CASE STUDY

VALUE ENGINEERING ON THE M6 JUNCTION 5 - 8

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TRAFFIC MANAGEMENT EXPERTS

INTRODUCTION

Working collaboratively with bmJV (BAM/Morgan SIndall Joint Venture) as part of the integrated project team, HW Martin (Traffic Management) Ltd revitalised the traffic management plan for the M6 Junction 5 - 8 to embed a customer focused-approach and engineer additional value.

The project is part of the package of works being delivered by the Smart Motorway Project (SMP) Alliance across the strategic road network.

By applying Project 13 Principles, the integrated project team succeeded in:

- Reducing the length of the proposed static works by 94%.
- Making a cost saving of c£1.5m by reducing the traffic management plan and incorporating permanent infrastructure.
- Ensuring there were no road traffic collisions (RTCs) in the works.
- Maximising customer satisfaction with no customer complaints reported.
- Achieveing 97% journey reliability.
- Achieving a 51% reduction in response times to breakdowns in the works using the Traffic Officer Service.
- Saving 2,792 tonnes of Co2.
- Saving 286,000 disrupted journeys and 80,000 hours of additional delays.

The project is now proposed as best practice business as usual for future projects including the M1 All Lane Running SMP Alliance scheme due to start in March 2024, and the M27 Concrete Roads Framework.

Start date: 25th September 2023

End date: 19th June 2024

Value of revised traffic management: c.£1.2m

Location: Birmingham

QUICK FACTS

national highways

smp alliance

Pictured: the M6 junction 5 at Castle Vale. Source: Google 2023.

EXCELLENCE IN OPERATION

ABOUT THE M6 JUNCTION 5-8 PROJECT

The M6 Junction 5 - 8 is part of the programme of works carried out by the SMP Alliance on behalf of National Highways.

This 11-mile corridor between Castle Bromwich and Ray Hall Triangle carries up to 150,000 vehicles per day. It is part of what is know as the Birmingham Box, a crucial arterial route where the M6 in the West Midlands links with the M5 and M42. The route incorporates the Bromford Viaduct, taking the M6 over Birmingham's city limits, and the Gravelly Hill Interchange, more commonly known as Spaghetti Junction.

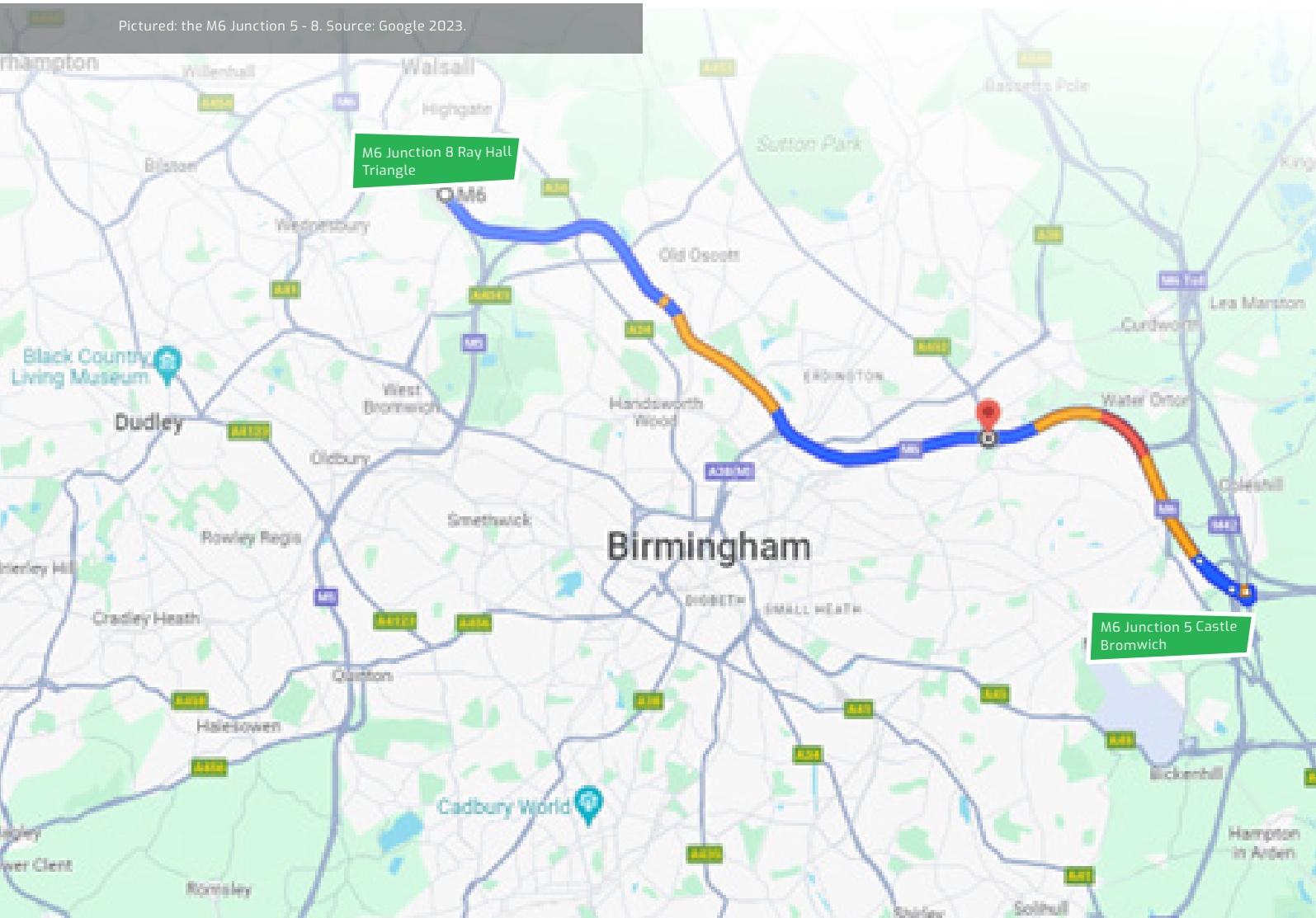
The M6 between Junctions 5 and 8 is one of seven sections of Dynamic Hard Shoulder (DHS) on the strategic road network. This classification of motorway gives Regional Operating Centres (ROC) the option to turn the hard shoulder into a running lane in response to traffic flow. Traffic is managed by the ROC using information displayed on overhead gantries.

