



WHITE PAPER

Preventing London Bus Delays with Metro Pro

Maintaining reliable and efficient bus services
through road works in Central London.

January 202

Together with:



SKANSKA

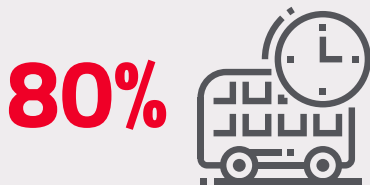


Introduction

Buses provide a crucial means of transportation for many Londoners, operating a vast network of routes, covering both central London and the outer suburbs, and providing access to areas where other forms of public transport may not reach.

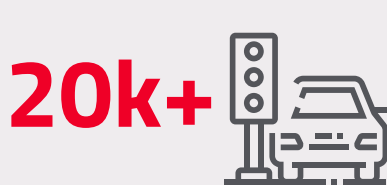
Buses also play a vital role in reducing traffic on London's roads, and are part of a wider public transport strategy to alleviate congestion and improve air quality. When roadworks are performed in and around London, the reduced road capacity caused by works can have a significant impact on scheduling. With many businesses and individuals relying on public transport, any delays to service operation can bear a significant economic cost to London.

It is no wonder why TfL put maintaining public transport service levels high on the agenda when discussing the impact of roadworks.



80%

Of London bus delays are caused by roadworks.



20k+

Sets of portable signals used in London every year.



UTC

Is available in some circumstances, but not all.

TfL, 2022

TFL ROADWORKS CHARTER

“We will support sustainable travel by working with TfL in the planning of our works to minimise the duration and impact on busy bus routes”

One of the key ways works promoters can improve the road user experience is by reducing delays caused by temporary traffic signals.

This case study looks at roadworks installed on Kilburn High Road in Central London, and the measures taken by our Professional Services team to evaluate and adjust the temporary traffic signal timings to reduce delays caused to London buses and other road users. The Kilburn High Road site is controlled by our Metro Pro traffic control system and Metro temporary traffic signals, with traffic management provided by Hatton Traffic Management. The system enables our Professional Services team to monitor and adapt signal timings 24/7, helping to fulfill one of the key requirements of TfL's Roadworks Charter.

This project is an example of how Hatton Traffic Management and SCS Railways are working together to meet the challenges of managing roadworks in the UK's largest growing city, while aligning with Vision Zero.

Location

Kilburn High Road

Kilburn is an area of north west London, England, which spans the boundary of three London Boroughs: Camden to the east, City of Westminster, and Brent to the west. It is centred on the busy High Road, which connects Central London to Watford and the M1.

It is served by the 16, 32, 189, 316, 332 and 632 London bus services.



The Kilburn High Road site has characteristics common to a wide range of temporary traffic management sites.

These include:

- 130m of Shuttle working
- The work spans across two neighbouring junctions
- Pedestrian crossing facilities
- A critical location with high traffic volumes where impact from works must be minimised

To deliver this scheme, Traffic Group Signals were approached by **Hatton Traffic Management** to use our Metro Pro product conjunction with Metro temporary traffic signals.

You can learn more about the Metro Pro product and it's applications on the Traffic Group Signals website.

