

**EXPLANATORY MEMORANDUM TO
THE M1 MOTORWAY (JUNCTIONS 25 TO 28) (VARIABLE SPEED LIMITS)
REGULATIONS 2011**

2011 No. 909

1. This explanatory memorandum has been prepared by the Department for Transport and is laid before Parliament by Command of Her Majesty.
2. **Purpose of the instrument**
 - 2.1 The Regulations will restrict drivers on roads to which the Regulations apply from driving a vehicle at a speed above the maximum indicated by each speed limit sign passed by that vehicle, until that vehicle passes a sign indicating that the national speed limit applies, or that vehicle leaves the roads covered by the Regulations. The roads to which these Regulations apply are on the M1 Motorway between junctions 25 and 28 and are more fully described in the Schedule to the Regulations.
3. **Matters of special interest to the Joint Committee on Statutory Instruments**
 - 3.1 None.
4. **Legislative Context**
 - 4.1 These Regulations have been made under Sections 17(2) and (3) of the Road Traffic Regulation Act 1984, which empowers the Secretary of State to make regulations with respect to the use of special roads generally and, as in this case, with respect to particular lengths of motorway. These Regulations allow for the operation and enforcement of variable mandatory speed limits (VMSL) in relation to the specified roads set out in the Schedule to the Regulations.
 - 4.2 Section 134(2) of the Road Traffic Regulation Act 1984 requires the Secretary of State to consult with representative organisations as he sees fit prior to making regulations under the Act.
 - 4.3 The Traffic Signs Regulations and General Directions 2002 (S.I. 2002/3113) as amended, enables certain traffic signs to be used to convey information about variable mandatory speed limits on motorways.
 - 4.4 In addition traffic signs authorised by the Secretary of State under section 64 of the Road Traffic Regulation Act 1984 placed on or near the specified roads set out in the Schedule to the Regulations will indicate to drivers that vehicles are entering, have entered or are exiting a road covered by the Regulations.
5. **Territorial Extent and Application**
 - 5.1 This instrument extends to Great Britain but applies only to England. Only those sections of motorway specified in the instrument will be affected, all of which are located in England.
6. **European Convention on Human Rights**
 - 6.1 As the instrument is subject to negative resolution procedure and does not amend primary legislation, no statement is required.

7. Policy background

- *What is being done and why*

- 7.1 The Government has a programme budget of up to £6 billion to improve and make better use of motorways and other key roads. The Highways Agency is developing its role as Network Operator through a series of traffic management, network control and measures with the aim of:
- achieving best use of existing road space;
 - responding more quickly to incidents and reducing clear-up times; and
 - reducing congestion and increasing the reliability of journey times.
- 7.2 The use of variable mandatory speed limits is an essential element in achieving these requirements. It is aimed at tackling congestion through the introduction of technology to make best use of the existing road space whilst maintaining and where possible, improving current safety standards.
- 7.3 Variable mandatory speed limits on the M1 Motorway between junctions 25 and 28 (“the Controlled Motorway Scheme”) will enable proactive management of the motorway network in the Derbyshire and Nottinghamshire area. The variable mandatory speed limit displayed on the motorway will take into account prevailing traffic conditions with the aim of ensuring the smooth flow of traffic.
- 7.4 The Highways Agency is committed to building upon the success of existing controlled motorway schemes, such as the M25 motorway between junctions 10 and 15, operational since 1995, and extended to junction 16 in 2002, (“the M25 scheme”) and the M20 motorway between junctions 4 and 7, operational since April 2010. It is expected that the Controlled Motorway Scheme will:
- reduce congestion;
 - provide more reliable journey times;
 - reduce the frequency of accidents;
 - reduce carbon emissions; and
 - reduce driver stress.

8. Consultation outcome

- 8.1 The Consultation in relation to the Controlled Motorway Scheme started on the 4 February 2010 and finished on 29 April 2010 (12 week period).
- 8.2 In all, a total of 17 responses were received with 8 in favour of the scheme and 9 against. In percentage terms this represents 47% in support and 53% against. Those in favour include local government organisations:
- Nottinghamshire Police;
 - South Yorkshire Police;
 - Police Federation of England and Wales;
 - Civil Engineering Contractors Association;
 - Parliamentary Advisory Council for Transport.
- 8.3 Whilst each of the above supports the proposals their responses also included additional comments about the scheme:

- a) Local police forces have some concerns regarding pursuit and access for emergency services. They have also expressed concerns over the ability for manual control of the system.
- b) Parliamentary Advisory Council had no objection to the scheme and wished for clarification on the accident savings given in the Impact Assessment.
- c) Civil Engineering Contractors Association believe that the scheme will achieve the benefits as outlined in the Consultation Paper. They also comment that the Highways agency should have a longer term development programme.
- d) Members of the public who regularly use the M1 between junctions 25 and 28 commented from a subjective viewpoint that they found the proposed variable speed limits between junction 25 to junction 28 preferable to the alternative and therefore welcomed the scheme.

