TRANSPORT FOR THE South East

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ENGLAND'S ECONOMIC HEARTLAND

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Bus Back Better Support Programme

Support Package 5 – **Bus Infrastructure Guidance and Road Space Design Webinar**

21 March 2023

Q & A

Please submit your questions throughout the webinar.

We will also be producing a FAQ document.

Today's presenters

Supported by

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Subject Matter Expert

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Contents

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Support Package 5 Overview

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Support Package Purpose

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Enable LTAs to develop clear criteria for assessing bus infrastructure measures, ranging from standalone interventions to wider multi-modal scheme proposals so they have confidence to proceed with delivery.

This should empower LTAs to implement bus priority schemes with additional confidence that the ideas they have are evidence-based and to be able to make a convincing case to stakeholders on the merits of the schemes.

Support Package Objectives

This support package will provide you with:

1. **An increased level of understanding of best practice and a greater competence in bus priority infrastructure options than you did previously.**

2. **More confidence in developing and implementing bus infrastructure and road space design schemes.**

3. **The ability to proceed with the development of bus priority schemes in your local area, which can be captured in your EP plans and schemes.**

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Context

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Context overview

Achieving the National Bus Strategy vision for bus priority

Vision	• Plans for bus lanes on any road where there is a frequent bus service, depending on congestion and physical space to install one. • Infrastructure should be full-time and as continuous as possible • Consider a suite of measures including bus lanes, traffic signal priority, bus gates and clear/consistent signage
Outcomes sought	• More reliable journey times for bus • Transformation of the road space / public realm • Perception of bus having an improved status in the road user hierarchy • More attractive journeys for bus users • Value for money • Increased public transport usage • Faster and more reliable services
Key components	• Traffic management • Corridor approach • Reallocation of road space • Virtual priority • Physical priority • Traffic management

Context overview

Challenges

- Reallocation of roadspace is challenging due to differing stakeholder perceptions and needs
- Cross-border difficulties (lack of continuity)
- Cost
- Integration with other modes
- Space requirements
- Political support

Buses are constrained by other road users, traffic has increased post-pandemic and as services get slower, they become more expensive to run and less attractive to passengers.

Bus priority schemes can make services faster, more reliable, more attractive to passengers and cheaper to run – shifting priority towards bus users, pedestrians and cyclists.

6: National bus strategy for England. (2021). *Department for Transport*. Available from: Bus Back Better (publishing.service.gov.uk)

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Design solutions

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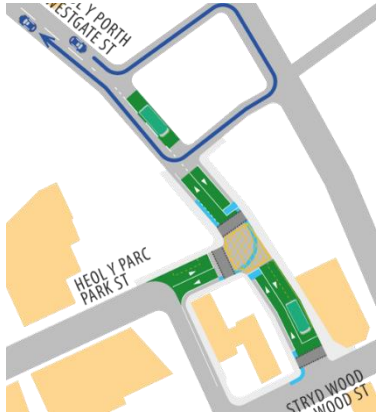
Solutions

Infrastructure and road space reallocation

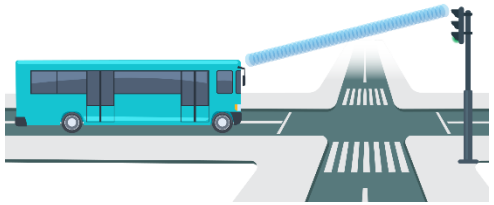
Physical priority

- Some form alteration to the way road space is managed
- Focused on the interaction of buses and general traffic to reduce congestion



Virtual priority

- Using technological solutions to regulate highway space to give buses priority over general traffic
- Enforcement issues



Corridor approach

- Segregating buses from general traffic to escape congestion
- Highly effective for speed and reliability

Traffic management

- To manage the movement of traffic and facilitate bus movement.

