Appendix 9.9

A4226 Five Mile Lane Proposed road safety improvement scheme

Extract from Soltys Brewster Interim Scheme Assessment Report Addendum

January 2011

(National Vegetation Survey)

A4226 FIVE MILE LANE
PROPOSED ROAD SAFETY IMPROVEMENT WORKS

INTERIM SCHEME ASSESSMENT REPORT

ADDENDUMS

January 2011

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PROPOSED ROAD SAFETY IMPROVEMENT SCHEME

A4226 FIVE MILE LANE

VALE OF GLAMORGAN

INTERIM SCHEME ASSESSMENT REPORT ADDENDUMS

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18.1.8 Travelling form Waycock Cross roundabout in a northerly direction the stream to the east of the carriageway, carrying surface water from the road and surrounding area to the Waycock River, would require culverting or realignment (and have cost implications) if widening to the east was implemented.

18.1.9 The advantage of an offline route would be that the existing road could remain open during construction and act as a local distributor road during operation carrying local traffic, pedestrians, equestrians and cyclists.

18.2 Biodiversity

18.2.1 In order to inform the route selection process and supplement the information contained within the ISAR a targeted survey to establish the community type and relative ecological interest within the two SSSI woodland blocks was undertaken in June 2010.

National Vegetation Survey

Methodology

18.2.2 Initially each woodland was walked in a semi-structured way to assess how many significantly different woodland communities were present; these were determined visually in terms of species composition and vegetation structure. This initial approach enabled similar stands - vegetation units that have distinctive floristic and structural properties - to be identified and subsequently sampled together.

18.2.3 Each of the different stands of woodland vegetation was then mapped (boundaries should be taken as indicative) and sampled in accordance with standard National Vegetation Classification (NVC) methodology (Rodwell 1997). Five quadrats were sampled per stand taking care to avoid areas of atypical vegetation e.g. tracks and scrub edges. Each woodland quadrat in fact represents three sub-quadrats within different scales of vegetation (Table 2.1), with quadrat size based on standard NVC methodology for woodland survey (Rodwell 1997). The location of sampled quadrats (Nos. 1 – 15) is shown on the figures in Volume 2.

Table 2.1 Woodland NVC sample (quadrat) sizes

Scale of vegetation	Quadrat size (m)
Canopy trees	50 x 50
Shrub understorey	10 x 10
Field layer/woodland floor	4 x 4

18.2.4 The frequency and above-ground cover of each vascular plant species and, for field layers, every moss or liverwort present in each quadrat was recorded and the data were subsequently combined into a floristic table for each sampled stand. MATCH software was then used to analyse each floristic table and produce a co-efficient of similarity against published NVC communities/sub-communities. As a rule of thumb, the higher the co-efficient, the better the match against published type. Surveyor experience and detailed vegetation descriptions provided within the *British Plant Communities* series (Woodlands and Scrub, Volume 1 1991) were then used to confirm the classification of each stand in terms of the NVC. It should be noted that as a tool for vegetation description, the NVC in general has limitations, especially with respect to plant communities arising from, or influenced by significant levels of human disturbance - for example brownfield sites.

NVC Survey Results

18.2.5 The survey and subsequent analysis of data indicated that both of the woodlands surveyed were matched against the W8 *Fraxinus excelsior – Acer campestre – Mercurialis perennis* (Ash – Field Maple – Dog's Mercury) woodland community. Within the survey corridor alongside the existing carriageway, there was very little difference between the two woodland blocks (i.e. eastern and western blocks), with both matched against the relatively species poor W8d Ivy sub-community of the Ash-maple-dog's mercury woodland. This tends to be the least diverse of the Ash-maple (W8) woodland sub-communities and is indicative of loss of diversity caused by long-term lack of woodland management operations e.g. cutting and coppicing.

