

Balsall Parish Council response to the consultation on the HS2 Phase One environmental statement

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I do NOT wish this response to be treated as confidential.

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1. Introduction

1.1 The respondent

The Parish of Balsall lies in the eastern part of Solihull borough within Community Forum Area (CFA) 23.

The route of HS2 phase 1 passes through the neighbouring Parish of Berkswell. Part of Balsall Parish is affected by road works associated with the scheme, but the major effects on the Parish are due to the general environmental impacts discussed in this response.

1.2 Purpose

This report has been prepared in response to the consultation on the HS2 Environmental Statement, whose purpose is to ensure that the decision taken by Parliament at Second Reading of the Bill is informed by the public's views on the Bill's environmental impacts.

1.3 Arrangement of response

The next section gives an outline of the key decisions that have shaped the HS2 scheme. After that, the environmental impact of each of the fourteen environmental topics used by HS2 Ltd is discussed. The final section indicates how the environmental impacts could be mitigated.

Observations are made generally in a south-to-north sequence.

2. The environmental damage from HS2

2.1 Valuing the environment

It is not easy to put a value on environment features, but methods continue to be developed, a good example being the CAVAT system for trees. Other approaches can be to assess the costs to create replacement features, or to quantify the cost for users to travel to equivalent alternative facilities, or to derive valuations subjectively, through focus groups.

2.2 The key decisions characterising HS2

The major environmental impacts of the HS2 scheme are the result of several key decisions. These derive from the remit given to HS2 Ltd in early 2009.

The design speed of 400 km/h means the route has to be virtually straight, and gives rise to profligate energy consumption, heavy maintenance, disproportionate safety measures, intrusive security precautions, and significantly higher construction costs.

The construction of the scheme to the continental GC gauge makes HS2 incompatible with all other railways in the country and passengers will experience difficulty in boarding due to the low platform height.

The HS2 network is described as a "Y". However, routing the line westwards toward Heathrow, before turning north, puts the stem of the Y onto a green-field route. There is poor connectivity with existing networks, and greatly increased travel at each end of the journey.

2.3 Attribution of environmental damage to causes

In the following section, the observations on each environmental topic are concluded with a brief description of how the environmental impact is affected by the key project decisions.

3. Detail observations on environmental topics

3.1 Agriculture, forestry and soils

3.1.1 Loss of agricultural land

Farms all along the route in neighbouring parishes will suffer significant land loss, severance of the routes needed for their business, and denial of grazing land due to the noise impact of the trains. The construction phase will occupy large areas of land on a temporary basis, which could cause farms to go out of business. The land itself, and the drainage system, may be hard to return to agriculture.

It seems likely the scheme will result in the diversion of agricultural land to other uses, with a consequent loss of amenity and attractiveness for the residents of Balsall Parish.

3.1.2 Attribution of environmental impact to project decisions

The straightness of an ultra-high speed line maximises the loss and severance of agricultural land. It is likely many holdings will become uneconomic during the construction phase. The noise from high-speed operation will prevent grazing near the line.

3.2 Air quality

3.2.1 Dust

During construction, air quality will be degraded by NO₂ and PM₁₀ emissions, and by dust generated during earthmoving or blown from stockpiles. During operation, NO₂ and PM₁₀ emissions from road traffic will be increased and affect new areas due to changes in the road layout.

Mitigation measures are proposed, but the provisions need strengthening (see §3.15.8).

There are concerns about dust sources close to Balsall Parish in Park Lane, Marsh Lane, and the A452.

The locations of material storage sites at Park Lane and Marsh Lane are unsuitable, and they should be relocated.

Similarly, the proposed construction haul routes through the Parish will cause an unacceptable risk of impaired air quality.

Consequently, there is a need for more direct and effective control measures in the Code of Construction Practice.

3.2.2 Attribution of environmental impact to project decisions

Construction of the scheme on a straight alignment increases the quantity of dust and fumes generated.

3.3 Climate

3.3.1 Energy consumption/ CO₂

During construction, the design of the scheme for high speed means more earth-moving, larger structures, and more extensive mitigation measures than a new conventional railway. Greenhouse Gas Emissions would be considerably greater than for capacity-enhancement of the existing railway network.

During operation, energy consumption is expected to be three times that of a railway operating at 200 km/h, with a serious adverse impact on emissions. The need for maintenance and consumable materials is also greatly increased.

It is generally considered that mass-transit transport systems only become efficient with respect to energy consumption if occupancy is high. With the scheme layout focused on a few key cities, it is hard to see how this will be achieved during much of the operating day.

3.3.2 Attribution of environmental impact to project decisions

The major earthmoving and civil engineering for a straight route will create huge quantities of CO₂. The network plan and use of the full speed capability will result in large unnecessary energy and materials consumption.

3.4 Community

3.4.1 Sense of place

The proposed intermediate station on HS2 is named Birmingham Interchange, even though it is 15 km from Birmingham, well outside the Birmingham administrative area, and with no apparent interchange function. It is a car-based station serving Solihull and north Warwickshire. To preserve community identity, it should be named Bickenhill, Stonebridge or some other name with a local resonance. This would help avoid confusion, as well as bringing a cultural benefit.

Confusion is already evident amongst travellers to the area, and moves are afoot to re-name Birmingham International Station as Birmingham Airport Station, to make clear it is not the city centre.

The allocation of a wrong and uncharacteristic name reduces the identity of the whole area.

3.4.2 Residential amenity

HS2 will have a dramatic impact on the amenity of the area, during both construction and operation. At present, residents enjoy the peaceful ambience, landscape, outdoor leisure opportunities, and heritage. They might agree with the former Secretary of State for Transport's remark¹: "this is not some Constable country", but damage to these characteristics has a direct negative effect on the quality of life.

These negative effects are detailed in other sections of this consultation response. Perhaps of greatest concern is noise and vibration, for which see §3.11. Landscape and visual effects (§3.8.3), traffic and transport (§3.12) and

¹ The Telegraph, 11 Dec 2010, Philip Hammond: high-speed rail will be a 'pleasant surprise' for many

recreational rights of way (§3.4.5) are other priorities, but all environmental topics bear on every resident to a greater or lesser extent.

The choice of a green-field route has maximised the disturbance expected during construction. Construction will generate significant intrusion from noise, dust, traffic, and light pollution.

There is a concern that the Bickenhill Station will result in increased car parking problems in nearby villages. Inconvenience is already caused by people parking, at no cost, and then going a short distance by public transport to Birmingham Airport or the NEC. The motivation is to avoid the high car parking charges at those facilities. Communities affected include Balsall Common, Hampton-in-Arden, and Meriden.

There is no desire to introduce charging or further restrictions in Balsall Common, so the remedy is to ensure that the charge for car parking at the Bickenhill station is either included in the HS2 ticket price, or else set at a modest level.

3.4.3 Community facilities

The effect of the scheme and its construction on community infrastructure seems to be recognised, but there are no proposals for mitigation or compensation. The scheme sponsor needs to accept responsibility for all adverse effects, and provide remedies. The operators or users of community assets should not have to take on the burden of finding alternatives or their own work-around schemes.

Nearby facilities that are to be lost or badly impaired include:

- The Lavender Hall Fishery
- Berkswell Clay Pigeon Club
- The Marsh Lane Nature Reserve
- The Heart of England Aeromodellers site
- The Olympia Motorcycle Track, Middle Bickenhill.