Solutions

Infrastructure and road space reallocation

The following are solutions which can be used

Physical priority

- Short bus lane
- Junction bypass
- Queue relocation
- Bus advance area
- Bus gate
- Sump buster
- Turning movement ban
- Hook turn
- Bus passing points
- Slip road
- Kerb modifications

Corridor approach

- Bus priority lanes (non-exclusive and semi-exclusive)
- Peak period bus lanes
- Segregated bus rapid transit lanes
- Contra flow bus lanes

Virtual priority

- Bus signal timing
- Priority movement repetition
- Green priority weighting
- Signal timings
- Signal priority
- Actuated priority phase

Traffic management

- One way streets
- Low traffic neighbourhoods
- Low emission zones
- Park and ride
- Interchange
- Real-time info
- Smartcard ticketing
- Dynamic scheduling

Solutions

Physical priority

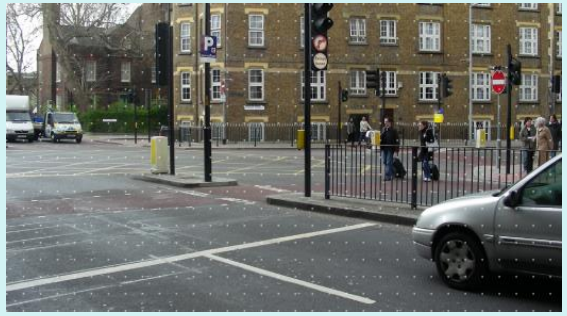
Solution Examples;

- Short bus lane
- Junction bypass
- Queue relocation
- Bus advance area
- Bus gate
- Sump buster
- Turning movement ban
- Hook turn
- Bus passing points
- Slip road

Case study of A100 Tower Bridge Road London

- Introduction of a right hand turn lane to reduce bus route length (decrease of 628m)
- The scheme enabled improved bus journey times and reliability.

Time	Savings from the scheme[1]
AM Peak	636 seconds
Inter-peak	391 seconds
PM Peak	591 seconds



Case study of Baldwin Street, Bristol

- Banned general traffic on streets around Baldwin Street in Bristol
- Bus gate installed and given priority
- Reduced traffic in the city centre and improved bus journey times
- Lots of fines issued due to signage confusions

BEFORE

AFTER

Case study of Vicar Lane, Leeds

- Changed into two-way route, to remove the bottlenecks and create a better bus stop environment.
- The northbound lane is opened to buses and taxis only in the peak periods and the southbound lane is opened to buses and taxis only during the daytime

BEFORE

AFTER

Solutions

Corridor Approach

Solution Examples;

- Bus priority lanes (non-exclusive and semi-exclusive)
- Peak period bus lanes
- Segregated bus rapid transit lanes
- Contra flow bus lanes

Case Study of The Leigh to Ellenbrook Guided Busway

- 7.5km kerb-guided busway
- integrated with park and ride sites and a walking/cycling path
- To justify the cost a system of detailed business case appraisal and monitoring was developed.
- Funded via the Greater Manchester Transport fund (£68m).
- Benefit to Cost Ratio of 2.1:1

Case Study of Crawley Fast Way

- Involves a series of bus priority measures linking Horley, Gatwick Airport and Crawley.
- Economic evaluation has displayed an economic return on investment of £4.67 for every £1 spent.
- Funded a combination of public and private sources (£38m).
- Displayed 160% patronage growth

Case Study of South East Hampshire BRT

- Produced a 3.4km busway reserved for bus and cycle use only.
- The route delivered £6.94 in economic benefits for every £1 invested.
- Patronage grew by 48% over the first 2 years of the project.
- The project achieved improved passenger satisfaction.
- Funded via the Local Plan as well as Community Infrastructure Fund spending (£25m)

Solutions

Virtual priority

Solution Examples;

- Bus signal timing
- Priority movement repetition
- Green priority weighting
- Signal timings
- Signal priority
- Actuated priority phase

Case Study of Bus Selected Vehicle Detection (SVD) in Coventry/ West Midlands

- Bus SVD provided at 10 traffic signal junctions on suspended bus lanes.
- Enabled vehicles to interact with traffic signals via transponders.
- Ensured that priority was given to buses.
- The move resulted in no determinantal impact on journey times for all vehicle traffic.
- Bus journey reliability improved.

