A report prepared for High Speed Two (HS2) Limited:

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Printed in Great Britain on paper containing at least 75% recycled fibre.
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<td>SV-01 presents the predicted operational sound from the new railway. The sound levels from the new railway (expressed as LpAeq,T) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.</td>
<td>SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme. The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.</td>
<td>The SV-03 figure series accompanies the construction noise &amp; vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-005.</td>
<td>The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.</td>
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<tr>
<th>Community Forum Area name</th>
<th>CFA 23 – Balsall Common and Hampton-in-Arden</th>
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Mapping explanatory notes

Copyright statements

Copyright statements are presented in the data dictionary and definitions section at the front of the map book, due to limited space to include this on the individual maps themselves.

Ordnance Survey data

All maps produced as part of the London-West Midlands Environmental Statement (ES) contain Ordnance Survey (OS) data. HS2 Ltd uses the most up-to-date mapping available, where possible, supplied by the OS. As such, we cannot be held responsible for any inaccuracies within this data.

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Chainage

Most of the maps presented as part of the ES have a chainage value shown next to the alignment. Chainage is presented on the maps in black font, in the form of XX+YYY, for example: 77+000.

Chainage (known as reference chainage) is referenced from Euston station, which is 0+000, and the value presented is in metres. For example, 77+000 refers to the point 77,000m, or 77km, from Euston station. Chainage values increase in intervals dependent on the map scale. For maps at 1:50,000, scale chainage is shown at 5km intervals. For maps at 1:25,000, scale chainage is shown at 2km intervals. For maps at 1:10,000, 1:5,000 and 1:2,500 scales, chainage is shown at 1km intervals.

Chainage has been included on the maps as a useful tool for comparing map sets showing the different environmental themes or engineering plans, due to map sets having different scales and therefore showing differing amounts of alignment on the map.

Map orientation

The majority of the maps presented in these map books are presented with the railway alignment running horizontally across the page. The direction of travel to London would be following the alignment to the right hand side of the page, and the West Midlands to the left.

The exceptions to this are map series LV-02, LV-03, LV-04, LV-07 and LV-08, which present the alignment running from the bottom to the top of the page. This is to allow more of the modelled outputs to be shown at the appropriate map scale. In this instance, the direction of travel to London would be to the bottom of the page, and the West Midlands to the top.
There are a total of 76 map books in the ES, spread across Volumes 2, 4 and 5. A list of the titles is provided in the table below for reference.

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LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

