

<b>Title:</b> Birmingham Box Managed Motorways - Phase 3 (BBMM3) <b>IA No:</b> DfT 00111  <b>Lead department or agency:</b> Highways Agency <b>Other departments or agencies:</b> None	<b>Impact Assessment (IA)</b>				
	<b>Date:</b> 17/07/2012				
	<b>Stage:</b> Final				
	<b>Source of intervention:</b> Domestic				
	<b>Type of measure:</b> Secondary legislation				
<b>Contact for enquiries:</b> Robert Edwards, Highways Agency, robert.edwards@highways.gsi.gov.uk					
<b>Summary: Intervention and Options</b>				<b>RPC Opinion:</b> RPC Opinion Status	

Cost of Preferred (or more likely) Option					
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANCB on 2009 prices)	In scope of One-In, One-Out?	Measure qualifies as	
£460.2m	£419.0m	£-18.2m	Yes	Zero Net Cost	

**What is the problem under consideration? Why is government intervention necessary?**

The Birmingham Box comprises sections of the M42, M6 and M5. From J5 to J8, the M6 experiences considerable congestion during peak periods due to a high traffic volume. The congestion reduces the efficiency of movement of people and goods to the detriment of business productivity and the economic and social activities of individuals. If these problems are to be alleviated, then some form of intervention is required. The intervention needs to be undertaken by government since the motorway is owned, operated and maintained by government through the Highways Agency (HA) and Department for Transport (DfT). The intervention forms part of the DfT's programme of improvements to the trunk road network.

**What are the policy objectives and the intended effects?**

The objective is to reduce the cost of congestion to business and individuals and thereby encourage economic activity and improve social well being. The intended effects are to reduce journey times and the variability in journey times caused by congestion. In particular, the intention is to reduce congestion on the motorway at all times of day, thereby reducing journey times and making them more predictable or "reliable". There are a number of secondary social and environmental effects which have been quantified and taken into consideration as part of the DfT appraisal process. These are described in the evidence base.

**What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)**

Option 1: The preferred intervention is a system called Managed Motorway. Managed Motorway involves allowing use of the hard shoulder as a running lane in congested conditions. The hard shoulder is opened when speeds reduce to approximately 60mph. At this point, a mandatory 60mph speed limit is imposed. This speed limit is subsequently reduced to 50 or 40mph if traffic levels continue to increase. A Variable Mandatory Speed Limit (VMSL) is therefore required as part of the Managed Motorway system. Secondary legislation is required in order to implement hard shoulder running (HSR) and VMSL.

Option 2: The non-preferred intervention involves widening of the carriageway to four lanes and retention of a permanent hard shoulder. Although this option has additional benefits compared to the preferred option, these are more than cancelled out by the substantial additional costs. Regulation is not however required.

<b>Will the policy be reviewed?</b> It will be reviewed. <b>If applicable, set review date:</b> 01/2015					
Does implementation go beyond minimum EU requirements?			N/A		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	<b>Micro</b> Yes	<b>&lt; 20</b> Yes	<b>Small</b> Yes	<b>Medium</b> Yes	<b>Large</b> Yes
What is the CO <sub>2</sub> equivalent change in greenhouse gas emissions? (Million tonnes CO <sub>2</sub> equivalent)			<b>Traded:</b> 0	<b>Non-traded:</b> -0.03	

*I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) that the benefits justify the costs.*

Signed by the responsible Minister: \_\_\_\_\_ Stephen Hammond \_\_\_\_\_ Date: 18/05/2013 \_\_\_\_\_

# Summary: Analysis & Evidence

# Policy Option 1

**Description:** Birmingham Box Managed Motorways - Phase 3 - (BBMM3)

## FULL ECONOMIC ASSESSMENT

Price Base Year 2011	PV Base Year 2012	Time Period Years 60	Net Benefit (Present Value (PV)) (£m)		
			Low: 229.2m	High: 614.7m	Best Estimate: £460.2m

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	N/A	N/A	N/A
High	N/A	N/A	N/A
Best Estimate	£182.9m	£4.7m	£295.8m

### Description and scale of key monetised costs by 'main affected groups'

Breakdown of Best Estimate 'Total Cost' in 2011 market prices, discounted to 2012 Present Value Year  
 Govt. (Public Accounts): Installation, Enforcement, Operation, Maintenance and Renewal: £172.8m  
 Road Users (Economy): Reduction in Transport Economic Efficiency During Const.and Maint: £58.1m  
 Public (Environment): Increase in road traffic Noise: £19.8m  
 Govt. (Public Accounts): Loss of Indirect Tax Revenue: £45.1m

### Other key non-monetised costs by 'main affected groups'

Wildlife (Environment): Slight Adverse impact on Biodiversity.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	N/A	£21.6m	£529.1m
High	N/A	£37.3m	£914.6m
Best Estimate	£0m	£30.8m	£756.0m

### Description and scale of key monetised benefits by 'main affected groups'

Breakdown of Best Estimate "Total Benefit" in 2011 market prices, discounted to 2012 Present Value Year.  
 Road Users (Economy): Improvement in Transport Economic Efficiency: £636.0m  
 Road Users (Economy): Improvement in Journey Time Reliability: £46.7m  
 Road Users (Society): Reduction in Accidents: £68.9m  
 Public (Environment): Reduction in Greenhouse Gas Emissions: £4.4m

### Other key non-monetised benefits by 'main affected groups'

None.

Key assumptions/sensitivities/risks	Discount rate (%)	3.5/3
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The majority of the benefits are based upon the outputs of a traffic model : in particular, the differences between model outputs for the without and with scheme scenarios in the opening year and future years. The estimated benefits are therefore dependent upon the accuracy of the models and future traffic forecasts. To minimise the risk of error in this regard, the traffic models and forecasts have been prepared following DfT guidance. The traffic model meets DfT performance requirements.

## BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			In scope of OIOO?	Measure qualifies as
Costs: £0m	Benefits: £18.2m	Net: -£18.2m	Yes	Zero net cost

# Evidence Base

## 1. Problem under Consideration

The Birmingham Motorway Box comprises sections of the M42, M6 and M5 and provides a “ring road” to the West Midlands conurbation. Substantial sections of the motorway box suffer from traffic congestion and to address this, in 2009 the Government announced that hard shoulder running would be extended to some of the busiest parts of the Highways Agency’s major road network and this initiated the Managed Motorways Programme. The Managed Motorway concept builds upon the success of the Active Traffic Management Pilot (which addressed the congestion on the key section of the M42) and the Agency has implemented Managed Motorway schemes on a further two sections of the M6 to either side of Junctions 5-8. Congestion on this section occurs throughout the day, but is greatest during the morning and evening peak periods when journey times between J5 and J8 are 65% greater northbound and 55% greater southbound than during free flow conditions. Two-way daily traffic flows average around 130,000 vehicles per day. This is almost 50% higher than the Congestion Reference Flow (CRF) of around 90,000 vehicles per day. The CRF represents the daily flow level at which a road is likely to be congested during peak hours.