Case Study Liverpool City Region

- Installation of Intelligent Transport Systems (ITS)
- ITS alters signal timings to prioritise buses which are running late.
- It uses Real Time Information Data to establish if a bus is late and alters accordingly.
- Using this existing technology reduces disruption of new equipment.
- Financed through the City Region's Local Growth Fund.

Case Study Nottingham and Derby

- A new central traffic signal bus priority scheme using the Transforming Cities Fund funding.
- This type of system means that proprietary infrastructure is not required.
- It also enables the storage of process data for analysis and optimisation.
- As of August 2020 there are 237 junctions in the Derby & Nottingham system.

Solutions

Traffic management

Solution Examples;

- One way streets
- Low traffic neighbourhoods
- Low emission zones
- Park and ride
- Interchange
- Real-time info
- Smartcard ticketing
- Dynamic scheduling

Case Study of Oxford Traffic Zones

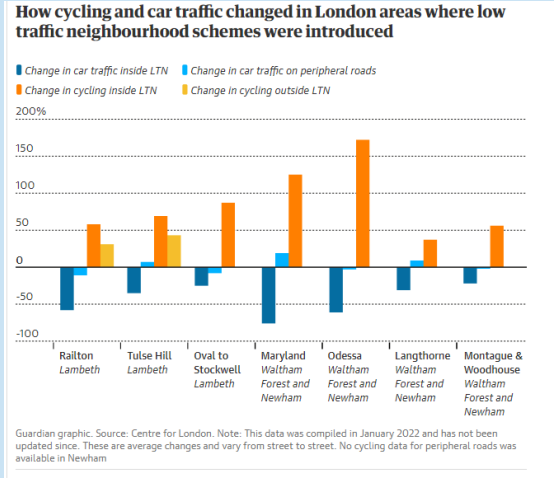
- Linked to the local transport plan in Oxford a 15 minute city approach has been developed.
- This combines workplace parking levies, traffic filters and a zero emission zone.
- Private vehicles can still operate but measures such as traffic filters limit where they can go and when.
- This enables priority to be given to bus and active travel to make these modes more reliable, faster and attractive.

Case Study of Park and Ride Scheme in Norwich

- A Park and Ride system with additional sites being added over time
- To incentivise family travel fares are expressed as per car rather than per passenger.
- Buses depart from Park and Ride sites up to every 10 minutes.
- Since the development of these sites traffic in the Central area has reduced.

Case Study of Low Traffic Neighbourhoods (LTN) in London

- As part of a target to make 80% of all London trips sustainable or active by 2041 a series of LTN's are being implemented.
- Findings thus far suggest that modal shift from car has been achieved within the LTN's.
- The evidence for this traffic moving to other roads is mixed.



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Other considerations

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Other considerations

Overview

Accessible infrastructure

Proposed bus infrastructure designs must be accessible to all types of users, inclusive of all gender, age and ability.

Integration with Active Travel

Bus infrastructure and road design schemes must designed to be integrated with walking and cycling. This includes designing infrastructure that prevents clashes between bus users and cyclists and pedestrians.

Scheme delivery

Considerations on appraisals and funding is crucial in delivering schemes successfully.

Monitoring and Evaluation

Schemes require monitoring and evaluation plans to identify and enable relevant data collection and assess scheme effectiveness against its objectives.

Marketing and Stakeholder Communication

Effective communication strategies must be in place to convince the public and those in power of the importance and benefits of bus infrastructure and road design schemes.

Enforcement

Provision of infrastructure needs to accompanied with robust enforcement for maximal effectiveness. Ideally, measures should be easy to understand for car drivers and should be reasonably self-enforcing.

