

M25 Junction 13 Improvement Scheme

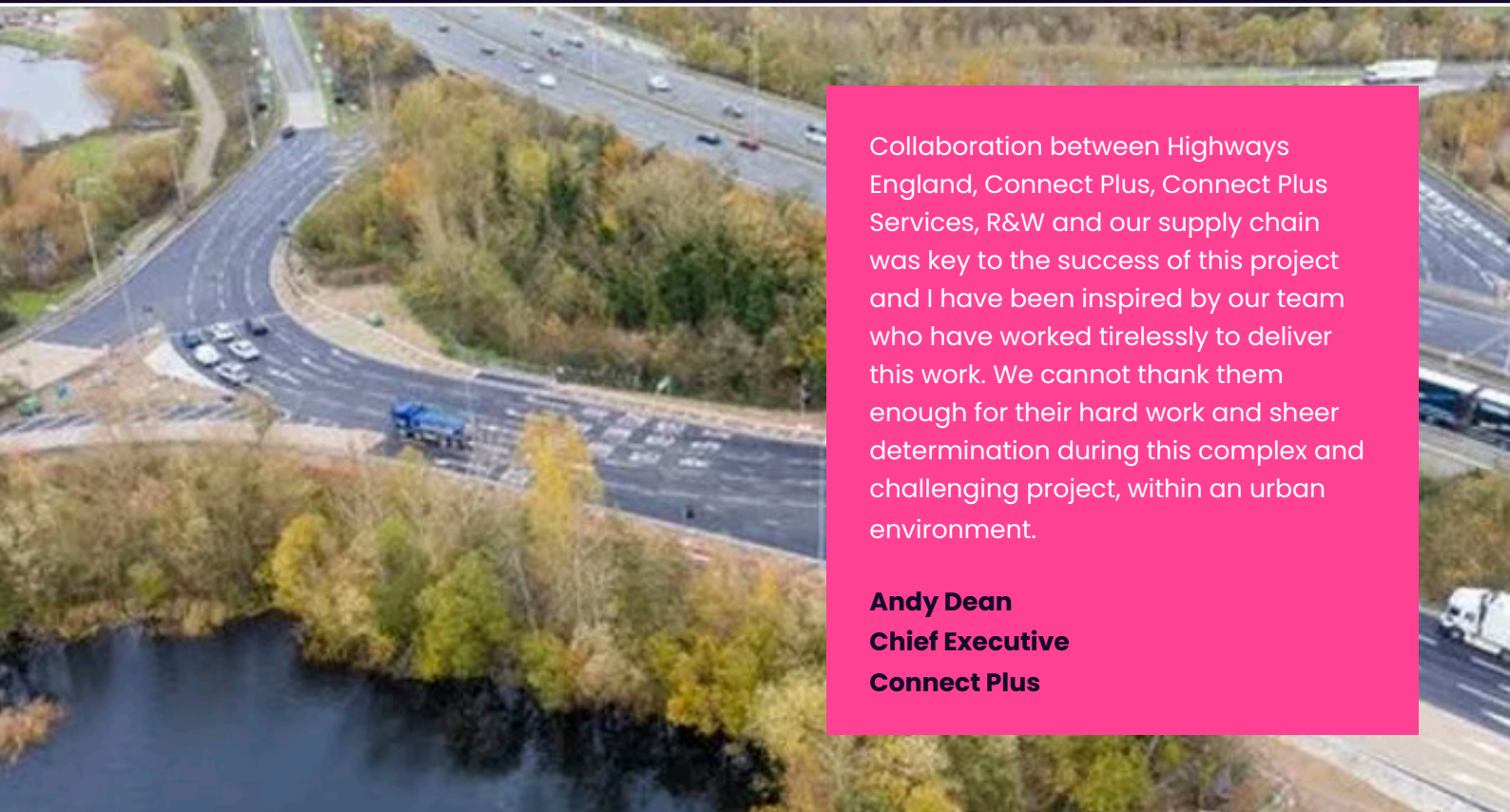


Client: Connect Plus

Value: £6m

Delivered: October 2019 – June 2021

Contract: NEC3 Option C



Collaboration between Highways England, Connect Plus, Connect Plus Services, R&W and our supply chain was key to the success of this project and I have been inspired by our team who have worked tirelessly to deliver this work. We cannot thank them enough for their hard work and sheer determination during this complex and challenging project, within an urban environment.