8.4 In response to the above:

- a) Various operational controlled motorway schemes allow for “hard shoulder running”, (allowing motorists to drive on the hard shoulder). This scheme is not designed to allow for hard shoulder running. Along the full length of the road affected by the Regulations there will be a hard shoulder at least 2.0 metres in width and sufficient to allow for use by emergency vehicles.
- b) Accidents figures were based on COBA (COst Benefit Analysis) programme. This compares the costs of providing road schemes with the benefits derived by road users (in terms of time, vehicle operating costs and accidents) and expresses the results in terms of a monetary valuation, which is the standard of the Department for Transport. On the M25 scheme, the implementation of the controlled motorway scheme with variable mandatory speed limits produced a 15% reduction in collision rates.
- c) The Highways Agency Business Plan for 2010-11 aims to developed Integrated Asset Management programme enabling a long-term strategic approach to managing and monitoring asset performance.

8.5 Of the 9 objections received the main issues raised were:

- a) The response from the Association of British Drivers focussed on the Impact Assessment presented in the consultation document and challenged the economic business case. Their letter also made suggestions for other measures which might be more appropriate.
- b) The Road Rescue Recovery Association claim that under other controlled motorway schemes the time taken to clear up incidents has increased. They believe that this is due to the signals not being reset quickly by the operator after an incident.
- c) The scheme will not reduce congestion.
- d) The scheme will increase driver stress.
- e) Signals and message signs show incorrect messages.
- f) Hindrance to emergency response.
- g) No evidence of accident rate reduction.
- h) Used to raise revenue.

8.6 In response to the above:

- a) The overall value of benefits of **£26.702 million** detailed in the Impact Assessment show that there is a positive economic benefit. This was based upon an analysis of the economically beneficial operation of the M25 scheme.
- b) The MIDAS (Motorway Incident Detection and Automatic Signalling) system will set signals automatically according to the queue protection algorithms. There is a function to

set the signs manually. This would be used to set signals for lane closure and lane diverts or speed limits lower than 50mph.

- c) There are no claims for an improvement in journey times. However evidence from the M25 scheme does indicate an increase journey time reliability.
- d) There is no evidence that driver stress will increase. The responses to our driver surveys have shown that having all vehicles travelling at approximately the same constant speed reduces stress for most drivers.
- e) The scheme when operational derives traffic data from sensors within the road surface. This data provides information on traffic numbers, speed and vehicle headway (distance between vehicles). When predetermined parameters are reached an appropriate speed limit is set automatically. These sensors have proven highly reliable and can operate for significant periods without failure.
- f) The scheme is not designed to allow motorists to drive on the hard shoulder. However there is a minimum of a 2.0m wide emergency access along the full length of the road affected by the Regulations.
- g) Analysis of the M25 scheme shows that controlled motorway schemes can be successful in achieving accident reduction.
- h) The studies on the M25 scheme have shown that without speed enforcement cameras compliance with variable mandatory speed limits is poor. The presence of cameras encourages drivers to comply with the speed limits. The cameras are therefore not expected to lead to a significant increase in revenue from fines.

8.7

- a) One topic raised which was considered to be outside the scope of this consultation was proposing that the speed limit should be raised above 70mph. (this has been included in table 4.1 of the Consultation Report)
- b) The response was to explain that raising the speed limit above the national 70mph limit was outside the scope of this consultation.

8.8 A more detailed analysis of the consultation outcome and report, including responses to the issues raised above, is available on the Highways Agency website (www.highways.gov.uk). Those who have responded to the consultation have been sent a copy of the Response to Consultation Report.

