

CASE STUDY

DIVERSION ROUTE BEST PRACTICE BECOMES BUSINESS AS USUAL ON THE A303



TRAFFIC MANAGEMENT EXPERTS

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INTRODUCTION





HW Martin (Traffic Management) Ltd and its client Galliford Try were recognised with a National Highways Award for customer-focused network management in 2022.

The award acknowledged how an innovative approach to diversion routes, born out of a need to reduce disruption for customers, became best practice business as usual for the A303 Sparkford to Ilchester scheme.

The project team developed a structured approach to assessing the route, understanding stakeholder

requirements, engaging with local businesses, and deploying mitigations – both traditional and technical – to minimise disruption to customers using the route.

A strategy was developed to disperse motorists onto alternative roads taking pressure off the diversion route. This successfully reduce traffic flow volumes by 23-38% and allowed the complex diversion route to operate efficiently. Journey time delays were far below what was projected on the diversion route as a result, at less than one minute per kilometre.

-  **Start date:**
-  **End date:**
-  **Value:**
-  **Location: Somerset, Cornwall**

QUICK FACTS

SETTING A PRECEDENT

The A303 Sparkford to Ilchester project has set a new benchmark for diversion route management in complex scenarios.

It raises the bar when it comes to customer-focused network management using automated route assessment, journey time and incident monitoring.

It has led to the adoption of similar strategies on other projects across the country such as on the M6. And the project team would like to promote this best practice approach across the wider supply chain.

National Highways
Industry Awards

2022

 national highways

Pictured: the A303

EXCELLENCE IN OPERATION



SAFE



TRUSTED



AGILE



PROGRESSIVE



SUSTAINABLE

EXCELLENCE IN OPERATION



ABOUT THE A303

The Sparkford to Ilchester scheme is a key improvement project from National Highways designed to enable safer, less disrupted journeys to the West of England by duelling the carriageway.

This part of the carriageway is put under high pressure at peak times, including weekends and during holiday periods. It is one of the main thoroughfares for holidaymakers travelling to Devon and Cornwall.



THE CHALLENGE

The traffic management needed to enable the installation of a temporary bridge over the A303 for heavy plant carrying earth and other materials.

A series of weekend closures would be required with the potential to cause major disruption.

The A303 is subject to high traffic flows of up to 23,500 vehicles per day during peak times.

In addition, the proposed diversion route was complex and comprised of single carriageways not designed for such high capacities of traffic. There were also a number of local sensitivities to consider.

An innovative solution to the traditional diversion route was required to maximise customer experience.

LOCAL SENSITIVITIES

The extreme peaks in traffic flow experienced on the A303 has led several local stakeholders to raise safety concerns in the past.

An Experimental Traffic Regulation Order (ETRO) was introduced to stop motorists 'rat-running' through adjoining communities during heavy congestion.

This is just one of many sensitivities that the A303 project team needed to consider to ensure customer satisfaction on the project.

Legacy information such as this meant the focus remained on satisfying customer needs - both the needs of the community, and of the road user.



Pictured top: is a major junction proposed on the project that provides a connection between the A359, Hazlegrove School and both carriageways of the A303.

Pictured top left: the lead up to the temporary bridge over the A303.

Pictured bottom left: the temporary bridge installed over the A303 for plant traffic

Main image: the A303

OVERCOMING THE CHALLENGE

Several strategies were combined to deliver the final service.

Beginning 20-weeks prior to the first planned full-weekend closure the project team focused on every detail to ensure the closures caused as little disruption as possible.

Planning was structured

through regular meetings and a project plan.

A comprehensive assessment of the diversion route and surrounding areas was undertaken covering safety, disruption, environmental factors and the comfort of road users and local communities. This assessment also looked at local stakeholder needs and

the overall driver experience.

Close engagement with those directly affected by the closure and the diversion route was instrumental to the success of the solution.

The project team from Galliford Try and HW Martin (Traffic Management) Ltd worked closely with Somerset County Council, National

Highways, the strategic road network maintenance and repair contractors, ETRO operators and the customers and affected stakeholders e.g., local businesses.

