
Project:	A45 Sprint Phase 1 – Birmingham to Solihull and Airport	Job No:	60599249
Subject:	A45 Stage 2 Road Safety Audit - Designer's Response		
Prepared by:	Elena Martin	Date:	05/08/2020
Checked by:	Richard Gardiner	Date:	07/08/2020
Approved by:	Andrew Child	Date:	07/08/2020

Introduction

The following technical note is produced to document the Designer's Response to each issue raised within the A45 Sprint Phase 1 Stage 2 Road Safety Audit (RSA) of the proposed A45 Sprint highway improvements works between Birmingham city centre to Solihull and Birmingham International Airport.

The Stage 2 RSA was carried out by AECOM in July 2020 to encompass changes made to the design and to reduce the scope of works under Phase 1. The Designer's Response should be read in conjunction with this report.

The technical note indicates each of the concerns identified by the safety auditors together with the recommendation made to address the problem. The Designer's Response to the recommendations has been shown in *italics*.

1.0 MATTERS ARISING FROM PREVIOUS STAGE 1 and STAGE 2 ROAD SAFETY AUDITS

1.1 Problem 1

Drawing: 60599249-ACM-0110-0000-DR-TR-000001-34

Location: Scheme extents

Summary: Insufficient space may result in dangerous manoeuvres resulting in collisions with oncoming vehicles.

Throughout the scheme, existing bus stops are proposed to be upgraded to Sprint bus stops. Additional Sprint bus stops are also to be constructed. The Sprint bus is suggested to be 18m long which is around 5m longer than a standard West Midlands bus. There are locations throughout the scheme where existing and proposed Sprint stops are situated close to pedestrian crossings and junctions meaning the Sprint bus may overhang on to them. This may result in dangerous manoeuvres being undertaken by approaching vehicles trying to get past the waiting bus leading to collisions with oncoming vehicles. Similarly, partially sighted or wheelchair/ pushchair users may find it difficult to manoeuvre around the bus increasing their risk of exposure to oncoming vehicles that may result in a collision causing serious injury.

Recommendation:

It is recommended that an assessment is undertaken at each Sprint bus stop location to ensure the proposed 18m long bus does not overhang on to pedestrian crossings, junctions or across accesses.

Design Organisation Response	<input type="checkbox"/> Accepted <input type="checkbox"/> Part Accepted <input checked="" type="checkbox"/> Rejected
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The current design has ensured that no sprint bus overhangs junctions or pedestrian crossings. some private accesses are currently blocked by a bus which continues to be the case with the sprint bus.

Client Organisation Comments

PH/SA Can only agree with designers comments – assuming all of the measurements for the design are correct.

1.2 Problem 2

Drawing: 60599249-ACM-0110-0000-DR-TR-000001-34

Location: Scheme extents

Summary: Lack of high friction surfacing (HFS) may result in overrun at junctions causing head on collisions with other vehicles.

New surfacing has been proposed throughout the route but not High Friction Surfacing (HFS). If HFS is not located on approach to junctions and pedestrian crossings, vehicles may not be aware of the upcoming hazard or fail to brake in time resulting in overshoot at the junction. This may result in head on or rear end collisions with other vehicles or crossing pedestrians resulting in serious or fatal injury.

Recommendation:

It is recommended that HFS or higher PSV is laid through the scheme at approaches to junctions and pedestrian crossings.

Design Organisation Response	<input type="checkbox"/> Accepted <input checked="" type="checkbox"/> Part Accepted <input type="checkbox"/> Rejected
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An assessment of the minimum PSV requirements has been undertaken by the pavement engineer for the areas where we are resurfacing the carriageway and HFS proposed as appropriate on the latest drawings.

Client Organisation Comments

PH/SA agree with designers comments – a review has been carried out of the 750 series and 68+PSV Material has been designed on all approaches.

1.3 Problem 3

Drawing: 60599249-ACM-0110-0000-DR-TR-000001-34

Location: Scheme extents

Summary: Lack of sign dimensions may result in obstructions for pedestrians and cyclists causing injury.

