

Vehicle features



Vehicle Features

Ultra vehicles feature four wheels with rubber pneumatic tyres, front-wheel steering and conventional damped-spring suspension. They comprise an aluminium ladder frame chassis onto which the majority of the vehicle propulsion and guidance equipment is mounted. Sitting on top of the chassis is an aluminium honeycomb floor. Above this honeycomb floor the vehicle is constructed of a steel frame and ABS-panel body that can be fitted with single- or double-side electric doors.

Comfortable and robust, Ultra pods are well-proven, reliable vehicles that are built from off-the-shelf automotive industry components and use advanced technology to provide a unique transport solution.

Powertrain and energy systems

- '7kW' synchronous AC drive motor (typical average motive power use < 2kW)
- Solid state drive controller/inverter
- 4 x 45Ah rear mounted 48V-nominal starved electrolyte lead acid traction batteries
- Automatic charging points
- Fixed ratio transaxle assembly
- Front wheel drive.

Braking Systems

- Drive motor regenerative braking
- Fail safe electromagnetic 'hold off' motor brake
- Fail safe electromagnetic 'hold off' rear wheel brakes
- Safety interlocks between brakes, motor and doors.

Chassis, suspension and steering systems

- Fabricated aluminium 'ladder frame' lower chassis with structural aluminium honeycomb floor and bulkhead panels
- Separate front and rear aluminium fabricated sub-frames with mountings for suspension, steering, motor/transmission and batteries
- Bumper structure designed to progressively absorb impact energy

- Welded steel tubular upper frame to support exterior and interior bodywork, side doors and front/rear hatches
- Double wishbone suspension front and rear using predominantly aluminium machined wishbones, coil over damper units and standard automotive joints, bearings and bushes
- Rack and pinion steering gear, operated by automotive electric power steering unit
- 13" Wheels with automotive tubeless radial (135x70R13) tyres

Exterior body, doors and glazing

- Body panels constructed in self-coloured ABS with high gloss acrylic capping
- Vacuum-formed exterior panels bonded to vehicle structure
- Twin leaf plug and slide doors
- Doors actuated by DC motors through reduction gearbox and locking linkage system
- Microprocessor controlled door operation
- Door leaves constructed of ABS panel, steel reinforcement and bonded laminated glass
- Flashing door header rail warning
- Vacuum-formed tinted acrylic 'quarter window' glazing
- External vehicle operating lights (front white and amber, rear red and amber)

Interior and passenger controls

- Interior panels vacuum-formed from grey, grained ABS
- Seats facing front and rear providing flexible accommodation for 4 adults
- Illuminating door/control switches
- Illuminating communication/alarm switches at both ends of vehicle (diagonal pair front right and rear left)
- Two-way communications between passengers and control team
- Internal and externally releasable emergency exit (locked while vehicle in motion)
- Passenger information LCD screen
- Internal lighting sufficient for reading
- Vehicle signs/symbols and information labels
- Non-slip, easy-clean floor covering
- Cabin heating, ventilation and air conditioning
- Cabin smoke detector, emergency fire extinguisher and two internal CCTV monitoring cameras mounted in the ceiling
- Weight sensors to monitor vehicle loading and prevent operation if overloaded.

Control and guidance

- Autonomous guidance, navigation and control unit using a combination of sensors for navigation
- Condition and performance monitoring of vehicle components and systems
- Automatic Vehicle Protection System to prevent collision between vehicles on guideway
- Wireless communication system for 2-way data, passenger communication and command exchange between vehicle and system central control.