Data dictionary and definitions
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<th>Legend features</th>
<th>Definition</th>
<th>Source</th>
<th>Copyright</th>
</tr>
</thead>
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<tr>
<td>Airborne sound and vibration assessment location</td>
<td>Locations near surface sections of the route at which a quantitative assessment of airborne sound and ground-borne vibration impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004.</td>
<td>High Speed Two (HS2) Ltd</td>
<td></td>
</tr>
<tr>
<td>Airborne sound assessment location</td>
<td>Locations at which a quantitative assessment of airborne sound impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004.</td>
<td>High Speed Two (HS2) Ltd</td>
<td></td>
</tr>
<tr>
<td>Airborne sound, ground-borne sound and vibration assessment location</td>
<td>Locations at which a quantitative assessment of airborne sound, ground-borne sound and vibration impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound &amp; vibration reports contained in Volume 5: Appendix SV-004.</td>
<td>High Speed Two (HS2) Ltd</td>
<td></td>
</tr>
<tr>
<td>Airborne sound study area</td>
<td>This defines the area within which operational airborne sound impacts of the scheme have been quantitatively assessed. This area is defined as within 1km of surface sections of the route in rural areas and within 500m of surface sections of the route in urban areas.</td>
<td>High Speed Two (HS2) Ltd</td>
<td></td>
</tr>
<tr>
<td>Baseline measurement locations</td>
<td>These represent locations at which sound measurements were carried out as part of the baseline sound surveys. Measurements of existing baseline sound levels at these locations have been used to derive baseline sound levels at operational and construction sound assessment locations. These baseline measurement locations are labelled with a reference number which enables cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002, which also describes how these are linked to baseline levels at assessment locations.</td>
<td>High Speed Two (HS2) Ltd</td>
<td></td>
</tr>
<tr>
<td>Committed developments</td>
<td>This informs the assessment of the future baseline. A development consent or allocation that has full or outline planning permission, or is allocated in an adopted development plan.</td>
<td>High Speed Two (HS2) Ltd</td>
<td>© Crown Copyright and database rights 2013 Ordnance Survey Licence Number 100043090.</td>
</tr>
<tr>
<td>Community Forum boundary</td>
<td>The Environmental Statement has been split into 26 sections called Community Forum Areas.</td>
<td>High Speed Two (HS2) Ltd</td>
<td>© Crown Copyright and database rights 2013 Ordnance Survey Licence Number 100043090.</td>
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<tr>
<td>Construction airborne sound and vibration assessment location</td>
<td>Locations at which a quantitative assessment of construction noise and vibration impacts of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the construction sound &amp; vibration reports contained in Volume 5: Appendix SV-003.</td>
<td>High Speed Two (HS2) Ltd</td>
<td></td>
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<tr>
<td>Construction airborne sound assessment location</td>
<td>Locations at which a quantitative assessment of construction noise impacts of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the construction sound &amp; vibration reports contained in Volume 5: Appendix SV-003.</td>
<td>High Speed Two (HS2) Ltd</td>
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<tr>
<td>Construction vibration assessment locations</td>
<td>Locations at which a quantitative assessment of construction vibration impacts of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the construction sound &amp; vibration reports contained in Volume 3: Appendix SV-003.</td>
<td>High Speed Two (HS2) Ltd</td>
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<tr>
<td>County boundary</td>
<td>County boundaries from Ordnance Survey boundary mapping.</td>
<td>Ordnance Survey</td>
<td>© Crown Copyright and database rights 2023 Ordnance Survey Licence Number 100049190.</td>
</tr>
<tr>
<td>Depot, station, headhouse or portal building</td>
<td>Extends to cover operational footprint of each depot and station and the footprint of each tunnel vent shaft and headhouse at surface level. Excludes any ancillary buildings associated with these structures.</td>
<td>High Speed Two (HS2) Ltd</td>
<td></td>
</tr>
<tr>
<td>District/Borough boundary</td>
<td>Ordnance Survey local authority boundary mapping.</td>
<td>Ordnance Survey</td>
<td>© Crown Copyright and database rights 2023 Ordnance Survey Licence Number 100049190.</td>
</tr>
<tr>
<td>Engineering earthworks: cutting</td>
<td>Cuttings created in the construction of the railway and associated works such as highways.</td>
<td>High Speed Two (HS2) Ltd</td>
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</tr>
<tr>
<td>Engineering earthworks: embankment</td>
<td>Embankments created in the construction of the railway and associated works such as highways.</td>
<td>High Speed Two (HS2) Ltd</td>
<td></td>
</tr>
<tr>
<td>Envisaged measures further reducing noise effects</td>
<td>Other environmental features e.g. landscaping: These lines represent environmental mitigation features provided for reasons other than noise mitigation which also reduce sound levels from the Proposed Scheme to the surrounding environment. These features are not placed specifically to reduce or remove a likely significant noise effect. Examples include landscaping and visual mitigation earthworks (non-engineering earthworks). Engineering e.g. cuttings: These lines represent engineering features which reduce sound levels from the Proposed Scheme to the surrounding environment but are not placed specifically to reduce or remove a likely significant noise effect. Examples include cuttings and safety barriers on viaducts which are not close to sensitive receptors.</td>
<td>High Speed Two (HS2) Ltd</td>
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<tr>
<td>Envisaged mitigation to avoid/reduce significant noise effects</td>
