Case study

# BBV M42 Corridor HS2

## Delivering Safer, Smarter Traffic Management for HS2

**Products installed:**

- Zoneguard
- RB80XA
- RB80
- RB140
- Multibloc F
- Maxibloc R

HS2 is the UK's largest infrastructure project, designed to improve connectivity between London, the Midlands, and the North. Along the M42 corridor – a critical section intersecting with the new rail line – Balfour Beatty VINCI (BBV) Joint Venture and HS2 Ltd faced a significant challenge: how to safely carry out major construction activities adjacent to a live motorway that sees over 28 million vehicle movements annually.

To enable safe, continuous working without compromising capacity or public safety, BBV turned to Virtus, HW Martin, and Hill & Smith Infrastructure for a temporary vehicle restraint solution. The goal was to protect both road users and workers while maintaining four narrow lanes and enabling simultaneous construction across multiple active sites.

## The challenge

Delivering a high-containment, legally compliant vehicle restraint system across one of the UK's most heavily trafficked motorway corridors came with complex technical, spatial, and logistical demands. Hill & Smith Infrastructure worked closely with Balfour Beatty VINCI Joint Venture, Virtus, HW Martin and HS2 to overcome a series of interconnected challenges that required precision design, collaborative problem-solving, and proactive planning from day one.

### Working safely in extremely confined conditions

Sections of the M42 corridor presented exceptionally tight working environments, with construction taking place just centimetres from live traffic. Normal containment systems were not suitable as they wouldn't provide adequate protection for the road user. Higher & very high containment systems would be required, still with the need to maintain four operational lanes.

### Enabling simultaneous working across multiple sites

To support HS2's ambitious delivery programme, construction activities needed to progress in parallel at multiple locations along the route. However, managing concurrent works on a live motorway with variable terrain, differing hazards, and changing access requirements added a layer of complexity to the planning process. Hill & Smith Infrastructure's restraint system design had to accommodate a wide variety of site conditions while enabling safe and efficient working in multiple locations.

### Dynamic programme with evolving site requirements

Unlike traditional road projects with fixed timelines, this section of HS2 required a responsive approach to planning and execution. Priorities shifted frequently based on construction sequencing, interface works, and external dependencies such as utility relocation and structural activity. The temporary vehicle restraint strategy had to be highly adaptable – capable of responding to changing conditions without requiring extensive redesign or delay.

### Bespoke solutions across a varied landscape

The M42 includes a wide range of road types, gradients, structures, and risk profiles – requiring a range of products, including Zoneguard, RB80XA, RB80, RB140, Multibloc F, and Maxibloc R to be deployed. Ensuring containment, compatibility, and continuity across this varied landscape was a significant technical challenge. For example, different containment levels were required to protect viaducts, embankments, and central reserve structures, while barrier transitions had to meet strict performance standards and fit seamlessly within constrained footprints. Therefore, design input and a tailored product mix that balanced performance, constructability, and cost would be essential.

## The solution

Hill & Smith Infrastructure's delivery on the M42 brought together tailored technical design, collaborative planning, and operational agility to meet the complex demands of HS2's high-profile construction works. From the earliest planning stages to final installation, the team worked as a fully integrated partner alongside Virtus and HW Martin, helping Balfour Beatty VINCI Joint Venture deliver safely, efficiently, and ahead of programme.

### Tailored product strategy

A one-size-fits-all approach was never going to work on this highly variable section of the road network. Instead, Hill & Smith Infrastructure developed a bespoke restraint strategy that aligned product selection with the specific hazards and spatial constraints at each location. In high-risk areas close to bridge piers and viaducts, high-containment systems such as RB80XA and RB140 were used to protect workers and infrastructure. Where flexibility was needed, systems like Zoneguard offered safer working zones while minimising footprint. MultiBloc and MaxiBloc units were recessed into the carriageway to maximise lane width without compromising containment. Each product variant was selected for its ability to meet containment

requirements, fit within tight spaces, support efficient installation and to maximise road user protection.

## Collaborative Design and Planning

From the outset, Hill & Smith Infrastructure worked with BBV, Virtus and HW Martin to shape barrier strategies that supported both construction safety and programme delivery.

A collaborative review of the structural designs was conducted by the Asset VRS team, HS2 Design Lead Phil Watts from Virtus, and Alex Beattie, Traffic Operations Manager from BBV. It was determined that the design did not lend itself to the use of traditional Temporary Visual Resource Screens (TVRS), particularly given that the works are situated in a predominantly high-risk area. This exemplifies collaborative working and a commitment to maintaining a safe system for both the travelling public and site teams.

The team contributed to detailed site hazard assessments, proposed alignment options, and developed feasibility studies for multiple temporary vehicle restraint systems. Close coordination with traffic management provider HW Martin and HS2 designers ensured that decisions were grounded in real-world site conditions and compliant with National Highways standards. The output included complete traffic management plans, TVRS Appendix 4.1 documentation, and holistic speed assessments, supported by regular design reviews and stakeholder meetings. This collaborative, multi-disciplinary process not only reduced the risk of rework but also created a shared understanding that enabled the team to adapt rapidly as construction sequencing evolved.

## Safe, Efficient Delivery on a Live Network

Installation works took place under night-time closures to minimise disruption and ensure safe working conditions. Once in place, the barrier systems allowed crews to operate safely during the day, avoiding the need for ongoing lane closures or extended night shifts. As the programme progressed, site access points were continuously adapted, and designs refined to meet changing construction demands. Regular lessons-learned sessions and “show and tell” demonstrations reinforced safe behaviours and deepened site-wide understanding of barrier performance, making safety a shared responsibility across all partners.

## The outcome

The TVRS strategy developed and delivered by Hill & Smith Infrastructure enabled safe, simultaneous working across multiple active sites – contributing to a programme reduction of between 12 and 18 months. By replacing cone-based delineation with high-containment vehicle restraint systems, the team significantly improved worker protection while maintaining four running lanes throughout the works. The solution also reduced the need for ongoing lane closures and night shifts, supporting more consistent daytime working and delivering long-term maintenance savings estimated at £246,000 per year. These efficiencies were achieved without compromising safety, compliance, or delivery quality – demonstrating the value of early engagement, adaptable design, and close collaboration across all project partners.

> *"Hill & Smith Infrastructure are a company – and a team – we know we can rely on. They share the same mindset as we do, which is key to delivering safely, efficiently, and to the standards a project like HS2 demands. That alignment and trust make all the difference on complex, fast-moving schemes like this one."*
>
> **Alex Beattie,**
> Traffic Operations Manager,
> Balfour Beatty VINCI / HS2.

### Find out more

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

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