## 2. Rationale for Intervention

The current congestion reduces the efficiency of movement of people and goods to the detriment of business productivity and the economic and social activities of individuals. If these problems are to be alleviated, then some form of intervention is required. The intervention needs to be undertaken by government since the motorway is owned, operated and maintained by the government through the Highways Agency (HA) and Department for Transport (DfT). The intervention forms part of the DfT's programme of major improvements to the trunk road network for the 2010-15 Spending Review period. The programme is delivered by the HA.

## 3. Policy Objective

The Department for Transport’s Business Plan 2011-15 set out a vision for a transport system that is an engine for economic growth and one that is also greener and safer and improves quality of life in our communities. By improving the links that help to move goods and people around, the Department can help to build the balanced, dynamic and low-carbon economy that is essential for future prosperity.

The primary objective of the DfT’s programme of trunk road improvements is to reduce the cost of congestion to business and individuals and thereby encourage economic activity and improve social well being. The Department seeks to achieve this by reducing congestion through increasing network capacity and improving journey time reliability. On the M6 between Junctions 5-8 in particular, the intention is to reduce congestion on the motorway at all times of day, thereby reducing journey times and making them more predictable or “reliable”.

Although the objective for the scheme is to reduce congestion and improve reliability, there are a number of secondary social and environmental effects which have been quantified and taken into consideration as part of the DfT appraisal process. These are described in the following paragraphs.

## 4. Description of Options

### 4.1 Do Nothing Baseline i.e. Existing Situation

The Do-Nothing Baseline, or existing situation, is a dual three lane carriageway to motorway standard (D3M) with the MIDAS system (Motorway Incident Detection and Automatic Settings). MIDAS is a system comprising inductive loops buried in the carriageway surface which detect the presence of stationary or slow moving traffic. This information is transmitted to computers which will then provide written warnings and advisory speed limits upstream of the congestion event. The warnings and advisory speed limits are provided via variable message signs which are mounted on cantilevered mast arms above the carriageway. The purpose of the system is to minimise the risk of collisions between fast moving upstream traffic and the slow moving or stationary traffic detected by the loops.

### 4.2 Option 1 (Preferred): Managed Motorway

The preferred option is Managed Motorway (MM) which involves using motorway signals to allow temporary use of the hard shoulder as a traffic running lane during busy periods. MM includes a system known as Controlled Motorway, which in turn includes the existing MIDAS sub system which will be retained.

The existing MIDAS system described above is the simplest application of motorway control technology. It is solely a safety feature designed to protect queues by providing a warning of their presence to upstream traffic. The next level of control is a system called Controlled Motorway (CM). This system includes MIDAS to protect against queues, but also uses Variable Mandatory Speed Limits (VMSL) to assist in preventing the development of queues. Controlled Motorway is sometimes implemented on existing carriageways as a standalone measure to improve journey time reliability. Alternatively, if the level of congestion is high enough to warrant it, CM can be introduced in conjunction with measures to increase the capacity of the carriageway. In the case of BB3MM, traffic flow levels are such that there is substantial traffic congestion and an increase in traffic capacity is required.

The two alternative means of increasing traffic capacity are widening of the carriageway, or introduction of the next and highest level of motorway control technology known as the Managed Motorway (MM) system. Both alternatives include MIDAS and CM technology, the essential difference being that MM relies on temporary use of the hard shoulder rather than physical enlargement to provide additional traffic capacity at busy times.

The operation of the MIDAS component of MM is described above in paragraph 4.1. Like MIDAS, the Controlled Motorway (CM) component uses the same carriageway loops to detect vehicles and also sets speed limits on variable message signs. The difference is that CM also sets speed limits at higher speeds when information on traffic density from the loops indicates that 'bunching' may be occurring. It does not therefore wait until a queue develops. Instead, CM sets variable mandatory speed limits of 60mph and 50mph to reduce bunching and thereby reduce the likelihood of a queue occurring. However, if traffic still becomes slow moving or stationary then, like MIDAS, it will set a 40mph limit. The only difference in these circumstances is that the 40mph limit is a mandatory limit rather than the advisory limit used by MIDAS.

In terms of the operational effects upon traffic flow, the CM system uses VMSL to slow down upstream traffic. This reduces the likelihood of it 'catching up' with a pocket of slower moving traffic and causing traffic density to reach a level at which flow breakdown occurs. Whilst the reduction in speed limit increases journey times upstream of the high density region, these are cancelled out by journey time savings arising from a reduced incidence of flow breakdown and associated queuing. The net effect on average journey times is neutral but the range or variation in journey times is reduced, thereby improving reliability. This is measured in the assessment process by predicting changes in the standard deviation of journey times of trips using the Controlled Motorway as part of their route.

Managed Motorway (MM) takes CM a stage further by reducing congestion and journey times, as well as improving journey time reliability. In particular, opening of the hard shoulder as a traffic running lane increases the available road space and thereby reduces the density of traffic (the number of vehicles per unit length of road). This reduced density allows traffic to travel at higher speeds whilst still maintaining a safe headway distance between themselves and the vehicle in front. The higher speeds mean reduced journey times and there is also an increase in the traffic carrying capacity of the road as a result of converting the hard shoulder to a traffic lane.

In order for MM to be successful, it is essential that the variable speed limits which form part of the system are complied with. This requires the speed limits to be mandatory. Secondary legislation is required to allow mandatory variable speed limits to operate. Secondary legislation is also required for the introduction of hard shoulder running.

It should be noted that the mandatory speed limit signs used as part of a controlled motorway are matrix signs which can display either 40, 50, 60 or the national speed limit sign. Being a mandatory sign, they are required to have a red outer ring in order to comply with the traffic signs regulations. They are also required to be displayed over each lane. Advisory signs used for MIDAS are also matrix signs, but do not have the red ring, nor is it a requirement to display them over every lane (though HA standards require this for carriageways of four or more lanes, making gantries a necessity).

Enforcement of VMSL is carried out using a combination of gantry-mounted speed enforcement cameras in conjunction with the Highways Agency Digital Enforcement Camera System (HADECS) to automatically monitor compliance and traditional enforcement by the Police. However, only a proportion of the gantries carry "live" enforcement cameras with the remainder having mock camera enclosures installed. These are known as Perceived Enforcement Gantries (PEGs).