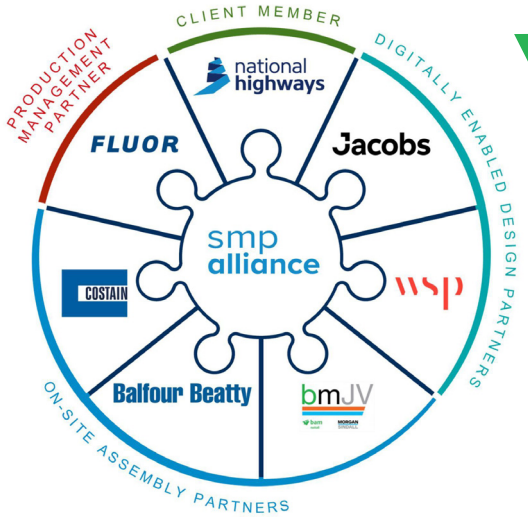
The plan to convert this stretch to an All Lane Running Smart Motorway was cancelled by the Government, along with several similar schemes, in April 2023. This was a response to public safety concerns around Smart Motorways.

Instead, work is being carried out to install additional safety measures between junctions 5 and 8 including upgrading the central reservation barrier and creating emergency areas.

Pictured: Spaghetti Junction, Birmingham (2023, November 13) Source: Wikipedia..

Pictured: the M6 Junction 5 - 8. Source: Google 2023.





THE SMP ALLIANCE

The SMP Alliance is a partnership comprising seven members:

- National Highways (the client)
- Fluor (production management partner)
- WSP and Jacobs (digitally enabled design partners)
- Balfour Beatty, BAM/Morgan Sindall Joint Venture, and Costain (on-site assembly partners)

HW Martin (Traffic Management) Ltd delivers traffic management solutions and programme support on behalf of the on-site assembly partners.

INTEGRATION

An essential part of the way the Alliance works is integration, ensuring the right people are engaged on the project at the right time to deliver added value.

Where this has been most successful is with bmJV and its supply chain.

Here an integrated, multi-organisational team (depicted in the diargram below) with representation from HW Martin (Traffic Management) Ltd, BAM, Morgan Sindall and National Highways is working collaboratively to minimize customer disruption, streamline the works programme, improve safety and find cost savings.