3.4.4 Community fund

There should be an enduring and robust form of community compensation, to be funded by the eventual operators of the HS2 scheme. The scheme should include initial and regular payments to offset the loss of public facilities, open space, and Public Rights of Way.

In addition, there should be penalty charges for infractions of control limits placed on noise, emissions, pollution, and other nuisances. These would be paid into the fund after impartial adjudication.

A fund committee should be established to allocate money to community projects in the area of Solihull borough adversely affected by the HS2 scheme.

3.4.5 Recreational Public Rights of Way

The network of Rights of Way is a major recreational resource for the whole area, and is one of the reasons that people choose to relocate to an area like Balsall Parish. The Kenilworth Greenway is a major community asset. Although its status is a Park, not a Public Right of Way, its primary function is as a vehicle-free communication route for walkers, cyclists, and equestrians between Berkswell Station and Kenilworth.

The HS2 scheme has considerable adverse impacts on the Greenway, both during construction and operation. The Greenway needs to be kept open during construction, and restored afterwards to the highest standard of amenity. It is vital that access and use continues to be convenient and safe, particularly for equestrians

The scheme promoter must certify that all parts of the Greenway are safe for horses and their riders.

The Parish Council is aware of numerous proposed diversions to Rights of Way in neighbouring areas. In many cases, the proposals are less than ideal and entail loss of amenity or undue prolongation of walking routes. High priority should be attached to restoring footpaths close to their original alignments.

3.4.6 Attribution of environmental impact to project decisions

The straightness of the line for ultra-high speed operation maximises severance and intrusion.

Construction will be particularly disruptive due to the large-scale transfer of spoil between the cut and fill sections of the straight alignment.

3.5 Cultural heritage

3.5.1 Overview

The commentary in the CFA 23 report gives a disappointing impression of both the antiquity and extent of the cultural heritage of the area.

Within our area, the (almost) total prevalence of Anglo-Saxon land-form place-names suggests significant settlement in the period following the decline of the Romano-British culture. There are indications the landscape was heath and moorland on the higher ground, although this is not, perhaps, incompatible with the phrase "heavily wooded" used in the CFA reports.

The report suggests the name Balsall is derived from a personal name, but it could also be a toponym derived from "bulge-hollow", which would be appropriate for a settlement near an almost full-circle loop of the River Blythe.

3.5.2 Protection of unidentified cultural assets

The large-scale earthmoving required for the construction of HS2 poses a major threat to archaeological traces that lie undetected in the soil. However, the removal of the upper layers of soil presents a tremendous opportunity to discover, research, and record evidence from the least-understood periods of our history.

The provisions of the Code of Construction Practice are inadequate as they stand, which is why dedicated archaeologists must be in attendance to monitor the work (see §3.15.9).

Areas of known crop-marks will need to be thoroughly investigated for dating evidence including artefacts and paleoethnobotanical deposits.

Trial excavations, field walking, and further documentary research should also be done where appropriate.

3.5.3 Mitigation of impacts on identified cultural assets

The identified cultural assets include built heritage, woodlands and hedgerows, and archaeological traces.

Some of these will experience destruction or serious impacts. Mitigation measures should include further realignment of the route of the scheme, protection zones during construction, full archaeological excavation and recording, and conservation and consolidation. For natural assets that cannot be protected, compensation should be provided through the creation of substitute environments. Individual protection plans should be prepared and implemented.

3.5.4 Attribution of environmental impact to project decisions

Numerous listed buildings and cultural assets will be impaired or lost due to the straightness of the route for ultra-high speed.

3.6 Ecology

3.6.1 Habitat loss and fragmentation

There are serious impacts on habitats and the connectivity between them, with consequential harm to important species of flora and fauna. The reporting and analysis is inadequate to determine net losses and gains, combination and connectivity effects, indirect impacts of noise and hydrology, and whether effects are truly temporary.

There is a major threat to the Kenilworth Greenway, both from the railway itself and the use of the Greenway during the construction phase. It is essential that the felling of mature trees is minimised and that the root systems of trees are effectively protected throughout the construction operations. Reinstatement of the whole environment should be guaranteed.

There needs to be a clear guarantee of replanting of all affected areas with equivalent species, with reinstatement of the topsoil.

Throughout the area, hedgerows will be lost, and although substitution is proposed, implementation to the best standard needs to be assured.

3.6.2 Severance

Apart from the direct loss of habitat, the line will be an impenetrable barrier for most wildlife. It will be securely fenced in all places, including beneath viaducts, because of the terrorism threat. Migration routes need to be provided, using either "green bridges" or by the use of open viaduct structures.

3.6.3 Management of the ecological impacts

A wide range of measures has been offered by the scheme sponsor, but the measures need to be turned into firm action plans, with guaranteed implementation, in advance of construction activity. Because of the uncertainties involved with the creation of alternative habitats and translocation of species, it is essential these tasks are started early and closely monitored.

The conformance to standards is not clear. There needs to be compliance with:

- the European Environmental Impact Assessment criteria
- the UK Chartered Institute of Ecology and Environmental Management standards, including those for integration of Climate Change and

Biodiversity considerations, and assessment of Indirect and Cumulative Impacts and Interactions

- BS 8545 *Trees: from nursery to independence in the landscape*.

Biodiversity offsetting is proposed, but there needs to be standardized implementation and monitoring methodology. There should be a commitment to seek an improvement to the natural environment, as laid down in the National Planning Policy Framework.

Where tree planting is to be used as an offset, a replacement ratio of 5-for-1 is required to ensure satisfactory replacement. Advice on species and locations should be agreed with local interests through the relevant parish and town councils.

There needs to be an established process for the long-term monitoring of the ecological impacts and mitigation/ compensation arrangements. Where adverse affects develop, the scheme operator should be required to provide funding for, and to take, restorative measures.

The on-going monitoring and management of the ecological impacts should be done through a process that involves Solihull Metropolitan Borough Council, the local parish and town councils, national organisations, and local special-interest groups.

3.6.4 Attribution of environmental impact to project decisions

The straightness of the line for ultra-high speed operation makes it impracticable to avoid damage to large areas of mature woodland and wetland habitats.

Ultra-high speed operation is a direct threat to barn owl populations near the line.

3.7 Electromagnetic Interference

3.7.1 Signal interference

The main concern of the scheme sponsor seems to be any interference effect on the scheme itself, though there is admission that tower cranes can cause disturbance to radio and television reception in the construction phase.

It is apparent there has been no assessment of the interference to radio signals due to elevated sections of the railway and modified roads. It is thought the UHF band is the most susceptible to blocking and multi-path interference.

The UHF band is used for telephony, television, emergency services, and navigation:

- 400 Mhz (75 cm) Tetra
- 470-860 MHz (35 - 64 cm) Digital TV
- 1200 and 1600 MHz (19/ 25 cm) GPS, GLONASS, COMPASS, Galileo
- 1710–1880 MHz (16-17.5 cm) 2G cellular
- 1900–2170 MHz (13.8-15.8 cm) 3G cellular

High speed trains will consume several times the 5 MW peak power consumed by current trains, so there will be very heavy currents in the electrical supply system.

It is not possible to comment at present on whether the disturbance due to the construction and operation of HS2 will be significant. A full analysis should be carried out to determine the extent of the problem, and the best way to restore acceptable signal strengths.

3.7.2 Attribution of environmental impact to project decisions

The ultra-high speed specification needs a straight alignment with high embankments and viaducts, and heavy currents in the electrical system. This increases the possible disruption of a wide range of signals used for telephony, television, and navigation.