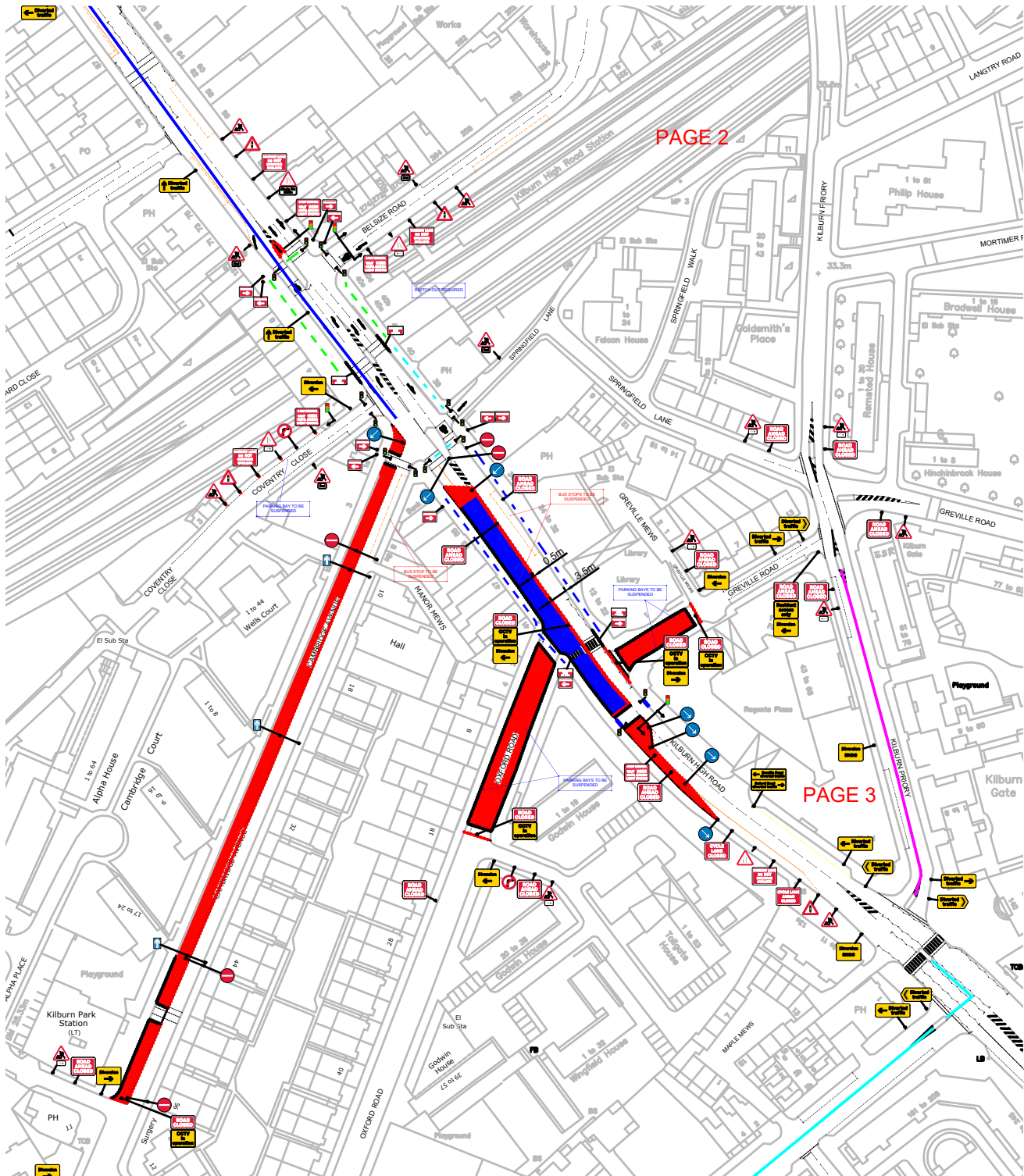


Traffic Management Layout

Working together with Hatton Traffic Management

Hatton are one of the leading traffic management providers in the UK, offering a complete range of temporary traffic management services across the UK from motorway closures through to portable traffic lights as well as providing city-wide event traffic management.

The site in question was located on Kilburn High Road and the A5 in the Borough of Camden, North London. The principal contractor was SCS Railways, and is part of a series of works conducted for HS2.