8.9 The Department for Transport has considered the responses to the consultation and an analysis of those responses. Taking into consideration the demonstrable proven benefits of the M25 scheme study the Department has decided that variable mandatory speed limits should be implemented on the M1 between junctions 25 and 28. It has also been decided that no new information has been provided following consultation that would require amending the Impact Assessment.

9. Guidance

9.1 The consultation pack issued by the Highways Agency to stakeholders on 4 February 2010 contained information on the operation of variable mandatory speed limits on the M1 between junctions 25 and 28. This consultation pack and a copy of the Response to Consultation Report is published on the Highways Agency website. Stake holders and road users will continue to be made aware of updates and news of the scheme's implementation through the HA website, media and press releases.

10. Impact

- 10.1 The impact on business, charities or voluntary bodies, and the public sector is that variable mandatory speed limits will benefit the motorist by helping to reduce congestion, be informative and improve journey reliability. It aims to reduce the impact of accidents and reduce driver stress.
- 10.2 An Impact Assessment is attached to this memorandum and will be published alongside the Explanatory Memorandum on www.legislation.gov.uk.

11. Regulating small business

- 11.1 The legislation applies to small business.
- 11.2 The Controlled Motorway Scheme will not have an adverse effect upon small businesses. The regulations do not impose any new or increased burden. The Highways Agency will continue to provide targeted information on the Controlled Motorway Scheme to numerous organisations, including small businesses within the surrounding area.

12. Monitoring & review

- 12.1 The operation of the variable mandatory speed limits scheme will be monitored and assessed to establish the effectiveness of the scheme on traffic flows, accidents and environmental factors.

13. Contact

- 13.1 Andrew Robinson-Morris at the Highways Agency can answer any queries regarding this instrument. Tel: 0121 678 8223 or e-mail: andrew.robinson-morris@highways.gsi.gov.uk.

Title: Impact Assessment of M1 Junctions 25 to 28 Lead department or agency: Highways Agency Other departments or agencies:	Impact Assessment (IA)
	IA No: DFT00015
	Date: 12/01/2010
	Stage: Final
	Source of intervention: Domestic
	Type of measure: Secondary legislation
	Contact for enquiries: Steve Wrenn 0121 6788039 steve.wrenn@highways.gsi.gov.uk

Summary: Intervention and Options

<p>What is the problem under consideration? Why is government intervention necessary?</p> <p>The M1 between junctions 25 and 28 experiences high traffic volumes and significant congestion resulting in increased business costs and reduced mobility. In order to improve traffic flows the Highways Agency proposes to introduce Variable Mandatory Speed Limits on this section of the motorway network. Secondary legislation is required to implement this measure.</p>
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<p>What are the policy objectives and the intended effects?</p> <p>The objectives of the scheme are to reduce congestion; achieve best use of the existing road space; provide quicker, more reliable journey times; reduce the frequency and impact of accidents; and allow faster response times to incidents and reduce clear-up times.</p>

<p>What policy options have been considered? Please justify preferred option (further details in Evidence Base)</p> <p>Option 1: (Baseline) Do nothing. Dual 4 lane motorway with gantry mounted VMS.</p> <p>Option 2: (Preferred) Introduction of Controlled Motorway Scheme with Variable Mandatory Speed Limits.</p> <p>This policy aims to:</p> <ul style="list-style-type: none"> • Reduce the frequency of accidents • Reduce carbon emissions • Provide more reliable journey times • Reduce congestion • Reduce driver stress

<p>When will the policy be reviewed to establish its impact and the extent to which the policy objectives have been achieved?</p>	<p>It will be reviewed during the first 5 years</p>
<p>Are there arrangements in place that will allow a systematic collection of monitoring information for future policy review?</p>	<p>Yes</p>

UUMinisterial Sign-off For final proposal stage Impact Assessments:

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) the benefits justify the costs.

Signed by the responsible Minister: Mike Penning

Date: 23rd March 2011

Summary: Analysis and Evidence

Policy Option 1

Description:

Price Base Year 2002	PV Base Year 2008	Time Period Years 30	Net Benefit (Present Value (PV)) (£m)		
			Low:	High:	Best Estimate: 26.702

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low		4		
High				
Best Estimate	9.476		0.487	24.098

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

Installation =	9.476
Maintenance =	14.536
Indirect Tax Revenues =	0.086

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

No other key non-monetised costs.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low		4		
High				
Best Estimate	0.000		1.693	50.800

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

Accident Saving =	32.996
Journey Time Reliability and Travel Time =	17.582
Emissions =	0.009
Vehicle Operating Cost =	0.213

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

Increased driver information, reduced driver stress, reduced fuel usage, reduced noise pollution. Increased mobility for people and goods, leading to wider economic benefits.

