Title:
M62 J25 - 30 Managed Motorway
IA No: DfT00150

Lead department or agency:
Highways Agency

Other departments or agencies:
None

Impact Assessment (IA)

Date: 02/04/2012

Stage: Final

Source of intervention: Domestic

Type of measure: Secondary legislation

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Summary: Intervention and Options

RPC Opinion: GREEN

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**
£1329.6m	£819.2m	£-35.7m	Yes	Zero Net Cost

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

The M62 between Junctions 25 and 30 experiences high traffic volumes and significant 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 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.

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.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 10/2018

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.	**Micro** Yes	**< 20** Yes	**Small** Yes	**Medium** Yes	**Large** Yes
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)			**Traded:** 0	**Non-traded:** -0.257	

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: Mike Penning Date: 02/04/2012

Summary: Analysis & Evidence

Policy Option 1

Description: M62 J25-30 Managed Motorway

FULL ECONOMIC ASSESSMENT

Price Base Year 2010	PV Base Year 2011	Time Period Years 60	Net Benefit (Present Value (PV)) (£m)		
			Low: N/A	**High:** N/A	**Best Estimate:** £1329.6m

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	N/A	2	N/A	**N/A**
High	N/A		N/A	**N/A**
Best Estimate	£192.6m		£3.8m	**£274.4m**

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

Breakdown of Best Estimate 'Total Cost' in 2010 market prices, discounted to 2011 Present Value Year.
Govt. (Public Accounts): Installation, Enforcement, Operation, Maintenance and Renewal:£200.5m
Road Users (Economy):Reduction in Transport Economic Efficiency During Const.and Maint.:£73.9m

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

Public (Environment): Slight Adverse impacts on Landscape and Townscape.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	N/A	2	N/A	**N/A**
High	N/A		N/A	**N/A**
Best Estimate	£0m		£67.4m	**£1,604.0m**

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

Breakdown of Best Estimate 'Total Benefit' in 2010 market prices, discounted to 2011 Present Value Year.
Road Users (Economy): Improvement in Transport Economic Efficiency:£1174.9m.
Road Users (Economy/Society):Improvement in JT Reliability:£307.5 / Reduction in Accidents:£56.7m.
Govt (Public Accounts): Increase in Indirect Tax Revenue:£33.1m
Public (Environment): Reduction in road traffic Noise and Greenhouse Gas Emissions:£31.8m

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

Overall improvement in air quality with reductions in concentrations around the M62 mainline and small increases in concentrations in the wider area. 2 AQMAs (Air Quality Management Areas) would gain an improvement with one other AQMA experiencing no change in concentrations.

Key assumptions/sensitivities/risks — **Discount rate (%)** 3.5/3

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:** £35.7m	**Net:** -£35.7m	Yes	Zero net cost

Evidence Base

1. Problem under Consideration

The M62 provides the strategic Trans-Pennine east-west route across the north of England, connecting Merseyside, Lancashire and Manchester to Yorkshire and the Humber. It also forms part of Euroroute 22 between Dublin and Russia. On a local scale the route connects the conurbations of Bradford and Leeds, both of which are commercial centres in their own right.

The scheme section lies between Junctions 25 – 30 and is constructed to dual three lane motorway standard (D3M). Traffic congestion occurs during the weekday morning and evening peak hours and also at other times when traffic flows are heavy. The maximum average annual two-way daily traffic flow on the scheme section is 140,000 vehicles per day. This flow level is more than 50% higher than the Congestion Reference Flow (CRF) of around 90,000 vehicles per day for a D3M carriageway. The CRF represents the daily flow level at which a road is likely to be congested during weekday 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, intervention is required. The intervention needs to be undertaken by government since the motorway is owned, operated and maintained by the government through the HA and Department for Transport (DfT). The intervention forms part of the DfT's programme of major trunk road improvements for the 2010-15 spending review period. The programme is delivered by the HA.

3. Policy Objective

The DfT's Business Plan 2011-15 sets 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 DfT 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 improvements seek to achieve this by reducing congestion in order to reduce journey times and improve journey time reliability. In the case of the proposed Managed Motorway scheme, a reduction in congestion is achieved by making the existing hard shoulder temporarily available for use as a traffic lane at busy times, thereby increasing the traffic carrying capacity of the carriageways and facilitating higher traffic speeds during congested periods.

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 ie 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 as described above is the simplest application of modern 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 the M62 J 25-30, 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 an increase in the traffic carrying capacity of the road.

In order for CM element of MM to be successful, it is essential that the variable speed limits which form part of the CM 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 conversion of the hard shoulder to a running lane.

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).