<td>Landscaping and/or fence barriers. These lines represent the envisaged mitigation provided specifically to reduce sound levels from the Proposed Scheme at sensitive receptors in order to reduce or remove likely operational significant noise effects. Examples include noise fence barriers or earth bunds (non-engineering earthworks) acting as noise barriers. These features are labelled with the height of the top of the barrier/bund above rail level. Engineering e.g. cuttings (green tunnels separately marked): These lines represent engineering features of the route which reduce sound levels from the Proposed Scheme at potentially significant sensitive receptors. These features, therefore, serve a material purpose in reducing or avoiding likely significant noise effects. Examples include engineering cuttings near to sensitive receptors. These features are labelled with the height of the top of the feature above rail level.</td>
<td>High Speed Two (HS2) Ltd</td>
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<tr>
<td>Ground-borne sound &amp; vibration study area (highly sensitive non-residential)</td>
<td>This defines the area within which direct operational ground-borne sound and vibration impacts of the scheme at highly sensitive non-residential receptors have been quantitatively assessed. This area is defined as within 200m of the route.</td>
<td>High Speed Two (HS2) Ltd</td>
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<tr>
<td>Ground-borne sound &amp; vibration study area (residential and non-residential)</td>
<td>This defines the area within which direct operational ground-borne sound and vibration impacts of the scheme at residential and non-residential receptors have been quantitatively assessed. This area is defined as within 85m of the route.</td>
<td>High Speed Two (HS2) Ltd</td>
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<tr>
<td>Ground-borne sound and/or vibration assessment</td>
<td>Locations near tunnelled sections of the route at which a quantitative assessment of ground-borne sound and vibration impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound &amp; vibration reports contained in Volume 5: Appendix SV-004.</td>
<td>High Speed Two (HS2) Ltd</td>
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<td>location</td>
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<tr>
<td>Minor ground-borne noise or vibration impact</td>
<td>Buildings at which a minor operational ground-borne sound or vibration impact is predicted from the Proposed Scheme.</td>
<td>High Speed Two (HS2) Ltd</td>
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<td>Non-engineering earthworks: cutting</td>
<td>Cuttings created in the construction of landscape features and mitigation measures.</td>
<td>High Speed Two (HS2) Ltd</td>
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<tr>
<td>Non-engineering earthworks: embankment</td>
<td>Embankments created in the construction of landscape features and mitigation measures.</td>
<td>High Speed Two (HS2) Ltd</td>
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<td>Operational airborne sound impacts at buildings</td>
<td>The buildings shown on SV-02 and SV-05 are colour-coded according to the magnitude of the predicted noise impacts of the Proposed Scheme. Noise impacts are calculated by comparing the sound levels predicted if the Proposed Scheme did not go ahead with those if it did (details of this process can be found in Volume 5: Appendix SV003-000). Panel B on SV-02/SV-05 contains a key showing the colours used with the corresponding impact categories. The impacts presented are the greatest (i.e. worst-case) of the impacts predicted for daytime and night-time.</td>
<td>High Speed Two (HS2) Ltd</td>
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<tr>
<td>Potential additional noise insulation (triggered by</td>
<td>This represents dwellings which would potentially be provided with noise insulation due maximum sound levels from the Proposed Scheme (further information regarding assessment criteria can be found in Volume 5 Appendix SV-005).</td>
<td>High Speed Two (HS2) Ltd</td>
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<tr>
<td>maximum sound levels at night)</td>
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<td></td>
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<tr>
<td>Potential additional noise insulation (triggered by</td>
<td>This represents dwellings which would potentially be provided with noise insulation due to noise from the Proposed Scheme exceeding the World Health Organization (WHO) night noise guidelines interim target (further information regarding assessment criteria can be found in Volume 5 Appendix SV-005).</td>
<td>High Speed Two (HS2) Ltd</td>
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<tr>
<td>WHO Night Noise Guidelines Interim Target)</td>
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<tr>
<td>Potential noise insulation (triggered by Noise</td>
<td>This represents dwellings which would potentially qualify for noise insulation under the Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996 (further information regarding assessment criteria can be found in Volume 5 Appendix SV-005).</td>
<td>High Speed Two (HS2) Ltd</td>
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<td>Insulation Regulations 1996)</td>
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<tr>
<td>Route in tunnel</td>
<td>Represents the proposed route of HS2, split into route on surface and tunnelled sections.</td>
<td>High Speed Two (HS2) Ltd</td>
<td></td>
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<tr>
<td>Route on surface</td>
<td>The sound levels from the Proposed Scheme (expressed as L_1000, and representing sound from the new railway only) are presented in 5dB steps. The levels are shown in the panel in the top-right hand corner of SV-01.</td>
<td>High Speed Two (HS2) Ltd</td>
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<td>Sound contours (SV-01)</td>
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<tr>
<td>Sound contours (SV-02/SV-05)</td>
<td>The sound levels from the Proposed Scheme (expressed as L_1000, and representing sound from the new railway only) are presented at two sound levels: 70 dB L_1000, 73 to 1000, and 55 dB L_1000, 73 to 200. The corresponding daytime levels (L_1000, 73 to 200) are shown in Panel A of SV-02/SV-05.</td>
<td>High Speed Two (HS2) Ltd</td>
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LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