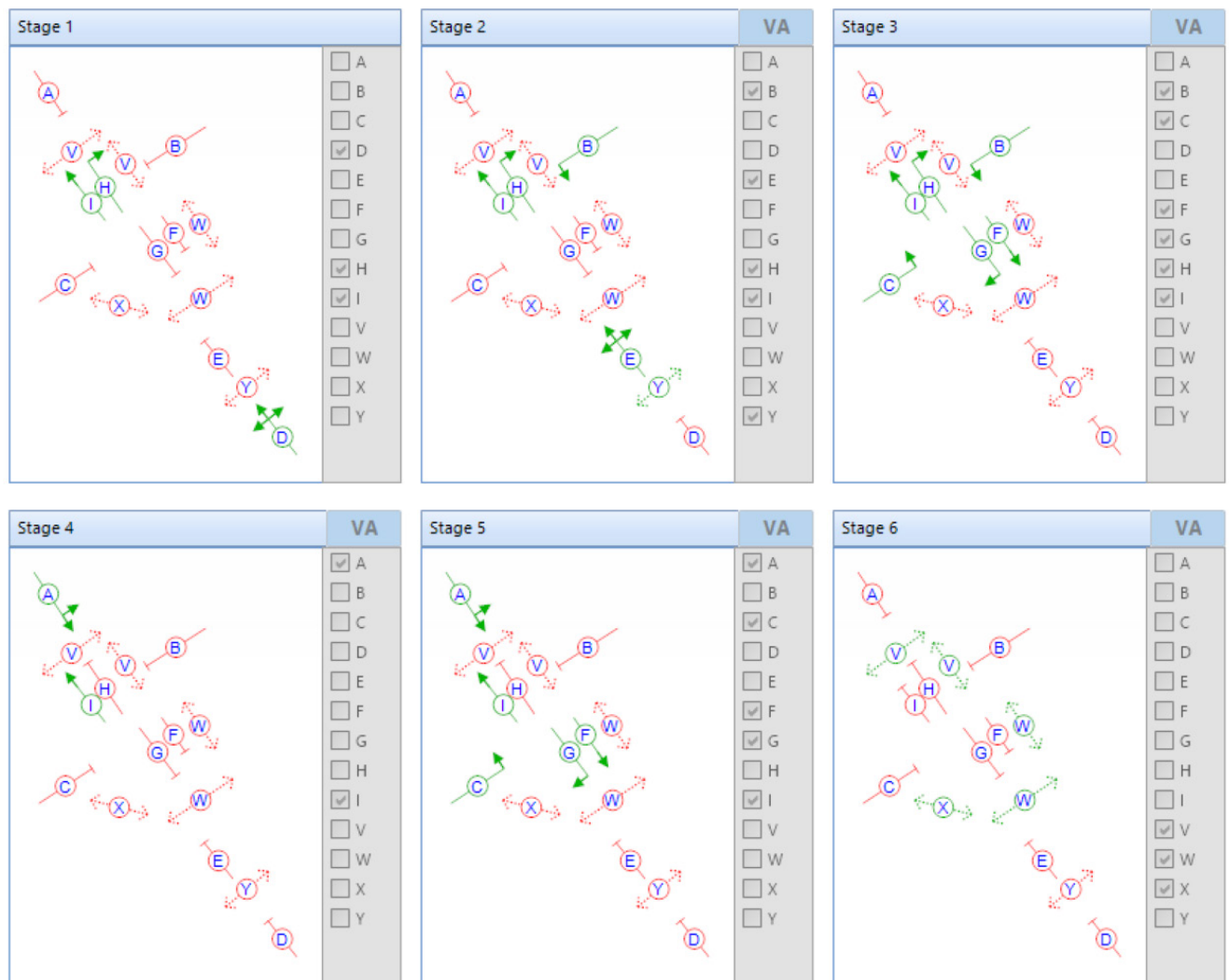


Scheme Design

Kilburn High Road

The scheme was designed based upon the traffic management plan provided by Hatton Traffic Management and agreed with the principal contractor, SCS Railways, and representatives from Transport for London.

Our Professional Services team devised a multi-stage scheme, adopting permanent-style signalling functions to maximise traffic flow. Some of the key functionalities of the scheme involve the use of internal stop lines, which allow the gating of platoons of vehicles, and dedicated vehicle phases for specific vehicle movements (e.g. right turns). To keep wait times to a minimum, 'walk with traffic' pedestrian crossings were used on non-conflicting phases. These functions are not available on conventional portable signals and the site geometry made cabled systems impractical.



Signal Studio

Schemes are designed using our Signal Studio design software, which has been purpose-built to work with our latest Metro™ and Evo®1 product range.