This scheme lies between two sections of the M6, (junctions 4 to 5 and junctions 8 to 10A) which already operate as managed motorways and have gantries with live enforcement sites. Consequently, this scheme should be regarded as part of a contiguous length of managed motorway running from junction 4 to 10a. An operational and safety review has therefore concluded that additional enforcement cameras are not needed between junctions 5 and 8 in order to achieve an acceptable level of speed compliance though the scheme will have five PEGs.

### **4.3 Option 2: Widening to Dual 4 Lane Motorway (D4M)**

This option involves widening the carriageway to four lanes in each direction and retaining the hard shoulder for emergency use only. In effect, the existing hard shoulder becomes a permanent running lane and a new hard shoulder is built next to the existing hard shoulder. In addition, CM is introduced and this operates together with MIDAS in the same way as described above for MM.

The advantage of a widened carriageway over MM is that the additional lane can operate at 70mph rather than 60mph. In particular, hard shoulder running cannot be brought into use until flow levels on the three normal lanes have reduced speeds to 60mph. However, on a widened carriageway the same flow levels could have an average speed of up to 70mph. This means that a widened carriageway will generate greater journey time benefits under normal operating conditions. Furthermore, a widened carriageway with an emergency only hard shoulder will not be blocked by incidents that are confined to the hard shoulder. A widened carriageway will therefore have greater incident related journey time variability and delay benefits for the same reduction in accident rate.

The costs of widening a motorway constructed at ground level are typically 2.5 times the costs of installing a Managed Motorway solution. In this case, more than 50% of the length of the scheme is elevated motorway which costs around 10 times more to widen than an "at grade" motorway. As a result, it was clear from an early stage in scheme development that the costs of this option would far outweigh any additional benefits and that Managed Motorway was clearly a better value for money solution. For this reason, detailed appraisal work was not undertaken of this option and there are no detailed estimates available of the costs and benefits.

In addition to being better value for money, the proposed MM scheme is also more affordable than widening: the cost of implementation being around 15% of the cost of widening the elevated motorway. Thus, with several motorway projects in the roads programme, the implementation of MM across a number of projects has allowed more motorway improvement projects to proceed in the current Spending Review period than would otherwise have been the case. This was also a key factor in the decision of the Secretary of State to pursue MM rather than widening.

## 4.4 Public Consultation

Following approval of the consultation stage IA, a formal consultation exercise was undertaken in respect of the preferred MM scheme. The consultation took place between April and June 2012 and involved sending the consultation document to over 90 stakeholders including representative organisations of those affected and individual businesses. In addition, the consultation document was placed upon the Highways Agency's web site. The consultation document included a copy of the consultation stage IA.

A total of fourteen responses were received to the consultation. Eleven of the fourteen were in favour of the scheme, including Royal Automobile Club (RAC), West Midlands Fire Service, Institute of Advanced Motorists (IAM), Wolverhampton City Council and Walsall Council. Three responses received were neutral and there were no objections to the scheme, although a small number of detailed concerns were noted.

The consultation responses received included a number of questions regarding the detailed operation and design of the proposed MM scheme.

## 5. Details of Costs and Benefits for Option 1 (Preferred)

### 5.1 Do Nothing Baseline i.e. Existing Situation

The "Do-Nothing" represents the baseline against which the proposed managed motorway is assessed.

### 5.2 Option 1 (Preferred): Managed Motorway

The impacts of the Managed Motorway, including costs and monetised benefits, have been appraised using the Department for Transport's (DfT) WebTAG (Web-based Transport Analysis Guidance) which is based upon HM Treasury Green Book principles. WebTAG identifies a wide range of possible impacts that transport schemes can have and prescribes detailed methodologies for quantifying these impacts and monetising them wherever possible. The range of impacts which must be considered come under the three main headings of Economy, Environment and Society which are then subdivided into sub-impacts such as journey times, reliability, noise, air quality, landscape, greenhouse gas emissions and accidents etc. Scheme promoters are required to assess all these impacts using the prescribed methodologies (links to the relevant sections of WebTAG are provided below) and to summarise the results of the analysis in an Appraisal Summary Table (AST). The AST forms a summary of the economic case for a scheme and is used by Highways Investment Board to inform all decisions relating to the selection of a preferred scheme option and the decision to ultimately invest in that option. The Managed Motorway scheme has been subject to these processes.

Because WebTAG relates to transport schemes generally, there is a second tier of more detailed appraisal guidance which relates specifically to trunk road schemes and which is contained within the DfT/HA's Design Manual for Roads and Bridges (DMRB). In particular, Volumes 11 to 14 of the DMRB contain supplementary appraisal guidance on a number of issues including traffic model building, the assessment of accident impacts and environmental assessment.

The cornerstone of the appraisal process for road schemes is a traffic model. The model is a computer based representation of the physical characteristics of the road network, the behaviour of different types of traffic using the network and the origins and destinations of that traffic. The model is built and calibrated to represent the road network (the "supply") and the traffic "demand" upon it at the current time "the base year". A set of independent traffic count and journey time data not used in the calibration process is then used to "validate" the base year predictions of the model.

Using the behavioural relationships between supply and demand contained within the model, it is possible to alter the network to represent a new road scheme, or change the traffic demand (to represent traffic growth), and identify how traffic flows and speeds change as a result. This provides the information necessary to identify changes in journey times, journey time reliability, vehicle operating costs, tax revenues and accidents across the network in any modelled future year. The information is also used to assess the environmental impact of a scheme in terms of greenhouse gas emissions, air quality and noise.

The proposed scheme uses the Policy Responsive Integrated Strategic Model (PRISM) transport model which covers the district boundaries of the West Midlands local authorities. A decreasing level of spatial representation is provided for the remainder of the West Midlands region and, in turn, the rest of the UK. The model has been developed and fully validated using a series of traffic surveys, journey time surveys, road side and household interview surveys in addition to existing data supplied by highway authorities.