CFA23 | Balsall Common and Hampton-in-Arden
- SV-01 - Operational Sound Contour Maps and Likely Significant Effects
- SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)
- SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
- SV-04 - Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments
SV-01 presents the predicted operational sound from the new railway. The sound levels from the new railway (expressed as LpAeq,T) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- Blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- Symbols representing buildings that would potentially qualify for noise insulation;
- Labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- The extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.
Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme. The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

Key items on the map include the following:

- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
- Blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- The study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
- The calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
- Sound contours representing sound produced by the new railway (displayed in a simpler manner than on SV-01 in order not to obscure other features on the map series);
- The assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and
- Labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.
Legend - General features
Route in bored tunnel
Route in green tunnel
Route on surface
Depot, station, headhouse or portal building
Community forum boundary
District/Borough boundary
County boundary

Legend - Sound related features
Airborne sound study area
Potential additional noise insulation (triggered by maximum sound levels at night or WHO Night Noise Guidelines Interim Target)
Potential noise insulation (triggered by Noise Insulation Regulations 1996)

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004. Likely significant effect indicated by OSV#-N#

Legend - Sound related features
Envisaged mitigation to avoid / reduce significant noise effects:
Landscape and/or fence barriers*
Engineering e.g. cuttings (green tunnels separately marked)
Envisaged measures further reducing noise effects:
Other environmental e.g. landscaping
Engineering e.g. cuttings

Night-time LpAeq,T
(T=23:00 to 07:00)
Daytime LpAeq,T
(T=07:00 to 23:00)
60 dB
> 70 dB
55 to 60 dB
65 to 70 dB
50 to 55 dB
60 to 65 dB
45 to 50 dB
55 to 60 dB
< 40 dB
< 50 dB

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C#

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004. Likely significant effect indicated by OSV#-N#
<table>
<thead>
<tr>
<th>Potential noise effect</th>
<th>Residential</th>
<th>Non-residential</th>
</tr>
</thead>
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<tr>
<td>Night-time L_{Aeq,T}</td>
<td>Daytime L_{Aeq,T}</td>
<td></td>
</tr>
<tr>
<td>L &gt; 70 dB</td>
<td>L &gt; 70 dB</td>
<td>Likely significant effect on dwellings indicated by &quot;&quot;, &quot;&quot;, &quot;&quot;, &quot;&quot;, &quot;&quot;, or &quot;&quot; avoided by noise insulation.</td>
</tr>
<tr>
<td>60 to 70 dB</td>
<td>65 to 70 dB</td>
<td>Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C#</td>
</tr>
<tr>
<td>55 to 60 dB</td>
<td>60 to 65 dB</td>
<td>Generally no adverse effect expected.</td>
</tr>
<tr>
<td>50 to 55 dB</td>
<td>55 to 60 dB</td>
<td></td>
</tr>
<tr>
<td>45 to 50 dB</td>
<td>50 to 55 dB</td>
<td></td>
</tr>
<tr>
<td>&lt; 40 dB</td>
<td>&lt; 50 dB</td>
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</table>

Legend - Sound related features
- Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)

* Labelled with total barrier height above rail level.

For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N#.

For Continuation Refer to Map Number SV-01-050b.

For further information see Volume 5, Appendix SV-001-000.

For details see relevant Volume 5 Appendix SV-004.
Legend - General features
- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features
- Envisaged mitigation to avoid / reduce significant noise effects:
  - Landscaping and/or fence barriers*
  - Engineering e.g. cuttings (green tunnels separately marked)
  - Other environmental e.g. landscaping
  - Engineering e.g. cuttings

* Labelled with total barrier height above rail level

Legend - Sound related features
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

¹ For further information see Volume 5, Appendix SV-003-004

HS2 (rail only) sound level \( L_{Aeq,T} \)
- Night-time \( L_{Aeq,T} \) (T=23:00 to 07:00)
- Daytime \( L_{Aeq,T} \) (T=07:00 to 23:00)

<table>
<thead>
<tr>
<th>Night-time ( L_{Aeq,T} ) (T=23:00 to 07:00)</th>
<th>Daytime ( L_{Aeq,T} ) (T=07:00 to 23:00)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 dB to 70 dB</td>
<td>55 to 60 dB</td>
</tr>
<tr>
<td>55 to 60 dB</td>
<td>50 to 55 dB</td>
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<tr>
<td>45 to 50 dB</td>
<td>40 to 45 dB</td>
</tr>
<tr>
<td>&lt; 40 dB</td>
<td>&lt; 50 dB</td>
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</tbody>
</table>

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004.

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-NF.

Potential noise effect¹,²
- For Continuation Refer to Map Number SV-01-051
- For Continuation Refer to Map Number SV-01-053

\( L_{Aeq,T} \) (T=07:00 to 23:00)

For further details see Volume 5, Appendix SV-004.