Other considerations

Accessible infrastructure

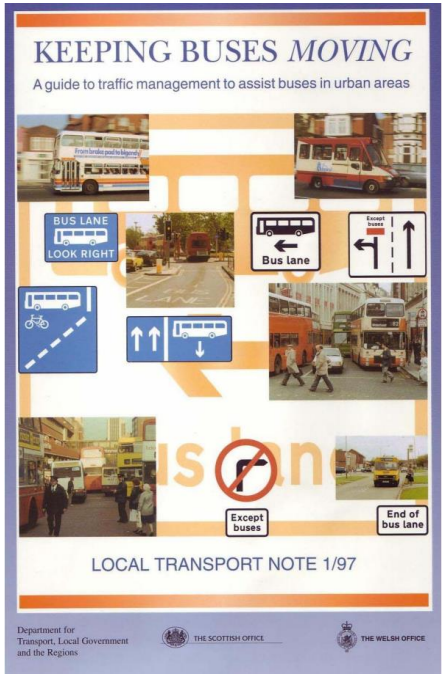
The Equality Act 2010 specifies that all building or service must be accessible to people with mobility issues.

Example of users with different needs

- Wheelchair users
- Elderly
- Those with injuries
- Those with strollers/prams or small children
- Hearing or vision disability

Guidance are being developed to align infrastructure design with these legal requirements:

- Accessible Bus Stop Design Guidance, TfL
- LTN 1/97, DfT



Local Transport Note 1/97 – outdated and in process of updating

Accessible Bus Stop Design Guidance – by TfL developed in context of Equality Act 2010

Other considerations

Integration with active travel

Taking an integrated approach in delivering transport improvements may reduce potential clashes.
– e.g.: delivering public realm improvements together with bus infrastructure programs

Section 6.6 of LTN1/201 provides guidance for the design and implementation of cycle infrastructure in relation to buses.

Examples of bus-cycling-walking infrastructure

- Cycle bypass lanes at bus stops or Floating bus stops
- Cycle Optimised Protected Signals (CYCLOPS) junction

Case study: Oxford Road

Cycling lanes along Oxford Road, Greater Manchester's busiest bus corridor, where 26 cycle bypass lanes at bus stops were delivered[3].

DfT reported a BCR of 7.15 due to a 38% increase in cycle volume.

BEFORE

AFTER

Other considerations

Scheme delivery

Appraisals

- The Green Book, HM Treasury
- Transport Appraisal Guidance, DfT
  - Calls for reform[1]
- Simplified Appraisal Framework (SAF) for Small Scale Public Transport Schemes

Funding

- Combination of public and private funding
- Public funding include from grants from DfT such as BSOG, BBA and Levelling Up Fund or local authority budgets
- Private funding include form bus operators and local developments (Section 106 and Section 278 agreements and CIL funding)
- Funding via enforcement

Case study: Derby Road

Nottingham City Council with local bus operators, implemented a series of measures along Quality Bus Partnership Corridors in the city. Measures include 24h bus lanes, onboard CCTV and low floor buses.

Scheme has led to substantial improvements in bus punctuality and an improved perception of bus services. Estimated BCR >7[2].

Derby Road Quality Bus Corridor in Nottingham[3]

Journey Time Savings	✓
Journey Time Reliability	✓
Improved Facilities (at the station)	RTPI improved shelter and timetable cases, 'info hubs'
Improved Facilities (on the bus/train)	Low floor buses
Non-User Benefits**	✓
Patronage	✓
Revenue Generated (e.g.ticket cost)	✓
Scheme Costs (Capital & Operating)	£9m Capital £48.6k p.a. operating

Appraisal input for SAF[2]

Other considerations

Monitoring and evaluation

Both monitoring and evaluation require a proportionate approach depending on the size and nature of the project.

Guidance available:

- DfT (2022) DfT evaluation strategy and programme 2022
- DfT (2012) Monitoring and Evaluation Framework for Local Authority Major Schemes
- LSTF (2012) Monitoring and Evaluation Guidance

SP2 – Data Analysis, Monitoring and Evaluation of this programme addresses this in detail.

Be evidence-driven and methods-neutral	Be embedded in intervention delivery
Use programme theory	Complement benefits management
Be relevant for policy	Match evidence to decision points
Link with appraisal	Seek formative evidence
Address strategic objectives	Increase consistency of approach

Guiding principles of Evaluation Strategy[4]

Case study: Mansfield Interchange

A fully enclosed bus station building with connecting footway to the railway station. Key features include pedestrian bridge linking bus and rail and improved walk routes to town centre.