There is some uncertainty in relation to forecasts of future traffic levels when modelling future years. These forecasts are made at a national level through the DfT's National Transport Model and are based upon certain assumptions regarding household growth, income growth, changes in fuel price and how these affect the level of car ownership and usage. Changing these core assumptions can affect the level of future year benefits and it is a requirement of WebTAG that different scenarios of future traffic growth are modelled, in addition to the most likely or "Core Scenario". These scenarios are termed the Highest and Lowest Benefits Scenarios and represent the highest and lowest levels of future traffic growth which might reasonably be expected to occur, though such outcomes are considered less likely than the Core Scenario. It is correct to infer from this that the greater the level of future traffic demand, the greater are the benefits of the proposed scheme (this applies to all road schemes). In addition, the future level of benefits is affected by future changes to the transport network or "supply". In particular, future provision of roadspace elsewhere in the road network can affect the level of traffic demand on the scheme section and thus the number of users who benefit from improved journey times. There is always some uncertainty regarding if and when transport improvements will occur, so the traffic model road networks for Highest and Lowest Benefits Scenarios are also different to those contained in the Core Scenario model. These scenarios therefore represent that combination of traffic demand and road supply which will produce the lowest and highest level of benefits that can reasonably be expected or, in other words, a full range of realistically possible outcomes.

It should be noted at this stage that WebTAG only regards expenditure such as construction, maintenance and operating costs as "costs". Any adverse impacts of a scheme are instead considered as disbenefits and, where monetised, are dealt with on the benefits side of the equation for purposes of calculating the benefit cost ratio metric used by the DfT. The Highest and Lowest Benefits Scenarios therefore relate to both positive and negative benefits, but not the scheme investment and running costs. The positive and negative benefits associated with the Highest and Lowest Benefits Scenarios are included in the summary sheet for the preferred option 1. The negative benefits have been included under "costs" since it is understood that this is how they are to be regarded for purposes of the IA.

As regards the costs of implementing and operating the scheme, WebTAG does not require the production of Highest and Lowest Costs Scenarios as part of the economic assessment. A single "Best Estimate" is used which includes a risk allowance based upon a quantified risk assessment. The estimate and the risk assessment is refined as the scheme progresses towards implementation and design work allows more accurate quantification of the risks and costs. At the end of each scheme stage, the net present value and benefit cost ratio of the scheme are recalculated on the basis of the latest scheme costs before a decision is made by the Highways Investment Board to proceed to the next stage. High and Low estimates of the costs are also not therefore provided in the summary sheet for the proposed MM scheme (Option 1).

WebTAG and the DMRB require that the costs and benefits of transport projects are valued at 2002 prices and discounted to 2002. However, for the purpose of the impact assessment these have been converted to 2011 Market Prices using HM Treasury GDP deflator factors and discounted to a present value year of 2012.

The Treasury Green Book requires that the appraisal period over which the costs and benefits should be assessed should extend to the useful life of the assets. In the case of road schemes which create new roadspace, the life of the roadspace is indefinite and, in such cases, WebTAG specifies a maximum appraisal period of 60 years from the year of opening. This is therefore the standard appraisal period for conventional road schemes involving new and widened roads. MM schemes are not of course conventional road schemes and a large part of the expenditure relates to items which have a 15 year life such as variable message signs, CCTV, telecommunications systems and computer hardware and software. There is however also substantial expenditure on gantries (which have a 30 year life) and the provision of new roadspace in the form of emergency refuge areas constructed at regular intervals adjacent to the hard shoulder (which have an indefinite life). Since those items with a 15 or 30 year life can be renewed at 15 and 30 year intervals, the appraisal work is based upon the maximum 60 year period which is relevant to the emergency refuge areas. The costs of renewing those elements of the scheme with a shorter life than 60 years are of course included in the cost benefit analysis.

## Monetised Costs (Core Scenario forecast – “Best Estimate”)

All Managed Motorway schemes have the following types of costs. All costs are incurred by government.

- TRANSITION: Cost of Installation;
- RECURRING: Cost of Enforcement of VMSL.
- RECURRING: Cost of Maintenance and Operation;
- RECURRING: Cost of Renewing electronic equipment at 15 year intervals.

In terms of non-financial costs, MM schemes are appraised against a range of potential impacts as set out in WebTAG. As mentioned above, the impacts which must be considered come under the three main headings of Economy, Environment and Society which are each then subdivided into a number of sub-impacts. A number of these sub-impacts can be monetised.

The proposed scheme has the following negative monetised impacts, or non-financial costs. These are described in the paragraphs below. All monetised values quoted relate to the Core Scenario forecast and are the Best Estimate:

- TRANSITION: Cost of disbenefits to Transport Economic Efficiency during Installation & Maintenance;
- RECURRING: Cost of increased Noise;
- RECURRING: Cost of a reduction in Indirect Tax Revenue.

### *Transition: Installation Costs*

The current capital cost of installing the proposed MM scheme was derived through a standardised cost estimation process designed and undertaken by the HA. The designer supplies details of the scheme to the HA Commercial Team who apply standard rates and return the cost estimate to the designers. This estimation process is refined as the scheme preparation process proceeds and the final cost estimate will not be available until the design is completed.

Table 1 provides a breakdown of the current scheme cost estimate, which is based on the scheme Delivery Partner’s negotiated Target Price. Preparation costs cover the balance of expenditure on the scheme design and preparation of tender documentation. Supervision costs cover the cost of the HA’s design agent supervising the contract on behalf of the HA. Works expenditure is the cost of materials and labour for constructing the scheme. Lands expenditure includes an allowance for leasing land required during construction for the erection of gantries. An allowance of £26.0m for risk is included, based on the scheme’s risk management plan.

**Table 1: Installation Costs (2011 Constant Market Prices – Undiscounted – in £m)**

Cost in 2011 market prices	2012	2013	2014	2015	Total
PREPARATION EXPENDITURE PROFILE	0.487	0.015	0	0	0.502
SUPERVISION EXPENDITURE PROFILE	2.822	3.057	0.803	0.030	6.712
WORKS EXPENDITURE PROFILE	37.639	40.781	10.704	0.401	89.525
LANDS EXPENDITURE OUTTURN	0.045	0.015	0	0	0.060
RISK	12.391	11.229	2.373	0	25.992
TOTAL EXPENDITURE FORECAST	53.384	55.097	13.879	0.431	122.791

### *Recurring: Enforcement Costs*

The proposed MM scheme is located in-between existing sections of MM (BBMM Phase 1 - M6 Junction 4 to 5 and BBMM Phase 2 - M6 Junction 8 to 10A) where there are a number of live enforcement sites. Following an operational and safety review it is considered that it is not necessary to introduce live automatic speed enforcement between M6 Junction 5 to 8. Motorists will perceive that speed enforcement is in place through the scheme and the other measures introduced as a result of the ‘controlled environment’ are expected to result in an acceptable level of speed compliance being achieved. Accordingly there are no additional enforcement costs associated with the proposed scheme.



### *Recurring: Maintenance and Operating Costs*

Maintenance and operating costs have been derived using the Highways Agency Managed Motorways Operational Cost Model spreadsheet.