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-NF.

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004.

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-NF.

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004.

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-NF.

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004.

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-NF.

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004.

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-NF.

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004.

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-NF.

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004.

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-NF.

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004.

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-NF.

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004.

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-NF.

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004.

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-NF.

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004.

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-NF.

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004.
A452 Kenilworth Road
Overbridge

4-Track Section Starts Here
and Continues North

NORTH
WARWICKSHIRE
DISTRICT

SOLIHULL
DISTRICT

152+000
155+000
154+000

For Continuation Refer
to Map Number SV-02-053

For Continuation Refer
to Map Number SV-02-051

Operational Noise and Vibration Impacts
and Likely Significant Effects (with Assessment Locations)

Legend - General features
- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features
- Committed developments (label as CFA#/#)
- Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged measures further reducing noise effects:
  - Landscaping and/or fence barriers*
  - Engineering e.g. cuttings

Panel A

HS2 (rail only) sound level L_{eq,T}:

<table>
<thead>
<tr>
<th>Night-time L_{eq,T} (T=23:00 to 07:00)</th>
<th>Daytime L_{eq,T} (T=07:00 to 23:00)</th>
<th>Potential noise effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 55 dB</td>
<td>&gt; 65 dB</td>
<td>Likely significant effect on dwellings indicated by an X or an X avoided by noise insulation. Effect dependent on sound level change since Panel B and significance criteria. Likely significant effect on groups of dwellings and associated facilities indicated by OSV#-C#2.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Residential &amp; quiet areas</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>40 to 55 dB</td>
<td>50 to 65 dB</td>
</tr>
<tr>
<td>&lt; 40 dB</td>
<td>&lt; 50 dB</td>
</tr>
</tbody>
</table>

Panel B

Operational airborne sound impacts at buildings: change in sound level (L_{eq,T} day/night):
- Major adverse (>10dB)
- Moderate adverse (5dB to 10dB)
- Minor adverse (3dB to 5dB)
- Negligible (-3dB to 3dB)
- Beneficial (<-3dB)

Potential additional noise insulation (triggered by maximum sound levels at night):
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)
- Potential noise insulation triggered by Noise Insulation Regulations 1996

Effect dependent on sound level change (see Panel A) and significance criteria. Likely significant effect on dwellings and associated facilities indicated by OSV#-C#2.

For further details see Volume 5 Appendix SV-004.

For further information see Volume 5 Appendix SV-001-000.

For details see relevant Volume 5 Appendix SV-004.

Effect dependent on sound level change (see Panel A) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C#2.

Potential additional noise insulation (triggered by maximum sound levels at night):
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)

Legend - Sound related features
- Ground-borne sound & vibration study area
- Ground-borne sound & vibration study area (non-residential and non-residential)
- Ground-borne sound and/or vibration assessment location
- Airborne sound and vibration assessment location
- Minor ground-borne noise or vibration impact
- Airborne sound study area

Potential noise effect

Effect dependent on receptor and baseline:

Beneficial (<-3dB): Generally no adverse effect expected.
Moderate adverse (5dB to 10dB): Likely significant effect on dwellings and associated facilities indicated by OSV#-C#2.
Minor adverse (3dB to 5dB): Likely significant effect on dwellings and associated facilities indicated by OSV#-C#2.
Negligible (-3dB to 3dB): Potentially significant noise effects indicated by OSV#-C#2.
Major adverse (>10dB): Major adverse noise effects indicated by OSV#-C#2.

Legend - Sound related features
- Airborne sound study area
- Airborne sound assessment location
- Ground-borne sound and/or vibration assessment location
- Minor ground-borne noise or vibration impact
- Ground-borne sound & vibration study area
- Ground-borne sound & vibration study area (highly sensitive non-residential)
The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.
Map Series Information:

The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.
Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

Legend - Sound related features
- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

Legend - General features
- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Engineering earthworks
- Embankment
- Cutting

Legend - Non-engineering earthworks
- Embankment
- Cutting

(labelled with Assessment Location ID reference number
for details of the assessment results see relevant Vol 5 Appendix SV-003)

(labelled with Measurement Location reference code)
Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments

Community Forum Area CFA23: Balsall Common & Hampton in Arden

Legend - General features
- Engineering earthworks
- Non-engineering earthworks
- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- County boundary
- Borough boundary
- Community forum boundary

Legend - Sound related features
- Cutting
- Embankment
- Baseline measurement location
- Airborne sound assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound and vibration assessment location
- Baseline measurement location

(labelled with Assessment Location ID reference number)

(labelled with Measurement Location reference code)

For Continuation Refer to Map Number SV-01-051

Scale at A3: 1:10,000

Date: 29/11/13

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Ordnance Survey Licence Number 100049190.
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LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

CFA24 | Birmingham Interchange and Chelmsley Wood

SV-01 - Operational Sound Contour Maps and Likely Significant Effects
SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)
SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
SV-04 - Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments
SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- black lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.
Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme. The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vo2 and Vo6.