Technology was used during the planning, delivery and closing stages of the project to ensure the solution was adaptable, accurate and informed by real-time data.

USING DIGITAL TWINS TO TEST THE DIVERSION ROUTE

In a first for industry, a digital twin of the diversion route was created by The Modelling Group in VisSim traffic simulation software.

This meant that different traffic environments could be tested to understand queue build-up and traffic behaviour.

Data harvested from local SMEs, including Fewzed Ltd and Floh Tech Ltd, was built into the model to make it as realistic as possible, and to broaden the scope of the tests.



The results influenced the mitigation measures that would be used and where they would be focused. For example, During the closures, the model was used to set the signal timing on traffic signals where roads narrowed to create the most efficient flow.

Pictured above: an example of traffic modelling from The Modelling Group.
Pictured right: an example of a road narrowing sign on a British road.

THE DATA HELPED TO IDENTIFY:

- ▶ Events happening in the local community that could affect traffic flow.
- ▶ Who the wider stakeholders were and how they might be affected.
- ▶ Locations of low bridges, road narrowings and complex junctions.
- ▶ Collision hotspots.
- ▶ Areas where noise disruption and air quality concerns could become an issue.



TRADITIONAL AND DIGITAL TRAFFIC MANAGEMENT WAS DEPLOYED DURING THE CLOSURE

Virtual incident monitoring, using data streams from Waze, mobile phone data and other sources, was used to continuously monitor the performance of the route and target event-based maintenance. For example, 23 incidents were identified and responded to (such as stopped vehicles) to ensure the route operated smoothly during the closures.

Variable Message Signs (VMS) provided accurate journey-time information at key alternative route decision points to ensure the customer could make the best-informed decision about which route to follow. The methodology was to provide alternative route information and disperse traffic more widely throughout the local area and not just focus the flow on the one diversion route. The team collaborated with local community ETRO operators and the Local Authorities to glean information about known 'rat-running' routes and direct traffic away from those.

Signage was deployed to identify the location of alternative services because some were closed on the diversion and alternative routes. This meant customers could better plan their journey and were not distracted trying to find services at critical times. In addition, over 40 additional explanatory signs were deployed to inform road users of the 'why' - the reason the work was taking place, the benefits to them and the mitigation measures being employed.

Temporary traffic signals at road narrowings were used to smooth the traffic flow and protect historic buildings that projected close to the highway. Dynamic signal timing and control methods were implemented using real-time queue length data and the traffic model created during planning to ensure the most efficient traffic flow. Escorts were provided for residents in vehicles and on foot using the areas within the closures to access their properties.



Pictured: the temporary bridge is lowered into place over the A303. Image used with thanks to National Highways.

THE RESULTS

In excess of 13,000 drivers would normally use the route on each weekend day but the project teams' strong communications programme and real time data-sharing strategy allowed 3,000 – 5,000 (23% - 38%) road users to find an alternative route thus enabling the complex diversion route to run more smoothly.

Delays on the 16km alternative route were less than 1 minute per kilometre at peak times which was deemed acceptable due to the nature of the diversion route.

Positive feedback was achieved across the board with many praising the



teams' focus on key safety issues in their communities whilst the diversion was under operation. The carefully managed approach was built in collaboration with the local authority and local stakeholders from the outset.

Only two improvement suggestions were submitted over the first full weekend closure by customers/ stakeholders suggesting overall that the approach