Andy Dean
Chief Executive
Connect Plus

Project overview

The objective of this scheme was to improve journey times and safety on one of the busiest sections of motorway in England. Junction 13 of the M25 in Staines, Surrey, is situated between the M3 and M4 motorways and serves the towns of Egham and Staines-Upon-Thames via the A30. The improvements have made the layout more intuitive by reducing the need to change lanes, which has made the junction safer and easier for drivers. Carriageway widening on both the gyratory and the northbound exit slip road, with additional lanes and new traffic signals, has also increased the junction's capacity and reduced congestion.

Scope of works

- Early Contractor Involvement (ECI)
- Widening of the northbound off slip from four to five lanes approaching the roundabout (requiring the installation of sheet piling)
- Construction of an extra lane to the gyratory system, with a reinforced concrete retaining wall to support the carriageway widening
- Traffic management, including the removal of existing traffic signals and installation of a temporary system
- Installation of new highways drainage
- Installation of new road crossings, ducts for traffic signals and street lighting, and foundations for signal poles and lighting
- Construction of three new maintenance lay-bys
- Installation of new VRS
- Surfacing of the whole junction and approaches, and road markings
- Installation and commissioning of new traffic signals and street lighting
- New acoustic fencing

Developing optimised solutions through ECI

During ECI, we met regularly with Connect Plus, the designer and our supply chain, to identify efficiencies and any elements that might impact the programme. The solutions we developed and implemented included:

Northbound exit slip road widening: for the 10m drop alongside the slip road, a sheet piled retaining wall was chosen to support the widening of the slip road instead of gabion baskets as originally proposed.

It was originally thought the sheet piling works would have to be carried out at night. Through ECI, we developed a solution to access the area across an adjacent field, enabling the piling to be installed during the day. This re-phasing resulted in a £500k cost saving and a two-month reduction in the programme.

Underground services: our GPR surveys and trial holes enabled us to determine the exact route and depth of an 11kV cable, as well as identify an unexpected BT cable. As a result, the invert level, route and size of the drainage pipes, and locations for lighting columns and traffic signal ducting were designed to avoid the cable, mitigating any diversion works.

Traffic management (TM) and phasing: to mitigate the impact of the works to the network, we developed optimised phasing during ECI, which reduced the programme by two months. We achieved this by carrying out phases simultaneously (where possible) and implementing day and night working to reduce overall duration.

Temporary works: to maintain access to adjacent lakes for anglers, we constructed a temporary road and parking.





Reducing the scheme's carbon footprint

For night working, we used X ECO6 Tower Lights instead of the standard equivalents, to reduce fuel consumption and the level of CO₂ produced. The battery for the lights is charged throughout the day using solar energy. When the battery's power has run out at night, the back-up diesel engine then powers the lights for the remaining time. We used eight tower lights per night shift, equating to a 233.6kg reduction of CO₂ per day. We also ran the compound on mains electricity rather than a diesel generator. This resulted in a reduction of 1500 litres of diesel per week.

Protecting the environment

The lake adjacent to the northbound exit slip runs into a central culvert flowing under Junction 13, which required us to obtain a Flood Risk Activity Permit (FRAP) from the Environment Agency (EA). The EA also required us to carry out a pre-construction survey to determine the exact location of the culvert, which we completed using a drone.

To widen the gyratory and slip road, we needed to carry out an extensive amount of vegetation clearance; we engaged an ecologist during ECI to assess the impact of this and to provide guidance so we could proceed safely with the necessary works.