Key assumptions/sensitivities/risks

Discount rate (%) 3.5

The impact assessment has compared controlled motorway using variable mandatory speed limits with the baseline widening scheme.
 The impacts of CM on M25 J10-16 will be transferable from the to M1 J25-28 scheme.
 The flow growth over the length of the scheme.

Impact on admin burden (AB) (£m):			Impact on policy cost savings (£m):	In scope
New AB: 0	AB savings: 0	Net: 0	Policy cost savings:	No

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?	England				
From what date will the policy be implemented?	01/10/2010				
Which organisation(s) will enforce the policy?	Police				
What is the annual change in enforcement cost (£m)?	0.1				
Does enforcement comply with Hampton principles?	Yes				
Does implementation go beyond minimum EU requirements?	N/A				
What is the CORR ₂ equivalent change in greenhouse gas emissions? (Million tonnes CO ₂ equivalent)	Traded: 0		Non-traded: 0.009		
Does the proposal have an impact on competition?	No				
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?	Costs: 0.0		Benefits: 0.0		
Annual cost (£m) per organisation (excl. Transition) (Constant Price)	Micro 0.0	< 20 0.0	Small 0.0	Medium 0.0	Large 0.0
Are any of these organisations exempt?	No	No	No	No	No

Specific Impact Tests: Checklist

Set out in the table below where information on any SITs undertaken as part of the analysis of the policy options can be found in the evidence base. For guidance on how to complete each test, double-click on the link for the guidance provided by the relevant department.

Please note this checklist is not intended to list each and every statutory consideration that departments should take into account when deciding which policy option to follow. It is the responsibility of departments to make sure that their duties are complied with.

Does your policy option/proposal have an impact on...?	Impact	Page ref within IA
Statutory equality duties ^{PP1} Statutory Equality Duties Impact Test guidance	No	10
Economic impacts		
Competition Competition Assessment Impact Test guidance	No	10
Small firms Small Firms Impact Test guidance	No	10
Environmental impacts		
Greenhouse gas assessment Greenhouse Gas Assessment Impact Test guidance	Yes	11
Wider environmental issues Wider Environmental Issues Impact Test guidance	No	11
Social impacts		
Health and well-being Health and Well-being Impact Test guidance	No	11
Human rights Human Rights Impact Test guidance	No	11
Justice system Justice Impact Test guidance	No	11
Rural proofing Rural Proofing Impact Test guidance	No	11
Sustainable development Sustainable Development Impact Test guidance	No	11

¹ Race, disability and gender Impact assessments are statutory requirements for relevant policies. Equality statutory requirements will be expanded 2011, once the Equality Bill comes into force. Statutory equality duties part of the Equality Bill apply to GB only. The Toolkit provides advice on statutory equality duties for public authorities with a remit in Northern Ireland.

Evidence Base (for summary sheets) – Notes

Use this space to set out the relevant references, evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Please fill in **References** section.

References

Include the links to relevant legislation and publications, such as public impact assessment of earlier stages (e.g. Consultation, Final, Enactment).

No.	Legislation or publication
1	
2	
3	
4	

+ Add another row

Evidence Base

Ensure that the information in this section provides clear evidence of the information provided in the summary pages of this form (recommended maximum of 30 pages). Complete the **Annual profile of monetised costs and benefits** (transition and recurring) below over the life of the preferred policy (use the spreadsheet attached if the period is longer than 10 years).

The spreadsheet also contains an emission changes table that you will need to fill in if your measure has an impact on greenhouse gas emissions.

Annual profile of monetised costs and benefits* - (£m) constant prices

	Y ₀	Y ₁	Y ₂	Y ₃	Y ₄	Y ₅	Y ₆	Y ₇	Y ₈	Y ₉
Transition costs										
Annual recurring cost										
Total annual costs										
Transition benefits										
Annual recurring benefits										
Total annual benefits										

* For non-monetised benefits please see summary pages and main evidence base section



Microsoft Office
Excel Worksheet

Evidence Base (for summary sheets)

Problem under consideration

The Highways Agency (HA) is examining the desirability of implementing Controlled Motorway (CM) operations as an extension to the existing widening scheme for the M1 between Junctions 25 and 28 in order to improve the reliability and safety of the road.