3.8 Land quality

3.8.1 Contamination

There is a risk of land contamination from earlier land-fills, and from construction and operation of the scheme.

Run-off into the water system would be particularly damaging, as would residues left on land that is returned to agriculture. The monitoring of pollution issues should be included in the remit of the ecologists employed through the provisions of the Code of Construction Practice (see §3.15.10).

3.8.2 Mineral resources

The main impacts of the scheme are the probable advancement of gravel/aggregate extraction, and the sterilisation of deep coal deposits.

There are existing agreements for the management of damage arising from extraction of the local aggregate resources.

3.8.3 Attribution of environmental impact to project decisions

The straightness of the route for ultra-high speed operation makes it more difficult to avoid land quality issues.

3.9 Landscape and visual assessment

3.9.1 Landscape amenity

The visual intrusion of the proposed scheme ranks second only to noise disturbance in the list of major concerns for local residents. Although the impacts during construction will be undesirable, it is the permanent effects during operation of the scheme that are of highest significance.

The cornerstone of planning policy in the region has been the preservation of the Meriden Gap. This epithet is applied to the open Arden landscape between the conurbations of Birmingham and Coventry. Unfortunately, the HS2 scheme cuts through the Gap and jeopardises its viability all the way from its narrowest point at Balsall Common, through the corridors between Bickenhill and Meriden, and between Chelmsley Wood and Coleshill.

Due to the major impact on agriculture (see §3.1), it is probable that some farms will become uneconomic and the land will become derelict. No account has been taken in the landscape assessment of inappropriate development arising from the economic damage done to agricultural businesses.

When land is released back to agriculture after the construction phase, fragmented areas might no longer be viable, and bring pressure for conversion

to solar farms, storage, light industrial uses, or other purposes that reduce the openness and visual amenity.

The most effective single remedy for the visual intrusion is the proposed realignment to the east, made possible by a tunnel at Balsall Common (see §4.3 below). This would greatly reduce the impact of the railway itself, and reduce the need for highway changes.

The alternative proposal, for a tunnel on the current proposed alignment (see §4.4 below) brings relief for the tunnelled area, but nothing for areas to the north of Balsall Parish. In addition, there is likely to be significant visual impact from the cutting leading to the tunnel portal.

An assessment of the visual impact of the scheme has to take account of the Overhead Line Equipment. The conductor wires are some 5 m above the rails, and the gantry pillars some 7 m above the rails. As well as these structures, full-height noise barriers, of similar height, are likely to be needed because of the high aerodynamic noise generated at the level of the conductors, by trains running at 360 km/h.

It is also noted that the proposed Limit of Deviation allows the line to be constructed 3 m higher than the nominal values in the Section diagrams.

Consequently, there are parts of the line where features will approach 20 m above the ground level. The visual intrusion, combined with tree loss, will seriously degrade the present appeal of the landscape of this largely rural area, and damage the setting of many grade 2 listed buildings. Residents and visitors are highly sensitive to these effects.

It is therefore critical to reduce the elevation of embankments, viaducts, and bridges wherever possible, and to ensure that everything is done to harmonise the new features with the existing landscape.

3.9.2 Design of structures

From the information given, it would appear the intention is to use a part-through concrete structure design for bridges and viaducts, with a depth of 2.8 m below the rails on short spans, and more on longer structures. A structural side wall some 1.5 m above rail height would be included, but, above this, any noise barrier (and the Overhead Line Equipment) would not contribute to the bridge structure.

An alternative would be to use a full through-truss structure. The structure below the rails would be some 1.5 m shallower. Above the rail level, either side of the tracks, integral walls of increased height would provide the structural strength. The lateral walls would have a secondary noise barrier function, and could also support the Overhead Line Equipment.

The benefits of a through-truss structure are twofold. Firstly, the rail elevation and the overall elevation could be reduced by 1.5 m. Secondly, the visual silhouette of bridges and viaducts would be reduced by the same amount.

3.9.3 Architectural design

Bridges and viaducts, particularly those with noise barriers and Overhead Line Equipment, will be prominent features in the landscape, and will require a good standard of design that harmonises with adjacent buildings and structures.

Aspects that can be optimised to lessen the intrusion of noise barriers include:

- colour
- texture
- patterning
- edge profile.

Lighting can be used to diminish silhouette effects.

3.9.4 Screening plantings

The planting of trees is essential to mitigate the landscape and visual impact of the scheme. Suitable foliage can conceal the constructed works, and also break up the outlines of buildings and the linearity of the noise barriers and Overhead Line Equipment. In addition, plantations can reduce the intrusion by disguising features as natural parts of the landscape.

Screening foliage needs to be planted early in the work programme.

Fast-growing species should be planted close to elements such as noise barriers, to achieve a dense green wall.

A varied mixture of native species should be arranged to disguise the "green wall". These plantings should be arranged irregularly, in depth, to create a natural effect. Large numbers of young tree whips should be interspersed with more mature specimens. The recommendations of BS 8545 *Trees: from nursery to independence in the landscape* should be followed.

The nominated undertaker will need to make enduring agreements for the on-going care and maintenance of the screening plantings. This would include:

- repair and removal of stakes and ties
- watering and drainage
- thinning and weeding
- disease management
- lopping and felling
- replacement plantings.

3.9.5 Security fencing

Little detail has been given about security fencing of the line. It is understood that for maximum effectiveness, noise barriers will be close to the line, while cable troughs and access tracks could result in a trace width, across fences, of 22 m.

It is anticipated that, where the noise barriers do not provide security, steel palisade fencing will be fitted along the base of embankments, around viaduct columns, and on the crest of cuttings.

It is important that the fences are coloured to tone into the environment. In rural settings, olive or yellow-green would be preferred. In built-up settings, chocolate brown or terracotta would be acceptable. The colour of the fencing should be approved by the local parish or town council.

The nominated undertaker will be expected to enter into undertakings to maintain the fencing in good repair.

3.9.6 Landscape and visual issues

The line crosses the West Coast Main Line on a bridge 48 m long. The elevation is 9.69 m, to provide 6.91 m clearance. The West Coast Main Line underbridge should be redesigned in accordance with §3.9.2 to reduce the rail elevation to 8.2 m with zero permitted upward variation. The height above datum would be reduced from 65.21 m to 63.71 m, with no upward variation.

The Balsall Common Viaduct over Truggist Lane and Bayleys Brook should be changed to a through-truss design in accordance with §3.9.2, and lowered by 1.5 m. (The current rail elevation above Truggist Lane is 9.51 m.) The height above datum would be reduced from 62.11 m to 60.61 m, with no upward variation.

The A452 viaduct over the line, Work 3/9, will be about 1.6 km long, with a road level 10.3 m above the rails, and a maximum elevation of the road above the ground of 13.15 m. These heights should be made the maximum permitted for the Work.

To contain traffic noise and stray lighting, the parapets will be of significant height, and the whole design of the viaduct needs to be carefully detailed in accordance with §3.9.3 to suit the environment.

3.9.7 Light pollution and nuisance

At night, operation of the scheme has the potential to cause serious visual intrusion from illuminated carriages, pantograph arcing, lighting of stations, signal lamps, and elevated highways. Some aspects will be mitigated by the noise barriers, which are needed throughout the Solihull section of the route.

During the construction phase, nocturnal working using high-intensity lighting could cause major disturbance, and effective control of work outside the core hours is required (see §3.15.4). Work on the elevated sections of the route would be of particular concern.