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 and benefits of the widening option were appraised using the same methodologies used to appraise the MM scheme. These methodologies are prescribed in DfT appraisal guidance and are described in detail in Section 5 below which discusses the costs and benefits of the MM scheme. The conclusion from the appraisal of the widening option was that although it generated additional benefits, these were more than cancelled out by the additional costs: in particular, the costs of widening the carriageway. At the time MM was selected by the Secretary of State as the preferred option, the Benefit Cost Ratio (BCR) of the proposed MM scheme was 5.6, compared with a BCR of 3.4 for the widening scheme. Since this time, further appraisal work undertaken in relation to the MM scheme has revealed an increase in the BCR to 7.6. This is somehwhat higher than the BCR of 5.8 shown in Table 2 on Page 15 of the IA. This is because DfT appraisal methodology treats negative benefits as reducing the benefits of a scheme rather than increasing its costs.

In addition to being better value for money, the proposed MM scheme is also more affordable than widening: the cost of implementation being only 44% of the cost of the widening. 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 a key factor in the decision of the Secretary of State to proceed with MM rather than widening.

4.3 Public Consultation

Following approval of the consultation stage IA, a formal public consultation exercise was undertaken in respect of the preferred MM scheme. The consultation took place between July and October 2011 and involved sending the consultation document to 80 stakeholders including representatative 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 eleven responses were received to the public consultation. Seven of the eleven were in favour of the scheme, including three local authorities, the Road Haulage Association, the Freight Transport

Association, Birstall Shopping Park and one member of the public. Only one objection to the scheme was received; this was from a member of the public on grounds that hard shoulder running is dangerous.

The consultation responses received included a number of questions regarding the detailed operation and design of the proposed MM scheme. Concerns were also expressed in regard to the delays that will result from roadworks during the construction period.

The Impact Assessment does address these issues raised by the public consultation. Evidence from the M25 CM scheme suggests this MM proposal will result in a improvement in safety (for the reasons set out on page 11), while the adverse impacts of likely delays during installation have been quantified (see page 9).

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

5.1 Do Nothing Baseline ie Existing Situation

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

5.2 Option 1 (Preferred): Managed Motorway

MM as described above essentially consists of two components: CM and hard shoulder running (HSR). However, in terms of presenting the costs and benefits of MM within this IA, it is not considered necessary to allocate costs and benefits to CM and HSR separately. This is because both CM (which includes VMSL) and HSR require secondary legislation. It is not therefore the case that some of the costs and benefits relate to something which is not the subject of the proposed regulations.

The impacts of the the MM scheme, 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.

It is important to appreciate that 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 SWYMBUS traffic model which covers the area bounded by the M6 to the west, A66 to the north, A19/A1 to the east and A50 to the south. A decreasing level of spatial representation is provided for the remainder of the 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 and roadside interviews in addition to data already available from the Highways Agency and local 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.

In the case of the proposed scheme, future year traffic forecasts have been prepared for the Highest and Lowest Benefits Scenarios. However, the magnitude of difference in these forecasts compared to the Core Scenario was relatively small and would not significantly alter the WebTAG Benefit Cost Ratio (BCR) or Value for Money (VfM) category of the scheme. In particular, the DfT allocates all schemes with a WebTAG BCR of 4 or more into the High VfM category. The scheme currently has a WebTAG BCR of 7.6, which makes it inconceivable that the Highest and Lowest Benefits forecasting scenarios would alter the BCR to the extent that the VfM category would change. For this reason, an economic assessment of the Highest and Lowest Benefits forecasting Scenarios was unecessary and was not undertaken. High and Low estimates of the benefits are not therefore provided in the summary sheet for the proposed MM scheme (Option 1).

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).

It should be noted 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 as negative values on the benefits side of the equation for purposes of calculating the BCR metric used by the DfT. However, for purposes of the IA, disbenefits are treated as costs along with the scheme investment and running costs. The costs and benefits for the Core Scenario forecasts are defined on this basis in the following paragraphs and within 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 2010 Prices (representing a recent year for which HM Treasury GDP deflator factors are available) and discounted to a present value year of 2011.

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 MM schemes have the following types of financial costs. All costs are incurred by the 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.

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. Preparation costs cover expenditure on the scheme design which is now complete (hence the costs are zero). 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. Historic or 'sunk' costs incurred to the end of March 2012 are excluded.

Table 1: Installation Costs (2010 Constant Market Prices – Undiscounted – in £m)

Cost in 2010 market prices	2012	2013	2014	2015	Total
PREPARATION EXPENDITURE PROFILE	0.000	0.000	0.000	0.000	0.000
SUPERVISION EXPENDITURE PROFILE	0.260	0.214	0.000	0.000	0.474
WORKS EXPENDITURE PROFILE	85.896	27.763	1.946	0.119	115.724
TOTAL EXPENDITURE FORECAST	86.156	27.977	1.946	0.119	116.200

Recurring: Enforcement Costs

The average annual enforcement cost of **£0.3m** over 60 years (2010 Constant Market Prices – Undiscounted), includes costs paid by the HA to cover the costs incurred by the Home Office in processing fixed penalty notices or prosecuting offenders.

