

## EXHIBIT LIST

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Petitioner: 01 Standard Pack - Areas

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Options Assessment: Country North - Burton Green Tunnel - Burton Green Alternative tunnelling propositions for the alignment running into Burton Green, Excluding West Midlands Metropolitan Area Options.

	Option A – PCR (Baseline)	Option B	Option C	Option D	Option E	Option F	Option G	Option H
<b>Section Length (m)</b>	146+175 to 146+695	146+125 to 146+645	146+125 to 146+645	145+000 to 147+500	145+000 to 151+000	143+600 – 151+000	140+300 to 151+000	146+125 to 146+695
<b>Total Cost (£)</b>	£32,000,000	£28,000,000	£30,000,000	£179,500,000	£461,000,000	£570,500,000	£845,000,000	£30,000,000
<b>Construction Cost (£)</b>	£32,000,000	£28,000,000	£30,000,000	£185,000,000	£470,000,000	£580,000,000	£855,000,000	£30,000,000
<b>Property Cost Delta from PCR (£)</b>	£0	£0	£0	-£5,500,000	-£9,000,000	-£9,500,000	-£10,000,000	£0
<b>Key engineering issues</b>	<p>PCR alignment with 520m green tunnel set approx 8-10m below level of existing former rail cutting (now Kenilworth Greenway). Tunnel box needs to be 27-28m wide to conform to Spatial Arrangement DAS, with space between tracks increased to 8.5m. Transition lengths either side of green tunnel to revert back to normal 5m track spacing for 400kph design speed.</p> <p>PCR horizontal alignment adjusted to the west; the down line by about 4.3 metres and the up line by about 0.7metres to accommodate a wider compliant green tunnel cross-section than that envisaged in the PCR scheme.</p>	<p>520m green tunnel set ~5m above level of PCR through clearances at Cromwell Lane. Tunnel box needs to be 27-28m wide so horizontal alignment shifted west slightly from PCR. Re-positioning of the 520 m green tunnel to the south, with integrated landscaping and earth bunding.</p>	<p>520m green tunnel set ~5m above level of PCR at north portal and at PCR level at south portal. Tunnel box needs to be 27-28m wide so horizontal alignment shifted west slightly from PCR. Re-positioning of the 520 m green tunnel to the south, with integrated landscaping and earth bunding.</p>	<p>Developed CF Short Bored Tunnel: Short "Bored/ Mined Tunnel" option from Ch 145+000 to 147+500 with green tunnel lead-in at both the southern and northern extents (~2.5 km in length), tunnel bore from 145+500 to 146+900 at 1.4km in length. Will not need an emergency access / vent shaft. May need pumping station.</p>	<p>Developed CF Longer Bored Tunnel: Long "Bored Tunnel" from Ch 145+000 to 151+000 with green tunnel lead-in at both the southern and northern extents (~7.4km in length), tunnel bore from 144+000 to 149+500 at 5.5km in length. Would require two emergency egress / vent shaft sites, along with associated vehicle accesses and hardstandings. Will need pumping station.</p>	<p>CF Longer "Bored Tunnel" from Ch 140+300 to 151+000 with green tunnel lead-in at both the southern and northern extents (~10.7 km in length), tunnel bore from 140+900 to 149+500 at 8.6km in length. Would require three emergency egress / vent shaft sites, along with associated vehicle accesses and hardstandings. Will need pumping station.</p>	<p>CF Long "Bored Tunnel" from Ch 140+300 to 151+000 with green tunnel lead-in at both the southern and northern extents (~10.7 km in length), tunnel bore from 140+900 to 149+500 at 8.6km in length. Would require three emergency egress / vent shaft sites, along with associated vehicle accesses and hardstandings. Will need pumping station.</p>	<p>570m green tunnel set ~5m above level of PCR through tunnel constrained by clearances at Cromwell Lane. Tunnel box needs to be 27-28m wide so horizontal alignment shifted west slightly from PCR. 50m extension at south end to allow space for integrated landscaping and earth bunding design and Greenway realignment.</p>
