

Lower Thames Crossing

9.17 Issue Specific Hearing 1
Action number 3 Design
and operational distinction
between an all purpose
trunk road (APTR)
and smart motorway

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List of contents

			Page number
1	Intro	duction	1
	1.1	Purpose of document	1
2	Desi	gn and operational distinction	3
	2.1	Introduction	3
	2.2	Design philosophy	3
	2.3	Key differentiators	
	2.4	Design and operational baseline	4
	2.5	Safety and operational features descriptors	6
	2.6	Baseline legal entity	8
	2.7	Permitted traffic classes	8
	2.8	Permitted vehicle speeds	9
3	Writt	en Ministerial Statement (WMS) 17 April 2023	11
	3.1	WMS	11
4	Sum	mary and conclusions	13
	4.1	Summary	
	4.2	Conclusions	

List of tables

	Page number
Table 2.1 Design and operations	5
Table 2.2 Safety and operational features descriptors	7
Table 2.3 Permitted traffic classes	9
Table 2.4 Permitted vehicle speed	9

1 Introduction

1.1 Purpose of document

- 1.1.1 This document has been produced by the Applicant in response to action number 3 raised at Issue Specific Hearing 1 (ISH1) Project definition.
- 1.1.2 Action number 3 was published by the Examining Authority (ExA) on 30 June 2023 [EV-023a] and reads:

'On 15 April 2023, the UK government announced the cancellation of uncompleted elements of the Smart Motorway programme. IPs have made RRs and oral submissions to the extent that the LTC design is (in their view) equivalent to a Smart Motorway in design and operation, whereas the Applicant has made submissions that it has been designed and will be operated as an All-Purpose Trunk Road (AAPT). Please provide a summary document describing the design and operational distinction between a three lane per side AAPT and a Smart Motorway'.

- 1.1.3 The ExA have made reference to a 'smart motorway'. For clarity there are three forms of smart motorway:
 - a. All lane running (ALR) motorway: add variable mandatory speed limits to control the speed and smooth the flow of traffic and increase capacity by permanently converting the hard shoulder into a running lane. ALR motorways feature emergency areas, which are places to stop in an emergency. To further enhance safety, stopped vehicle detection technology is put in place on all ALR motorways.
 - b. Controlled motorway (CM): apply variable mandatory speed limits to a conventional motorway to control the speed and smooth the flow of traffic and retain a permanent hard shoulder. Overhead electronic signs display messages to drivers, such as warning of an incident ahead.
 - c. Dynamic Hard Shoulder (DHS) motorway: apply variable mandatory speed limits to control the speed and smooth the flow of traffic and temporarily increase capacity by using the hard shoulder as a running lane at the busiest times. Electronic signs and signals instruct drivers when hard shoulder is available to use for live running. When the hard shoulder is operating as a live lane, the speed is set at a maximum of 60mph. DHS motorways feature emergency areas, which are places to stop in an emergency.
- 1.1.4 For the purposes of this document 'smart motorway' is defined as an ALR motorway.

1.1.5 Following this introduction, Section 2 focuses on the design and operational distinction between ALR motorways and All Purpose Trunk Roads (APTRs) and provides an overview of Relevant Representations and oral submissions relating to smart motorways. Section 3 sets out the Government's Written Ministerial Statement delivered to Parliament 17 April 2023 on the cancellation of smart motorways. Section 4 provides a summary and conclusion.