The additional average annual maintenance cost is **£1.2m** over 60 years (2011 Constant Market Prices – Undiscounted). This includes the costs associated with the maintenance of gantries, signs, loops and cabinets, together with the additional costs associated with the use of the hard shoulder, including additional winter gritting, lighting, markings, loops and CCTV systems, plus specialist IT hardware and software. It also includes the cost of such items as additional control room staff and the power consumption of the various items of electronic equipment.

### *Recurring: Renewal Costs*

The additional average annual renewal cost of **£0.9m** over 60 years (2011 Constant Market Prices – Undiscounted), is based on replacing all electrical equipment at expiry of a 15 year operational life. Gantries will require replacement after 30 years.

### *Transition: Transport Economic Efficiency Costs during Installation and Maintenance*

The cost of disbenefits to transport economic efficiency during installation and maintenance is **£60.1m** (2011 Constant Market Prices – Undiscounted). These costs are primarily the result of the traffic delays caused by the roadworks necessary to construct and maintain the scheme. In brief, WebTAG identifies a value of time for different types of vehicles and trip purposes and these values are multiplied by the number of additional hours of delay which are incurred during the roadworks (when a lower 50mph speed limit will be in operation). In this case, the delays during construction have been cancelled out to a large extent by delay savings during maintenance, i.e. delays with the scheme during maintenance are less than those without the scheme.

WebTAG values of time and vehicle operating costs depend upon the vehicle type, trip purpose of the occupants, the number of occupants and the time of travel. The value of time also increases over time in line with GDP growth. The value of time for the average vehicle in 2011 at 2011 market prices is £15.14 per hour. Further details of the values and how they are calculated can be found at [Department for Transport - Transport Analysis Guidance - WebTAG - Documents - Guidance documents - expert](#)

### *Recurring: Noise Costs*

There are approximately 27,500 residential properties within the study area of the scheme which receive changed traffic noise levels. Comparing the with scheme case with the without scheme case, in the scheme opening year, noise levels rise for about 23,000 properties adjacent to the motorway because using the hard shoulder simultaneously increases the volume of traffic that can use the motorway and brings traffic closer. No property receives an increase in noise greater than 2.9 decibels and for the majority of properties, the increase in noise is less than 1 decibel [dB(A)]. About 4000 properties on local roads receive reduced traffic levels because traffic is attracted from these roads to the motorway due to its increased capacity. Based on the [Department for Transport - Transport Analysis Guidance - WebTAG - Documents - Guidance documents - expert](#), the annual average cost of changed noise levels on property values is **£0.8m** over 60 years (2011 Constant Market Prices).

Within the appraisal, changes in noise levels are ascribed a monetary value that varies in line with how loud the noise level is. At the quieter 45 dB(A) level, an increase of 1 decibel is valued at £10.91 per household. This increases until at a level of 80 dB(A), a one decibel increase is valued at £127.24 per household. These are both in 2011 market prices.

### *Recurring: Indirect Tax Revenue Costs*

The average annual decrease in indirect tax revenue of **£1.8m** over 60 years (2011 Constant Market Prices – Undiscounted) arises as a result of changes in the volume, speed and distance travelled on the road network by vehicles. In particular, the scheme provides additional traffic capacity which results in traffic redistributing across the network to reduce its journey time. This can mean some traffic will travel a shorter distance, or at a higher more fuel efficient speed e.g. on the managed motorway. The tax revenues concerned are VAT and fuel duty.

The reduction in tax revenues reflects the fact that the scheme results in an overall decrease in the cost of operating vehicles. This is taken account of as a benefit to road users and increases the Transport Economic Efficiency benefit (see below). Although a benefit to road users, the reduction in revenue is a cost to wider society since it can no longer be used by government for the benefit of society.

The information required to calculate the impact on tax revenues is extracted from the traffic model in the form of matrices of trip numbers, travel times and distances between every origin and destination. Matrices are extracted for the with and without scheme scenarios and for different time periods, vehicle type and trip purpose in various future modelled years. The matrices are then fed into a DfT sponsored computer program called Transport User Benefit Appraisal (TUBA) which calculates the total volume of fuel (petrol and diesel) used by business and non-business users in the road network in the with and without scheme scenarios for each year of the 60 year appraisal period (using the information from the traffic model on trip numbers, travel times and distances). The difference in the volume of fuel used then allows the difference in fuel duty and VAT between the with and without scheme scenarios to be calculated.

### **Non-Monetised Costs**

There are slight adverse impacts on three Sites of Local Importance for Nature Conservation designated within the motorway corridor, as they will be subject to limited land take (all within the motorway boundary) required to construct the scheme. Although further assessment is required to determine any impacts on badgers, implementation of appropriate mitigation measures are expected to result in neutral impacts on this species. Impacts on all other sites and species such as great crested newts, reptiles, bats and breeding birds are predicted to be neutral as direct impacts through loss of suitable habitats are not expected. Slight adverse (the lowest level of a seven point qualitative scale) impacts, are anticipated on other Biodiversity Action Plan (BAP) species such as common toad, common frog and hedgehog due to potential habitat disturbance and loss within the highway boundary resulting from construction of the scheme.

An appraisal of the effects on Air Quality resulting from the scheme has been undertaken in accordance with current DfT TAG and DMRB guidance. This has shown that no additional properties exceed the annual mean PM10 (particulate matter smaller than 1 hundredth of a millimetre) EU Limit Value and no current exceedences are removed as a result of the proposed scheme. The scheme is predicted to lead to an improvement in air quality in terms of PM10 overall. The scheme intersects three Air Quality Management Areas (AQMAS) and a total of nine AQMAS are affected by changes to road traffic characteristics resulting from the scheme. A detailed assessment using dispersion modelling undertaken in accordance with DMRB guidance has concluded that the overall number of properties at which the annual mean nitrogen dioxide limit value is exceeded remains the same with or without the scheme.

### **Monetised Benefits (Core Scenario forecast – “Best Estimate”)**

MM schemes are appraised against a range of potential impacts as set out in WebTAG. As mentioned earlier, the impacts which must be considered come under the three main headings of Economy, Environment and Society which are each then divided into a number of sub-impacts. A number of these sub-impacts can be monetised.

The proposed scheme has the following positive monetised impacts, or benefits. All of the monetised benefits are social rather than financial benefits.

- **RECURRING:** Benefits to Transport Economic Efficiency through a reduction in journey times and vehicle operating costs. In addition, there is a net increase in the combined revenues received from road user charges and public transport fares (private sector providers);
- **RECURRING:** Benefits to Journey Time Reliability through a reduction in day to day journey time variability;
- **RECURRING:** Benefits to Road Safety through a reduction in accidents;
- **RECURRING:** Benefits to Climate Change through a reduction in greenhouse gas emissions.

