

# **The design and cost of T3i**

## **by Barnaby Usborne**

**Leader of the CRAG engineering team**

**Supported by Rodney Craig, CRAG engineering team**

CHILTERN RIDGES HS2 ACTION GROUP  
CONSERVE THE CHILTERN AND COUNTRYSIDE LTD

# THE CHILTERN LONG TUNNEL OPTIONS

*Tier 1 mitigation*

**Fully-bored  
long tunnels**

*Tier 2 mitigation: e.g. short tunnels*

*Tier 3 mitigation: detailed local measures*

# THE CHILTERN LONG TUNNEL OPTIONS

*Tier 1 mitigation*

**The Chiltern Long Tunnel (CLT)**  
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**The CRAG long tunnel (T3i)**

*Tier 2 mitigation: e.g. short tunnels*

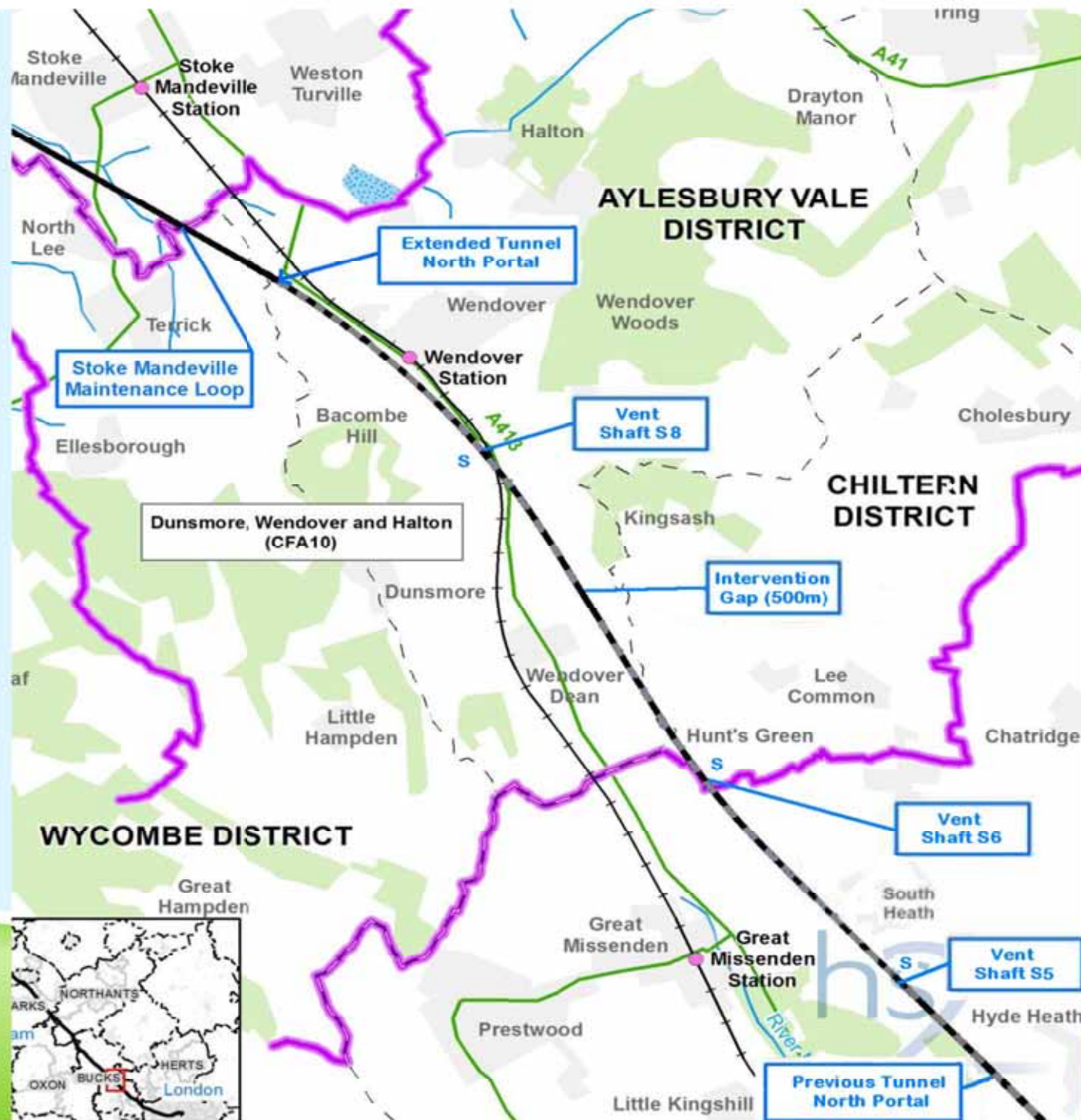
*Tier 3 mitigation: detailed local measures*



