

## Executive Summary

The Government has set out its proposals for constructing a high speed railway line (HS2) between London and Birmingham and published its preferred route in January 2012, following consultation on original proposals through 2011. The preferred route includes a tunnel from the M25 (Ch 31+400) to Mantles Wood (Ch 44+700).

This proposal would cause permanent damage to this part of the Area of Outstanding Natural Beauty which includes two “gateways” for visitors at Great Missenden and Wendover and hosts a network of footpaths, bridleways and viewpoints in the Misbourne Valley, through which the line would run. The tranquillity of the area would be seriously damaged by the noise of up to 28 high speed trains per hour and its natural beauty would be irredeemably damaged by the scars of rail cuttings, bunds, gantries, security fencing and other surface elements required for such a major piece of infrastructure.

As a consequence, Peter Brett Associates LLP (PBA) was commissioned by Conserve the Chilterns and Countryside (CCC) and Chiltern Ridges Action Group (CRAG) to consider the information available and develop in more detail the potential for a full tunnel through the Chilterns Area of Outstanding Natural Beauty (AONB).

The most significant change made to the horizontal alignment by HS2 Limited following the consultation process was to move the line to the west of Amersham. The main vertical alignment changes were the extension of the bored tunnel to Mantles Wood and introduction of longer sections of “green tunnel” past South Heath and Wendover.

The viaduct and embankments on the way down from Wendover Dean into Wendover will be raised for over two kilometres. Whilst there is traffic noise from the A413, during the night time in particular noise from trains on this raised section will affect dwellings throughout this area of the valley including Wendover and the surrounding villages.

Spoil from the excavation of the cuttings in open sections of the route in the AONB, including substantial amounts from the green tunnels, will be transported out of the area in tens of thousands of lorry movements. Three sections of the route in the AONB will be challenging to construct without traffic disruption to busy routes and three permanent road changes will be required.

The opportunity for a full tunnel solution through the Chilterns AONB was apparently considered by HS2 Limited but it would appear that details of potential solutions were not sufficiently developed to enable a complete solution to be brought forward. In particular, the European Technical Specification on Interoperability (TSI) stipulates that any tunnel in excess of 20 kilometres in length requires a special safety investigation to be undertaken to demonstrate the safety of the tunnel, or to identify any additional infrastructure measures required. In the current alignment the distance from the tunnel entry point within the M25 to the edge of the AONB north of Wendover is 24.5 kilometres. However, if a long tunnel is divided by a section in open air which is at least 500 metres long with suitable access and egress then the tunnels can be treated as two separate tunnels.

Given all the benefits which accrue to the residents of and visitors to the Chilterns (both during construction and operation) of a full tunnel through the Chilterns, and who receive no other benefits from HS2, PBA has worked with CCC and the engineering group in CRAG to consider how this could be addressed and achieve a cost neutral solution.

We believe there are two further options that have not been considered by HS2 Ltd. In proposing two options there is actually only one difference between them and hence we have also considered the primary engineering and environmental issues associated with these differences.

New Option T1 has two pairs of Tunnel Boring Machines (TBMs) working from opposite ends of the AONB. One pair of TBMs would bore from inside the M25 to Mantles Wood the other from outside the AONB north of Wendover to the same point. A gap of over 500m would be left at Mantles Wood to comply with the TSI. The northern portal should be outside the AONB as this would allow for easier disposal of surplus spoil using the Chiltern Line. The northern section could be tunnelled at the same time as the southern section, and the total programme time would be reduced.

In New Option T2, instead of the two pairs of TBMs meeting at Mantles Wood they would meet at, and be extracted from, an enlarged vent shaft to the north side of the A413 near Keepers Wood (Ch43+000). A gap of 500 metres to comply with the TSI would be sited at Durham Farm, Wendover Dean which is only 19 kilometres from the M25 portal and a tunnel of that length would also comply with the TSI. Under the 2012 Route, Durham Farm is proposed as the site for a 500 metre long viaduct. With a continuous bore from Wendover through to Chainage Ch43.000, the complexity of constructing the green tunnels through Wendover and South Heath as envisaged under the 2012 Route, and the resulting destruction of two ancient woodlands would be avoided.

The final selection of the location of a gap in the long tunnel requires further analysis once the principal of the tunnel has been accepted. The overriding primary effect of opting for a full tunnel will be to avoid the environmental impacts on the AONB from HS2.

Both of the new options are estimated to cost between £35m and £65m more than the currently proposed 2012 route. This represents a difference of between approximately 3% and 6%, which in itself can be considered negligible. In particular there is uncertainty about the allowance that might have been made with respect to landscape. Even using HS2 Limited's current methodology a landscape related cost of £65m can be identified, which would be saved by the tunnel options proposed, and this valuation could reasonably be increased to a figure in excess of £200m. The Chilterns Tunnel proposed will avoid major surface construction at 10 surface locations and avoid the loss of ancient woodland and Grim's Ditch Scheduled Ancient Monument.