Customer focussed approach

Positive outcomes:

- Improving safety for all
- Providing fast and reliable journeys
- A well maintained and resilient network
- Being environmentally responsible
- Meeting the need of all road users
- Achieving efficient delivery

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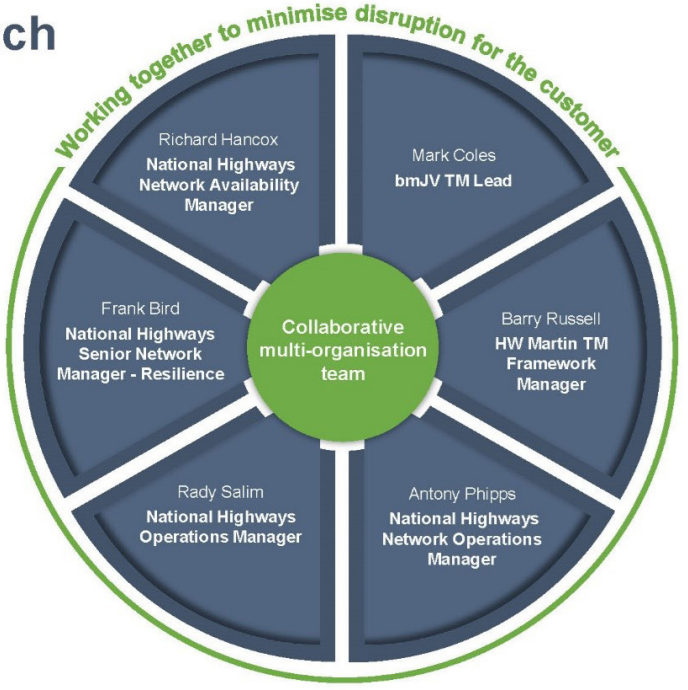

THE CHALLENGE

Typically, traffic management for a major project such as this entails long-lengths of static roadworks, narrow lanes and a sea of yellow signage.

However, the integrated partnership on the M6 Junction 5-8 took an innovative stance, challenging the norm with a different approach that is now proposed as best practice, business as usual for future projects.

This approach aligns with the Project 13 ethos that an **enterprise model** is the answer to the ineffective transactional model currently in place for delivering major projects in the UK.

The enterprise model brings together owners, partners, advisors and suppliers into an integrated and collaborative arrangement that is underpinned by effective, long-term relationships.

In this example, the emphasis is on creating effective, high-performing teams, who are aligned on the overall objectives of the Alliance. Each function is empowered to deliver their respective parts of the greater whole, and encouraged to pool resources, share expertise and challenge each other to engineer greater project value.

The integrated team opted to re-write the rule book on the M6 Junction 5-8, focusing on:

- Enhancing safety for all.
- Reducing customer disruption and discomfort.
- Ensuring faster, more reliable delivery.

INTEGRATING WITH THE TEAM

HW Martin (Traffic Management) Ltd's Regional Manager, Barry Russell, represents the organisation within the integrated project team supporting on-site delivery of bmJVs SMP Alliance projects.

He was tasked with finding cost savings in the traffic management plan by interrogating the construction timeline. His recommendations needed to be repeatable across all SMP Alliance projects without compromising safety.

This lateral thinking would not have been possible without the formation of a team with a culture that emphasised Project 13 principles and recognised the value of traffic management beyond 'just' supplying cones and signs.

HW Martin (Traffic Management) Ltd 'work-shopped' the solution with the integrated team to create a plan that was more agile, digitally focused and customer friendly. A detailed traffic model was built to test and optimise the new approach. This was a data-led initative, using information for several sources including:

- Existing technology e.g., Stopped Vehicle Detection data.
- Legacy traffic and logistics data from a similar project on the M6 Junctions 4-5.
- Connected vehicle data e.g., Waze and Sat-Nav.
- Secondary data from social listening, Transport Focus and the Office of Road and Rail.

CUSTOMER INSIGHTS

In addition, first-hand data was collected from stakeholders in customer groups. This outlined several customer pain points that needed to be addressed, including:

- Maintaining standard width lanes.
- Using only a short section of 24/7 lane closures.
- Removing the diversions and disruptive overnight full-road closures.
- Providing predictable, repeatable journeys.
- Using existing high-quality road markings to deliver the best journey possible.
- Providing high quality, advance information about planned works via several sources.
- Providing real-time incident and journey-time information.
- Rapid response times to issues by using existing permanent assets e.g., CCTV.

THE OUTCOME

The result was a 94% reduction in the length of the proposed static works programme that addressed several customer pain points.

The original scope involved a 20km stretch of roadworks in place twenty four hours per day, seven days per week for 30 weeks. But this was reduced to just 1.2km.