2 Design and operational distinction

2.1 Introduction

- 2.1.1 This section sets out the design and operational distinction between a baseline conventional all-purpose trunk road (APTR), an ALR motorway and the A122 operating as an APTR.
- 2.1.2 The design and operational distinctions are set out under the following sub-headings:
 - a. Design philosophy
 - b. Key differentiators
 - c. Design and operational baseline
 - d. Safety and operational features descriptors
 - e. Baseline legal entity
 - f. Permitted traffic classes
 - g. Permitted vehicle speeds

2.2 Design philosophy

- 2.2.1 The key design philosophy is that A122 is an APTR, not a motorway or ALR motorway.
- 2.2.2 APTRs are either new build or upgrade of an existing route. Examples of APTRs include the A13, A14, A556 (links the M6 with M56) and A1089.
- 2.2.3 The operation of APTRs without hard shoulders is not a recent development. There are many hundreds of miles of APTR, without hard shoulder, currently in operation across the country which are used by millions of road users each year.
- 2.2.4 The design standard for ALR motorways applies where there is an existing motorway, and its hard shoulder is converted into a permanent traffic lane with the implementation of safety and operational features.
- 2.2.5 ALR motorways have been introduced along existing sections of motorway to increase capacity within the existing highway boundary. Examples include sections of the M6 and M25.
- 2.2.6 Whilst there are many facets involved in determining the design and operating regime for a road, key factors for the A122 are as follows:
 - a. User safety.
 - b. The A122 is new build and not a conversion of an existing road.

- c. Purpose of route and route consistency, taking into account the interfaces that the A122 has with APTRs (A2, A13, A1089), M25 and the local road network.
- d. Operation of the road tunnel.

2.3 Key differentiators

- 2.3.1 The key differentiators are listed below. Further details are set out in Sections 2.4, 2.5, 2.6, 2.7 and 2.8.
 - a. ALR motorways are established by the permanent conversion of an existing conventional motorway hard shoulder to a traffic lane.
 - b. An APTR does not have a hard shoulder in the baseline design.
 - c. Different design standards are used for ALR motorways and APTRs; including number of lanes, lane widths, hard strip widths, junction design, verges and gradients.
 - Technology services enhance the safety, road user experience and operation of any road.
 - On ALR motorways it also provides mitigation for some of the hazards, such as those related to removing the existing hard shoulder.
 - ii. The introduction of technology on the A122 provides enhancements over and above it operating as a conventional APTR.
 - e. Legal entity motorways (including ALR motorways) are designated as 'special roads'; the A122 is designated as a 'trunk road'.
 - f. Differences in speed limits for different classes of vehicle.

2.4 Design and operational baseline

2.4.1 Table 2.1 sets out the design and operational baselines for a ALR motorway, conventional APTR and the A122 operating as an APTR.

Table 2.1 Design and operations

Baseline	ALR motorway	Conventional APTR	A122 (APTR)	
Number of traffic lanes (determined by traffic flows)	4	Typically, 2 or 3	2 or 3	
Hard shoulder provision	The baseline standard for ALR motorways is the conversion of an existing hard shoulder on a motorway to a permanent traffic lane.	The baseline standard for an APTR is that no hard shoulder is provided. Examples of APTRs include the A13 and A1089 where there are no hard shoulders. The provision of a hard shoulder would constitute a departure from standards.	The baseline standard for the A122 operating as an APTR is that no hard shoulder is provided. The provision of a hard shoulder would constitute a departure from standards.	
Safety and operational features	*Refer to sub-section for further narrative.	on 2.5 'Safety and operational feature descriptors'		
On-road operational resource to assist incident management	Yes – operational resources (Traffic Officers) deployed from the Regional Operations Centre)	No / limited	Yes – enhanced provision compared to conventional APTR provision. Resources (Traffic Officers) to patrol A122 to be deployed by the Regional Operations Centre and stationed at both tunnel portals). A dedicated on-road resource means faster response to and clearance of incidents.	
Lane widths	Typically: • Lane 1: 3.65m • Lane 2: 3.50m (min) • Lane 3: 3.40m (min) • Lane 4: 3.20m (min)	Typically: 3 lane configuration: • Lane 1: 3.65m • Lane 2: 3.70m • Lane 3: 3.65m 2 lane dual carriageway configuration: • Lane 1: 3.65m • Lane 2: 3.65m	3 lane configuration: • Lane 1: 3.65m • Lane 2: 3.70m • Lane 3: 3.65m 2 lane configuration: • Lane 1: 3.65m • Lane 2: 3.65m	