18.2.6 Within the western woodland block, localised areas supported indicator species of a (historically) more diverse woodland, including some of the species referred to in the SSSI citation (Appendix 18.3) such as Herb Paris *Paris quadrifolia*, Greater Butterfly Orchid *Platanthera chlorantha* and Woodruff *Galium odoratum*.

18.2.7 In the eastern woodland block, small populations of Goldilocks Buttercup *Ranunculus auricomus* and Greater Butterfly-orchid were seen near the road although the woodland community and ground flora overall was species-poor and comparable with the western woodland block.

18.2.8 The W8d sub-community type was applicable over both woodland blocks although one area at the southern edge of the western woodland block (see Figures) was slightly more diverse and had affinities with the W8e Herb-Robert *Geranium robertianum*) sub-community which is more species-rich than W8d. However, the differences were not considered sufficiently marked so as to effect the overall classification to the W8d sub-community.

18.2.9 The location of surveyed quadrats and woodland community types is illustrated on the Figures with more detailed habitat descriptions and floristic tables used for the MATCH analysis provided in Appendices 18.1 & 18.2 respectively.

Assessment Of Impacts

18.2.10 The ISAR had indicated that the off-line alignment (Blue Route) would result in a Severe Adverse impact on biodiversity in the short term, reducing to Moderate Adverse in the long term with the adoption of mitigation measures (e.g. woodland management plan, new planting). Each of the on-line options were assessed as having a Moderate Adverse impact in the short term, reducing to Slight Adverse over the long term.

18.2.11 Whilst the ISAR assessments were based on consideration of all the habitat features within the southern part of the scheme (Sector 6 in the ISAR), the severity of the impact was strongly influenced by the extent of SSSI loss under each alignment. Further design of the scheme – considering both on-line and off-line options has provided a quantitative estimate of the impact on the SSSI units as shown in Table 2.2. The indicated percentages are based on a total area of 125,000m^2 (12.5ha.) for the two woodland blocks with the route alignment options arranged from 'worst case' – Option 1 Blue Route - to that which minimises the footprint of the scheme – Option 6. This effectively translates to a loss of approximately 9% of the woodland under the Blue Route, compared to 5% under Option 6.

18.2.12 A further consideration relating to the impact of the on and off-line alignments is that the latter would lead to increased fragmentation of the woodland habitat, as the scheme would effectively introduce a new road corridor through the woodland. Each of the on-line options would

increase the footprint of the existing carriageway, which would avoid or minimise the potential risk of increased fragmentation.

18.2.13 The relative uniformity of the woodland community within both woodland blocks does not indicate that widening on the eastern or western side would be preferable for the on-line solutions, although the western side did support a greater number of woodland indicator species in the ground flora. For the on-line alignments, 3 & 5 would predominantly involve widening to the east of the existing carriageway, with alignments 4 & 6 involving widening to the west.

Table 2.2 Approximate extent of woodland loss under each alignment based on a total area of 125,000m² (12.5Ha).

Alignment	Approximate area of woodland lost			A (m²)	B (m²)	Fragments habitat
1 (Blue)	11,060 m²	1.1Ha	8.8%	0	0	Yes
2	9,940 m²	0.9Ha	8.0%	1,120	1,120	Yes
3	7,560 m²	0.7Ha	6.0%	2,380	3,500	No - Widens existing carriageway gap
4	7,540 m²	0.7Ha	6.0%	20	3,520	No - Widens existing carriageway gap
5	6,680 m²	0.6Ha	5.3%	860	4,380	No - Widens existing carriageway gap
6	6,430 m²	0.6Ha	5.1%	250	4,630	No - Widens existing carriageway gap

A = difference in woodland area loss between the alignment and the option above (the next worst performing option)

E.g. Alignment 5 loss of woodland value A (m²) = 7,540 – 6,680 = 860

B = difference in woodland area loss between the alignment and the worst performing option

E.g. Alignment 5 loss of woodland value B (m²) = 11,060 – 6,680 = 4,380

18.2.14 All of the route alignments would result in some loss of woodland habitat – ranging from 9% in the worst case (i.e. Alignment 1 – Blue) to 5% with on-line widening. In order to maintain consistency and permit comparison with the ISAR, the assessment criteria have been based on guidance within the Design Manual for Roads and Bridges (DMRB) and WelTAG and have not

been amended or updated – for a further description of the assessment methodology, see Section 1.4 of the ISAR.