Floodlighting for nocturnal maintenance is another major issue that remains unquantified. As a general rule, no light source should be mounted higher than the adjacent noise wall, thus avoiding any light nuisance.

In the medium term, the availability of night-vision equipment at reasonable cost will allow work to be conducted with no, or very low, levels of artificial illumination. Similarly, vehicles are already being fitted with vision sensors and it will become unnecessary to provide artificial illumination of carriageways and car parks.

3.9.8 Attribution of environmental impact to project decisions

The ultra-high design speed results in a green-field route that does not conform to the land profile and cuts across existing transport corridors. The elevated sections and the road overbridges, will be hugely intrusive.

3.10 Socio-economics

3.10.1 Local employment

It is noted that job losses in the agricultural sector are not assessed at the local level.

Impairment of local employment, during both construction and operation of the scheme, appears to be based solely on the loss or relocation of premises, and not the wider environmental impacts including major traffic disruption.

HS2 Ltd are using a job loss factor of 12% of employment directly impacted, based on experience with the 2012 Olympics. However, the pattern of employment and factors affecting trade are entirely different in the rural Midlands. A marginal loss of trade or premises could be sufficient to undermine the viability of a business.

Potential job displacement or losses are listed as 100 in CFA18, 20 in CFA23, 30 in CFA24, 220 in CFA25, and 2600 in CFA26. In addition, the scheme has put paid to planned job creation amounting to 600 in CFA18 and 7100 in CFA26.

These losses do not include reductions in agricultural employment, nor indirect losses to environmental factors, "critical mass", and combined effects. Much of the planned route in Solihull borough is used for agricultural production. The loss of land area is compounded by the shape and accessibility of what is left. Furthermore, the noise disturbance will prevent the use of adjacent land for grazing, for both livestock and horses. Farms losing more than a small area may become completely uneconomic.

A number of farms in the area will have a large proportion of their land taken on a temporary basis during the construction phase, and these will be unable to remain in business.

HS2 Ltd will change travel habits, and the shortened journey times to the NEC and the Airport could reduce the need for over-night accommodation, refreshment, and entertainment. There are several establishments that are suffering already due to the poor performance of the NEC, and their existence will be further threatened by a loss of trade due to HS2.

Industrialisation of the landscape, and the loss of amenity of footpaths, will cut the number of visiting walkers, naturalists, and photographers. People do not wish to walk where they will be blasted by train noise every 2 minutes, nor do they wish to contemplate a synthetic landscape dominated by railway viaducts, road bridges, and noise walls. As was seen during the 2001 Foot and Mouth crisis, domestic tourism is critical to many establishments offering refreshment and souvenirs.

In addition, there is a variety of full-time and casual jobs in the rural economy that will be jeopardised by the disruption in the area.

The influx of the mobile construction workers will doubtless create ancillary employment, but this will be temporary and is no compensation for the damage to established agricultural and non-agricultural businesses. There is little expectation that many construction jobs will go to local people, based on experience with similar projects.

3.10.2 Local economy

The projected benefits of the scheme are claimed to substantially outweigh the potential shorter-term adverse socio-economic effects during the construction phase, but the basis for this is widely challenged.

HS2 Ltd expects 30% of passengers to be travelling on business. The remainder will be commuting or travelling for leisure purposes. The problem for the local economy is whether these categories bring a benefit or a loss.

The effect of quick subsidised transport to the capital could be dire. Quality retail, entertainment, and services could all start melting away, and as establishments lose critical mass, the pull to the stronger economy becomes ever stronger.

Equally, a London weighting allowance might be sufficient to drain vital essential workers - teachers, nurses, police, and so forth - from this area. Not many will travel the other way.

The potential economic harm from HS2 will extend beyond loss of trade and loss of staff. The Midlands will have to carry its share of the operating subsidy and capital costs. There is also concern about the cost of the people mover system, which will contribute little, but whose cost could fall onto the local taxpayer.

To inhibit a net outflow to London of key workers and jobs in retail and leisure, there needs to be a degree of fare regulation. A "carnet" system of multiple tickets bought at one time would discourage the multiple journeys that would be possible in one day with a conventional season ticket. There also needs to be minimum pricing of off-peak tickets and tickets sold as a package with air travel. The ratio of the maximum to minimum price paid for a ticket should be set in the future franchise agreements.

3.10.3 Attribution of environmental impact to project decisions

Due to the effects of the straight-line route on agriculture, recreation, and employment land, there will be a considerable loss of rural jobs. The short journey time could result in a long-term drain of revenue and key workers.

3.11 Sound, noise and vibration

3.11.1 The noise problem

Noise is one of the key concerns of residents near the proposed route of HS2. For most people, it is impossible to avoid or ignore, and the effects on health and well-being have been identified clearly over the years.

Noise is a particularly troublesome problem for the young, old, housebound, or ill, and for domestic animals and wildlife, and for anyone working with them. Sleep that is disturbed by noise causes fatigue, accidents and reduced performance, hypertension, myocardial infarctions, depression, and other mental conditions.

Vibration is a similar problem affecting those close to, or over, noise sources.

For the HS2 scheme, there are a number of sources of noise and vibration:

- the trains themselves
- road traffic that has been diverted or increased in volume by the scheme
- fixed installations such as power supplies and stations
- maintenance activities, particularly those scheduled to take place at night
- construction work and associated transport activity.

The control of noise and vibration issues can be split into several stages:

- control of the noise and vibration at source
- control of the propagation of the noise and vibration
- control of the noise and vibration at the receptor.

The most significant source of noise and vibration for most residents is the trains themselves.

Mitigation of the noise during the propagation stage is essentially through the use of barriers (reflective or absorptive) and of berms.

By the time the noise reaches the receptor, control measures involve excluding the noise or avoiding exposure. Both of these may entail a change in routine that may itself be disturbing.

Unfortunately, key information on the noise and vibration issue is presented in a confused and confusing way that gives the impression the scheme sponsor is trying to obscure or deflect public scrutiny.

Operational noise considerations are confined to that from the trains, with nothing on maintenance activities. The L_{den} day-evening-night parameter, mandated by the European Environmental Noise Directive as a standardised indicator, is not used. More importantly, the peak noise level is at least as relevant as the continuous-equivalent level, due to the short duration noise pulses generated by high-speed trains, yet is largely ignored by HS2 Ltd. In particular, the peak noise level is the key determinant for sleep disturbance.

3.11.2 Noise from HS2 trains

It is known from peer-reviewed technical literature that for high-speed trains, aerodynamic noise becomes predominant above 300 km/h. The aerodynamic sources are higher up the train than are the sources for rolling noise.

The projected peak noise levels, at 25 m from the line, for an HS2 train at 360 km/h are quoted in Technical Appendix SV-001-000 as:

- rolling noise 90 dB at rail height
- body aerodynamic noise 90 dB at 0.5 m above rail height
- raised pantograph noise 82 dB at 5 m above rail height
- total peak noise level of 93 dB.

If trains are run at the full line speed of 400 km/h, the peak noise levels from the wheels, body aerodynamics, and pantograph aerodynamics would increase by 1.3 dB, 3.2 dB, and 3.2 dB, respectively.

However, all these values depend on successful use of advanced technology:

- high quality tracks
- best practice mechanical and aerodynamic design
- 10 dB improvement through aerodynamic design of pantograph
- no recess for pantograph, and no other roof-mounted equipment
- good maintenance of the permanent way and of the aerodynamic features of the trains.