Baseline	ALR motorway	Conventional APTR	A122 (APTR)
Hard strip widths. (A hard strip provides a surfaced strip that abuts the carriageway. The key reasons for the provision of hard strips include: Partial provision for stopped vehicles Overrun facility for driver error and evasive action Improved level of service and driver comfort Pavement integrity / stability	Typically: • 0.50m nearside and offside but offside can be reduced to 0.30m	Typically: • 1.0m nearside • 1.0m offside	1.0m nearside1.0m offside
Verge widths	Variable and constrained by highway boundary limits	Variable. Typically, wider than ALR motorways.	Typically, wider than ALR motorways.
Vehicle restraint system (VRS)	As required. Verge VRS lengths are in typically greater when compared to APTR, due to the retrofitting of ALR motorways and associated additional verge features within an existing highway boundary	As required	As required. A122 designed to minimise use of VRS.
Colour of advance directional signs	Blue background	Green background	Green background
Permitted traffic classes and vehicle type speeds	*Refer to sub-section 2.7 'permitted traffic classes' and 2.8 'permitted vehicle type speeds' for further narrative.		

2.5 Safety and operational features descriptors

2.5.1 Safety is National Highways' highest priority. National Highways is constantly developing features, systems and protocols to improve operations and safety. National Highways has various safety and operational features (as outlined in Table 2.2) that can be introduced on roads that form part of the strategic road network (SRN). These features are not assigned to a specific road type otherwise this would preclude the provision of appropriate safety and operational benefits for a specific road type.

2.5.2 Table 2.2 sets out the safety and operational features that can be provided and are found on the SRN (note that SRN is used to describe both motorways and APTRs operated by National Highways) to enhance safety and operational efficiency irrespective of road type.

Table 2.2 Safety and operational features descriptors

Safety and operational feature	ALR motorway	Conventional APTR	A122 (APTR)
Variable mandatory speed limits (VMSL) – helps keep traffic moving, reducing stop-start traffic.	Yes	No / limited	Yes – enhancement over conventional APTR
Detection systems to monitor traffic for changes in flows and speeds, which is known as MIDAS.	Yes	No / limited	Yes – enhancement over conventional APTR
Stopped vehicle detection – ability to detect stopped vehicles in a live lane to enable the activation of appropriate incident response regime.	Yes	No	Yes – enhancement over conventional APTR
CCTV cameras that National Highways operators can remotely move and zoom to monitor and manage congestion and incidents, where notified. The system has the ability to see 100% of the carriageway.	Yes	No / limited	Yes – enhancement over conventional APTR
Signs (variable message signs) and signals to provide better information, which can alert drivers to hazards ahead and display Red X signals to close a lane or lanes to other traffic when a stopped vehicle is identified in them.	Yes	No / limited	Yes – enhancement over conventional APTR
Enforcement cameras to deter the minority who break speed limits and ignore Red X signals.	Yes	No / limited	Yes – enhancement over conventional APTR
Clearly signed and orange- coloured emergency areas set back from the road with telephones linking directly to the Regional Operations Centre.	Yes	No (laybys approx. 2.5km)	Yes – enhancement over conventional APTR. Emergency areas have the same colour as the adjoining carriageway

2.6 Baseline legal entity

- 2.6.1 All motorways in England are designated as 'special roads'.
- 2.6.2 For clarity, a 'special road' is a road that does not have any Public Rights of Way unless specific authorisation is given by the Secretary of State for specific traffic classes to use the road.
- 2.6.3 Motorways (including ALR motorways) are restricted to traffic classes I and II only (refer to Section 2.7: Permitted traffic classes, for further information).
- 2.6.4 APTRs are not normally designated as 'special roads'.
- 2.6.5 An APTR assumes an automatic Public Right of Way unless a relevant Order or Orders are secured to prohibit specific traffic classes.
- 2.6.6 Refer to Section 2.7: Permitted traffic classes, for further narrative on which types of traffic are permitted on motorways, APTRs and the A122 operating as an APTR.

