VOLUME 11 SECTION 3 PART 3 DISRUPTION DUE TO CONSTRUCTION

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1. INTRODUCTION

1.1 "Disruption due to construction" is a term which covers the effects on people and on the natural environment which can occur between the start of pre-construction works and the end of the contract maintenance period. Disruption due to construction need not be as a result of work directly on the road scheme itself, but can also arise from advance works by utilities, which may extend well beyond the highway construction site.

1.2 Most of the operational impacts described in SECTION 3 may occur to a greater or lesser extent during construction. The construction effects are, of course, temporary but may be significant. Typical construction impacts might include a localised increase in noise, vibration, dust and dirt, and a loss of amenity due to the presence of heavy construction traffic. Those affected can include people in their homes or places of work; people visiting shopping centres or community facilities; and pedestrians, cyclists or vehicle travellers. Ground-borne vibration, for example, caused by the activities of plant such as dozers, scrapers and dump trucks can become perceptible in dwellings and cause nuisance (Martin 1977). The highest levels of vibration are likely to be caused by piling operations, however. Vibrations can be reduced by the use of specilialised equipment. Martin (1980) gives further guidance on mitigation measures and describes a method of predicting vibration levels.

1.3 Impacts on vehicle travellers consist primarily of longer journey times during the construction period, which are taken into account in the economic assessment of queues and delays at roadworks (QUADRO) and will generally need no further assessment. Advice on techniques to minimise delays is listed in CHAPTER 4. However, where diversions during the construction period will cause significant temporary increases in traffic on nearby roads, the resulting impact on the local environment should be assessed. Where a diversion is complicated, or is likely to involve delays, the adverse impacts on vehicle travellers should be included in the assessment of driver stress (see SECTION 3, PART 10).

1.4 Construction work can potentially also affect the natural environment - for example, if material from the construction site accidentally enters a watercourse, or is temporarily stored on ecologically valuable land. Wildlife may also be disturbed.

1.5 Disruption due to construction is generally a more localised phenomenon than the impacts of a scheme once it has opened to traffic. One study has shown that at least half the people living within 50 metres either side of the site boundary were seriously bothered by construction nuisance in one form or another, but that beyond 100 metres less than 20% of the people were seriously bothered (see TRRL Supplementary Report SR 562).

1.6 Where material needs to be transported to or from the highway construction site, the impacts along construction access routes should also be assessed.

2. MITIGATION OF DISRUPTION

2.1 Disruption due to construction can be mitigated to a certain extent both under powers conferred by the Land Compensation Act 1973, in Scotland the Land Compensation (Scotland) Act 1973 and by imposing contractual working restraints. Briefly, the 1973 Act allows for temporary rehousing when the disruption is of such an extent that continued occupation is not reasonably possible. The Act, as implemented by the Noise Insulation Regulation 1975, or in Scotland Noise Insulation (Scotland) Regulation 1975, also permits insulation of eligible buildings against construction noise where that noise seriously affects, for a substantial period of time, the enjoyment of the building. This is independent of any requirement for noise insulation resulting from traffic noise. However, where houses are eligible for insulation from traffic noise, the insulation work should be carried out early enough for the recipients to benefit during the construction period.

2.2 Contractual working restraints are particularly important where the natural environment needs to be protected against potentially adverse impacts caused by a scheme's construction. For example, restrictions can be written into the contract documents which prevent the contractor storing borrow or surplus material in particular areas. Contract conditions can also be used to limit noise from the construction site, to control working hours (especially for potentially disruptive operations), to prevent access to sensitive areas, to restrict construction traffic to suitable haul routes, and to ensure that such routes are cleaned or swept regularly. It is important that contractual working restraints are discussed in advance with the local authority Environmental Health Officer. Monitoring of conditions regarding noise, vibration and dust may be necessary during construction.

2.3 In considering possible methods of mitigating adverse impacts during the construction period, it will be necessary to balance the severity of an impact with its duration. For example, it may be better to cause greater disruption over a short period than less disruption over an extended period.

3. STAGES IN THE ASSESSMENT OF DISRUPTION DUE TO CONSTRUCTION

3.1 Generally, the following levels of assessment will be appropriate at the key stages.

Stage 1

3.2 The objective at this stage is to undertake sufficient assessment to identify the possible disruption due to construction of the broadly defined routes, or corridors as developed by the Design Organisation and agreed with the Overseeing Department's Project Manager. At this stage only a broad assessment will be possible. For example, any route corridors which could involve significant disruption due to their proximity to population centres, or the possible need for tunnelling, bridgeworks or other intrusive construction processes, should be identified.

Stage 2

3.3 The objective at this stage is to undertake sufficient assessment to identify the factors and effects associated with disruption due to construction to be taken into account by the Design Organisation in developing and refining route options in agreement with the Overseeing Department's Project Manager.

3.4 The steps to take in the assessment of possible disruption at the highway works site are:-

(i) estimate the number of properties within 100m of each possible route option, highlighting any properties which are particularly sensitive to disruption (for example, schools, hospitals, aged persons homes or libraries). This information should already have been collected for the noise assessment;

(ii) note any areas or features of ecological or archaeological or historic value within 100m of a route option which might need to be protected from adverse impacts (for example, watercourses, and designated or other important wildlife sites) or which may need to be rescued;

(iii) note any likely significant differences in the magnitude of disruption between route options. For example, routes which would require large scale earth movements, tunnelling or bridgeworks would be more disruptive, other things being equal, than routes where earth movements were relatively minor. Some routes may require considerable diversion of traffic, whilst others may not.

3.5 An assessment in the broadest terms should also be produced of significant differences in the borrow and surplus material requirements of the possible route options.