<b>Key EIA issues – Direct</b>	<p>Construction &amp; operation impacts on Burton Green and Balsall Common area, mainly noise, vibration, visual, planting and habitat loss, diversion of footpaths and Kenilworth Greenway. May require land from rear gardens along Hodgett's Lane and demolition of village hall and three houses in Burton Green. Widespread impacts of elevated route in Berkswell over WCML, included impacts on riverside habitats and designed landscape.</p>	<p>Reduced construction impact compared to Option A on Burton Green due to shorter construction period and possibility to retain gardens and village hall on Hodgett's Lane. Earthworks design around extended south portal would be more successful at screening route, despite being raised, and integrating realigned Greenway. Reduced tunnel length at north end would be largely masked by HS2 being in partly retained cutting, but there may be some lessening of noise mitigation. Widespread impacts of elevated route in Berkswell over WCML, included impacts on riverside habitats and designed landscape.</p>	<p>Similar to Option B, plus earthworks design around extended south portal would be even more successful at screening route and integrating realigned Greenway. Reduced tunnel length at north end would be largely masked by HS2 being in partly retained cutting, but there may be some lessening of noise mitigation. Widespread impacts of elevated route in Berkswell over WCML, included impacts on riverside habitats and designed landscape.</p>	<p>Construction impacts on Burton Green reduced considerably, with Feeder Station being the closest works. Operational impacts also reduced as portals would be further from the Burton Green area and the perception of community severance reduced. Widespread impacts of elevated route in Berkswell over WCML, included impacts on riverside habitats and designed landscape.</p>	<p>Construction impacts on Burton Green and Balsall Common area reduced considerably, with Feeder Station and vent shafts being the closest works. However, construction impacts on Crackley and Gibbett Hill are increased due to the raising of the road and local railway. Operational impacts on Green and Balsall Common area reduced considerably as portals would be further from both settlements and the perception of community severance reduced. However, raising HS2, local railway and A429 would increase operational impacts on Crackley and Gibbett Hill. On balance, no better than Option D, in environmental terms, when taking Balsall Common area also into account, as impacts on the Crackley and Gibbett Hill areas are increased.</p>	<p>Construction impacts on Burton Green and Balsall Common area reduced considerably, with Feeder Station and vent shafts being the closest works. However, construction impacts on Crackley and Gibbett Hill are increased due to the raising of the road and local railway. Operational impacts on Green and Balsall Common area reduced considerably as portals would be further from both settlements and the perception of community severance reduced. However, raising HS2, local railway and A429 would increase operational impacts on Crackley and Gibbett Hill. On balance, no better than Option D, in environmental terms, when taking Balsall Common area also into account, as impacts on the Crackley and Gibbett Hill areas are increased.</p>	<p>Similar to Option E, plus it will also avoid impacts on Kenilworth golf course, Dale House Farm (grade II) and other properties nearby, Finham Brook, Milburn Grange Farm, houses at Crackley, Canley Brook, houses at Gibbett Hill, Cryfield Grange &amp; Oak Tree Cottage, Crackley Wood and Birches Wood Farm. Avoids creating severance of narrow Green Belt gap between settlements. Also avoids demolition of New Kingswood Farm and loss of farmyard at Dale House Farm.</p>	<p>Has reduced construction impact on Burton Green due to reduced construction period and ability to retain gardens and village hall on Hodgett's Lane. Earthworks design around extended south portal would be more successful at screening route, despite being raised, and integrating realigned Greenway. Better than Option B overall; would be better than Option C if had lowered southern portal. Widespread impacts of elevated route in Berkswell over WCML, included impacts on riverside habitats and designed landscape.</p>