2.7 Permitted traffic classes

- 2.7.1 The A122, whilst operating as an APTR, shall operate with permitted traffic classes I and II only which is the same as ALR motorways or any other type of motorway. The reasons for this are:
 - a. Enhancing road user safety in the tunnels (reducing speed differentials between vehicles, resulting in less lane changing within the tunnel).
 - b. Consistency of permitted traffic classes along the A122 route.
- 2.7.2 Schedule 4 to the Highways Act 1980 defines the traffic classes that are permitted on the English road network. These are summarised in Table 2.3. Examples of APTRs where authorised and unauthorised traffic classes are similar to those proposed to be implemented on the A122 include:
 - a. A14 Huntingdon to Cambridge
 - b. A19 Tyne Tunnel
 - c. A3 Hazel Grove Interchange to French Lane (includes the Hindhead Tunnel)
 - d. A20 Roundhill tunnel
 - e. A27 Southwick tunnel
- 2.7.3 In addition, similar restrictions are proposed for the A12 Chelmsford to A120 widening scheme (currently in Development Consent Order Examination).

Table 2.3 Permitted traffic classes

Traffic class (summary)	All motorways	Conventional APTR	A122 (APTR)
Class I – heavy and light locomotives, motor tractors, heavy motor cars, motor car and motor cycles whereof the cylinder capacity of the engine is not less than 50cc, and trailers drawn thereby.	Permitted	Permitted	Permitted
Class II – motor vehicles and trailers	Permitted	Permitted	Permitted
Class III – motor vehicle controlled by pedestrians	Not permitted	Permitted	Not permitted
Class IV – all motor vehicles less than 50cc not comprised in Classes I, II and III	Not permitted	Permitted	Not permitted
Class V – Vehicles drawn by animals	Not permitted	Permitted	Not permitted
Class VI – Vehicles drawn or propelled by pedestrians	Not permitted	Permitted	Not permitted
Class VII – cycles	Not permitted	Permitted	Not permitted
Class VIII – animals ridden, led or driven	Not permitted	Permitted	Not permitted
Class IX – pedestrians, perambulators, push- chairs and other forms of baby carriages and dogs held on a lead	Not permitted	Permitted	Not permitted
Class X – motor cycles less than 50cc	Not permitted	Permitted	Not permitted
Class XI – invalid carriages	Not permitted	Permitted	Not permitted

2.8 Permitted vehicle speeds

2.8.1 Whilst the maximum speed limit is 70mph for both ALR motorways and the A122 operating as an APTR, there are distinctions in maximum speed limits for specific types of vehicles on specific types of road. These are summarised in Table 2.4.

Table 2.4 Permitted vehicle speed

Vehicle class	Maximum permitted vehicle speed (mph)			
	All motorways	Conventional dual carriageway APTR	A122 (APTR)	
Cars, motorcycles, car-derived vans and dual-purpose vehicles	70	70	70	
Cars, motorcycles, car-derived vans and dual-purpose vehicles when towing caravans or trailers	60	60	60	
Motorhomes or motor caravans (not more than 3.05 tonnes maximum unladen weight)	70	70	70	

Vehicle class	Maximum permitted vehicle speed (mph)			
	All motorways	Conventional dual carriageway APTR	A122 (APTR)	
Motorhomes or motor caravans (more than 3.05 tonnes maximum unladen weight)	70	60	60	
Buses, coaches and minibuses (not more than 12 metres overall length)	70	60	60	
Buses, coaches and minibuses (more than 12 metres overall length)	60	60	60	
Goods vehicles (not more than 7.5 tonnes maximum laden weight)	70 60 if articulated or towing a trailer	60	60	
Goods vehicles (more than 7.5 tonnes maximum laden weight) in England and Wales	60	60	60	

