Infrastructure design

Ultra pod system guideways are flat driveable surfaces that are at least 1.6m wide, with 0.25 metre kerbs that are used for optical navigation.

The guideway features no mechanical elements or power systems, with the exception of embedded transponders. Cabling for the system is cased within a covered tray that runs along the centre of the guideway.

Lightweight and quick to set up, individual pieces can be fabricated off-site and then transported to be assembled in-situ, minimizing assembly time and cost.

Different materials can be used for guideway construction depending on the particular application; examples include steel with pre-cast concrete plank, fiberglass grid floor, or a simple concrete/asphalt base if at ground level.

Minimal visual impact

Ultra's pod system guideways are only 45cm deep (including kerbs), minimising their visual impact. Part of the reason for this is that the lightweight nature of the system gives it a low loading requirement; the British standard for a footpath is 5kN/m2, whereas the pods system is only 2.2kN/m2. This low overall loading also allows the vehicles to run on existing building floors without significant strengthening or modification.

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Customisation

The remarkable flexibility of Ultra's guideways enable low-cost and aesthetically-pleasing designs to be built, as well as offering a broad range of customisation options to suit the needs of the surrounding environment and the system's practical application. These options include:

- Svelte safety rail – A series of potential safety rail designs that offer high levels of safety, with low levels of visual intrusion
- Fiberglass grid running surface – This enables light to shine through and is ideal for reducing visual impact on elevated guideways.
- Cantilevered support – This option enables guideways to be cantilevered off existing structures in highly-developed urban environments, saving space and effectively integrating the system with existing infrastructure
- Cut-and-cover sub-grade guideway – The cut-and-cover method of tunnelling, which involves excavating a trench and roofing-over with an overhead support system, is an effective way of reducing the system's visual impact. A glass ceiling in a culvert is among the options available here.
- Partially sub-grade station – Stations can be designed to be set slightly below ground in order to provide access to sub-grade systems.
- Solar-powered stations – Ultra is able to integrate photovoltaic panels in its station designs in order to power them. Viability studies, procurement and installation for such panels would be performed by an external contractor.

Guideway specifications

Listed below are the specifications for Ultra's pod system guideways:

Overall Steel/Concrete Elevated Guideway Width	2.1 m
Overall Concrete At-Grade Guideway Width	1.75 m
Internal Guideway Width	1.6 m
Internal Guideway Height	0.25 m
External Guideway Depth (for 18m spacing)	0.45 m
Typical Elevated Guideway Headroom for main road crossings	5.7 m
Typical Elevated Guideway Headroom for pedestrian crossings	2.5 m
Typical column spacing	18 m
Typical "long" column spacing	36 m
Typical column load	10 tonnes

Station Elements

The Ultra pods system station at T5 Heathrow Airport comprises the following main elements:

1. Berth – vehicle docking point, interfaces, buffer and charging equipment

2. Passenger interface – each berth features a destination selection console, communications, and automatic doors

3. Plinth – a raised floor for passenger-level access to vehicles

4. Envelope – the overall station building

5. Canopy – passenger area roof and vehicle solar shading

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Example Station Types

Remote station – Comprises 20m2 passenger weather-protected concourse and two berths; 1-berth and 3-or-more-berth versions are developed from the same elements.

Terminal station – Focal or terminal stations require multiple-berths that are typically within or attached to a host building. In such instances canopy and parts of the envelope may not be required but otherwise the same elements are employed.

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