Because it is relatively easy to screen noise emanating at a low level on the train, most concern is focused on the pantograph noise. For this element, the scheme sponsor is confident that significant improvements can be achieved

over current trains, and that these improvements will apply to all trains using the HS2 network, throughout their service life.

However, it is surprising and regrettable that - five years into this major engineering project - the scheme sponsor is unable to demonstrate any hardware, or lay to rest the risk relating to the acceptability of running a train at 360 or 400 km/h through a populated area.

Whilst the intention to specify quieter trains is welcome, it is the actual noise level at the receptor that is critical. Given that reduction of the aerodynamic noise would depend on precise maintenance of the aerodynamic shielding, there needs to be incentives for the operator to do this.

3.11.3 Propagation of train noise

The reduction in peak noise level reported by various sources for a point source is 5 dB to 6 dB for a doubling of distance. The data published by HS2 Ltd, show noise level reductions of -5 dB at 50 m, -10 dB at 100 m, -16 dB at 200 m, and -22 dB at 400 m.

Topography and terrain factors will affect these values. When the line is elevated on a viaduct, it is possible for noise barriers and the structure itself to give greater close-in attenuation of the noise. When the line is in a valley, the attenuation with distance will be less effective.

The natural rate of attenuation is inadequate to prevent noise nuisance, and other than placing the line in a tunnel or deep cutting, the Best Practicable Means for mitigating noise seems to be the installation of line-side absorptive noise barriers.

It is noted that the scheme sponsor is now proposing barriers up to 5 m high (above the rail datum).

However, barriers 7 m high are recognised as necessary to contain noise from the pantograph system. Attenuation greater than 10 dB is possible.

3.11.4 Perception and mitigation at the receptor

Because of the rapid onset and high level of the noise pulse, the continuous-equivalent noise level is not a good indicator of disturbance. Despite repeated requests, and promises from HS2 Ltd, peak noise levels (L_{Amax}) have not been made available.

The World Health Organisation stated in the 1999 that if the noise were not continuous, sleep disturbance correlated best with L_{Amax} , and that effects had been observed at 45 dB or less. The equivalent outside peak noise would be 60 dB.

In the *Night Noise Guidelines for Europe* (2009) the World Health Organisation recommended a continuous-equivalent outside noise level of 40 dB. HS2 Ltd prefers to use the Interim Target level of 55 dB, but the World Health Organisation is very clear that this value can only be considered temporarily, and for exceptional local situations.

Given that all other sources of environmental noise will have decreased significantly in the 15 years before HS2 services build up, a target of 40 dB continuous-equivalent outside noise level is very appropriate. Converting this to a peak noise level gives a value of 57 dB. This 2009 target is consistent with

the interior peak noise levels at which the biological effects of noise on sleep are first observed.

In terms of day-time disturbance, the 1999 World Health Organisation guidance is that a similar continuous-equivalent level of 40 dB is desirable to prevent annoyance during activities carried on outdoors. For discontinuous noise, such as high-speed railway noise, an even lower level would be preferred.

However, the "moderate annoyance" caused by a 10 dB increase in continuous-equivalent level is often tolerated, with a day target level of 50 dB. In contrast, the scheme sponsor is seeking to work to a limit of 65 dB continuous-equivalent noise level, citing as authority *The Noise Insulation (Railways and Other Guided Transport Systems) Regulations* (SI No. 428) dating back to 1996. It is not acceptable to apply standards that will be thirty years out of date when the scheme comes into operation.

When the noise level is unacceptable to the receptor, additional mitigation is required. Sound proofing of buildings is possible, but this means that windows need to be kept shut and that residents are prevented from enjoying the amenity of gardens and outdoor areas. If windows need to be kept shut at night, it is likely that air-conditioning will be required, and this brings further sound proofing challenges.

3.11.5 Noise regulation

Based on the experience of controlling noise from aircraft, it is essential to have mandatory target levels, monitoring stations, and the charging of penalties to discourage infringements. Because of component deterioration experienced in service, and environmental variation, actual measurement is the only way to protect residents near the proposed railway.

In the case of a railway, if the operator has a train that cannot meet the required standard, it is possible for a penalty to be avoided by running the train more slowly.

Accordingly, the scheme should include fixed noise monitoring points at regular intervals, a scale of permitted peak noise levels dependent on distance and topography, a system of spot-checks using portable noise monitors, and a penalty charge system that will ensure compliance.

To contain noise nuisance to a strip 400 m across, a target peak noise level of 57 dB should be set for a distance 200 m from the track-side. This would need a level of 73 dB at 25 m. Given good attenuation of low-level sources, noise barriers are needed to reduce the pantograph noise by 9 dB.

With the data given by HS2 Ltd, this target is achievable on level terrain. In a valley situation, the 200 m distance should be enlarged to reflect a constant level of noise mitigation performance.

This noise level would be enforced by permanent noise monitoring stations located on alternating sides of the line at intervals of about 10 km. It would be necessary to choose locations that provided low background noise, and had suitable access and topography.

The noise monitors should be able to communicate with passing trains, so the drivers would be made aware of noise infringements immediately they have been detected.

Penalty charges would be exacted on the operating company, and paid into the Community Fund (see §3.4.4), as is done with many aircraft noise schemes.

3.11.6 Road noise

In addition to train noise, the area will be subjected to increased road noise, particularly on main routes such as the A452 leading to the Bickenhill station. In addition, traffic flows will be diverted to new areas, and there may be an increase in street parking by users seeking to avoid charges at the station.

There are also a number of high road bridges and viaducts, and these should have parapets to attenuate the noise. In sensitive locations, noise barriers will be required.

3.11.7 Maintenance noise

Overnight maintenance is a major concern. For instance, the need to maintain track alignment and quality will require frequent grinding. This is a noisy operation that can only be done at night. The same applies to relaying the track and tamping of the ballast.

It is essential that during maintenance, the noise barriers are kept in place, any vehicles operating outside the barriers are controlled for quietness, and that the same peak noise levels are enforced as for the trains themselves, i.e. 73 dB peak at 25 m.

3.11.8 Construction noise

Construction noise and vibration will affect a swathe of residential areas. This is due to both site operations and construction traffic.

The application of Best Practicable Means criteria need to be enforced through the Code of Construction Practice and the community engagement process (see §3.15.12).

3.11.9 Noise and vibration issues

The published noise contours do not include the effect of the A452 viaduct over HS2, and noise barriers will be required to reduce noise levels at the adjacent properties to World Health Organisation guideline values given in §3.11.4.

3.11.10 Attribution of environmental impact to project decisions

When trains run at the full design speed, the exponential rise in noise will increase the disruption to all nearby activities, and the necessary noise mitigation will increase visual intrusion.

3.12 Traffic and transport

3.12.1 Construction transport requirements

The construction works for the scheme will generate very large transport requirements. Transport is required for:

- delivery and removal of construction machinery
- distribution of excavated material from cuttings and tunnels to areas of embankment and landfill

- movement of personnel between worksites and accommodation sites
- delivery of materials for construction of bridges, viaducts, and roadways
- delivery of materials for realignment of utilities and watercourses
- delivery of materials for construction of the permanent way, signalling, and Overhead Line Equipment
- delivery of materials for building the station and auto-transformer installations

The main areas of excavation in the Borough are the tunnel and cutting north-west of Burton Green, and the cuttings at Park Lane and Diddington. In the neighbouring CFA25 is the portal for the Bromford tunnel.