3 Written Ministerial Statement (WMS) 17 April 2023

3.1 WMS

- 3.1.1 ISH1 action number 3 states that 'On 15 April 2023, the UK government announced the cancellation of uncompleted elements of the Smart Motorway programme'.
- 3.1.2 As the issue of the cancellation of the smart motorways programme has been raised it is necessary to provide clarity on the government's announcement.
- 3.1.3 The government issued a news release on 15 April 2023 on the cancellation of new smart motorways. This was followed by the WMS laid in Parliament 17 April 2023 which sets out:
 - a. the reasoning for the cancellation of new smart motorways
 - which smart motorway schemes were to be cancelled and those to be completed
 - c. the further provision of safety enhancements
- 3.1.4 The complete WMS is reiterated below in italics.

'The government has announced that all plans for new smart motorways have been cancelled.

This will mean that the 11 schemes already paused from the second Road Strategy (2020-2025) and the 3 earmarked for construction during the third Road Investment Strategy (2025 to 2030) will be removed from the government's road-building plans in recognition of the current lack of public confidence felt by drivers and cost pressures.

While no new stretches will be converted, work on the M56 J6 to J8 and M6 J21a to J26 will go ahead as planned given they are already over three-quarters constructed.

The government and National Highways will continue to invest £900 million in further safety improvements on existing smart motorways. This includes installing stopped vehicle detection technology on every all lane running smart motorway which has now been completed, adding an additional 150 emergency areas across the network by 2025 and investing in giving motorists clear advice when using existing smart motorways.

The government will also continue to deliver against its other commitments as set out in its response to the Transport Select Committee in January 2022.

This government will continue to ensure that our roads remain among the safest in the world – helping drivers not just to be safe, but crucially, to feel safe and confident when driving.

The following schemes have been cancelled RIS2 (2020 to 2025) paused schemes

New all lane running smart motorways

M3 junctions 9 to 14

M40/M42 interchange

M62 junctions 20 to 25

M25 junctions 10 to 16

Dynamic hard shoulder to all lane running conversions

M1 junctions 10 to 13

M4/M5 interchange (M4 junctions 19 to 20 and M5 junctions 15 to 17)

M6 junctions 4 to 5

M6 junctions 5 to 8

M6 junctions 8 to 10a

M42 junctions 3a to 7

M62 junctions 25 to 30

RIS3 (2025 to 2030) pipeline schemes

M1 North Leicestershire

M1 junctions 35a to 39 Sheffield to Wakefield

M6 junctions 19 to 21a Knutsford to Croft'

- 3.1.5 With reference to the WMS, the Applicant wishes to emphasis the following:
 - The WMS makes no reference to the proposed A122 which is the new APTR trunk road to be constructed.
 - b. The WMS states that 'no new stretches will be converted'. The A122 is a new build APTR and therefore is not a conversion of an existing motorway to ALR motorway.
 - Sections of smart motorway that were three-quarters constructed, at the time of the April 2023 Government announcement, were to be completed.
- 3.1.6 In addition to the WMS, the Minister for Roads and Local Transport, Richard Holden MP, wrote to the Chair of the Thames Crossing Action Group on 20 March 2023. The letter confirms that the design standard used is the most appropriate and that the road has been designated an APTR, and therefore not as a smart motorway.
- 3.1.7 A copy of the letter is included in Annex A.