Signal Studio enables the designer to compare the relative efficiency benefits of the different signalling methods that could be employed for the site. This allows schemes to be designed then simulated and timing diagrams produced. The timing diagram gives an indication of the relative green-to-red time ratios throughout the signalling cycle, with the primary aim to reduce the amount of vehicle and pedestrian idling as much as is safely possible.

Implementation



CCTV

The use of CCTV equipment allowed us to monitor the site following deployment. This helps us to understand whether the control measures we designed were appropriate for the traffic volumes.

Public Transport and Pedestrians

The site presented a number of challenges, particularly the need to limit delays to the bus service, the use of pedestrian facilities and a shuttle lane spanning over 130 metres in length.



Command Centre

Our Professional Services team monitored and adjusted the site timings from our purpose-built Command Centre van. The vehicle has onboard facilities for taking control of the site, viewing CCTV footage and making updates to the scheme design, allowing our Professional Services team to adopt a highly agile approach to traffic control.



Week 1 Observations

The site was deployed and monitored closely for the first week. The primary challenge of the site was working with the 300 metre shuttle lane running through the middle of the site. The impact of the shuttle lane was particularly felt when accommodating for cyclists, which increases vehicle waiting times. Furthermore, the presence of a shuttle lane can influence driver behaviour, with several instances of non-compliance being reported.

The following areas were observed, which would then inform how the site would need to be adjusted to reduce the impact of the works.

Greater understanding of traffic levels at each phase

We observed from the CCTV that Phase B had very minimal traffic levels, so could be fitted in more efficiently.

Understanding driver behaviour

Compliance during the first week of roadworks was poor, which can have an impact on traffic flow and can impact other phases.

Typical behaviours observed:

- Jumping red light
- Not observing road signs
- Unsafe overtaking of cycles and e-scooters

Monitoring journey time data

Once the system is running, our Professional Services team needed to observe the timings for each phase to assess efficiency. This process can enable us to understand and test the most optimum cycle time for the site.

This was performed using our journey time bot, C:Live, which provides realtime tracking of average journey times between phases, providing an accurate measure of signal performance. Our Professional Services team use C:Live on problem sites where pro-active traffic management is required to prevent traffic build-up or to quickly adapt to a site incident. This data also provides a basis of comparison when changes to the signalling are implemented.

In addition, we were provided regular feedback from TfL and London bus drivers through the principle contractor.