Ex post business case analysis show that BCR of scheme is likely to be in the range of 4.3 - 6.5.

KPI	Target	Actual data
Patronage growth	5% growth in first year	7% growth in the first year.
Customer satisfaction	Customer satisfaction rating over 90%	Satisfaction has increased significantly since 2005. However, only five categories have scored 90% or above, while the rest of the categories have slightly lower satisfaction scores (70-88%).
New bus and rail users	None	Data indicates potential reverse of rail station usage decline.
Bus to rail interchange passengers	2% increase in bus to rail interchange	Significant increase in rating of the walk route to the train – No data confirming increase in interchange passengers.
Bus accidents	Reduce bus accidents to 25% of 2005 levels	Reduction in accidents to 29% of 2005 levels in 2014. However, this cannot be robustly attributed to the new interchange.
Journey time	No specific target	Improvement in reliability (5% increase in buses that were on time).

Key Performance Indicators, Targets and Data for Mansfield Interchange[3]

Other considerations

Marketing and stakeholder communication

Stakeholder Identification

Identifying stakeholders helps formulate effective strategies for communication in securing support. Stakeholders includes:

- Bus users
- Communities
- Businesses and retailers
- Politicians
- Advocacy groups (e.g.; active travel or disability)

Online consultations have the potential to reach more people, but need to be accompanied by alerts in physical world.

SP4 – Presenting a Strong Case and Influencing of this programme addresses this in detail.

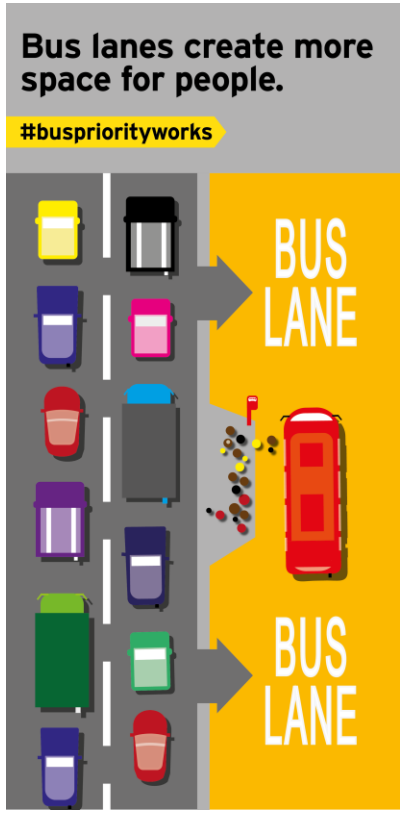
Promotion and marketing

Various methods are used to communicate how to use a road once a bus priority project is implemented (depending on the scale of the project).

Virtual Consultation room increase engagement reach for bus corridors in Midlothian[1]

Interagency co-operation
Public outreach
Public representative support
Popular vote

Successful communication methods for public support on bus priority projects[2]



#busprioritywks infographics[6]

Other considerations

Enforcement

May 2022 – Traffic Management Act (2004) amendments come into force
October 2022 – DfT published a statutory guidance the amendment
Summary: LAs allowed to apply for an order to enable moving traffic enforcement, enabling co-ordination of any new traffic management measures needed for bus priority with parking enforcement.

Issues to consider before applying for enforcement powers

- Formulating and reviewing policies
- Traffic regulation orders

West Sussex City Council developed a guidance[1] for developers who are installing bus gates. Guidance includes:

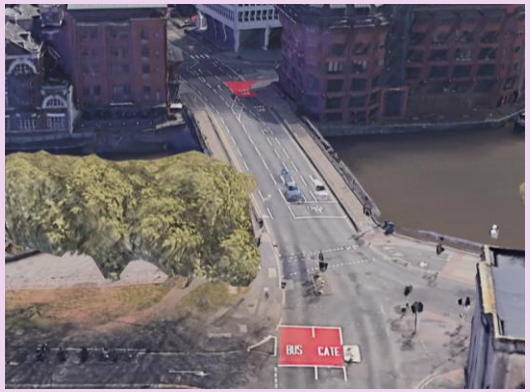
- TROs and RSAs
- Signage types and positioning
- Camera types and positioning.