Reducing accidents on the scheme section leads to the following additional benefits:

- RECURRING: A reduction in incident related journey time variability as a result of fewer accidents;
- RECURRING: A reduction in delay as a result of reducing the time spent queuing at an accident site.

The monetised benefits are described in detail within the paragraphs below. All monetised values quoted relate to the Core Scenario forecast and are the Best Estimate:

*Recurring: Transport Economic Efficiency Benefit*

The average annual transport economic efficiency benefit is **£25.9m** over 60 years (2011 Constant Market Prices – Undiscounted). This benefit comprises the following elements:

- Reduction in Journey Times: £25.8m
- Reduction in Vehicle Operating Costs: £0.1m

The reductions in journey time arise as a result of the additional traffic capacity provided by allowing use of the hard shoulder. In congested periods, the additional capacity reduces traffic density and increases speeds on the motorway. It also allows additional traffic to reassign to the motorway from other slower routes to reduce its journey time. This in turn reduces journey times on other routes in the network.

The change in vehicle operating costs is the sum of changes in both the fuel and non-fuel related costs of all vehicle trips in the network. These will increase if the scheme results in traffic reassigning to a longer (but quicker) route, or if vehicle speeds move in either direction away from the optimum speed for fuel efficiency for the type of vehicle concerned. The converse applies as well, so the overall change in vehicle operating costs is the sum of many increases and decreases over the area of the traffic model.

The information required to calculate the benefits is extracted from the traffic model in the form of matrices of trip numbers, travel times and distances between every origin and destination. Matrices are extracted for the with and without scheme scenarios and for different time periods, vehicle type and trip purpose in various future modelled years. The matrices are then fed into a DfT sponsored computer program called Transport User Benefit Appraisal (TUBA) which calculates the total journey times, vehicle operating costs, user charges, carbon emissions, fares and tax revenues in each year of the DfT 60 year appraisal period. All the components are monetised within TUBA and the with scheme costs are subtracted from the without scheme costs to determine the benefit or disbenefit.

WebTAG values of time and vehicle operating costs depend upon the vehicle type, trip purpose of the occupants, the number of occupants and the time of travel. The value of time also increases over time in line with GDP growth. The value of time for the average vehicle in 2011 at 2011 market prices is £15.14 per hour. Further details of the values and how they are calculated can be found at [Department for Transport - Transport Analysis Guidance - WebTAG - Documents - Guidance documents - expert](#)

*Recurring: Journey Time Reliability Benefit*

The average annual journey time reliability benefit is **£1.9m** over 60 years (2011 Constant Market Prices – Undiscounted). This benefit comprises the following elements:

- Reductions in Journey Time Variability: £1.2m
- Reductions in Incident Related Delay: £0.7m

The reductions in journey time variability arise as a result of making journey times on the scheme section more uniform (day to day variability) and reducing accidents (incident related variability). In particular, congestion, flow breakdown and accidents generate significant variability in journey times which makes them less predictable or “reliable”. The reductions in incident related delay arise from reducing the number of accidents on the scheme section.

The information required to calculate the benefits is extracted from the traffic model in the form of the numbers of trips per day using the scheme section, the length of these trips and which routes they use. The information is extracted for various future modelled years for both the with and without scheme scenarios. It is then entered into a DfT sponsored computer program called Incident Cost benefit Analysis (INCA) which calculates the change in standard deviation of the average journey time for each route at different times of the day. The calculations are undertaken for both the with and without scheme scenarios and repeated for each year of the DfT 60 year appraisal period. A monetary valuation is attached to the changes in standard deviation which are then multiplied by the number of vehicles on each route. A reduction in standard deviation (or “variability”) is a benefit and an increase is a disbenefit.

The WebTAG value for the standard deviation of journey time in minutes is equal to 80% of the WebTAG values of time. The value of time per vehicle depends upon vehicle type, trip purpose of the occupants, the number of occupants and the time of travel. The value of time also increases over time in line with GDP growth. The value of time for the average vehicle in 2011 at 2011 market prices is £15.14 per hour. More details can be found at [Department for Transport - Transport Analysis Guidance - WebTAG - Documents - Guidance documents - expert](#)

INCA is also used to calculate the reductions in incident related delay. INCA does this by using the traffic flow inputs and traffic capacity of the carriageways to calculate the total queuing delay generated by accidents in both the with and without scheme scenarios on the scheme section. The user supplies the with and without scheme accident rates. A reduction of 15% is used for Managed Motorway schemes as explained below in the section on road safety benefits.

#### *Recurring: Road Safety Benefit*

The average annual road safety benefit is **£2.8m** over 60 years (2011 Constant Market Prices – Undiscounted). The benefit arises as a result of a reduction in the accident rate (accidents per million vehicle kilometres) on the scheme section following deployment of the Managed Motorway system. There are also accident reductions on other routes as a result of traffic reassigning from these routes to the motorway due to the increase in traffic capacity provided by opening of the hard shoulder i.e. the reduced journey times attract traffic to the motorway (accident rates for motorways are lower than for other road types).

It is assumed that Managed Motorway schemes reduce the existing accident rate by 15%. This figure is recommended in the HA's Interim Advice Note (IAN) IAN 160 "Appraisal of Technology Schemes", which is in turn based upon the before and after evaluation of the existing Controlled Motorway scheme between J15 to 16 of the M25. The reduction is believed to be the result of a number of factors (a) imposing mandatory rather than just advisory speed limits in the event of incidents and congestion (b) a requirement for drivers to stay in lane when the speed limits are in operation (c) the presence of speed enforcement cameras which discourages speeding even when reduced speed limits are not in operation.

The information required to calculate the accident impact is extracted from the traffic model in the form of the physical characteristics of the road network in the model area and the daily traffic flows on links and junctions. The information is extracted for various future modelled years for both the with and without scheme cases. In addition, the numbers of existing accidents at links and junctions within the network are obtained from police records. All the data is then entered into a DfT sponsored computer program called COSt Benefit Analysis (COBA) which calculates an accident rate for each link and junction and hence produces the number of accidents in the whole network for the with and without scheme cases in each year of the DfT's 60 year appraisal period. COBA attaches a monetary valuation to accidents and sums the total accident costs for each network. The difference in accident costs between the with and without scheme scenarios is the accident benefit of the scheme. In this case, COBA has predicted an overall saving in accidents of 1,066 across the road network over the 60 year appraisal period.