Over the 30 week scheme the following was also removed from the traffic management plan:

- Free breakdown recovery - replaced by National Highways' Traffic Officers Service.
- Temporary assets such as CCTV and TASCAR (Temporary Automatic Speed Cameras) - replaced by existing, permenant assets.
- Four weeks of road closures and associated labour needed to install the temporary assets.
- Traditional traffic management signage - replaced by existing overhead gantries.

In addition, night closure times were optimised to minimise disruption to haulage drivers using the route.

Altering the length of the static roadworks saved:

- £1.5m in costs
- 118,000 disrupted journeys
- 6,574 hours of additional delays
- 230 tonnes of Co2

All Lane Running (ALR) was adopted through the works and standard width lanes were retained in direct response to customer concerns. The Dynamic Hard Shoulder was used as the safe working area, and delineated from the other three lanes with cones. Sections of Vehicle Restraint System (VRS) was installed at intervals where work was being carried out to ensure the safety of operational personnel. This ensured that nearly 70% of the works was a designated safe space for vehicles needing assistance in the event of an accident or breakdown (in line with the Highway Code) or for roadworkers.

The speed was fixed at 50mph during the day. This was important because, unlike most major projects, the SMP Alliance promotes daytime working. Only some elements of the programme are carried out at night.

At night, the speed limit was increased to 60mph when traffic counts were lower. This also served to improve air quality.

Fourteen planned diversion routes were removed saving:

- 168,000 disrupted journeys
- 73,000 hours of additional delay
- 2,562 tonnes of Co2

This also prevented disruption and discomfort to other stakeholders living and working along the diversion route.

DIGITAL COMMUNICATION

Digital communication with customers was optimised in the following ways:

- Using existing roadside Variable Message Signs (VMS) to communicate in real time with customers.
- Using existing permanent structures including CCTV and TASCAR (and associated escalation plans) to detect and respond to incidents quickly.
- Planning and sharing information in a timely fashion via the dedicated project web pages, social media and satalite navigation tools.
- Sharing real-time journey information via Waze, Tom Tom and HERE.
- Monitoring and adapting to changing traffic conditions in real-time by working closely with National Highways and FMG (specialist incident management and vehicle recovery) to manage breakdowns and recovery.
- Using the skills of the Traffic Officer Service and Network Video Recorder System (NVRS) to provide a high quality, rapid response to incidents to keep traffic moving.

SHARING BEST PRACTICE

The Alliance team and HW Martin (Traffic Management) Ltd are engaging with other Alliance partners to formulate an Alliance-level approach using this blueprint, for example on the M1. They have hosted site visits to showcase the model and supported other partners to apply the strategy to their projects.

The strategy has been adopted by the National Emergency Area Retrofit (NEAR) programme, and the Concrete Roads Framework (CRF).

The on-site delivery team will continue to monitor the project to ensure it has a measurable impact on customer and safety focused delivery approaches.

The project was nominated for a 2023 National Highways Industry Award for Customer Focused Network Management.

IN SUMMARY

The integrated, multi-organisations approach to on-site delivery led to the development of a traffic management plan that was customer-focused and value engineered to reduce costs and carbon emissions.

The result was a 94% reduction in the proposed static works programme that addressed several customer pain points.

By applying Project 13 principles, the project team succeeded in:

- Reducing the length of the proposed static works by 94%.
- Making a cost saving of c£1.5m by reducing the traffic management plan and incorporating permanent infrastructure.
- Ensuring there were no road traffic collisions (RTCs) in the works.
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The project has contributed to four of the six Performance Goals that National Highways outlined in its Strategic Business Plan for 2020 to 2025, including:

- Improving safety for all.
- Providing fast and reliable journeys.
- Meeting the needs of all users.
- Delivering even more value for customers.

Barry Russell, Regional Manager at HW Martin (Traffic Management) Ltd, said:
"This project challenges our industry to do something differently, and embed change into business as usual. But, what doesn't change, is the customer's world. In terms of driving on a DHS or ALR motorway, it remains the same. This alone is a signifcant reduction in discomfort and inconvenience. Customers continue to receive all instructions via the overhead gantries – the red X and the 50mph speed limit. And the ROC retains full control over what is communicated there as always.

"The driver's view is also less obstructed as we have done away with a lot of unnecessary signage that repeats what is already on the overhead gantries."

The construction programme proved to be robust, predictable and commercially viable. The Alliance team managed to reduce costs by making using of existing technology which sets a precedent for working on Smart Motorways and roads with existing technology in place in the future.

The approach is a blueprint that bmJV and HW Martin (Traffic Management) Ltd are already repeating across the network. Major construction projects on arterial routes are being delivered with no full closures, and 24/7 closures kept to shorter lengths.