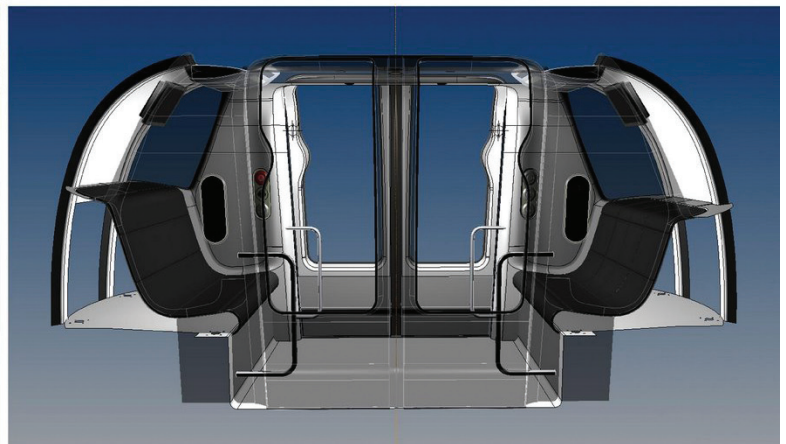
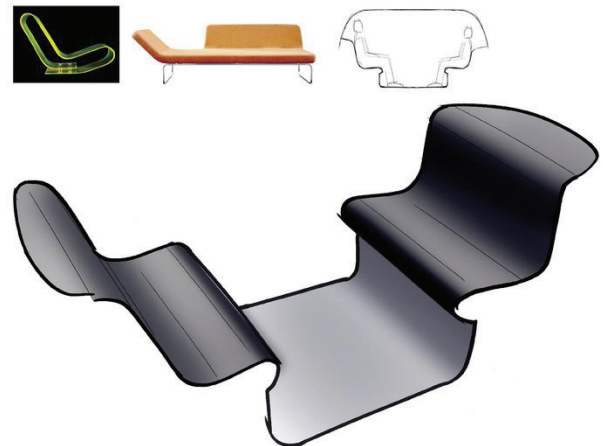
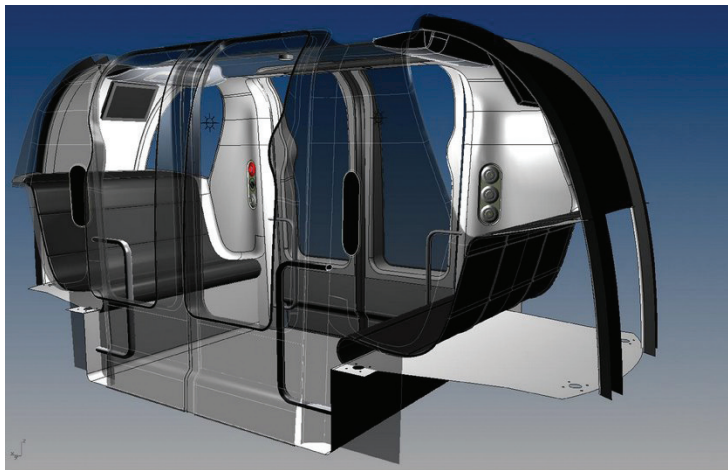




Customisation

The pods used in Ultra's PRT system can be adapted both internally and externally to suit a variety applications and environments.

Interior Design



Ultra's pod interiors are customisable, with the vacuum-formed grey panels offering a neutral base onto which appropriate designs and graphics can be printed.

In addition to these aesthetic styling options, Ultra pods have many customizable interior features:

Air-conditioning and heating systems provide passenger comfort during journeys, and can be adapted to suit extreme temperatures.

Interior LCD screen and audio system enables the operator to provide the passenger with relevant information about their journey; they can also be used to provide other services, such as advertising local services and amenities. Alternatively, the media system could be used to play music or video clips for the entertainment of the passengers.

A smart-card system can be incorporated for destination selection and payment; regular passengers could also have their favourite video/audio preferences stored on their card.

Exterior Aesthetics

The exterior of the vehicle is formed from vacuum-formed panels, constructed using self-coloured ABS with high-gloss acrylic capping, attached to a tubular steel frame.

This setup allows considerable flexibility in design, as each panel, including the windows, can be stylised as required. This enables completely different styles to be implemented in each system without delays or significant design and tooling costs.

The exterior design flexibility enables the client to visually integrate the Ultra pods system with the architecture and location environment.

Pallet-based freight vehicle

Ultra pods can also be modified to carry freight, with the flat floor and large door opening enabling pallet-based goods to be easily loaded and unloaded.

Pods can be adapted for cold storage and waste handling; while in transit the freight pod will, to the casual eye, look in keeping with the remainder of the vehicles, thus maintaining the prestigious appearance of the PRT system.

Vehicle specifications

The physical specifications for the Ultra pods are given below. The vehicle features a flat floor which aligns accurately with stations to allow safe and easy access for push chairs, wheelchairs, luggage and people and meets the access requirements in both the UK (Disability Discrimination Act, DDA) and the US (Americans with Disabilities Act, ADA).

Physical Specifications

Vehicle length	3.7 m
Vehicle width	1.47 m
Vehicle height	1.8 m
Empty weight	850 kg
Door opening area	≥1.5m x 0.9m (h x w)
Flat floor area	≥1.44m x 1.2m (l x w)

Performance & Manoeuvrability

The table below gives a summary of the performance statistics for the Ultra pods:

Maximum speed	40 kph (25 mph)
Emergency deceleration rate	~ 3 m/s ²
Vehicle range	> 10 km
Maximum payload	450 kg
Minimum turn radius	5 m
Maximum climb angle	20 %
Maximum planned climb angle	10 %
Maximum planned decline angle	6.25 %