WebTAG values of accidents vary by road and junction type and increase over time in line with forecast growth in GDP. However, the value of a motorway accident in 2011 with the average number and severity of casualties is £94,026 in 2011 market prices. More details of the values and how they are calculated can be found at [Department for Transport - Transport Analysis Guidance - WebTAG - Documents - Guidance documents - expert](#)

#### *Recurring: Climate Change Benefit*

The average annual climate change benefit is **£0.2m** over 60 years (2011 Constant Market Prices – Undiscounted). The benefit arises as a result of a reduction in non-traded CO<sub>2</sub> emissions from vehicle traffic within the road network. The reduction occurs because the scheme results in less congestion across the network, thereby increasing speeds to a more carbon efficient level. This more than offsets the additional emissions from traffic generated by the scheme i.e. the demand response to the reduced road based travel costs resulting from the scheme.

Carbon benefits are an output of the TUBA program which is described above under the Transport Economic Efficiency benefit. In particular, TUBA calculates the total volume of fuel burned by vehicles in the road network in order to calculate the change in vehicle operating costs which form part of the transport economic efficiency benefit. Having calculated the volume of fuel used, it is straightforward for TUBA to then calculate total carbon emissions over the 60 year appraisal period for the with and without scheme scenarios.

WebTAG values of non-traded carbon for all future years and fuel types can be found at [Department for Transport - Transport Analysis Guidance - WebTAG - Documents - Guidance documents - expert](#)

## Non-Monetised Benefits

The proposed scheme has no non-monetised benefits.

## 6. Rationale and Evidence for Proportional Approach

The proposed scheme is at the Final stage and a Level 5 Analysis has therefore been undertaken. A Level 5 Analysis is the most detailed level of analysis identified in the IA Toolkit document and involves quantifying and, where possible, monetising the costs and benefits of the proposal. In the case of the proposed MM scheme, the analysis has been undertaken in accordance with the full requirements of WebTAG. In particular, all the potential impacts identified in WebTAG have been quantified and all of these have been assessed using the methodologies prescribed therein.

## 7. Risks and Assumptions

A Quantified Risk Assessment has been undertaken in relation to risks affecting the costs of construction and a Risk Allowance of £26.0M in 2011 market prices is included in the scheme estimate.

The magnitude of the benefits is primarily dependent upon the accuracy of the traffic model and the future year forecasts of traffic demand. The primary issue with the modelling is that commercially available models are designed to deal with links which have static rather than dynamic traffic capacities i.e. capacities which change in response to traffic demand through opening of the hard shoulder. It has been necessary therefore to represent the operation of the managed motorway in a simplified and somewhat idealised manner. In order to ensure that the managed motorway operates as closely as possible to the way in which it has been modelled, the HA is developing a Managed Motorway Performance Reporting Tool. This is software which will collect and analyse traffic control centre data on how managed motorway has been operating. It will then identify changes that can be implemented to ensure that the system is being operated in an efficient manner, as per the modelling assumptions.

An implicit assumption is that road based travel will continue to have the same level of importance for the full 60 years of the appraisal period. Whilst this seems likely, there is much less certainty as to whether Managed Motorway will continue in its present form for this length of time. However, since it is likely that any changes will be the result of innovation from experience or developments in technology, these can be expected to reduce the operating/maintenance costs and/or increase the benefits.

## 8. Direct Costs and Benefits to Business (One-In, One-Out Approach)

The One-in, One-out (OIOO) rule means that no new primary or secondary UK legislation that imposes costs on business can be brought "In" without the identification of existing regulations with an equivalent value that can be removed, or taken "Out". The deployment of VMSL requires secondary legislation, as does the introduction of hard shoulder running. The proposals are therefore in scope for the OIOO rule.

The proposed managed motorway imposes no direct costs on business. The net impact on business is to increase business productivity by improving transport economic efficiency and journey time reliability for business users of the proposed scheme. Whilst business users also benefit from the reduction in accidents associated with the scheme, these are considered as indirect benefits and by definition are excluded from consideration here. The scheme can therefore be regarded as an "In" regulation with "Zero net cost" to business.

As described in Section 5, the computer program TUBA is used to calculate the monetised transport economic efficiency benefits of the proposed scheme. TUBA also calculates the benefits by different trip purposes: business users, commuting users and other users. These detailed TUBA results reveal that the proportion of transport economic efficiency benefits received by business users is 71%.

The computer programs INCA and COBA are used to calculate the monetised journey time reliability and accident benefits respectively. Unfortunately, INCA and COBA do not disaggregate the journey time reliability and accident benefits between business and non-business users. However, a reasonably reliable estimate of the proportion of the benefits received by business users can be calculated by

assuming a national average mix of vehicle types and trip purposes. It is estimated on this basis that 45% of the reliability and accident benefits will accrue to business users.

The total Core Scenario forecast (Best Estimate) benefits to business users over 60 years are as follows (in 2009 market prices, discounted to 2010 at 3.5% for years 0-30 and 3% thereafter). It should be noted that only the transport economic efficiency and journey time reliability benefits are considered to be direct benefits to business. As stated above, the accident impacts are considered to be indirect (second round) costs and are not included in either the Business NPV on Page 1 of the IA, or as benefits within the Business Assessment on Page 2.

- Transport Economic Efficiency £400.4m
- Journey Time Reliability £18.6m
- *Accidents* £27.5m

The equivalent annual values are as follows:

- Transport Economic Efficiency £17.4m
- Journey Time Reliability £0.8m
- *Accidents* £1.2m

## 9. Wider Impacts

Consideration has been given to the list of potential impacts set out on Pages 16-18 of the IA Toolkit. A number of these are relevant to transport schemes and are recognised as potential impacts of transport schemes in WebTAG. This includes the economic impact on consumers and businesses, safety, crime, greenhouse gases, air quality, landscape, water environment and noise. Where these impacts are non-neutral, they are discussed in Section 5 above.

The potential impact of the proposed scheme upon equalities issues is described below. The remaining potential impacts identified in the IA Toolkit are not relevant to the proposed scheme and can be considered as neutral. This includes health, education, waste management and human rights.

### 9.1 Equalities

The proposed scheme would not introduce any additional regulatory restrictions on the use of the motorway over and above those pertaining to the existing use. As such there are no specific impacts in terms of the public sector duties towards disability, gender (including gender identity), race, pregnancy and maternity, religion or belief, age, sexual orientation and discrimination in relation to marriage and civil partnership. Furthermore, whilst the use of motorways is restricted to certain categories of driver, based on tested ability to operate a vehicle, there is no additional or lesser restriction for the use of a managed motorway and, as such, the effect in terms of furthering equality aims has been assessed as neutral.