Key items on the map include the following:

- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
- Blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- The study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
- The calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
- Sound contours representing sound produced by the new railway (displayed in a simpler manner than on SV-01 in order not to obscure other features on the map series);
- The assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and
- Labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.
Legend - General features
- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features
- Engineering earthworks: Embankment
- Non-engineering earthworks: Cutting
- Envisaged mitigation to avoid / reduce significant noise effects:
  - Landscaping and/or fence barriers
  - Engineering e.g. cuttings (green tunnels separately marked)
  - Envisaged measures further reducing noise effects:
  - Other environmental e.g. landscaping
  - Engineering e.g. cuttings

Legend - Sound study area
- Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)

* Labelled with total barrier height above rail level

<table>
<thead>
<tr>
<th>Potential noise effect</th>
<th>Residential</th>
<th>Non-residential &amp; quiet areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daytime L_{Aeq,T} (T=07:00 to 23:00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 40 dB</td>
<td>&lt; 50 dB</td>
<td></td>
</tr>
<tr>
<td>40 to 45 dB</td>
<td>50 to 65 dB</td>
<td></td>
</tr>
<tr>
<td>45 to 50 dB</td>
<td>55 to 65 dB</td>
<td></td>
</tr>
<tr>
<td>50 to 55 dB</td>
<td>60 to 65 dB</td>
<td></td>
</tr>
<tr>
<td>&gt; 55 dB</td>
<td>65 to 70 dB</td>
<td></td>
</tr>
</tbody>
</table>

| Night-time L_{Aeq,T} (T=23:00 to 07:00) | | |
|-----------------------------------------|-------------|
| Likely significant effect on dwellings indicated by * or + avoided by noise insulation |
| Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# |

Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004. Likely significant effect indicated by OSV#-N#.
### M6 Motorway Box Structure

**NORTH WARWICKSHIRE DISTRICT**

**SOLIHULL DISTRICT**

For Continuation Refer to Map Number SV-02-055

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### Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)

#### Panel A

**Legend - General features**
- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary

**Legend - Sound related features**
- Engineering earthworks: Embankment, Cutting
- Non engineering earthworks: Embankment, Cutting

<table>
<thead>
<tr>
<th>Sound Level (L_{1eq,T})</th>
<th>Residential</th>
<th>Non-residential &amp; quiet areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Night-time (T=23:00 to 07:00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 55 dB</td>
<td>Likely significant effect on dwellings indicated by X or avoided by noise insulation</td>
<td></td>
</tr>
<tr>
<td>40 to 55 dB</td>
<td>Effect dependent on sound level change. See Panel B and significance criteria. Likely significant effect on groups of dwellings and associated facilities indicated by OSV-CIF</td>
<td></td>
</tr>
<tr>
<td>&lt; 40 dB</td>
<td>Generally no adverse effect expected</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sound Level (L_{1eq,T})</th>
<th>Residential</th>
<th>Non-residential &amp; quiet areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daytime (T=07:00 to 23:00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 65 dB</td>
<td>Likely significant effect on dwellings indicated by X or avoided by noise insulation</td>
<td></td>
</tr>
<tr>
<td>50 to 65 dB</td>
<td>Effect dependent on sound level change. See Panel B and significance criteria. Likely significant effect on groups of dwellings and associated facilities indicated by OSV-CIF</td>
<td></td>
</tr>
<tr>
<td>&lt; 50 dB</td>
<td>Generally no adverse effect expected</td>
<td></td>
</tr>
</tbody>
</table>

---

### Operational airborne sound impacts at buildings

#### Panel B

**Legend - Sound related features**
- Committed developments (label as CFA#/#)
- Envisaged mitigation to avoid / reduce significant noise effects:
  - Landscaping and/or fence barriers
  - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged measures further reducing noise effects:
  - Other environmental features e.g. landscaping
  - Engineering e.g. cuttings

**Map Reference:** SV-02-054a

**Map Name:** Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)

**Community Forum Area:** CFA24: Birmingham Interchange & Chelmsley Wood

---

The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.
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LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

CFA25 | Castle Bromwich and Bromford
SV-01 - Operational Sound Contour Maps and Likely Significant Effects
SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)
SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
SV-04 - Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments
Main Map Legend

- Route in tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- County boundary
- District/Borough boundary

Map sheets included
- in this community forum
- not included in this community forum

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vo2 and Vo2b.