Rationale for intervention

The Controlled Motorway Scheme will aim to deliver a number of positive benefits in the form of safer roads and more reliable journey times. These are:

- Making best use of the existing infrastructure
- Reduced congestion, increased throughput of traffic and improved journey time reliability
- Reduced traffic flow breakdown
- Reduced accidents
- Reduced carbon dioxide emissions

Annual Average Daily Traffic (AADT) flows on the length of motorway range from 112,000 to 120,000 vehicles per day. By 2032, growth factors of 1.344 are expected, which would increase the AADT flows on the busiest (southern) link to 164,000 two-way in vehicles per day.

Following the successful trial of Controlled Motorway Scheme on the M42 and the publication on 4th March 2008 of the Department for Transport's "Advanced Motorway Signalling and Traffic Management Feasibility Study", the Secretary of State has requested that the Highways Agency assess the feasibility of a CM solution on the M1. The feasibility study indicated that the CM scheme could be delivered.

Policy objective

Obtaining an acceptable level of compliance with the speed limits displayed on the overhead gantries is key to the successful and safe operation of the Controlled Motorway Scheme. Enforcement of the variable mandatory speed limits is planned to be carried out using a combination of gantry-mounted speed enforcement cameras and traditional enforcement by the Police. HADECS 2 will be used to automatically monitor variable mandatory speed limits.

A consultation will take place with affected stakeholder groups and interested parties. Consultation packs will be issued. Following completion of the consultation stakeholder feedback will be assessed and results from the consultation will be published.

Description of options

Two scenarios are compared for this scheme.

Option 1 is a 'Do-Minimum', which is the dual 4-lane motorway (D4M) over the length of the M1 between Junctions 25 and 28 (the current widening scheme), which includes the MIDAS incident detection system.

Option 2, 'Do-Something' case is the installation of CM operations on the same section of the M1. This consists of the installation of mandatory variable speed limit signs and enforcement cameras for more effective management of traffic during incidents, accidents and queuing. The provision of MIDAS and CCTV are already included in the widening contract, and are essential elements of the proposed controlled motorway scheme.

The CM scheme is compared against the D4M 'Do-Minimum'.

Costs and benefits

The components of the costs and benefits of the scheme and are summarised in Table 1 below. This table includes costs and benefits which are regularly or occasionally present in monetised from in transport appraisals, together with some where monetisation is in prospect.

	Costs	Benefits
Transition	Investment costs 9.476	
Recurring	Operating / Maintenance Costs 14.536	Greenhouse Gases 0.009
	Indirect Tax Revenues 0.086	Accidents 32.996
		Consumer & Business Users & Providers 0.213
		Reliability 17.582
Total	24.098	50.800

Table 1 – Controlled Motorway Costs and Benefits

The savings (benefits) derived from the scheme are quantified in terms of journey time, vehicle operating costs (VOC), accident reduction and reduced carbon impacts. Costs include the capital cost of installation of the controlled motorway equipment, related infrastructure and systems, the operational costs of running the system (that part which would not be covered under conventional MIDAS operations), maintenance costs, replacement costs and the loss of indirect tax revenue within the 30-year appraisal period. There may also be other significant costs and benefits, some of which cannot be present in monetised from. Where this is the case, the analysis does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Resource costs are converted to market prices by applying a factor of 1.209, which is the stated overall rate of taxation in the economy. The 2002 undiscounted market prices were discounted to a 2002 present value year, using the standard discounting rates set out in WebTAG Unit 3.5.4; namely, a discount rate of 3.5% per year applies cumulatively to the costs to be incurred.

The first scheme year, the year for which a full calendar year of benefits would be produced, was taken to be 2011. The horizon year, the last year of the appraisal period, was taken to be 30 years after the first scheme year, 2040. Because CM is categorised as a technology scheme, the appraisal was evaluated over a period of 30 years, from 2011 to 2040.

Investment costs

The cost of the CM scheme was provided by the Highways Agency, and includes costs incurred by the Contractor, MVM, and those incurred by the HA. As outturn costs, these forecasts include inflation effects, and are given in July 2007 prices. The 2007 Q3 outturn costs were deflated using the retail price index (RPI) record of inflation. The rebasing to 2002 prices, is calculated using the proportional change in RPI between 2002 (RPI: 176.2) and 2007 Q3 (RPI 207.1).