The main areas of fill and embankment in the Borough are either side of Truggist Lane, for the A452 viaduct, for the A452 roundabout, and at Chelmsley Wood.

The major structures in the Borough are the overbridges for Waste Lane, Lavender Hall Lane, and the A45, the viaduct for the A452, and the viaducts over the Meriden Road B4102, River Blythe, the M42, and the M6.

The main buildings in the Borough are the Bickenhill Station, and the auto-transformer installations at Burton Green, Bradnocks Marsh, and Bickenhill.

As the line-of-route is constructed, it will become available for transport purposes, but even at this stage, there will remain considerable off-route transport. Unfortunately, many of our local roads are completely unsuitable for construction traffic. Many are lanes with a 2 m width restriction. HGVs are permitted on an access-only basis. They have various bends and pinch-points which already cause traffic difficulties.

In addition, the programme of road closures will divert traffic and cause over-loading of the roads that are still available. Assessments have been made for peak hours, but disruption will occur throughout the day. The impact on public transport, commuters, delivery vehicles, utility vehicles, emergency services, and farm traffic will be very severe.

The minor local roads are used for every type of purpose, including recreational use by horse-riders, cyclists, joggers, and walkers. Also, many are public transport routes, and the reliability of service is already disturbed by minor roadworks or other events.

3.12.2 Construction phase traffic issues

Kelsey Lane and Waste Lane are 'B' classified roads, but cannot accept high volumes of construction traffic without causing major delays. This is a principal route for HGVs.

The protracted closures of Waste Lane for construction is unacceptable and will cause traffic chaos over a wide area. This is the only route for other-than-small vehicles between Balsall Common and the Coventry direction.

Use of Station Road, Truggist Lane, and Hodgetts Lane for construction traffic is unacceptable due to the width and strength of the roads, the fragility of the grass verges and hedges, the closeness of residential properties to the carriageway, and constricted junctions.

The temporary closures of Truggist Lane will cause major inconvenience and divert traffic onto other local roads.

Use of Hallmeadow Road, Station Road, and the car park at Berkswell Station for construction traffic will cause considerable difficulty for residents, users of local businesses, and London-Midland rail passengers. Hallmeadow Road is already used as over-flow parking for the station. An alternative proposal to accommodate existing needs is essential.

Use of Park Lane and Lavender Hall Lane for construction traffic, and the 12-month closure of the latter, will disrupt communications between Berkswell and the A452, and will cause damage and disturbance in the constricted section near the Listed Lavender Hall buildings. These roads are unsuitable for HGVs, and are width-limited to 2 m.

Use of the A452 for construction traffic through the centre of Balsall Common is unacceptable. This road is already over-used by HGVs and further traffic will cause serious difficulty for residents and existing users. The speed limit has recently been reduced from 40 mph to 30 mph, and signal-controlled crossings have been provided in recent years because of the peak hour traffic flows.

The restrictions on the A452 due to construction of the viaduct will be very disruptive, and will have to be limited to off-peak periods and when there is low activity at the NEC.

The changes to the road network approaching, and including, the M42 and M6 will cause very serious difficulties, and it is essential that lane restrictions and closures are phased to prevent the whole area becoming disrupted. Inevitably, traffic will be diverted onto local roads. It may be appropriate to restrict on-street parking temporarily, and this will have to be agreed on a local basis.

3.12.3 Construction phase traffic mitigation

The proposed use of a haul route along the line-of-route is welcomed, but the proposals still impose unacceptable transport demands on the local road network. The overall conclusion is that the plan for constructing the scheme in this area is not viable. The disruption to all forms of local transport for up to 6 years is intolerable.

Many of these difficulties have arisen from the choice of a green-field route that cuts-across rather than follows existing transport routes. Considerable mitigation would be provided by the proposed more-easterly alignment, dependent on a tunnel in the Berkswell/ Balsall Common area (see §4.3 below).

The programme of temporary road diversions and overnight closures will cause considerable inconvenience unless they are properly coordinated, well signed, and there is good advance warning in a comprehensible form to all users. A clear procedure for ensuring this is required.

To reduce the major disruption of road transport by construction traffic, the transport of materials and equipment by air should be adopted. In particular, large capacity lighter-than-air vehicles are expected to be available within the project timeframe. These are being developed by a number of companies, with capacities of 50 t, and potentially up to 500 t and more:

- Aeros Craft, Montebello, California

- CargoLifter GmbH, Berlin
- Hybrid Air Vehicles Ltd, Cranfield
- Lockheed Martin Advanced Development Programs
- Russian Aeronautical Systems, Ltd, Moscow

The primary application for such systems has been seen as the transport of heavy payloads in remote areas with limited ground infrastructure. For instance, an initiative for exploring the benefits was started 3 years ago by NASA Ames, the State of Alaska, and the US Department of Transportation. However, the technology would be equally applicable in areas where roads were available but could not be used because of environmental or congestion considerations.

For the HS2 construction phase, significant earthmoving and construction is required at locations with problematic access to the primary trunk road network. These include Burton Green, the Truggist Lane area of Balsall Common, the Meriden Road area of Hampton-in-Arden, and the Castle Vale area adjacent to the Bromford Tunnel portal.

There would be a need for a base for air-lifter operations. Coventry Airport, at Baginton, would be a possibility as it has relatively low traffic at present. The distances from there, to the four sites mentioned, would be 8.5 km, 11 km, 15.5 km, and 26 km. (For reference, a 20 km radius southwards from Coventry Airport would reach beyond Ladbroke.) Apart from terminal traffic at Baginton, potential air traffic conflicts would be limited to light aircraft and emergency service helicopters operating under visual flight rules, if operations were kept at low level.

To use large capacity air transport, the first step would be to establish a clear landing zone at the work site and erect security fencing. Because of varying wind conditions, a 360° capability is needed. Thereafter, all substantial materials could be delivered by air. Heavy earth-moving equipment and vehicles, including specialist tunnel-boring machinery could be delivered direct from the manufacturer, rather than re-handled at intermediate points.

Equipment could be re-located to other work sites, and ultimately, removed from the area, upon project completion.

There will be a continual requirement to handle spoil generated by tunnel boring and other excavation. To uplift and re-distribute spoil on a local basis, an airship in the 300 t class would be ideal, with multiple missions each day. However, airships of this capacity have yet to be demonstrated.

It would also be possible to deposit the material at remote locations for land reclamation, flood defences, or other purposes, but this would need further airships because of the increased transit times to sites possibly 200 km away.

Spoil would be carried in hoppers filled by conveyor belts or directly by the earth-moving machinery. These could be designed for rapid pick-up, and lifted in rotation by the airship. Controlled discharge would facilitate the construction of embankments or the restoration of the ground profile.

Availability of airlift would also allow large bridge and viaduct sections to be delivered directly from the fabricators to their final positions. This would reduce the need for conventional cranes, permit an increase in the size of pre-

fabricated components, and avoid all the difficulties of transporting large sections by road.

This is the primary purpose of the Cargolifter Balloon Crane System, which is a simpler approach using tethered lifting devices. This would be ideally suited for transport of spoil, equipment, and materials along the line of route.

Although it is still unconventional to use airships to support construction projects, the potential benefits are larger than simply avoiding adverse effects on the highway infrastructure. There are economies to be gained by avoiding the re-handling of materials and equipment between transport modes, and by extending the range over which they can be carried efficiently.