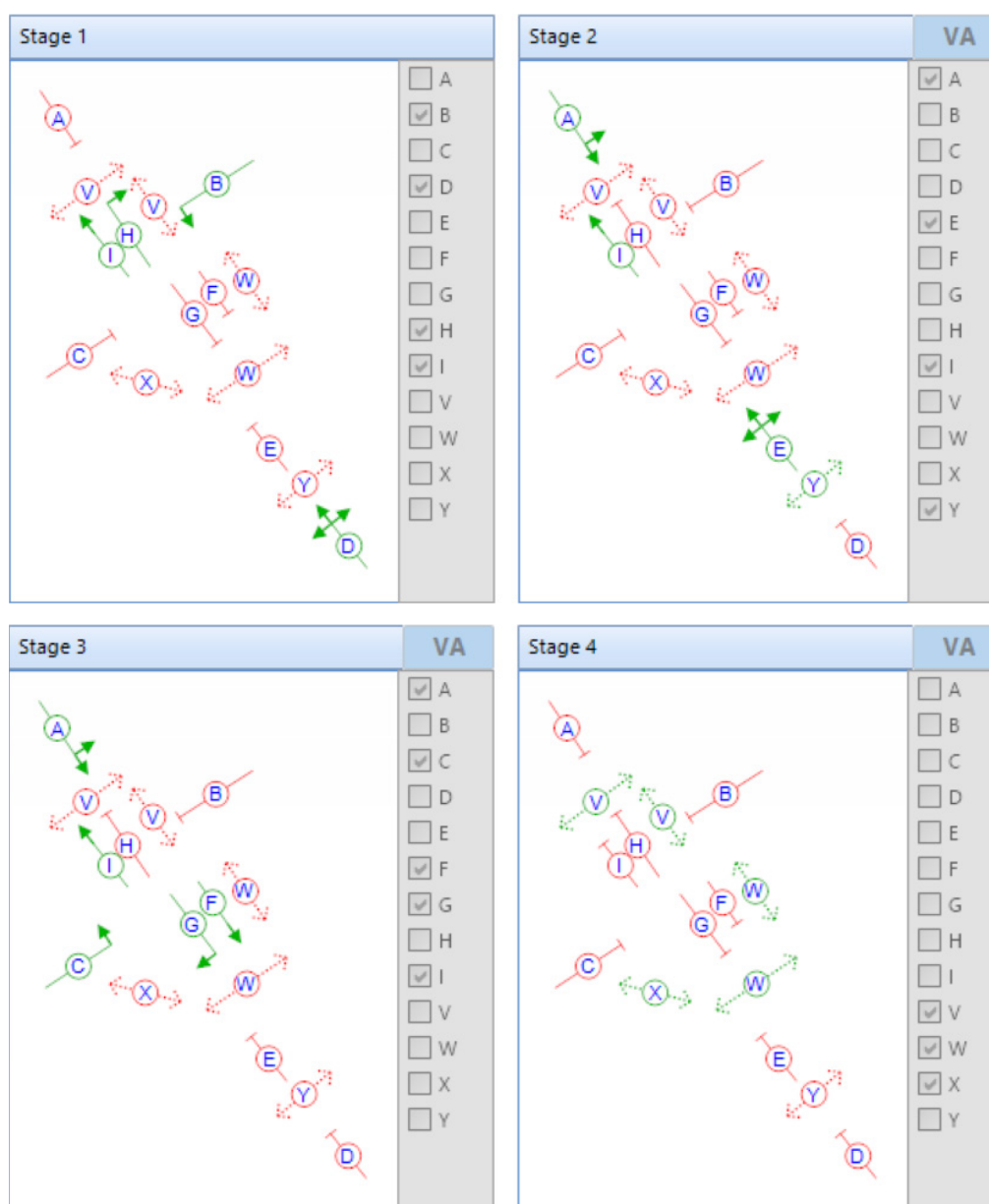
Optimising the Scheme

Following initial observations, changes to the scheme were to be made. During the scheme review, changes included adjustments to the staging and repositioning of the signal pods.

Aside from reducing the number of stages from 6 to 4, in Stage 2 we now bring traffic from Phase A up to queue at Phase F, which is at the top end of the shuttle. The benefit of this design change provided us with traffic ready to send through the shuttle as soon as the road clears, without waiting for traffic to arrive from Phase A.