Table 1 indicates that the investment costs of the CM option to the Public Accounts would be £9.5M greater than that of the D4M with MIDAS. This includes the historic expenditure incurred in 2008 and 2009.

Operating / maintenance costs

Operating costs relate to any costs associated with operating the Controlled Motorway over and above those in the 'Do-Minimum' case, i.e. D4M with MIDAS. The "Managed Motorways Operational Costs Report" (February 2009) has been used to produce an estimate of operational and maintenance costs. This is shown in Table 2 below.

Cost Item	Generic Cost £/c'way km	proportion applicable to CM	CM Cost £/c'way km
1. AMI Indicators	17,500	0.3	5,250
2. Loops	4,600	1.0	4,600
3. Hard shoulder cameras	4,300	0	0
4. HADECs enforcement cameras	3,200	1.0	3,200
5. Spares for field electronics	3,400	0.3	1,020
6. MS4 Message signs	8,400	0	0
7. Pavement	12,400	0	0
8. Gantries	9,500	0	0
9. Staff costs	4,400	0.3	1,320
10. Miscellaneous (items 1-9 cover 83% of costs)	15,390		3,152
Total			18,542**

** including optimism bias and at 2008 resource prices

Table 2 - CM Maintenance and Operating Costs

The 2008 resource prices has been inflated using 'real' costs and accrued over the 30-year appraisal period (2011 to 2040). This cost was then discounted to a 2002 present value year and converted to 2002 market prices. The CM maintenance and operating cost, discounted to a 2002 present value year, was £14.5M.

The MIDAS system would have included advisory lane control signals above each lane of the motorway. The CM scheme would replace this system with AMI signals, which show the mandatory speed limits. It is estimated that 70% of the costs of the AMI indicators would have been required to implement MIDAS signing (i.e. in the 'Do-Minimum' case). Therefore only 0.3 of the cost of the AMI indicators, field electronics cost and staff cost was attributed to the CM scheme.

Indirect tax revenues

The loss of indirect tax revenue to HM Treasury, because more efficient travel results in less fuel duty paid, was calculated using the 'queuing time saved' outputs from INCA and the methodology described in the Draft Guidance. Appendix A4 of the Draft Guidance document provides a look-up table giving VOC and carbon emission benefits per vehicle hour of queuing time saved, as output by INCA.

The total reduction in indirect tax revenue for the 30-year appraisal period from 2011 to 2040, discounted to a 2002 present value year, amounts to £0.1M.

Greenhouse gases

Total carbon impact benefits for the 30-year appraisal period from 2011 to 2040 amount to £0.01M discounted to 2002 values.

Accidents

Accident cost savings were calculated using the COBA software. Accident rates were based on observed data for personal injury accidents (PIA) on the M1 J25 to 28 between 2000 and 2005. The rate used in the Do Minimum COBA analysis was 0.106 accidents per million vehicle km, and assumed no change in rate with the widening from a D3M to a D4M. In the 'Do-Something' case (i.e. with CM), a 15% decrease in the accident rate was assumed, giving a rate of 0.0904 accidents per million vehicle km. The rates used for the accidents in the 'Do-Something' case were reduced by 15% compared with the 'Do-Minimum' case. This is based on the reductions achieved as a result of Controlled Motorways' variable mandatory speed limits (VMSL) on the M25.

The number of accidents and casualties in the Do-Minimum and Do-Something output from the COBA based spreadsheet calculations are shown in Table 3. Over the 30-year evaluation period, the total number of personal injury accident collisions saved is 649. This number of accidents includes an estimated 10 fatal and 59 serious casualties. The total economic valuation of accident benefits accruing to the section of the M1 between Junction 25 and Junction 28 through implementation of a Controlled Motorway scheme would be £33.0M.

	Accidents	Casualties			Cost £M
		Fatal	Serious	Slight	
Do-Minimum	4316.5	65.7	394.2	6994.9	219.446
Do-Something	3667.5	55.8	334.9	5943.1	186.450
Benefit	649.0	9.9	59.3	1051.8	32.996

Table 3 - Accident Savings and Benefits

Consumer and business users and providers

The vehicle operating costs (VOC) and carbon emissions saved, as a result of the scheme, are related to delay savings. Total VOC benefits for the 30-year appraisal period from 2011 to 2040 amount to £0.2M at 2002 market prices discounted to 2002 values.