Key items on the map include the following:

- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
- the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
- sound contours representing sound produced by the new railway (displayed in a simpler manner than on SV-01 in order not to obscure other features on the map series);
- the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and
- labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.
HS2 (rail only) sound level $L_{peak,T}$

<table>
<thead>
<tr>
<th>Night-time $L_{peak,T}$ (T=23:00 to 07:00)</th>
<th>Daytime $L_{peak,T}$ (T=07:00 to 23:00)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely significant effect on dwellings indicated by $F$ or $G$, avoided by noise insulation</td>
<td></td>
</tr>
<tr>
<td>Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-N$^*$</td>
<td></td>
</tr>
</tbody>
</table>

| Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004. Likely significant effect indicated by OSV-N$^*$. |

Legend - General features
- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features
- Landscaping and/or fence barriers*
- Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged measures further reducing noise effects (e.g. landscaping, engineering etc.)

Airborne sound study area
- Potential additional noise insulation (triggers by maximum sound levels at night)$^{1,2}$
- Potential additional noise insulation ( triggered by WHO Night Noise Guidelines Interim Target)$^{1,2}$
- Potential noise insulation ( triggered by Noise Insulation Regulations 1996)$^{1,2}$

* Labelled with total barrier height above rail level

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-001-000

Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV-N$^*$
### Operational Sound Contour Maps and Likely Significant Effects

**Legend - General features**
- Road in tunnel train tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- Borough boundary

**Legend - Sound related features**
- Engineering earthworks
  - Embankment
  - Cutting
- Non-engineering earthworks
  - Embankment
  - Cutting

**Legend - Sound related features (cont.)**
- Envisaged mitigation to avoid/ reduce significant noise effects:
  - Landscaping and/or fence barriers
  - Engineering e.g. cuttings (green tunnels separately marked)
  - Other environmental e.g. landscaping
  - Engineering e.g. cuttings

**HS2 (rail only) sound level $L_{peak, T}$**

<table>
<thead>
<tr>
<th>Night-time $L_{peak, T}$ ($T=23:00$ to $07:00$)</th>
<th>Daytime $L_{peak, T}$ ($T=07:00$ to $23:00$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely significant effect on dwellings indicated by $\mathbf{F}$ or $\mathbf{X}$ avoided by noise insulation.</td>
<td></td>
</tr>
<tr>
<td>Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# endurance.</td>
<td></td>
</tr>
<tr>
<td>Effect dependent on sound-level change and significance criteria. Likely significant effect on dwellings indicated by OSV#-N#.</td>
<td></td>
</tr>
</tbody>
</table>

* Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV-004. Likely significant effect indicated by OSV#-N#.

**Legend - Sound related features**
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target). *(l)*
- Potential noise insulation (triggered by Noise Insulation Regulations 1996). *(l)*

**Airborne sound study area**
- Likely significant effect on dwellings indicated by $\mathbf{F}$ or $\mathbf{X}$ avoided by noise insulation.
- Likely significant effect on dwellings and associated facilities indicated by OSV#-C# endurance.
Operational Noise and Vibration Impacts

Legend - Sound related features
- Commitment developments (label as CFA#/#)
- Envisaged mitigation to avoid/reduce significant noise effects:
  - Landscaping and/or fence barriers*
- Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged measures further reducing noise effects:
  - Engineering e.g. cuttings
- Airborne sound study area
- Ground-borne sound & vibration study area
  - Residential and non-residential
  - Highly sensitive non-residential
  - Airborne sound and vibration assessment location
  - Ground-borne sound and/or vibration assessment location
  - Airborne sound, ground-borne sound and/or vibration assessment location
  - Minor ground-borne noise or vibration impact

Legend - Engineering earthworks
- Embankment
- Cutting

Legend - General features
- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Potential noise effect

- Generally no adverse effect expected
- Minor adverse (3dB to 5dB)
- Moderate adverse (5dB to 10dB)
- Major adverse (>10dB)
- Beneficial (<3dB)

