorporation of design features such as bat roosts, and if managed appropriately, provide a resource for species such as pollinators.

Landscape Institute Technical Guidance Note 09/2015, Green Bridges (December 2015) states that “fragmentation of the landscape, loss of its patterns and features and disruption to ecosystem connectivity are major problems. Green bridges can play a part in ensuring connectivity is retained or reinstated... Through creating high quality, visually attractive and convenient crossings for pedestrians, cyclists and horse riders, green bridges can encourage more people to use these routes with resulting health, well-being and other benefits.”

Types

Four broad green bridge types are identified in the Landscape Institute Technical Guidance Note 09/2015, Green Bridges (December 2015), each is described briefly below:
• Natural Bridge: These are the largest type, with widths of 70-100m+ and aim to provide an ecosystem level of connection. Human use (or not) is carefully considered, depending on the sensitivity of the target wildlife.
• Wildlife Bridge: Similar to a Natural Bridge but smaller in size (40-70m width), intended primarily to facilitate particular species crossing the transport infrastructure below.
• Mixed Use Bridge: Used where access is the principle aim and where any species use is seen as an additional benefit rather than a core aim. These bridges are effectively divided into two areas, with a zone for wildlife and a zone for access. The width of the wildlife zone should be calculated and added to the width required for access to give the total width. It is recommended that the access is placed on one side of the bridge to maximise the width of the wildlife zone.
• Modified Grey Bridge: A lower cost option that involves the adaptation of a grey bridge design, it is not an alternative to the other bridge types as it is unlikely to provide the same level of function, but it will improve the general permeability of the infrastructure. It is not recommended for roads with heavy usage. The widths of green strips should be a minimum of 1m wide and 0.3m deep. Vertical greening could be considered to enhance its aesthetic and biodiversity value.

The type of green bridge selected should be based on the aims and objectives of the project, which in turn is influenced by the landscape, biodiversity and access needs and the constraints and opportunities specific to the potential location.

Mixed Use Bridge illustration:

Modified Grey Bridge illustration:
Project context

A number of the potential route options for the Cambourne to Cambridge Better Public Transport Project would require the creation of a new bridge over the M11. The M11 at this location runs north-south and is made up of two lanes and a hard shoulder in each direction, it severs habitat connectivity east-west. The creation of a new bridge over the M11 would provide an opportunity to reconnect severed habitats and provide a safe passage for a variety of wildlife. The location would be within the green belt and would be judged against planning policies that seek to increase or enhance opportunities for access to the countryside.

Existing bridges across the M11 into, and out of, Cambridge in this area are the A1303 road bridge (M11 J13) and the footbridge to the south-west of the University of Cambridge West Cambridge Campus. Both options provide no habitat connectivity or green verges, leave pedestrians and cyclists exposed to the views and pollution of the M11 and offer little aesthetic value.

South of M11 J13 there are blocks of tree and shrub planting along both sides of the motorway, including a City Wildlife Site to the east. In the local vicinity there are a range of habitats including areas of farmland with hedgerow boundaries (some of which are also City Wildlife Sites), the traditional orchard at Coton, open water features within the University of Cambridge West Cambridge Campus and Coton Country Park.

The project would consist of a public transport route which would also be used by pedestrians and cyclists. As the new bridge would be required to carry the public transport route, the Natural Bridge and Wildlife Bridge types would not be appropriate for this project, leaving the Mixed Use Bridge and Modified Grey Bridge as potential options for consideration. As the bridge would cross the M11, railings/parapets would be required for the safety of users of the bridge and the M11.

Suggested objectives

In response to the context described above, a green bridge solution for the Cambourne to Cambridge Better Public Transport Project would respond to a number of existing issues, such as the severance of the M11, and respond to local planning policy objectives. However, to guide the development and design of the green bridge, some clear objectives need to be set.

The primary objective for a bridge over the M11 is to carry and facilitate a fast, frequent and reliable public transport service between Cambourne and Cambridge.

Secondary objectives could be to create a green bridge (Mixed Use or Modified Grey Bridge) that:

- Improves habitat and landscape connectivity to reduce the severance effect of the M11 and provide a safe passage across the M11 for targeted species identified through the environmental assessment process.
- Improves the amenity for pedestrians and cyclists travelling into, and out of, Cambridge.
- Link with wider stakeholder objectives such as the Cambridge Greenways project.
- Creates a bridge that is a recognisable and positive green gateway to Cambridge when viewed by users of the M11. This could be achieved through design of green features visible from passing traffic, a high quality bridge structure design or a combination of the two.

Green bridge over M11 concept: