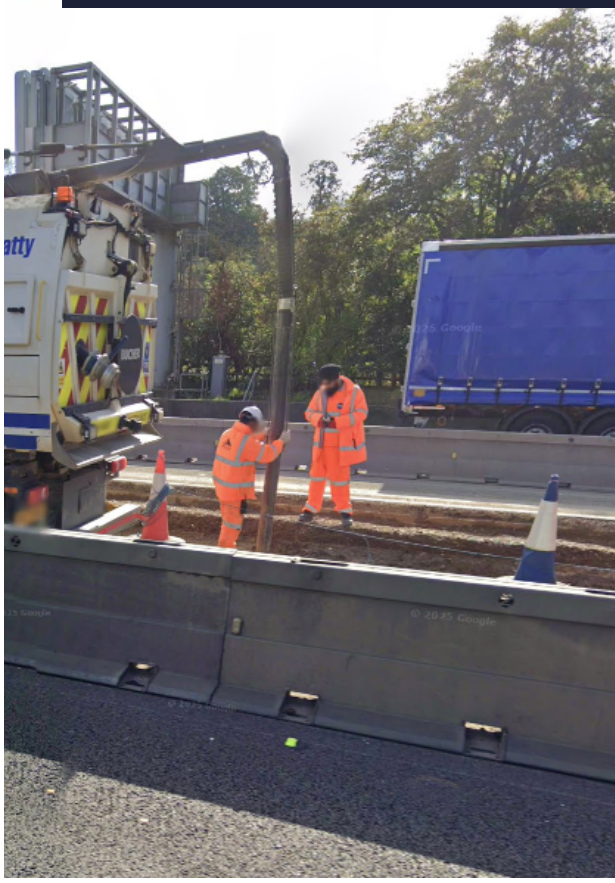
Case study

M1 J10-13 Smart Motorway Upgrades

Enhancing Safety Whilst Minimising Disruption

Products installed:

- RB80
- Zone guard Temporary VRS



As part of SMP Alliance's delivery of the safety enhancement programme between Junctions 10 and 13 of the M1 for National Highways, essential upgrades have been made to the central reservation to improve safety and resilience for all road users. Located near the busy Luton Airport junction, this high traffic stretch of road required replacement of existing steel barriers with safer modern concrete alternatives. Balfour Beatty, the SMP Alliance on-site assembly partner for this scheme, led delivery of the works, with Hill & Smith Infrastructure playing a key supporting role. Hill & Smith supplied and installed temporary barrier systems that enabled essential drainage, earthworks, and structure upgrades for project operations to progress safely and efficiently.

The challenge

Delivering a central reservation upgrade on one of the UK's busiest motorway corridors came with significant technical and logistical demands. Hill & Smith Infrastructure worked closely with project partners to overcome a series of interconnected challenges that required precision planning, agility, and consistent communication.

High traffic volumes at Junction 10

Junction 10 of the M1 serves as a key access point to Luton Airport, making it one of the most heavily trafficked sections of the motorway. Any closures or disruption in this area had the potential to cause widespread congestion and delay, not only for general road users but also for time-critical airport traffic. This necessitated a meticulously planned traffic management strategy that prioritised safety while minimising disruption. The project team had to carefully coordinate road closures with surrounding routes and ensure the motorway was fully reopened to traffic by 5 a.m. each day to avoid impacting peak travel periods. Working around such a critical transport node meant programme timing was of the utmost importance, requiring continual monitoring and adjustment of site activities.

Limited working windows

Due to the high volume of traffic, particularly during daytime hours, the majority of construction activity was confined to overnight shifts. These narrow windows limited the time available for installation and removal of temporary barriers, meaning each shift had to be carefully scheduled and executed with maximum efficiency. Delays or overruns were not an option, as failure to reopen the motorway by early morning could have serious consequences for road users and the project team alike.

To meet this challenge, whenever traffic management workforce availability allowed, two dedicated barrier crews operated in tandem, ensuring productivity targets were consistently met. This required close coordination between teams, suppliers and traffic management partners to align tasks and maintain momentum across the programme.

Complex stakeholder environment

The project corridor included access routes to major distribution centres operated by Royal Mail and Amazon, making stakeholder coordination an essential component of the project. Disruptions to these operators' logistics networks would have national knock-on effects, so early and frequent engagement was required to plan around their delivery schedules and peak periods. In addition, the team worked with local authorities, traffic management providers, and multiple supply chain partners to align priorities and manage expectations.

The level of collaboration and flexibility required extended beyond typical construction timelines, often involving last-minute adjustments to plans in response to stakeholder needs. Daily meetings played a key role in maintaining transparency, fostering agility and ensuring all parties remained aligned.

Tight programme constraints

The project team faced pressure to deliver an 18.9km central reservation concrete barrier upgrade within the mandated completion timeframe, on a live motorway, with minimal disruption. The scale of the works, which included drainage, structure upgrades, and permanent barrier installation, meant that every day counted. Delays in one area could have a cascading effect on other activities, so progress tracking and resource allocation were tightly controlled throughout.

Hill & Smith's flexible barrier deployment approach enabled critical works to be carried out without compromising programme milestones. Maintaining this momentum across such a large footprint required a high degree of coordination, adaptability, and resilience from everyone involved.

Barrier transitions across bridge decks

Ensuring a safe and consistent barrier system across a variety of road structures posed a technical challenge. The project included several bridge decks where standard barrier solutions were not sufficient, requiring carefully specified transitions between systems. These transitions had to meet strict performance requirements while fitting within space constraints and coordinating with structural features of the bridge.

The Hill & Smith team provided bespoke product combinations – including steel and concrete systems – and worked closely with the design and installation teams to ensure continuity of containment and visual consistency. Getting this right was vital not only for safety during construction, but also to uphold long-term performance of the upgraded central reservation.

The solution

Delivering safe and efficient access for infrastructure upgrades on a live motorway requires more than just reliable products – it demands early engagement, intelligent planning, and seamless on-site execution. Hill & Smith Infrastructure brought all three to the table, working collaboratively together with SMP Alliance partner Balfour Beatty and Alliance suppliers Chevron and WJ, as well as local authorities to ensure that progress could be made without compromising safety, schedule, or stakeholder satisfaction.

Tailored Barrier Systems to Suit Site Conditions

Hill & Smith Infrastructure supplied a temporary barrier solution carefully tailored to the specific operational demands of the M1 J10–13 upgrade. Working alongside Chevron at the tender stage, the team helped define which barrier products – including RB80 and Zone guard systems – would be most appropriate across the project's varied conditions, including bridge decks and areas with tight spatial constraints.

The placement, sequencing, and access provisions of the provided solutions were developed in close collaboration with project partners to suit the scheme's complex logistics. Dynamic access and egress points were incorporated to support frequent haulage movements and rapid access for work crews. The result was a barrier system that met all safety and performance standards while remaining adaptable to the pace and pressures of a live motorway environment.

Agile Planning and Responsive On-Site Coordination

With working windows limited to overnight shifts and a hard stop each morning to reopen the motorway by 5 a.m., planning had to be exceptionally precise. Hill & Smith worked collaboratively from the tender stage to develop a barrier layout that would support rapid deployment and seamless integration with traffic management strategies. This early engagement allowed the team to influence product choice, placement, and access strategies in alignment with Chevron's design inputs.

Once on site, the team took an agile, responsive approach: daily meetings were held to assess progress, address obstacles, and reallocate resources where needed. This flexibility helped the team stay on track even when faced with unpredictable weather, shifting priorities, or changes to site logistics.

Collaborative Delivery with Multiple Stakeholders

The project corridor was shared by a diverse group of stakeholders – including WJ (for white lining), Chevron (for traffic management), Luton Airport, and major logistics operators such as Royal Mail and Amazon. Hill & Smith Infrastructure maintained close communication with each party within the works area to ensure that barrier works complemented rather than conflicted with other scheduled tasks. Barrier installation could not

proceed without white lines in place, making timing and cooperation between Hill & Smith Infrastructure and WJ particularly crucial.

The same was true at the end of each shift: for example, when installing up to 2.4 km of barrier overnight, it was vital that Chevron was ready and resourced to remove cones, reopen lanes, and restore traffic flow. By fostering strong relationships and a shared understanding of the constraints, the team created a unified working environment where each partner could operate efficiently and safely.

Safe, High-Speed Installation in a Live Environment

With traffic flowing past at high speed and night-time visibility limited, safety was non-negotiable. Hill & Smith Infrastructure deployed two full-time barrier crews to maximise productivity within the constrained window available each night. The use of high-visibility safety enhancements – such as reflective paddles on the barriers to create a delineated line and chevron stickers on the crash cushions – helped reduce risks for both workers and road users. Thanks to the team's focus on efficiency and safety, barrier installation often reached up to 2.4 kilometres per night - an impressive rate for a live environment of this scale.

The outcome

The M1 J10–13 upgrade was successfully delivered within a 12-month programme, with Hill & Smith Infrastructure playing a key role in enabling safe and efficient access to works across the 18.9-kilometre stretch. Despite tight working windows, high traffic volumes, and complex stakeholder demands, the project was completed without major disruption. Hill & Smith Infrastructure's temporary barrier systems supported round-the-clock progress, with dynamic access points and rapid installation rates – up to 2.4km per night – helping maintain momentum.
The upgraded central reservation now offers improved long-term safety for road users, demonstrating what early collaboration and agile delivery can achieve on live motorway schemes.

David Hughes, Head of Operations – Services of Hill & Smith Infrastructure added about the key factors that contributed to the successful delivery of the project: "Product quality and performance, responsiveness on site, and a collaborative mindset were instrumental in helping us deliver this project safely and on schedule. Understanding the pressures of working in a live environment and working closely with our partners to adapt to every challenge was paramount to this scheme."

Find out more

For more information on Temporary Vehicle Restraint Systems (TVRS), contact **info@hillandsmithinfrastructure.com**

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Photography: Google, "Streetview," digital images, Google Maps (http://maps.google.com), photograph of M1 between J10-J13, taken September 2024. Retrieved July 2025.