New signing has been proposed along the route, but no dimensions (mounting heights, post sizes and offsets) of these signs have been provided. Signs can become obstructions for both pedestrians and cyclists and can cause serious injury if they were to hit them. Similarly, signs may overhang the kerb line and become an obstruction for oncoming vehicles, particularly wider vehicles such as HGVs and buses, resulting in damage and possible injury to pedestrians or onboard passengers.

Recommendation:

It is recommended that signs are installed at a sufficient offset from the carriageway with appropriate posts and located away from the centre of non-motorised user routes on the footway so that they do not cause an obstruction.

Design Organisation Response	<input checked="" type="checkbox"/> Accepted	<input type="checkbox"/> Part Accepted	<input type="checkbox"/> Rejected
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A Sign Schedule to accompany the signing drawings outlining dimensions for foundations, posts and mounting heights has been produced. Sign locations are subject to agreement with the Project Manager and installed in accordance with the Specification which outlines clearance from carriageway etc.

Client Organisation Comments

PH/SA accept the process of agreeing locations with the PM based on the signing schedule as the scheme progresses – these agreed locations for install should be subject to audit thereafter.

A pragmatic approach to the installation of each sign should be used to minimise the risk to highway users.

1.4 Problem 4

Drawing: 60599249-ACM-0110-0000-DR-TR-000001-34

Location: Scheme extents

Summary: Lack of information regarding sign illumination may result in poor vehicle manoeuvres and confusion leading to collisions.

New signing has been proposed along the route, but no illumination has been detailed on the signing. Vehicles may fail to read the sign during the hours of darkness resulting in confusion and sudden braking which may cause rear end shunt collisions.

Recommendation:

It is recommended that signs are illuminated throughout the scheme.

Design Organisation Response	<input checked="" type="checkbox"/> Accepted	<input type="checkbox"/> Part Accepted	<input type="checkbox"/> Rejected
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A Sign Schedule to accompany the signing drawings outlining illumination requirements has been produced. Standards for signs and their illumination are detailed in the Specification.

Client Organisation Comments

PH/SA Agreed

1.5 Problem 11

Drawing: 60599249-ACM-0110-0000-DR-TR-000009

Location: Access to Birmingham Bio Power Station

Summary: Poor alignment may result in side swipes between buses and exiting vehicles.

A bus lane is proposed along the length of the A45 Small Heath Highway. Travelling southbound, the proposed bus lane starts after the access to Birmingham Bio Power Plant with the edge of the carriageway now being behind the access and not in line with the existing splitter island. A bus wishing to travel in the bus lane may start to move in to the lane after the splitter island, crossing the give-way markings as they do so, leading to potential collisions with vehicles egressing the Birmingham Bio Power Station.

Recommendation:

It is recommended that the alignment is changed to ensure the start of the bus lane is away from the exit of Birmingham Bio Power Station.

Design Organisation Response	<input type="checkbox"/> Accepted	<input type="checkbox"/> Part Accepted	<input checked="" type="checkbox"/> Rejected
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The tracking of a Sprint vehicle is dictated by the geometry of the highway alignment (Existing traffic island) for a bus moving from existing lane 1 to proposed bus lane taking into account the traffic island. A smooth tracked path at 40 mph does not conflict with the give way line from Birmingham Bio Power Station.

Client Organisation Comments

PH/SA agree with designer comment – site review may be required once setting out is complete for exact measurements available at the site.

1.6 Problem 13

Drawing: 60599249-ACM-0110-0000-DR-TR-000013

Location: Swan Island westbound off-slip

Summary: Inappropriate merge point may result in head on or side swipe collisions causing

serious injury.

A Sprint stop is located at the top of the westbound off-slip leading to Swan Island. The bus lane terminates at the bus stop and buses are to merge in to the adjacent running lane from the bus stop. Additionally, the access/ egress to/ from Charles Edward Road is located in front of the bus stop which may lead to conflicts and collisions occurring between merging vehicles and vehicles turning in to Charles Edward Road. Similarly, waiting vehicles may not have adequate visibility, due to a stationary bus, resulting in the vehicles merging in to the path of an oncoming vehicle causing a collision.