## 10. Recommendation, Implementation and Review

### 10.1 Proposed Solution

The proposed scheme involves the implementation of Managed Motorway between Junctions 5-8 of the M6 in Birmingham. The Managed Motorway system is essentially the Controlled Motorway (CM) system with a facility to provide additional traffic capacity by opening the hard shoulder to motorway traffic at busy times i.e. Hard Shoulder Running (HSR). In the case of the Birmingham Box Managed Motorways, the preferred option is MM rather than widening. This is because widening is considerably more expensive, ten times the cost of MM in this instance.

The purpose of CM element of MM is to reduce the incidence of flow breakdown by using Variable Mandatory Speed Limits (VMSL) of 60, 50 and 40 mph to reduce the likelihood of faster moving upstream traffic 'catching up' with a pocket of slower moving traffic and causing traffic density in this region to reach a level where flow breakdown occurs. By reducing the incidence of flow breakdown, there is less variation in journey times and journey times become more predictable or 'reliable'.

The HSR element of MM reduces average journey times as well as improving journey time reliability. This is achieved because the hard shoulder temporarily acts as a running lane, thereby reducing traffic density and increasing traffic speeds above what they would otherwise be. The aim is to open the hard shoulder when traffic volume on the three normal lanes reduces average speeds to around 60mph and to then close it again (and remove the 60mph limit) when the volume has reduced to the extent that speeds on the normal three lanes would be in excess of 60.

In order for MM to be successful, it is essential that the variable speed limits which form part of the system are complied with. This requires the speed limits to be mandatory. Secondary legislation is required to allow mandatory variable speed limits to operate. Secondary legislation is also required for the introduction of hard shoulder running.

Enforcement of the VMSL is planned to be carried out using a combination of gantry-mounted speed enforcement cameras and traditional enforcement by the Police. The Highways Agency Digital Enforcement Camera System (HADECS), which has been installed on the adjacent sections of Managed Motorway, will be used to automatically monitor compliance with the VMSL in operation on the scheme.

A summary of the costs and Core Scenario benefits (“Best Estimate” benefits) of the proposed scheme is provided in Table 2 below. The costs and benefits cover the standard DfT 60 year appraisal period from 2014. In accordance with the Treasury Green Book, the discount rate is 3.5% per year for 30 years from the present year and 3% per year thereafter.

**Table 2 – Summary of 60 year Costs and Benefits (2011 Market Prices, Discounted to 2012)**

<b>Type of Cost (A)</b>	<b>Cost (£m)</b>	<b>Type of Benefit (B)</b>	<b>Benefit (£m)</b>
Installation	120.0	Journey Times (TEE)	634.3
Enforcement	0.0	Vehicle Operating Costs (TEE)	1.7
Operation	12.8	Journey Time Reliability	30.4
Maintenance	16.9	Incident Related Delay	16.3
Renewal	23.1	Accidents	68.9
Journey Times and Vehicle Operating Costs during Installation and Maintenance (TEE)	58.1	Greenhouse Gases (CO <sub>2</sub> )	4.4
Noise	19.8		
Loss of Tax Revenue	45.1		
<b>ALL (TOTAL A)</b>	<b>295.8</b>	<b>ALL (TOTAL B)</b>	<b>756.0</b>

<b>Net Present Value (B-A)</b>	<b>460.2</b>
<b>Benefit Cost Ratio (B/A)</b>	<b>2.56</b>

## 10.2 Implementation Plan

The scheme is due for completion in 2014.

## 10.3 Post Implementation Review (Evaluation)

The Post Implementation Review Plan is attached as Annex 1.

## Annex 1: Post implementation review (PIR) plan

A PIR should be undertaken, usually three to five years after implementation of the policy, but exceptionally a longer period may be more appropriate. If the policy is subject to a sunset clause, the review should be carried out sufficiently early that any renewal or amendment to legislation can be enacted before the expiry date. A PIR should examine the extent to which the implemented regulations have achieved their objectives, assess their costs and benefits and identify whether they are having any unintended consequences. Please set out the PIR Plan as detailed below. If there is no plan to do a PIR please provide reasons below.

<p><b>Basis of the review:</b> [The basis of the review could be statutory (forming part of the legislation), i.e. a sunset clause or a duty to review, or there could be a political commitment to review (PIR)];</p> <p>A review of the project performance will be undertaken in accordance with the Highways Agency's Interim Advice Note 39/01: Post Opening Project Evaluation (POPE) process. This involves a formal evaluation of the project one year and five years after opening. More information on POPE can be found on the HA web site at: <a href="#">Highways Agency - Post Opening Project Evaluation (POPE)</a></p>
<p><b>Review objective:</b> [Is it intended as a proportionate check that regulation is operating as expected to tackle the problem of concern?; or as a wider exploration of the policy approach taken?; or as a link from policy objective to outcome?]</p> <p>The objectives of the POPE review are to evaluate whether the predicted outcomes were realised and to identify any lessons learned as part of a continual improvement process.</p>
<p><b>Review approach and rationale:</b> [e.g. describe here the review approach (in-depth evaluation, scope review of monitoring data, scan of stakeholder views, etc.) and the rationale that made choosing such an approach]</p> <p>The approach to the review is as prescribed in the Highways Agency's POPE Methodology Handbook. It comprises:</p> <ul style="list-style-type: none"><li>• Before and after comparison of traffic flows, journey times and accidents</li><li>• Assessment against scheme objectives;</li><li>• Comparison of predicted costs and benefits vs. outturn costs and benefits;</li><li>• Evaluation of the NATA objectives, as detailed in the AST, using POPE+ toolkit</li></ul>
<p><b>Baseline:</b> [The current (baseline) position against which the change introduced by the legislation can be measured]</p> <p>Existing situation without scheme.</p>
<p><b>Success criteria:</b> [Criteria showing achievement of the policy objectives as set out in the final impact assessment; criteria for modifying or replacing the policy if it does not achieve its objectives]</p> <p>Outturn costs and benefits to be consistent with predicted costs and benefits.</p>
<p><b>Monitoring information arrangements:</b> [Provide further details of the planned/existing arrangements in place that will allow a systematic collection of monitoring information for future policy review]</p> <p>As prescribed in the Highways Agency's POPE Methodology Handbook. Existing arrangements for the collection of data relating to traffic flows, speeds and accidents will enable the systematic collection of monitoring information.</p>
<p><b>Reasons for not planning a review:</b> [If there is no plan to do a PIR please provide reasons here]</p> <p>Not Applicable.</p>