Reliability

Reliability benefits were evaluated using the INCA software, version 4.1. This included delay benefits resulting from a reduction in incidents, and day to day travel time variation benefits resulting from more reliable journey times.

INCA calculates benefits in terms of reduction in delay time resulting from fewer incidents, and reduction in travel time variability. The value of time savings takes into account the number of hours saved in each time period (a.m. peak, p.m. peak, inter-peak, off-peak), and the breakdown within each time period by vehicle occupancy and user category (business, commuter, other). Value of time per vehicle hour differs by vehicle type, traffic composition, trip purpose, time of day and vehicle occupancy. INCA defaults for these parameters were adopted.

INCA runs were carried out for a 30-year appraisal period using an Opening Year of 2011 and last year for traffic growth of 2032. The horizon year is 2040. Summary results are shown in Table 4 below.

	Benefit (£ millions)
Criteria	D4CM
Total Travel Time Variability Benefit	12.795
Total Delay Benefit	4.787
Total Benefits	17.582

Table 4 - Total INCA Benefits

The INCA runs produce reliability benefits (comprising delay and travel time variability benefits) of £17.6M in market prices for the M1 CM scheme. This suggests, in journey reliability terms, that the M1 scheme would provide a positive monetary benefit.

Summary and preferred option

The HA is improving the M1 motorway, between J25 to J28, to D4M standard. The Scheme is to implement Controlled Motorway technology to this length of the motorway.

The analysis of monetised costs and benefits in Table 1 records that the Net Present Value of the CM scheme is £26.7M (at 2002 market prices, discounted to a 2002 present value year). The benefit to cost (BCR) ratio is 2.11

The NATA BCR for this scheme is 1.38; this BCR is based on robust economic values and includes values for changes in green house gases but not noise pollution. Sensitivity tests have been undertaken to show that the new shadow price of carbon does not significantly impact on the overall BCR. The adjusted BCR of the scheme is 2.11 and includes the less robust monetised values of reliability and landscape impacts.

The results of the assessments were reported in a technical Appraisal Report, and are summarised in the Appraisal Summary Table (AST) below.

Impact Area	Summary of AST commentary	Overall Effect
Noise	For the Scheme design year 2023, the adoption of VMSL results in no change in the number of people annoyed by traffic noise in the study area.	No change
Emissions	The mandatory speed limits will improve the traffic flow and therefore reduce vehicle emissions.	Benefit
Landscape and Townscape	The combination of VMSL to the MIDAS scheme would have no significant impact.	No change
Heritage	The combination of VMSL to the MIDAS scheme would have no significant impact.	No change
Biodiversity	The combination of VMSL to the MIDAS scheme would have no significant impact.	No change
Journey Ambience	Due to the presence of enforcement cameras there might be an increase in driver stress.	No change
Safety	There would be an additional 15% reduction in accidents with MIDAS already installed.	Benefit
Economy	Scheme would deliver major increase in journey time reliability and travel time contributing £17.5M in economic benefits.	Benefit
Accessibility	No effects on severance or access to transport options.	No change
Integration	Scheme would improve accessibility to various development areas without requiring landtake.	No change

Table 5 - Appraisal Summary Table

In terms of transport economic efficiency, the CM scheme would provide good value for money.

The Highways Agency recommends Option 2, outlined at the beginning of this document. The Controlled Motorway Scheme has the potential to produce considerable benefits by aiming to reduce congestion, improve journey time reliability and reduce accidents, driver stress and pollution levels.

Specific Impact Tests

Statutory equality duties

Race

The Commission for Race Equality guidelines have been followed in order to assess the impact of the Controlled Motorway Scheme upon race equality.

The Controlled Motorway Scheme aims to establish a sustainable balance between wider economic growth, social inclusion and environmental objectives. It is therefore not expected that the Controlled Motorway Scheme will impact upon race equality.

Disability

The Disability Rights Commission guidelines have been followed in order to assess the impact of the Controlled Motorway Scheme upon the disabled.

A full disability impact assessment will not be necessary as the Controlled Motorway Scheme will not have an adverse impact upon the disabled.

Gender

The Government Equalities Office guidelines have been followed in order to assess the impact of the Controlled Motorway Scheme upon gender equality.

A full gender equality assessment will not be necessary as the Controlled Motorway Scheme does not discriminate between genders.