Case study: Bristol Bridge

Bristol City Council implemented several bus gates in the city centre. Each bus gate is signed as required by Traffic Signs Regulations and General Directions 2016 (TSRGD 2016)[2].

However, in 2021, a ticket given for driving through the new bus gate was quashed, citing inadequate warning signs. Following the adjudication by a fines tribunal, Bristol City Council has painted more warnings in the road and created lanes to warn drivers they are not allowed to go through.

Bristol Bridge Bus Gate, with traffic signs[3]



Bristol Bridge Bus Gate, with painted road surface[4]

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Key advice

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Key advice

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Context specific

1.

More than ‘bus’

Improve for all

Public realm improvements

Holistic development

2.

Traffic management measures can work

Hard infrastructure is not the only option

3.

Early engagement

Early engagement with operators and local stakeholders is key

4.

Don’t over-engineer

Simpler measures are often the most effective

Scheme development

Q & A

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Q&A

Pre-submitted questions

Organisation			
Bus lanes			
Bus gates			
Bus stop laout			
Bus priority at junctions			
Prioritising road space allocation			
Other		Bus friendly traffic calming	
Specific support	How to approach with members so not seen as 'anti-car'	Traffic calming chicanes on commercial bus routes - operators really don't like them; they say they penalise buses more than cars and can lead to tyre damage when kerbs are clipped. Our engineers say some form of traffic calming calming is required, but we have struggled to find anything that both parties can agree to.	In a space constrained area floating bus stops have been provided, where there is not adequate space a "hybrid" arrangement has been designed in which passengers load and unload from the bus on the floating island but then cross a cycle lane (raised, coloured and with zebra marking) to travel onwards on the footway / wait at the bus stop. Are any further improvements that can be made to this arrangement?

Q&A

Pre-submitted questions

Organisation	
Bus lanes	
Bus gates	
Bus stop laout	
Bus priority at junctions	
Prioritising road space allocation	
Other	
Specific support	How to approach with members so not seen as 'anti-car'

Detailed information provided in the Technical Advice Note to follow as well as early in the presentation.

SP4 covers this point in more detail i.e. how to gain political support for implementation.

Parking

- Give and take approach – remove some space but add some better arranged spaces with kerb build-outs and public realm, crossing etc. to make self-enforcing (avoid all day parking)
- Key is early engagement
- Marketing campaigns
- Image and perception

- Impacts on active travel
  - Cite examples of successful schemes of fully or semi-segregated schemes

- Won't congestion increase?
  - Counter by pointing out that bus priority enables buses to provide a quicker more reliable service making them more appealing to car users -> buses are a more efficient use of space than cars

Q&A

Pre-submitted questions

Organisation	
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Detailed information provided in the Technical Advice Note to follow

- Conduct engagement with operators
- Look beyond hard infrastructure
  - 20mph speed limits?
  - Camera enforcement?
  - Important not to over engineer
- Ensure buses have priority

Bus Priority Team technical advice note BP2/05 (London, 2005)

Q&A

Pre-submitted questions

Organisation	
Bus lanes	
Bus gates	
Bus stop laout	
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Detailed information provided in the Technical Advice Note to follow

Greater Manchester

Think about:

- Adequate waiting area space
- Improved signage
- Visibility and line of site for the cyclists to the crossing / bus stop and vice versa
  - Stopping speed distances (LTN 1/20)
- Does the stop cater for those with mobility impairments, the elderly and others?
- Traffic calming measures to slow cyclist down i.e. a winding approach, planters etc.

Q & A

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Next steps

Completed

Review specific queries

Webinar

Coming Up

FAQ Document

Support Package materials made available online

Please send any additional questions to holly.mizser-jones@arup.com and Patrick.Noonan@mottmac.com by COB 24th March 2023

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