Off-line Options (Routes 1 & 2)

18.2.15 Both these alignments would result in habitat loss away from the existing road corridor and would be likely to increase habitat fragmentation resulting in an impact of Major magnitude on a High Value receptor and an overall Severe Adverse impact on the woodland in the short term and in the absence of mitigation/compensation measures.

On-line Options (3 & 5)

18.2.16 On-line widening, with most of the works footprint to the east of the existing carriageway would result in a loss of between 5% and 6% of the woodland within the two blocks. This would represent an impact of Moderate magnitude on a High value receptor and an overall Moderate Adverse impact in the short term and in the absence of mitigation/compensation measures. The presence of the stream corridor on the eastern side of the carriageway, is a further consideration for these alignments as it is likely that culverting and/or localised diversions would be required at a cost to the scheme.

On-line Options (4 & 6)

18.2.17 As described for the previous on-line options, widening the existing carriageway to the west would result in a loss of between 5% and 6% of the woodland habitat. The overall impact would be comparable (Moderate Adverse) although widening to the west would avoid or minimise additional effects on the stream corridor.

18.2.18 A further consideration for the impact assessment of off-line *versus* on-line options based on the assessment criteria published by the Institute of Ecology and Environmental Management - IEEM (2006) is of potential benefit (in terms of decision making) in supplementing the assessment under DMRB/WelTAG. The IEEM criteria are based around the principle of establishing the ecological 'significance' of an impact – this is defined as an effect (adverse or beneficial) on the integrity of a defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area. In this context, integrity is defined as the:

> *'Coherence of a site's ecological structure and function across its whole area that allows it to sustain the habitat, complex of habitats and/or levels of populations'.*

18.2.19 Using this (IEEM) measure of 'significance' the off-line solutions would be likely to result in a significant adverse impact – i.e. would affect the integrity of the woodland – whereas the on-line widening would be unlikely to result in a significant impact, particularly with the adoption of appropriate mitigation and/or compensation measures (see Section 4.0) .

18.3 Landscape

18.3.1 The following section considers each route alignment on the woodland in terms of the potential effects on visual amenity and landscape character. The assessment follows best practice guidance. The assessment methodology can be found in Appendix 18.4.

Visual Amenity

18.3.2 Potential adverse effects on visual receptors are limited by the screening qualities of the woodland. Receptors are likely to be restricted to The Welsh Hawking Centre and adjacent dwellings, farm workers and vehicle travellers. The receptor group composed of visitors to the Welsh Hawking Centre (Medium sensitivity) would be affected during the open season and during the hours of business, as they arrive and leave the attraction. From within the centre views of the new routes are unlikely. Residents in the two adjacent dwellings (High sensitivity) would similarly have views of the new alignments as they arrive and leave and potentially from second story windows that address the road. Farm workers are of Medium sensitivity and would obtain intermittent views of the new alignments from the valley floor. The most numerous receptors would be of Low sensitivity (vehicle travellers).

18.3.3 Views to the existing woodland edges (edges both addressing the road and fields within the valley bottom) are composed of a well formed canopy and shrub layer/woodland edge. The character of the woodland alters beyond these edges; lack of management has created dense stands of tall trees with narrow canopies. Both the offline and online improvements would create new edges exposing the internal nature of the woodland altering visual character in the short term until new planting establishes and existing canopies, and any new planting, grow into the new conditions.

18.3.4 Views of the woodland from the south (Waycock Cross) correlate to the SSSI woodland boundary. To the west of the carriageway non designated woodland continues to the south beyond the SSSI boundary, effectively concealing views of the southern edge of the designation.