3.12.4 Operation phase road traffic issues

The proposed changes to Lavender Hall Lane and Park Lane are unsatisfactory, as they tend to direct traffic through the constricted section of Lavender Hall Lane (past Lavender Hall and over the narrow bridge across the Rugby-Birmingham railway) as well as causing severe intrusion on the properties there. Although Park Lane is lightly used, the new configuration looks more likely to cause congestion and delays.

There is a long-term intention to provide a safe pedestrian route along Lavender Hall Lane between Berkswell and Balsall Common. This would be compromised by any increase in the road traffic on the route, particularly in the constricted section.

The original proposal in March 2010 was to retain both lanes on their current alignment. The current scheme involves the creation of new roads and a substantial overbridge, and it is considered a better result could be achieved with the same effort.

An improved link between Berkswell and Balsall Common could be provided by a new bridge over the Rugby-Birmingham line and a new road joining the A452 Kenilworth Road at the Hallmeadow Road roundabout. A bridge over HS2 would be required, and this could either be as presently proposed, or else it could be 200 m or so north-west, with the road joining the current road system at the Park Lane/ Lavender Hall Lane T-junction.

Vehicular access from the properties near Lavender Hall would be stopped-up in the Berkswell direction, with both options, but with the first, a pedestrian route could be provided which would be shorter than following the new road to the A452 roundabout.

3.12.5 Rail services on existing lines

Rail services on the West Coast Main Line will be severely affected for the 8 years taken to rebuild Euston station, and by local impacts. The plan to reduce the number of working platforms will cause very serious delays, and a lack of resilience to other difficulties. The proposal does not seem to be practicable as it stands.

There will also be considerable extra road traffic during the construction phase as people try to reach the Chiltern Line stations.

Services on the current mainline are to be reduced in order to help pay for HS2 services. In addition, the cost of running the shuttle between Birmingham

International and the Bickenhill station is likely to devolve upon the local public transport authority. Both these moves will be to the detriment of the great majority of public transport users in our area, and the scheme sponsor should undertake to keep the cost associated with running HS2 entirely separate from the funding for the current system.

3.12.6 Rail services provided by HS2

The lack of intermediate stations is perceived as reducing the usefulness of the new railway. In addition, the connectivity between the HS2 system and the current network is poor. Very few people will travel from Coventry or intermediate points by public transport to reach the Bickenhill station. Generally, users will have to travel further by car to access the new system than with the classic rail network.

Construction of HS2 to the Continental GC gauge is detrimental to persons with mobility difficulties because of the extra step up from the platform. Many people will also find the super-sized stations for 400 m long trains to be inconvenient.

The Y network plan is likely to cause unreliability to the HS2 services on account of the high utilisation and lack of alternative routes to the North. It will not be possible for GC gauge trains to divert onto the existing network. Services to the north from Birmingham will be restricted by the need to use the dedicated "classic-compatible" rolling stock.

3.12.7 Attribution of environmental impact to project decisions

The ultra-high speed specification is responsible for the poor connectivity with the existing network, and for the major challenges that will disrupt all surface transport during the construction period.

The GC gauge trains and Y-shaped network plan cause a lack of resilience to the new HS2 network.

3.13 Waste and material resources

3.13.1 Solid wastes

This topic is reviewed on a route-wide basis (ES Volume 3).

There is insufficient detail to comment on the acceptability of the disposal of construction and operation wastes.

There has been no consideration of the effects of producing the construction materials for the scheme. These need to be identified by type and origin so that the environmental impacts can be properly assessed.

3.13.2 Attribution of environmental impact to project decisions

The straightness of the route results in unnecessarily large quantities of spoil, for which no acceptable disposal site has been identified.

3.14 Water resources and flood risk

3.14.1 Groundwater

The route of the scheme through Solihull borough cuts across a basin that drains eventually into the Trent and North Sea. The gradients are gentle, and the bedrock cloaked with a thick layer of sand, gravel, and clay.

Movement of groundwater is a vital part of the drainage system, and degradation of permeability will create difficulties.

Recent year-to-year variation in precipitation has resulted in wide variation in the levels of ground water and watercourses. There is concern that dewatering and alteration of groundwater and sub-strata water flow paths could increase the fluctuation.

During all of the excavation operations, there needs to be on-site identification of the exposed strata and hydraulic modelling to determine appropriate mitigation. A task force should be established to review findings on a monthly basis and ensure corrective actions are carried out.

3.14.2 Contamination

There is a risk of contaminated run-off from the line reaching Lavender Hall Fishery and Berkswell Lake, which are close to the proposed scheme. It is essential that run-off from the tracks is filtered to remove pollutants before it enters the natural drainage system.

At Bradnocks Marsh, the Auto-transformer station could also be a site of spillage and pollution, and there needs to be a containment barrier around the site.

3.14.3 Attribution of environmental impact to project decisions

The straight alignment for ultra-high speed operation has resulted in large amounts of cut and fill, which will cause fundamental changes in the hydrology.

3.15 Construction regulation

3.15.1 Code of Construction Practice management principles

The Code of Construction Practice is a key document for the protection of the communities where the scheme is to be built and for the safeguarding of the environment in the widest sense.

The responsibility for enforcement is placed on the Nominated Undertaker. Whilst the Nominated Undertaker should be responsible for delivering the requirements, there is a conflict of interest in having the Nominated Undertaker do the enforcement, and this can only bring weakness and delay if problems occur.

3.15.2 Enforcement of Environmental Health controls

The edition of the Code published with the Bill would confer further powers on the Secretary of State for summary approval of controls for

- handling of reusable spoil and topsoil
- storage sites for construction material, spoil or topsoil
- works screening
- artificial lighting
- dust suppression
- road mud prevention measures.

The Local Planning Authorities will have powers to approve

- construction compounds
- routes for construction traffic.

The preferred method is for these matters to be regulated by local independent officials. Local Authorities carry out this function at present, but for a major scheme like HS2, parish or town councils could also employ dedicated Environmental Health Officers, either individually or through a sharing arrangement.

The local authority Environmental Health Officer needs to have the power to suspend works, should agreed control measures be breached, and until more rigorous measures have been put in place.

The Nominated Undertaker should cover the full cost of employing dedicated Environmental Health Officers to monitor and enforce the Code. Such funding would be available to any level of local government requesting it. Within Solihull borough, parish and town councils in the area affected by HS2, should be funded to jointly employ an Environmental Health Officer for the duration of the construction phase.

3.15.3 Community relations

The Nominated Undertaker and its contractors must be required to engage with local councils and amenity groups, and attend meetings as requested by them.

The Nominated Undertaker and its contractors should make available the general work plan, and, for works detailed therein, should give the relevant parish or town council and amenity groups a month's notice before their commencement, to allow time for representations to be made.

Local councils should be able to claim through the Small Claims Procedure if they incur damage.

3.15.4 Working hours

The start up and close down periods should be restricted to 30 min, to prevent abuse of the system for regulating activities that could cause disturbance.

It is recognised that some activities need to be continued outside core hours, but these need to be sanctioned on a local basis. Anything that could cause undue disturbance - noise, vibration, traffic, dust, fumes, lighting - should be negotiated through the community relations process. The local council or amenity group should have the right of refusal.

Work outside the core hours would need to be justified, for instance by the use of major plant like tunnelling machines, or to avoid day-time disruption to road and rail travel.

Applications for such works should be made 14 days in advance, with the work to be done specified in detail.