4 Summary and conclusions

4.1 Summary

- 4.1.1 Certain Interested Parties have made Relevant Representation and oral submissions to the ExA to the extent that the A122 road design is (in their view) equivalent to a smart motorway (ALR motorway) in design and operation.
- 4.1.2 The Applicant refutes this assumption based on design and operational differences.
- 4.1.3 The government's Written Ministerial Statement (WMS) laid to Parliament on 17 April 2023 set out the reasoning for the cancellation of new smart motorways, which smart motorway schemes would be cancelled, which would be completed as they were already in construction and that no further conversions from motorway to smart motorway would occur and that further safety enhancements were to be implemented on existing sections of smart motorway. The WMS made no reference to the A122 and confirmed that the WMS related only to the new conversion of an existing motorway to a smart motorway.
- 4.1.4 ALR motorways and all-purpose trunk roads (APTRs) have distinct key differentiators:
 - a. The A122 is an APTR, not a motorway or ALR motorway.
 - b. ALR motorways are established by the permanent conversion of an existing conventional motorway hard shoulder to a traffic lane.
 - c. An APTR does not have a hard shoulder in the baseline design.
 - d. Different design standards are used for ALR motorways and APTRs including number of lanes, lane widths, hard strip widths, junction design, verges and gradients.
 - e. Technology services enhance the safety, road user experience and operation of any road.
 - On ALR motorways it also provides mitigation for some of the hazards, such as those related to removing the existing hard shoulder.
 - ii. The introduction of technology on the A122 provides enhancements over and above it operating as a conventional APTR.
 - f. Legal entity motorways (including ALR motorways) are designated as 'special roads'; the A122 is designated as an APTR.
 - g. Differences in speed limits for different classes of vehicle.
- 4.1.5 The operation of APTRs without hard shoulders is not a recent development. There are many hundreds of miles of APTR, without hard shoulder, currently in operation across the country which are used by millions of road users each year.

4.1.6 Safety is National Highways highest priority. National Highways are constantly developing features, systems and protocols to further improve safety and operations. The safety and operational features (as outlined within this document) can be introduced on roads that form part of the strategic road network. These features are not limited to a specific road type otherwise this would preclude the provision of safety and operational benefits.

4.2 Conclusions

- 4.2.1 Taking all matters into account it is concluded that the A122 is not a smart motorway (ALR motorway) or 'smart motorway by stealth' as put forward by the opinion of certain Interested Parties.
- 4.2.2 APTRs have been in existence for many years and are used regularly by the public. Like other ATPRs, the A122 will typically have 1m nearside and offside hard strips and no hard shoulder.
- 4.2.3 Safety is National Highways highest priority. The design of the A122 seeks to further enhance safety, beyond that of a conventional APTR, through addition of technology services and features to better support the road user.
- 4.2.4 Therefore, the appropriate design and operation for the A122 is that of an APTR with enhanced safety and operational features.

Annex A



Laura Blake Chair Thames Crossing Action Group From the Parliamentary Under Secretary of State Richard Holden MP

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Web site: www.gav.uk/dft

Our Ref. MC/424219 Your Ref. TCAG-MHRH-SLTC-230305

7 March 2023

Dear heune

Thank you for your letter of 5 March to the Secretary of State and myself, raising your concern about the proposed Lower Thames Crossing.

Between 2015 and 2020 National Highways undertook a full review of the Design Manual for Roads and Bridges and released new standards. In October 2019 it was confirmed that the Lower Thames Crossing would be designed in accordance with GD 300 (Requirements for new and upgraded all-purpose trunk roads (expressways). GD 300 provides the design requirements and guidance for new and upgraded all-purpose trunk roads.

This design standard was the most appropriate for the objectives of the Lower Thames Crossing, and its designation was confirmed as an all-purpose trunk road (A-road).

National Highways has undertaken a Costs and Benefits Appraisal – Light Touch (COBALT) accident analysis, further information can be found at section 8.6.16 of the Economic Impact Report¹.

Safety is a key priority for National Highways. Lower Thames Crossing tunnels and roads will be designed and built to the highest safety standards recommended today. National Highways continues to adapt its design of the project to incorporate any advances in design and technology that emerge in the years ahead.

https://infrastructure.planninginspectorate.gov.uk/wp-content/pc/uploads/projects/TR010032/TR010032-001336-7.7%20Combined%20Modelling%20and%20Appraisal%20Report%20-%20Appendix%20D%20-%20Economic%20Appraisal%20Report.pdf

As this is a live Development Consent Order application, I hope you will appreciate that it would be inappropriate to comment further.

Best wishes,

RICHARD HOLDEN MP

MINISTER FOR ROADS AND LOCAL TRANSPORT

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