	Option A – PCR (Baseline)	Option B	Option C	Option D	Option E	Option F	Option G	Option H
<b>Key EIA issues – Indirect</b>	Traffic, footpath and Greenway diversions and/or temporary closures during construction.	Similar to Option A	Similar to Option A	Less than Option A, with only the northern part of the Greenway and routes around Balsall Common affected.	Much less than Option A, with no effect on Greenway and diversions only needed near portal areas.	Much less than Option A, with no effect on Greenway and diversions only needed near portal areas.	Much less than Option A, with no effect on Greenway and diversions only needed near portal areas.	Similar to Option B
<b>Residential demolitions</b>	3	3	3	None	None	None	None	3
<b>Noise/ nuisance issues</b>	Construction noise and vibration through Burton Green and on Balsall Common area. Tunnel mitigates most of operational noise in Burton Green. Detailed design needs to address vibration.	Construction period reduced for Burton Green, due to reduced depth of excavation. Operational noise improved for Burton Green, as southern portal further from houses & gardens on Cromwell Lane. Reduced tunnel length at north end would mean lessening of noise mitigation.	Similar to Option B.	Construction noise & vibration much reduced for Burton Green, with Feeder Station and vent shaft being the closest works. Operational noise & vibration improved for Burton Green, as tunnel deeper and portals further away.	Construction noise & vibration much reduced for Burton Green and Balsall Common area, with Feeder Station and vent shafts being the closest works. Operational noise & vibration improved for Burton Green and much improved for Balsall Common area, with deep tunnel and portals further away.	Construction noise & vibration much reduced for Burton Green and Balsall Common area, with Feeder Station and vent shafts being the closest works, but increased for Crackley and Gibbett Hill. Operational noise & vibration improved for Burton Green and much improved for Balsall Common area, with deep tunnel and portals further away. Raised HS2, local rail and road levels at Crackley and Gibbett Hill may worsen noise impacts.	Construction noise & vibration much reduced for Kenilworth, Burton Green and Balsall Common areas, with Feeder Station and vent shafts being the closest works. Operational noise & vibration improved for Burton Green and much improved for Kenilworth and Balsall Common areas, with deep tunnel and portals further away.	Construction period reduced for Burton Green. Operational noise improved for Burton Green, as southern portal further from houses & gardens on Cromwell Lane.
<b>ESAs</b>								
<b>Ramifications of change options</b>	Rail levels can fit with WMM alignment to north (also raised slightly to achieve required clearance across WCMML by Balsall Common). Track separation required for Tunnel extends north and south of Burton Green.	Rail levels can fit with WMM alignment to north.	Rail levels can fit with WMM alignment to north.	Increase in capital costs. Extension to PCR programme. Increased size of for construction compounds and work areas. Need to ensure that bored tunnel levels fit with WMM alignment to north. Track separation greater than PCR and extends further to north and south.	Increase in capital costs. Extension to PCR programme. Increased size of for construction compounds and work areas. Need to ensure that bored tunnel levels fit with WMM alignment to north. Track separation greater than PCR and extends further to south than option D.	Increase in capital costs. Extension to PCR programme. Increased size of for construction compounds and work areas. Need to ensure that bored tunnel levels fit with WMM alignment to north. Track separation greater than PCR and extends further to south than option D.	Increase in capital costs. Extension to PCR programme. Increased size of construction compounds and work areas. Need to ensure that bored tunnel levels fit with WMM alignment to north. Track separation greater than PCR and extends further to south than option E.	Rail levels can fit with WMM alignment to north.

## House of Commons Select Committee: First Special Report of Session 2014-15, para 55-57.

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55. The village of Burton Green will be bisected by the railway. To mitigate the effect of the line, the Bill proposed a 621m green tunnel which will be extended by 50m at both ends by proposed additional provisions. Petitioners from Burton Green were concerned about blight and community cohesion, and argued for a deep bored tunnel or alternatively a short bored tunnel.

56. The Promoters now propose further additional provisions. These include a 2m lowering of the line alignment in cutting, enhanced bunding and screening, and routing of construction traffic away from the village.

57. The additional costs of a deep bored tunnel would be between £179.5m and £645m. The costs of a short bored tunnel would be between £28m and £32m. Even allowing for possible overestimates, we have concluded that neither such tunnel option would represent value for money. The additional mitigation proposed by the Promoter, together with other measures that we have suggested, should be some help.