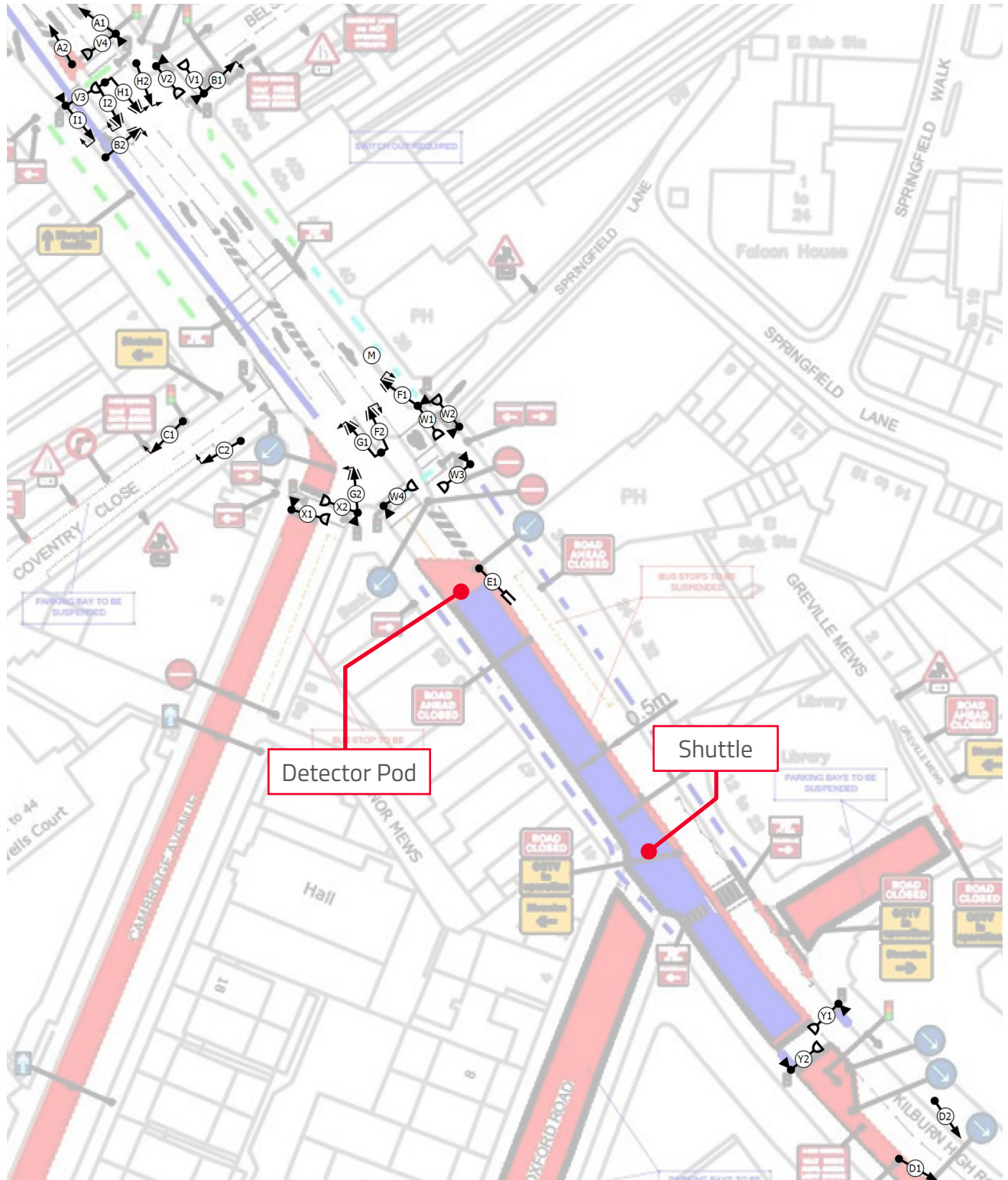
To bring further optimisation to the scheme, we combined Stage 2 with a detector pod (Phase E), which we installed within the end taper of the work zone. The detector pod enabled us to detect the last vehicle or bicycle traversing through the site, so that as soon as the shuttle clears we can progress Phase F.

This decision enabled buses to move with greater efficiency through the site, and reduced the impact the long shuttle lane had on traffic flow and idling vehicles.



New Scheme Design

Here is the new schematic along with site layout. The traffic management plan illustrates length of the shuttle and the positioning of the detector pod, enabling the detection of the last vehicle to pass through Phase D. The adaption to Stage 2 allows the use of a significant amount of roadspace between Phase A and Phase F, enabling a greater volume of vehicles to pass through the site.



Detector Pod for Cyclists

A large section of the shuttle lane is uphill. A slow moving cyclist presents the potential to reduce vehicular movement to <10mph. With vehicles reduced to such speeds, this introduces the risk of the shuttle not being cleared before running the next stage. This can create a dangerous situation for cyclists and other road users, and can cause congestion throughout the site.