# THE T3i TUNNEL OPTION

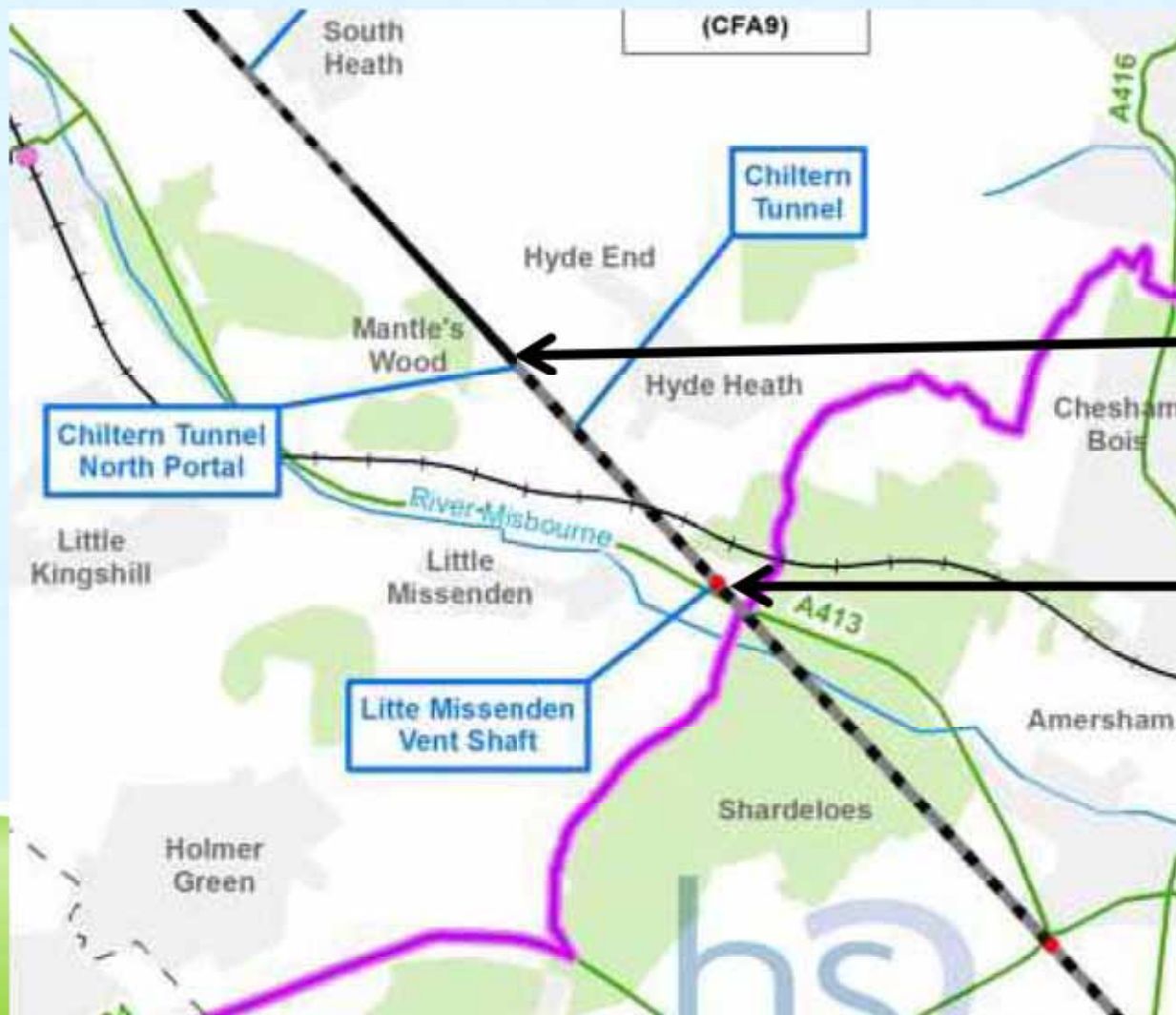
## Key features:

- ▶ Fully-bored tunnel through the Chilterns
- ▶ Runs from the M25 to a point near the AONB boundary near Wendover
- ▶ Follows HS2 Ltd's route for its full length
- ▶ Includes an 'open-to-air' intervention gap
- ▶ The north portal is further from Wendover than the current proposal
- ▶ T3i developed by HS2 Ltd from CRAG T2 option





# TBMS EXTRACTED FROM VENT SHAFT



**TBMs removed here:**

\* HS2 proposed scheme

\* T3i proposal

# THE NORTHERN PORTAL: STOKE MANDEVILLE AND WENDOVER



Distance to corner of Stoke Mandeville	Proposal and portal chainage	Distance to corner of Wendover
2900m	1. Current proposal – 54.900	300m
2300m	2. Crag T3i bored Tunnel – 55.450	650m
2000m	3. Chiltern Long Tunnel – 55.800	1000m



# ADVANTAGES OF T3i

- ▶ Uses the horizontal alignment of the proposed route
- ▶ Developed with HS2 Ltd; have agreed engineering aspects
- ▶ Meets regulatory safety / operation requirements
- ▶ Widely discussed during development
- ▶ Achievable within the planned timescale
- ▶ Cheapest full tunnel option (HS2 Ltd estimates £349m T3i c.f. £485m CLT)
- ▶ Northern portal is over 2 km from corner of Stoke Mandeville
- ▶ Achieves almost all of the potential environmental benefits



# DISADVANTAGES: COMPARED WITH OTHER LONG TUNNEL OPTIONS

- ▶ Has an open-to-air gap at Durham Farm

... but an improvement on the current proposal and meets regulations

- ▶ North portal nearer to Wendover than CLT

... but acceptable to Wendover if CLT not approved

# AREAS OF AGREEMENT WITH HS2 LTD

- ▶ Meets current design constraints
- ▶ Meets applicable European Safety Standards (TSI)
- ▶ Has clear environmental benefits
- ▶ Does not result in additional construction time
- ▶ Additional construction costs likely to be in the range £ 250 - 350 million

# WHERE THERE IS NO AGREEMENT

- ▶ Exact costs
- ▶ Value of associated benefits
- ▶ Spoil handling
- ▶ Construction compound at northern portal



# CONSTRUCTION COSTS

\* HS2 Ltd claim that T3i would cost an additional **£349 million**

\* Reasons why we believe it could be significantly less than this:

- ▶ Faster tunnelling – HS2 Ltd's estimate too pessimistic
- ▶ Quicker fit-out – HS2 Ltd's estimate too pessimistic
- ▶ Less spoil disposal at Durham Farm - with minor alignment changes and mitigation
- ▶ Savings by removing need for double-handling spoil
- ▶ Inappropriate allocation of overheads

\* These could reduce the additional cost to **~£250 million**

# CONCLUSIONS

- ▶ T3i is a viable option for a full tunnel
- ▶ It provides most of the benefits of other long tunnel options
- ▶ It offers a balanced solution for the protection of the nationally significant Chilterns AONB as well as the local residents...
- ▶ It benefits the nation as a whole

**A 'value-for-money' option**