Economic impacts

Competition

The Office of Fair Trading guidelines have been followed in order to assess the impact of the Controlled Motorway Scheme upon market competition.

It has been concluded that there will not be any adverse effects upon competition in the marketplace. The introduction of the Controlled Motorway Scheme will reduce travel times and improve journey reliability which will contribute positively to competition in the marketplace. There will be agglomeration and competition benefits resulting from employment density change, due to improved journey times and productivity working.

Small firms

The Department for Business Enterprise and Regulatory Reform guidelines have been followed in order to assess the impact of the Controlled Motorway Scheme upon small firms. The Controlled Motorway Scheme will not have an adverse effect upon small firms. The proposals do not impose any new or increased burden. Small businesses have not been consulted separately. However, the Highways Agency will be sending targeted information on the Controlled Motorway Scheme to numerous organisations within the area.

Environmental impacts

Greenhouse gas assessment

The Government's carbon assessment guidelines have been followed in order to assess the impact of the Controlled Motorway Scheme upon carbon emissions.

The Controlled Motorway Scheme will provide a reduction in the emission of harmful gases and noise pollutants. Mandatory variable speed limits lead to more uniform speeds and a reduction in flow breakdown and associated queuing. This will lead to reduced carbon emissions, though it is not possible to quantify this effect.

The Controlled Motorway Scheme will not have an adverse effect upon carbon emissions.

Wider environmental issues

Full environmental assessments have been carried out in accordance with the Highways Agency national and local environmental strategies and policies including:

- Towards a Balance with Nature: The Highways Agency Environment Strategic Plan; and
- Living with Roads: An Environmental Strategy for England's Main Roads.

Social impacts

Health and well-being

The Department of Health guidelines have been followed in order to assess the impact of the Controlled Motorway Scheme upon public health.

A full health impact assessment will not be necessary as the Controlled Motorway Scheme will not have a significant impact upon public health.

Human rights

The Ministry of Justice guidelines have been followed in order to assess the impact of the Controlled Motorway Scheme upon human rights. The Controlled Motorway Scheme will not have an adverse affect upon human rights.

Justice system

The Department for Constitutional Affairs guidelines have been followed in order to assess the impact of the Controlled Motorway Scheme upon Legal Aid.

There are no new criminal sanctions or civil penalties that will be introduced as part of the Controlled Motorway Scheme. Therefore, a full Legal Aid impact test is not required.

Rural proofing

The Commission for Rural Communities guidelines have been followed in order to assess the impact of the Controlled Motorway Scheme upon rural circumstances and needs.

The Controlled Motorway Scheme will not have an adverse affect upon rural circumstances and needs.

Sustainable Development

The Government's Sustainable Development Strategy guidelines have been followed in order to assess the impact of the Controlled Motorway Scheme upon sustainable development.

The Controlled Motorway Scheme will not have an adverse effect upon sustainable development.

Annexes

Annex 1 should be used to set out the Post Implementation Review Plan as detailed below. Further annexes may be added where the Specific Impact Tests yield information relevant to an overall understanding of policy options.

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. 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>Basis of the review: [The basis of the review could be statutory (forming part of the legislation), it could be to review existing policy or there could be a political commitment to review]; Review after operational 'switch on'.</p>
<p>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 system when it is operational needs to operate in the correct way and appropriate for traffic conditions.</p>
<p>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] Assessment of system parameters by analysis of signal setting data and traffic flow. Assessment of driver behaviour and the level of compliance with the speed limit.</p>
<p>Baseline: [The current (baseline) position against which the change introduced by the legislation can be measured] Existing dual 3 lane road with additional lane (i.e. D4M) and MIDAS. Controlled Motorway expected to give additional benefit of 15% reduction in accident rate above D4M MIDAS operation.</p>
<p>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] Scheme should display the appropriate signals. Inappropriate signals will be eliminated by retuning system parameters. Drivers comply with the set speed limits. Review consistency with other schemes on the ground.</p>
<p>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] Real time traffic data and real time signal setting data will be routinely collected and analysed. Journey time and accident data will also be available.</p>
<p>Reasons for not planning a PIR: [If there is no plan to do a PIR please provide reasons here] No formal benefit evaluation is planned for the M1 J25-28 scheme. The scheme is one of several currently being rolled out on the Highways Agency network. Benefits have already been seen on the M25 J10-16 scheme.</p>