Bank Holidays should be treated the same as Sundays.

3.15.5 Site management

Sites should be set up, maintained, cleared, and reinstated to the satisfaction of the local council and local amenity groups, through the engagement process. Aspects requiring agreement include mitigation of visual intrusion, protection and insulation from noise and vibration, and positioning of material dumps and roadways.

Traffic routes should be regulated similarly through the engagement process.

3.15.6 Site security

There is concern about the policing of the large numbers of migrant workers. These will represent a substantial influx, and the existing police force may be insufficient to maintain good order at all times.

The Nominated Undertaker and its contractors should arrange for sufficient security personnel to maintain local order, and this should be done to the satisfaction of the local council and local amenity groups, through the community engagement process.

3.15.7 Agriculture, forestry and soils

The protection of trees demands specialist knowledge. The Nominated Undertaker and contractors should work through the community engagement process on measures to protect trees, and should liaise with the Local Authority Tree Officers and/ or the local Tree Wardens.

In rural areas, propagation of weeds is a major concern, and access should be granted to sites for those with a legitimate interest, which could be controlled through the community relations meetings.

3.15.8 Air quality

Dust generation is a key concern for residents, businesses, and local farmers. It is a financial and health concern, as well as for amenity reasons.

HS1 was associated with major dust problems, despite being a high profile project. Construction of HS2 can be expected to use the same technology as HS1, and could have the same impacts.

The community relations system needs to be able to regulate dust control measures, such as wetting down, hoarding, sheeting of loads, location and size of spoil dumps, roadway surfaces,

There needs to be objective control measures that can be enforced by the Environmental Health Officers. Requirements for Noise and Dust Emissions should be based on the NPPF Technical Guidance for Minerals, issued by the Department for Communities and Local Government in March 2012. These should be regarded as the minimum acceptable requirements.

3.15.9 Cultural heritage

It is understood that about half the archaeological sites excavated during the construction of HS1 were unidentified prior to the project.

To safeguard cultural heritage assets, the Nominated Undertaker should provide funds to employ dedicated qualified archaeological observers. For Solihull borough, the parish and town councils in the area affected by HS2 should be funded to jointly employ a qualified archaeologist for the duration of the construction phase.

The qualified archaeologist would be empowered to stop work when discoveries are made, and to take protective measures such as the erection of fencing. The principles of PPS 5 (2010) should be applied to sites in any way affected by work on HS2.

3.15.10 Ecology

The parish and town councils, in the area of Solihull borough affected by HS2, should be funded by the Nominated Undertaker to jointly employ a qualified ecologist for the duration of the construction phase.

The qualified ecologist would be responsible for ensuring that all matters relating to habitats, fauna, flora, and land quality (see §3.8.1) were handled properly and in accordance with agreed procedures. The ecologist would have the power to suspend works when agreed control measures were breached, and until corrective actions were taken.

3.15.11 Landscape and visual assessment

There needs to be strong control measures to ensure major activities, temporary buildings, and equipment are concealed from view as best as possible.

Using the natural topography would be the best method, assisted by well-maintained hoardings.

This is a further issue that should be controlled through the community relations process and Environmental Health Officers.

3.15.12 Noise and vibration

The Environmental Health Officers would be responsible for enforcing the application of “Best Practicable Means” to reduce noise disturbance.

Bunds may limit the extent of noise emission but are only practical in limited and restricted areas and not over the length of the construction worksites

Noise insulation for adjacent properties should be made available whenever continuous-equivalent noise levels of 50 dB and above at the receptor are predicted. This would be negotiated through the community relations system.

Section 61 of the Control of Pollution Act 1974 will be applied, but there needs to be definition of how disagreements are handled and enforcement powers are used.

The control of working hours and traffic routes are important aspects of noise control.

3.15.13 Closures and diversions

Requests for the closure or diversion of carriageways, footpaths or bridleways should be handled through the community engagement process.

The relevant parish or town council should have the right to refuse permission for all route closures and diversions, and should have the power to regulate the time of day when heavy traffic flows and traffic control measures are allowed.

To manage peak hour traffic, the local council or amenity group should be able to impose traffic restrictions and employ traffic control systems.

4. Reducing and offsetting the environmental damage

4.1 General

Mitigation measures are intended to avoid or reduce the environmental impacts. Compensation measures are aimed at providing replacements or substitutes for

assets that are lost, or lump-sum payment or on-going financial support when this is not feasible.

4.2 *Alternative schemes*

Many alternative and less damaging or costly schemes have been advanced to improve the capacity of the rail network. The two major rail routes from London to Birmingham are capable of upgrade, and alternative new routes have been identified that follow existing transport corridors. Development of these would avoid the environmental impacts of the selected green-field route.

The local two-track spur of the West Coast Main Line between Coventry and Birmingham remains under-used and capable of considerable improvement in terms of capacity, timing and convenience. Apart from better management of franchising and time-tabling, the main priorities would be higher-performance local rolling stock and grade-separation of the junctions in Coventry.

4.3 *Berkswell/ Balsall Common tunnel with easterly realignment*

The greatest reduction of the environmental impacts in the area around Balsall Parish can be achieved by tunnelling the line through the high ground near Balsall Common, and shifting the alignment further north by a few hundred metres to the east.

HS2 Ltd have accepted that this is practicable and acknowledged the major benefits. The change has been refused because the cost-benefit analysis places no value on the environmental and community damage during construction and operation.

This proposal would put the northern portal of the tunnel near Cornets End, in an area already disturbed by quarrying. Keeping the line close to the current alignment of the A452 would lessen impacts on all the communities up to the M6, avoid the unsatisfactory road configuration and access provision at Marsh Lane, and reduce the many major changes to the road network.

4.4 *Berkswell/ Balsall Common tunnel on current route*

Several tunnel options have been offered to HS2 Ltd. The scheme sponsor prefers those that adhere to the line-of-route published in March 2010. While impacts on Balsall Common and Berkswell are reduced, those on Hampton-in-Arden and Chelmsley Wood are unchanged.

Although a tunnel on the existing line would bring improvements, it would fail to capitalise on the opportunity for wider environmental savings.

4.5 *Mitigation and compensation for the current route*

In addition, a long list of detailed mitigation measures are included in Section 3. These are summarised as:

- restoration of all public rights of way and private access routes close to their original alignment
- agreements to cover the extra maintenance cost of changed routes
- full-height noise barriers to provide acceptable peak sound levels close to and away from the line

- integration of full-height noise barriers into the structural design of viaducts, with correspondingly shallower support structures beneath track level
 - comprehensive screening of structures by planting of native tree species
 - architectural styling of all structures to be developed with and agreed by the affected local communities
 - open viaduct structures to be used in preference to high embankments
 - migration routes for wildlife, and screening of the track to reduce bird strikes, in locations agreed by the local communities
 - the provision of substitute community facilities to replace all those impaired by the scheme
 - compensatory measures to offset habitat loss and other damage to species of concern
 - full identification, recording, protection, and conservation of cultural artefacts and assets
 - full recompense for losses incurred by businesses and owners of residential property due to the construction and operation of the scheme
 - minimisation of disruption and damage arising from the construction process through local engagement, monitoring and regulation
 - a community fund to support local causes, in perpetuity, to offset damage to the local amenity and environment not compensated by other means
 - minimisation of intrusion and damage, during construction, by using aerial means to deliver and remove machinery and materials
 - prediction and correction of radio frequency blockage and distortion caused by the scheme
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