Recurring: Maintenance and Operating Costs

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

The additional average annual maintenance and operating costs are **£2.1m** over 60 years (2010 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 **£1.4m** over 60 years (2010 Constant Market Prices – Undiscounted), is based on replacing all electronic 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 **£76.4m** (2010 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).

WebTAG values of time 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 2010 market prices is £14.80 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

Non-Monetised Costs

A number of the sub-impacts required to be assessed under WebTAG cannot be monetised and are assessed using a seven point qualitative Assessment Score which ranges from Large Beneficial through Neutral to Large Adverse. Those with a Slight, Moderate or Large Adverse score can be regarded as non-financial costs, whilst those with a Slight, Moderate or Large Beneficial score can be regarded as non-financial benefits.

There scheme has a Slight Adverse impact upon Landscape and Townscape. This is the result of minor adverse visual amenity effects from properties, footpaths and overbridges due to the loss of vegetation and installation of infrastructure resulting from the scheme. Over time, as mitigation and replacement planting establishes, these impacts would be reduced.

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. With the exception of Indirect Tax Revenues, all of the monetised benefits are social rather than financial benefits.

- RECURRING: Benefits to Transport Economic Efficiency through a net reduction in journey times and vehicle operating costs;
- 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 from an increase in Indirect Tax Revenue.
- RECURRING: Benefits to Climate Change through a reduction in greenhouse gas emissions.
- RECURRING: Benefits of a reduction in Noise

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 **£49.4m** over 60 years (2010 Constant Market Prices – Undiscounted). This benefit comprises the following elements (negative values are disbenefits):

- Reduction in Journey Times: £51.5m
- Increase in Vehicle Operating Costs: -£2.1m

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 increase 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. Although in the case of the proposed scheme there is an increase in vehicle operating costs, these costs are regarded by WebTAG as a component of the Transport Economic Efficiency impact which is beneficial in overall terms. They are therefore included here, rather than as a "Cost".

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 2010 market prices is £14.80 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 **£12.9m** over 60 years (2010 Constant Market Prices – Undiscounted). This benefit comprises of the following elements:

- Reductions in journey time variability: £11.6m
- Reductions in incident related delay: £1.3m

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 2010 market prices is £14.80 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 **£2.4m** over 60 years (2010 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 ie 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 draft Interim Advice Note (IAN) "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 a decrease in accident costs across the network as a whole, including on the scheme section itself.

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 £91,885 in 2010 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 **£1.1m** over 60 years (2010 Constant Market Prices – Undiscounted). The benefit arises as a result of a reduction in non-traded CO_2 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 ie 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

Recurring: Noise Benefits

The annual average noise benefit is **£0.2m** over 60 years (2010 Constant Market Prices - Undiscounted). The benefit relates to the effect of changes in noise levels on the value of properties within the study area. Some properties receive increased noise levels, particularly those closest to the motorway, whilst others receive a reduction in noise levels. Overall, the net effect is beneficial on property values and there is also a net reduction of 107 in the population likely to be annoyed by noise levels. More details about how WebTAG values changes in noise can be found at Department for Transport - Transport Analysis Guidance - WebTAG - Documents - Guidance documents - expert,

Recurring: Indirect Tax Revenue Benefit

The average annual increase in indirect tax revenue of **£1.4m** over 60 years (2010 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 longer distance, or at a less fuel efficient speed. The tax revenues concerned are VAT and fuel duty.

The increase in tax revenues reflects the fact that the scheme results in an overall increase in the cost of operating vehicles. This is taken account of as a cost to road users and reduces the transport economic efficiency benefit (see above). Although a cost to road users, the additional revenue is a benefit to wider society since it can be used by government to the benefit of society.

Changes in tax revenues 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 (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 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 Benefits

A number of the sub-impacts required to be assessed under WebTAG cannot be monetised and are assessed using a seven point qualitative Assessment Score which ranges from Large Beneficial through Neutral to Large Adverse. Those with a Slight, Moderate or Large Adverse score can be regarded as non-financial costs, whilst those with a Slight, Moderate or Large Beneficial score can be regarded as non-financial benefits.