Recommendation:

It is recommended that the hatched markings are amended to provide additional merge length without compromising the Charles Edward Road junction.

Design Organisation Response	<input type="checkbox"/> Accepted <input type="checkbox"/> Part Accepted <input checked="" type="checkbox"/> Rejected
<i>The proposals are an improvement on the existing arrangement with the introduction of a length of merge for buses. This combined with the reduced number of bus services using this stop ((existing services replaced by Sprint or relocated to the existing stop to the east) and the reduced speeds as traffic approaches the stop line at the roundabout make this a more suitable solution for merging busses and left turning movements to Edgar Charles Road. Visibility for traffic on Charles Edward Road is similar to the existing scenario but with less buses expected at the stop and the faster turnaround of the sprint bus will provide a safer movement</i>	
Client Organisation Comments	
PH/SA concur with designer comment for CHARLES EDWARD ROAD the adjustment of the junction area does restrict the view for left hand turners slightly more however this would only be the case when a bus is stood at the new stop.	

1.7 Problem 16

Drawing: 60599249-ACM-0110-0000-DR-TR-000017

Location: Relocated pedestrian crossing adjacent to Sheldon Shopping Park

Summary: Lack of pedestrian guard railing may result in pedestrian crossing at dangerous locations increasing their risk of being struck by an oncoming vehicle.

The proposals relocate an existing pedestrian crossing on the eastbound side of the A45 carriageway which in turn increases the distance along the central reserve between the two crossing points. However, no measures have been proposed within the verge to prevent pedestrians crossing early, increasing their chances of being struck by an oncoming vehicle.

Recommendation:

It is recommended that measures are provided within the verge to prevent unsafe crossing (i.e. guardrails).

Design Organisation Response	<input checked="" type="checkbox"/> Accepted <input type="checkbox"/> Part Accepted <input type="checkbox"/> Rejected
	<input checked="" type="checkbox"/> Removed from Phase 1 scheme

The crossing location has been revised to be part of the bus gate facility whilst reducing stagger in the central reserve. Pedestrian guard railings have been provided in the footway and central reserve.

Client Organisation Comments

PH/SA Comment – Works have been removed from scope – no longer applicable.

2.0 MATTERS ARISING FROM THIS STAGE 2 ROAD SAFETY AUDIT

2.1 Problem 1

Drawing: 60599249-ACM-1250-0002-DR-TR-000012

Location: A45 (westbound) adjacent to Forest Road

Summary: Poor alignment of the start of the bus lane may result in side swipe collisions.

The proposed start of a bus lane heading westbound on the A45, after the junction with Forest Road, has poor alignment. This may confuse approaching motorists, causing them to make sudden lane change manoeuvres which may result in side swipe collisions.

Recommendation:

It is recommended that the bus lane starts before the junction, allowing provision for left turning vehicles but prohibiting ahead only vehicles, except buses.

Design Organisation Response	<input type="checkbox"/> Accepted	<input type="checkbox"/> Part Accepted	<input checked="" type="checkbox"/> Rejected
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The Start of the bus lane has been located to the required 45m from the junction allowing for a standard merging length for lane 1 traffic to lane 2. Advanced signage and a straight highway alignment with clear visibility also assist with driver awareness of the start of the bus lane.

Client Organisation Comments

SA PH Comment – The Auditors recommendation does give rise to less side swipe potential on the west side of the junction however the re works involved to facilitate this would need to include additional road marking on the west bound carriageway and adjusted kerblin buildout on the southwest corner to force vehicle exiting forest road into lane 2 and instead of being able to turn into lane 1 (the bus lane) loss of parking east side of the junction and notwithstanding the existing left hand turn manoeuvre heading westbound currently appears to be the majority manoeuvre - Agree designer comments should take precedent.

2.2 Problem 2

Drawing: 60599249-ACM-1250-0002-DR-TR-000013

Location: Swan Island westbound off-slip

Summary: Location of proposed sign may not be visible to oncoming vehicles resulting in hesitation and sudden braking causing rear shunt collisions.