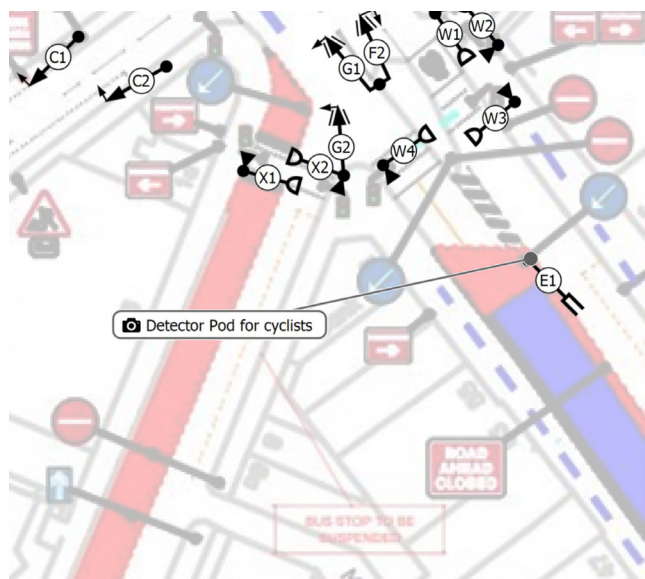
The common solution in this case would be to increase the cycle time, which can cause frustration if the shuttle lane is clear, or tolerate a degree of risk.

Our Professional Services team recommended placing a detector pod at the end of the shuttle lane, so that a clearance stage can be run if vehicular movement is detected at the end of the stage. This extends the phase in the presence of a slow moving vehicle or cyclist, and prevents over-extension if the shuttle is clear.



Detector Pod

The detector pod comprises of an AGD306 microwave vehicle radar, installed upon a Metro signal pole and base unit. The pod does not feature a signal head, simply a controller used to demand a call extension from the Metro Pro master controller.



Results

The Kilburn High Road scheme ran for 6 weeks, from 6th March until 1st of May 2023.

The goal for Hatton Traffic Management and their client, SCS Railways, was to create a well-coordinated and efficient traffic management system, enhancing road user safety and minimizing delays for London Bus Services.

Kilburn High Road presented several challenges for temporary traffic management due to its high volume of vehicular and pedestrian traffic. The road's narrow layout and complex junction configuration made it difficult to implement changes without causing significant disruptions. Additionally, the presence of nearby businesses and residential areas required careful planning to avoid negatively impacting their operations and daily routines.

The Metro temporary traffic signals demonstrated high effectiveness and efficiency in managing traffic flow. The adaptive system constantly adjusted signal timings based on real-time traffic conditions, effectively reducing congestion and wait times for road users. This dynamic approach significantly contributed to the smooth operation of the traffic management plan.

On the partnership with Traffic Group Signals, John Woodiwiss at Hatton Traffic Management comments:

"The installation and removal of the temporary traffic signals was executed seamlessly by TGS. Their expertise and experience ensured that the equipment was set up swiftly and safely, minimizing disruptions during the transition. The engineering team's professionalism and commitment to quality service were evident throughout the project."

The scheme design services and signal configuration management for this project was provided by our Professional Services team. Their meticulous planning and attention to detail resulted in a well-coordinated signal system that met the unique demands of the site. The team's expertise in signal configuration contributed to the efficient management of traffic flow and pedestrian safety.

The first week of monitoring and adapting the signal timing plan was key to optimising the site as much as possible, which helped to reduce delays to bus movements and other road users. Despite the significantly reduced road capacity, delays to London bus services were kept to an absolute minimum, which was recognised by the client and other key stakeholders.

The most prolonged delays to buses were between 1 and 2 minutes between 1600-1700

Jim Marshall, Area Traffic Manager, SCS Railways

Through open and transparent collaboration, a willingness to embrace new technology and by allowing our Professional Services team to adapt the scheme to suit local conditions, the project was an overwhelming success. This was mirrored by John Woodiwiss, who remarked of the project:

"Overall, we are highly satisfied with the service provided by Traffic Group Signals for this project. Their expertise, professionalism, and dedication to addressing the unique challenges of the site were instrumental in achieving our traffic management objectives effectively and efficiently. The positive feedback from stakeholders further validates the success of our collaboration."

We look forward to supporting Hatton Traffic Management and SCS Railways on future projects.

With special thanks to

John Woodiwiss at Hatton Traffic Management

Jim Marshall, Nickie Boughton at SCS Railways



For more information

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