The scheme has is a Slight Beneficial impact upon Air Quality. In particular, there is an overall reduction in the number of properties with pollutant concentrations (Nitrous Oxides and Particulate Matter) above the EU limit value. Two Air Quality Management Areas would gain an improvement with one other AQMA experiencing no change in concentrations. In terms of Nitrogen Dioxide levels, 3010 properties will experience an improvement, 2440 properties will experience a deterioration and 4221 properties will experience no change. For PM10 emissions, 2168 properties will experience an improvement, 659 properties will experience a deterioration and 6834 properties will experience no change.

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 is included in the scheme estimate. The scheme estimate and risk assessment will be refined as the scheme design progresses and more information becomes available.

In terms of the magnitude of the benefits, these are primarily dependent upon the accuracy of the traffic model and the future year forecasts of traffic demand. To minimise the risk of error in this regard, the traffic model and forecasts have been prepared in accordance with WebTAG guidance and the model meets DfT performance requirements.

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 MM 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 technological development, these can be expected to reduce the operating and 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 purposes of applying the OIOO rule.

The proposed scheme imposes no direct costs on business. Its net impact on business is to increase business productivity by improving transport economic efficiency and journey time reliability. Whilst business users also benefit from the reduction in accidents associated with the scheme, these are considered as indirect benefits and by definition excluded from consideration here. On balance, therefore, this scheme is “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 benefits received by business users is 60%.

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 is 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 benefits are considered to be indirect (second round) benefits 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 £689.3m
- Journey Time Reliability £129.9m
- *Accidents* *£23.9m*

The equivalent annual values are as follows;

- Transport Economic Efficiency £30.0m
- Journey Time Reliability £5.7m
- *Accidents* *£1.0m*

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 the justice system and equalities issues are 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 Justice System

In Managed Motorway schemes, the enforcement of VMSL will use the Highways Agency Digital Enforcement Camera System (HADECS). The digital photographs are transmitted electronically to a Police Fixed Penalty Office (FPO), where the offending drivers are identified and appropriate action taken. The complete process impacts on the Highways Agency, the Police, the Crown Prosecution Service (CPS) and HM Courts Service. However, experience has shown that a relatively small number of offenders will have to be processed through the Magistrates' Courts.

The resources required to support the enforcement process are the subject of an agreement between the four parties concerned (Managed Motorway National Enforcement Strategic Agreement, December 2009). The intention of the agreement is to ensure that enforcement of managed motorways will have minimal impact on the normal procedures of the Police, CPS and Courts. To maximise efficiency, ensure consistency and minimise financial impact it is proposed to identify key Police Forces, CPS offices and Magistrates Courts in each of the seven Highways Agency Regions and to process enforcement cases centrally on a regional basis.

9.2 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 25-30 of the M62. The MM 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 ie Hard Shoulder Running (HSR). In the case of the M62 J25-30, the preferred option is MM rather than widening. This is because MM is better value for money and more affordable than widening.

The MM system includes MIDAS and Controlled Motorway (CM) technology. The purpose of the CM element of MM2 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) will be used to automatically monitor compliance with the VMSL which form part of the MM system.

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 (2010 Market Prices, Discounted to 2011)

Type of Cost (A)	**Cost (£m)**	**Type of Benefit (B)**	**Benefit (£m)**
Installation	111.2	Journey Times (TEE)	1,224.0
Enforcement	7.1	Vehicle Operating Costs (TEE)	-49.1
Operation	14.8	Journey Time Reliability	275.8
Maintenance	34.0	Incident Related Delay	31.7
Renewal	33.4	Accidents	56.7
Journey Times and Vehicle Operating Costs during Installation and Maintenance (TEE)	73.9	Greenhouse Gases (CO_2)	26.2
		Noise	5.6
		Additional Tax Revenue	33.1
ALL (TOTAL A)	**274.4**	**ALL (TOTAL B)**	**1,604.0**

Net Present Value (B-A)	**1329.6**
Benefit Cost Ratio (B/A)	**5.8**

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.

Basis of the review: [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)];

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: Highways Agency - Post Opening Project Evaluation (POPE)

Review objective: [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?]

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.

Review approach and rationale: [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]

The approach to the review is as prescribed in the Highways Agency's POPE Methodology Handbook. It comprises:

- Before and after comparison of traffic flows, journey times and accidents
- Assessment against scheme objectives;
- Comparison of predicted costs and benefits vs. outturn costs and benefits;
- Evaluation of the NATA objectives, as detailed in the AST, using POPE+ toolkit

Baseline: [The current (baseline) position against which the change introduced by the legislation can be measured]

Existing situation without scheme.

Success criteria: [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]

Outurn costs and benefits to be consistent with predicted costs and benefits.

Monitoring information arrangements: [Provide further details of the planned/existing arrangements in place that will allow a systematic collection systematic collection of monitoring information for future policy review]

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.

Reasons for not planning a review: [If there is no plan to do a PIR please provide reasons here]

Not Applicable.