Change in sound level (LpAeq,T day/night)

For Details see relevant Volume 5 Appendix SV-004

**Potential noise insulation (triggered by WHO Night Noise Guidelines 2009)**
The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.
Legend - General features
- Engineering earthworks
- Non-engineering earthworks
- Embankment
- Cutting

Legend - Sound related features
- Airborne sound and/or vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Baseline measurement locations

Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments

Community Forum Area CFA25: Castle Bromwich & Bromford

Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments

Community Forum Area CFA25: Castle Bromwich & Bromford

For Continuation Refer to Map Number SV-01-066

(for details of the assessment results see Vol 5 Appendix SV004)
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LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

CFA26 | Washwood Heath to Curzon Street

SV-01 - Operational Sound Contour Maps and Likely Significant Effects
SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)
SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
SV-04 - Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments
SV-01 presents the predicted operational sound from the new railway. The sound levels from the new railway (expressed as LpAeq,T) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.
Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme. The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

Key items on the map include the following:

- The Proposed Scheme (the proposed railway alignments and surrounding associated earthwork/roads);
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
- the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
- sound contours representing sound produced by the new railway (displayed in a simpler manner than on SV-01 in order not to obscure other features on the map series);
- the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and
- labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.
### Panel A

<table>
<thead>
<tr>
<th>Night-time $L_{eq,T}$ (T=23:00 to 07:00)</th>
<th>Daytime $L_{eq,T}$ (T=07:00 to 23:00)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 55 dB</td>
<td>&gt; 60 dB</td>
</tr>
<tr>
<td>40 to 55 dB</td>
<td>45 to 60 dB</td>
</tr>
<tr>
<td>&lt; 40 dB</td>
<td>&lt; 45 dB</td>
</tr>
</tbody>
</table>

**Legend - General features**
- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary

**Legend - Sound related features**
- Engineering earthworks
  - Embankment
  - Cutting
- Non-engineering earthworks
  - Embankment
  - Cutting

### Panel B

**Legend - Sound related features**
- Committed developments (label as CFA#/#)
- Envisaged mitigation to avoid/reduce significant noise effects:
  - Landscaping and/or fence barriers
- Envisaged measures further reducing noise effects:
  - Other environmental features e.g. landscaping
  - Engineering e.g. cuttings
- Airborne sound study area
- Ground-borne sound & vibration study area
- Airborne sound and vibration study area
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Minor ground-borne noise or vibration impact

---

**Military Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)**

- Major adverse (>10dB)
- Moderate adverse (5dB to 10dB)
- Minor adverse (3dB to 5dB)
- Negligible (<3dB)
- Beneficial (<-3dB)

---

**Legend - Sound related features**
- Airborne sound level $L_{eq,T}$
- Potential noise effect:
  - Likely significant effect on buildings indicated by $\times$ or $\times$ avoided by noise insulation
  - Effect dependent on sound level change, see Panel A and significance criteria. Likely significant effects: on groups of dwellings and associated facilities indicated by OCSV24-CP

---

**Operational noise and vibration impacts at buildings change in sound level ($L_{eq,T}$, day/night)**

- Major adverse (>10dB)
- Moderate adverse (5dB to 10dB)
- Minor adverse (3dB to 5dB)
- Negligible (<3dB)

---

**Effect dependent on sound level change, see Panel A and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OCSV24-CP**

---

**Potential noise insulation (triggered by maximum sound levels at night)**

---

**For further details see Volume 5 Appendix SV-004. Likely significant effect indicated by OSV#-N#2**

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**Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)**

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**Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)**

---

**Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C#2**

---

**Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C#2**
The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.
Map Series Information:

The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

Route in tunnel
Route on surface
Depot, station, headhouse or portal building
Community forum boundary
Existing railway station
County boundary
District/Borough boundary

Map sheets included in this community forum
Map sheets not included in this community forum

Community Forum Area CFA26:
Washwood Heath to Curzon Street

Map Name
SV-04-INDEX-CFA26

Index Map of:
Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments

Community Forum Area CFA26:
Washwood Heath to Curzon Street

Map Number
SV-04-069

Route in tunnel
Route on surface
Depot, station, headhouse or portal building
Community forum boundary

Scale at A3: 1:30,000

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Map Name
SV-04-070

Route in tunnel
Route on surface
Depot, station, headhouse or portal building
Community forum boundary

Scale at A3: 1:30,000

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