(iv) estimate approximate likely quantities of borrow or surplus material associated with the possible route options;

(v) discuss the possible need for borrow pits or disposal sites with the local planning authority and note any potential problems (for example, the need to remove or treat toxic waste or to avoid sensitive Archaeological or Historic Landscapes). Discussions should also cover possible haul routes, see also ref 4.2;

(vi) where appropriate, inform the local waste regulation authority about borrow and surplus fill issues (see DOE Circular 20/87 for England or Welsh office Circular 36/87 for Wales), and take account of their views.

3.6 The result of the assessment at this Stage should be described in the Stage 2 Report and should consist of:-

(a) a statement of the number of properties within 100m of each possible route option highlighting any sensitive properties or sites. The 100m band should be interpreted flexibly;

(b) a statement of any significant difference between the borrow or surplus material needs of possible route options and a summary of the results of any discussions with the local planning authority (and the statutory bodies whose interests may be affected).

Stage 3

3.7 In most cases, at this stage the assessment of possible disruption at the road works site will consist largely of updating the Stage 2 assessment for the preferred route. The steps to take are:-

(i) verify the estimated number of properties within 100m of the preferred route, and highlight any which are particularly sensitive to disruption. Again the 100m distance band should be used flexibly;

(ii) check on the presence of areas or features of ecological or archaeological value within 100m of the preferred route which might need to be protected from adverse impacts;

(iii) note any construction operations which could have a particularly significant impact - for example, the scale of earth movements within the construction site, the storage and treatment of surplus material before it can be removed from the works site (such as wet peat which needs to be dried out and which may need to cover a large area of ground), the extent of special operations such as piling, bridgeworks or tunnelling, and the likelihood of night-time working;

(iv) assess the extent of potential impacts, taking account of proposed mitigation agreed with the Overseeing Department's Project Manager, such as the early provision of environmental barriers or noise insulation, restrictions on noise levels or any other special conditions to be written into the contract documents.

3.8 As the earthworks design for the preferred route develops, an estimate should be made of the likely quantities of surplus material and borrow associated with the scheme. The level of assessment will depend on the quantity of material which needs to be transported to or from the highway construction site, and the availability of borrow or surplus fill capacity in the locality. Generally, there will be three possible levels of assessment:-

(a) In some cases, where the earthworks requirement can be met entirely within the proposed site boundary, there will be no need for a separate assessment of borrow or surplus material issues. The possibility of achieving such a position and the associated impacts should be considered.

(b) Where quantities of borrow or surplus material need to be won or disposed of off site, further consultation with the local planning authority will be necessary. Where appropriate the use of suitable waste materials should be considered. In some cases, discussions will indicate that sufficient capacity is available locally from borrow pits or disposal sites with planning permission. In such instances, the environmental impact of the pits or sites will already have been taken into account by the local planning authority, along with all other relevant considerations, when granting planning permission. This should be noted in the Environmental Statement, along with the amount of material which will be taken to or from the road construction site, the number of lorry movements involved, and any disruption due to traffic using haul routes between the possible disposal sites (or borrow pits) and the highway works site.

(c) In other instances, there will not be sufficient capacity from available borrow pits or disposal sites with planning permission. In such cases, the quantities of material involved should be estimated, the number and broad location of possible borrow pits or disposal sites indicated, and the impact in the worst case considered in broad terms, both for the works themselves and for the haul routes. The type of information on the worst case should include a general indication of the size and location of the potential pits or disposal sites and their distance from the road scheme, the existing land use, an estimate of the number of properties within 100m (interpreted flexibly) and possible disruption to them, and an indication of any other adverse impacts (eg, on the ecology, or on agriculture). A more general section on borrow and surplus material issues should also be included in the Environmental Statement. This should include a note of discussions with the local planning authorities on areas where there would be - or was likely to be - a presumption in favour of or against planning permission being

given for such developments in future.

3.9 In the latter two cases, the Environmental Statement should also mention the following factors:-

- that the decision on the location of borrow pits and disposal sites is ultimately one for the contractor to take, bearing in mind the relevant legal requirements. While certain sources of secondary material may be acceptable, the contractor is entitled to use alternative sources.

- that the Overseeing Department's policy is to help tenderers select suitable locations by passing on the results of its discussions with the local planning authorities about disposal sites and borrow pits, see also ref 4.2;

- that disposal sites and borrow pits will require planning permission and that the local planning authority considers environmental factors before deciding on planning applications;

- that there are strict legal controls to prevent illegal dumping of surplus fill, including a requirement for a waste disposal licence to be obtained and a `duty of care' on the contractor.

3.10 The result of the assessment of the Stage should be described in the Environmental Statement.

4. FURTHER READING

4.1 Nuisance from road construction : a study at the A31 Poulner Lane Diversion, Ringwood : TRRL SR562 1980 by C J Baughan.

4.2 Use of Waste Material for road fill. Department of the Environment Circular 20/87 Department of Transport Circular 3/87 Welsh Office Circular 36/87.

4.3 Code of Practice `The Reduction of Traffic Delays at Roadworks'. Scottish Office Industry Department Roads Directorate and the County Surveyors Society.

4.4 The Land Compensation Act 1973 (HMSO, 1973).

4.5 The Land Compensation (Scotland) Act 1973 (HMSO, 1973).

4.6 The Noise Insulation Regulation 1975 (as amended by the Noise Insulation Regulation 1988).

4.7 SA8: Use of Substances Hazardous to Health in Highway Construction. (MCHW 6.2.1)

4.8 Ground vibrations caused by road construction operations.
TRL Report SR 328 1977 by D J Martin.

4.9 Ground vibrations from impact pile driving during road Construction.
TRL Report SR 544 1980 by D J Martin