An end of bus lane sign (PS 2.043) is located at the front of the footway within a bus layby. If a bus is waiting within the layby, an oncoming vehicle may fail to notice the end of bus lane sign due to visibility being restricted by the stopped bus. This may result in a driver hesitating when

approaching the existing hatching, unsure as to whether they are able to move over to the left. This may cause sudden braking resulting in rear end shunts.

Recommendation:

It is recommended that sign PS 2.043 is relocated to the front of the footway after the end of the layby. Alternatively, a secondary sign could be positioned within the central reserve.

Design Organisation Response	<input type="checkbox"/> Accepted	<input type="checkbox"/> Part Accepted	<input checked="" type="checkbox"/> Rejected
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The end of bus lane sign is provided for use where it is not obvious that a bus lane has ended according to the Traffic Signs Manual. The road markings to diagram 1049A are deemed appropriate to ensure that the drivers are aware of the end of the bus lane. The road geometry provides good forward visibility combined with the occasional use of the stop it is deemed that there is sufficient visibility of the need to merge into the single lane.

Client Organisation Comments

SA PH Comment - TSRGD does not require the signs however the sign has been placed for additional consistency through the scheme – Agree with Designer

2.3 Problem 3

Drawing: 60599249-ACM-1250-0002-DR-TR-000013

Location: Swan Island westbound off-slip

Summary: Location of proposed sprint stop leading to potential pedestrian injuries.

A sprint stop located on the eastbound off-slip from the Swan Island has been located on an existing subway ramp. It is unclear whether the ramp is proposed to be filled in as part of the scheme. This may result in pedestrians crossing the carriageway in unsafe locations, putting them at risk of being struck by oncoming vehicles.

Recommendation:

It is recommended that the sprint stop is relocated away from the subway ramp to maintain access.

Design Organisation Response	<input type="checkbox"/> Accepted	<input type="checkbox"/> Part Accepted	<input checked="" type="checkbox"/> Rejected
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The Subway is retained under the scheme proposals. location of the stop allows clear footway room to the opening for the subway. The sprint stop has tactile paving to denote its location. The location is considered appropriate.

Client Organisation Comments

PH SA Agree with designer comment

2.4 Problem 4

Drawing: 60599249-ACM-1250-0002-DR-TR-000016

Location: A45 opposite Lyndon Road

Summary: Proposed loading bay is located on the footway leading to potential pedestrian injuries occurring.

A loading bay has been relocated on to the footway as part of the phase 1 proposals. This may become a hazard for pedestrians, particularly visually impaired users who may be unaware of the loading bay. If a pedestrian was to inadvertently walk across the loading bay, they may be struck by a vehicle entering the loading bay or potentially hit a stationary vehicle leading to injuries.

Recommendation:

It is recommended that measures are incorporated to guide pedestrians around the loading bay.

Design Organisation Response	<input type="checkbox"/> Accepted <input type="checkbox"/> Part Accepted <input type="checkbox"/> Rejected <input checked="" type="checkbox"/> Removed from Phase 1 scheme
<i>The use of edging kerb shown in pink and road markings depict the position of the bay and gives clear indication of the bay. This should be monitored post construction and if problems exist then extra measures can be incorporated.</i>	
Client Organisation Comments	
SA PH Comment Relevant to Phase 2 – Not applicable in phase 1 of the works – to revisit in phase 2	

2.5 Problem 5

Drawing: 60599249-ACM-1300-0001-DR-TR-000017

Location: A45 Coventry Road

Summary: Inconsistency in lighting column positions may result in obstructions for pedestrians and cyclists causing injuries if they were to strike the posts.

New lighting columns have been proposed along the A45. A number of the proposed lighting columns have been positioned at the front of the footway which may lead to dark spots on the footway resulting in pedestrian slips, trips and falls that may cause injuries. Additionally, the positioning of the lighting columns may become an obstruction for users leading to pedestrians inadvertently moving across the path of another pedestrian and injuries occurring.

Recommendation:

It is recommended that lighting columns are relocated to the back of the footway.