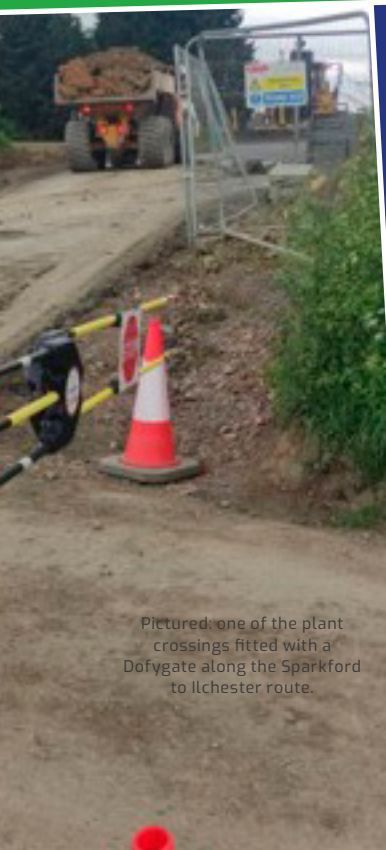
caused less concern to those affected. Numerous compliments were also received from local businesses stating that "it was no more of an issue than normal".

Positive feedback was received from Gary Masters from the National Highways Occupancy Team who stated:

"What it exemplifies is that traffic management is so much more than 'signing and

guarding', which is what most people view it as. Ultimately, it's about managing drivers and a big part of that is [a] behavioural shift, i.e., getting people to slow down, drive more carefully, or, in this case, stay away. We achieved this through careful analysis of normal traffic flows, our views on the capacity of the diversion, communications and a carefully considered VMS plan."

USING TECHNOLOGY TO MAKE PLANT CROSSINGS SAFER



Pictured: one of the plant crossings fitted with a Dofygate along the Sparkford to Ilchester route.

Manned Dofygates were used on the A303 to reduce incursions and therefore make plant crossings safer.

During the construction phase of the project, heavy plant carrying earth and other materials crossed the busy highway at several junctures 500 times per day.

Safe, efficient plant crossing points were therefore essential to the smooth running of the project. Each crossing was fitted with a Dofygate synced to the traffic

vehicles and road users to share space safely.

However, it was found that automating the crossings caused more incursions than it prevented in this case.

In 2021, an increase in incursions between plant vehicles and road users at the crossings was recorded prompting a study into safer solutions.

CCTV was installed at each crossing point as a precautionary measure and to capture independent

evidence of any incursions as part of the root-cause analysis. What the investigation team found were frequent occurrences of both road users and plant vehicle operators 'jumping' the red light.

Interviews with the plant operators found that there was a perception that the lights favoured the local traffic and that they were unable to keep up with their quotas due to lengthy stops at the crossings which was impacting the bottom line. ▶

A study was conducted that timed the wait times experienced at a Dofygate that was controlled with automated traffic signals, compared to a set of signals and Dofygates controlled manually by an operator. On paper, it was expected that the fully automated system would be the most

efficient from a time and cost perspective.

Instead, the study found that vehicle plant operators were waiting an average of 40 seconds at the automated crossing even when their route was clear compared to just 3.2 seconds when the crossing was manned by a dedicated operative.



Pictured: heavy duty plant responsible for making over 500 journeys per day across the A303 shifting earth as part of construction.



Pictured: one of the plant crossings on the Sparkford to Ilchester route.

OVER A SINGLE DAY THE VEHICLE PLANT OPERATORS WERE LOSING NEARLY EIGHT HOURS WAITING AT A RED LIGHT.

That equated to one full shift lost every day. Over the six-year project term it was estimated that automated gates caused almost one and a half years of lost time. The time spent stationary also wasted approximately 178 litres of fuel and created 466kg of Co2 per day.

The investigation led to all plant crossings fitted with Dofygates being manned by a dedicated operative. This reduced lost time to just 46 minutes per day. Fuel wastage dropped by 84% and the Co2 emissions by 85% per day.

Simultaneously, a drive through of the route from a customer perspective also found a root cause was the false perception that there was no heavy plant coming. The traffic light heads were located at some distance from the actual crossing and dense vegetation alongside the road meant plant vehicles were not visible to road users until the last minute.

To remedy this the traffic light heads were moved closer to the crossing and the vegetation maintained more regularly to aide visibility.



Pictured: one of the plant crossings fitted with a Dofygate along the Sparkford to Ilchester route. The image shows the relocated traffic light heads closer to the crossing to make it easier for customers to assess the risks of crossing.