Design Organisation Response	<input type="checkbox"/> Accepted <input checked="" type="checkbox"/> Part Accepted <input type="checkbox"/> Rejected
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New proposed lighting columns will be reviewed with the local highway authority and located appropriately.

Client Organisation Comments

SA PH Comment - Calculations on lighting levels and locations have been approved by BCC and are adequate for the scheme

2.6 Problem 6

Drawing: 60599249-ACM-1250-0002-DR-TR-000020

Location: Lode Lane (northbound) adjacent to Castle Lane

Summary: Sprint bus may overhang egress resulting in collisions.

A proposed Sprint bus stop has been located after the access/egress of a service road; this appears to be a conflict point. A sprint bus is larger in length than a regular bus and may overhang the mouth of the access of the service road. This may lead to vehicles undertaking unsafe manoeuvres to access Lode Lane resulting in loss of control or collisions with oncoming vehicles.

Recommendation:

It is recommended that the sprint stop is relocated north away from the service road access/egress.

Design Organisation Response	<input type="checkbox"/> Accepted <input type="checkbox"/> Part Accepted <input checked="" type="checkbox"/> Rejected
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This stop has been designed to accommodate the sprint bus within the bus cage which will ensure that the sprint bus will not overhang the access road.

Client Organisation Comments

SA PH Comment Agree with designer – no overhang is proposed as the Sprint bus will stop within the cage

2.7 Problem 7

Drawing: 60599249-ACM-1250-0002-DR-TR-000028

Location: Morrisons exit

Summary: Lack of enforcement may result in vehicles undertaking unsafe manoeuvres resulting in collisions.

The proposals extend the splitter island at the Morrisons junction on the A45. Whilst the Audit Team agree this is to deter vehicles from accessing Coalway Avenue from Morrisons, no signing

has been proposed to enforce this prohibited movement. This may result in vehicles undertaking unsafe manoeuvres to access Coalway Avenue, increasing the risk of collisions with other road users.

Recommendation:

It is recommended that additional signing is installed which shows vehicles are to turn right only from the right-hand lane exit. An additional right only sign could be installed on the splitter island opposite the junction.

Design Organisation Response	<input type="checkbox"/> Accepted <input type="checkbox"/> Part Accepted <input type="checkbox"/> Rejected
	<input checked="" type="checkbox"/> Removed from Phase 1 scheme

The existing road markings indicate the allowable movement. It is considered that additional right turn signs may lead to further confusion with the junction layout. A plain faced bollard will be provided to the splitter island.

Client Organisation Comments

SA PH Comment Relevant to Phase 2 – Not applicable in phase 1 of the works – to revisit in phase 2

2.8 Problem 8

Drawing: 60599249-ACM-1250-0002-DR-TR-000029

Location: A45 (eastbound) adjacent to Arden Oak Road

Summary: Sprint buses accessing the proposed sprint stop may collide with vehicles egressing from Arden Oak Road.

A proposed sprint bus stop has been located after the junction with Arden Oak Road; this appears to be a conflict point. As the sprint bus pulls into the bus stop layby, vehicles egressing from Arden Oak Road may collide with the bus resulting in a collision.

Recommendation:

It is recommended that a build out is provided to separate the bus lay by and egress from the junction.

Design Organisation Response	<input type="checkbox"/> Accepted <input type="checkbox"/> Part Accepted <input type="checkbox"/> Rejected
	<input checked="" type="checkbox"/> Removed from Phase 1 scheme

This is an existing layout. Proposed works are resurfacing, re lining and bus shelter replacement. Traffic collision data from Data Insight for the last 12 years reports 2 incidents at this junction, neither are related to the bus movement to the layby. It is not considered that this arrangement should be changed under this scheme.

Client Organisation Comments

SA PH Comment Relevant to Phase 2 – Not applicable in phase 1 of the works – to revisit in phase 2

3.0 CLIENT ORGANISATION STATEMENT:

I accept these proposals by the Design Organisation

Name: Stuart Amphlett in conjunction with Paul Hammett

Position: NEC 4 Project Manager

Organisation: Transport for West Midlands

Signed: Stuart Amphlett / Paul Hammett

Dated: 08/10/2020