

APPENDIX 3



OFFICE OF THE
DEPUTY PRIME MINISTER

miro

Mineral Industry
Research Organisation

The Sustainable Use of High Specification Aggregates for Skid-Resistant Road Surfacing in England



CAPITA SYMONDS

8. CONCLUSIONS & RECOMMENDATIONS

- 8.1 This study has updated the report produced by Travers Morgan in 1993 to give a fully revised assessment of the market for High Specification Aggregates (HSA) for skid resistant road surfacing in England, and has begun to highlight some of the sustainability issues relating to the supply of these important materials. In doing so it has assessed all potential supply sources throughout the UK, and obtained new information on aggregate quality, output and reserves for all of those which supply HSA to road surfacing contracts in England, including sites which have the potential to do so but which are currently dormant or inactive.
- 8.2 The research has explained and quantified the effects of the substantial changes in asphalt technology that have occurred since 1993, demonstrating a 2.3 -fold (130%) increase in the 'specified demand' for HSA as a direct consequence of the introduction of thin surfacings. Despite this, the rate at which HSA resources are being consumed has changed very little since 1992, implying that a much higher proportion of HSA production now goes into materials where such aggregate is required by specification than was formerly the case. In this sense, the 'efficiency' of utilisation of HSA resources has substantially increased.
- 8.3 Despite the limited increase in total output from HSA sites, the current lifetime of permitted HSA reserves within England has been reduced from 21 years in 1992, to just 17 years, in 2002, and to only 15 years if reserves at dormant and inactive sites are excluded. This is directly related to the reduced HSA landbank now available.
- 8.4 Of the various factors likely to influence future trends in HSA demand, most seem to point to an expectation of either minimal change or a slight reduction. There is, however, considerable uncertainty and **it is therefore recommended that ODPM and mineral planners should anticipate a modest increase in HSA demand over the next decade.**
- 8.5 In the interest of reducing some of these uncertainties, **it is recommended that future changes in demand within this specialist sector of the aggregates market should be monitored, along with changes in the various driving forces involved.**
- 8.6 To achieve this, and to provide the information needed to assess the relative sustainability of different options (see below), **it is recommended that essential data on the use and performance of HSA in different types of surfacing should be collected by local authorities and Highways Agency maintenance contractors through the use of Pavement Management Systems.** Guidance from the Highways Agency is urgently needed to ensure that such data is consistently recorded, stored and capable of easy and timely retrieval when required for analysis.
- 8.7 Until such time as those systems are being used more effectively in all areas, **it is recommended that more detailed monitoring should be carried out on the supply of HSA materials, preferably through improvements to the ODPM's periodic Aggregate Mineral (AM) surveys.** In particular, the existing breakdown by measured PSV is not sufficient (and not really needed in view of the data provided in this report). What is needed is a breakdown of output from HSA quarries by supplies to different PSV specifications and different types of surfacing material, specifically:
- (i) Hot Rolled Asphalt surface courses,
 - (ii) Proprietary thin surfacings (ideally broken down by thickness),
 - (iii) generic Stone Mastic Asphalt mixtures (ideally broken down by thickness),
 - (iv) coated macadam surface courses,
 - (v) surface dressing,
 - (vi) 'other' surface courses and
 - (vii) binder courses (irrespective of type).
- 8.8 This is deliberately a slightly different breakdown to that attempted in this study, in which generic SMAs and binder courses may well have been included in the 'other' category. Similar data would be useful for quarries with PSVs of less than 58, but only for those supplying material for road surfacing.

- 8.9 Ideally, a breakdown is also needed by supplies to final contract destinations, at least on a National basis, and preferably on a regional basis, as attempted in this study. Such data would be useful for all types of aggregate, not just road surfacing material.
- 8.10 Secondary and recycled sources will be able to meet part of the future demand for High Specification Aggregates, and there is a possibility that their contributions could grow. Steel slag aggregates could be used more extensively than they currently are, and should certainly be encouraged as a 'renewable' alternative to quarrying, but at best they can only ever account for a small fraction of total demand, and their future is entirely controlled by that of the British steel industry. As past events have shown, the fortunes of the steel industry can change very rapidly, but the timescale for developing new reserves of primary aggregate can take much longer.
- 8.11 It should also become possible for high PSV aggregate to be recycled from old surface courses into new ones, as technology in this area improves, though it is likely to be some time before this has any significant effect on the demand for new HSA material, especially for the higher PSV ranges.
- 8.12 There will therefore be a continuing, and possibly growing requirement for HSA from primary sources and, in order to restore the available landbank of permitted reserves at HSA sources to former levels, so that an adequate security of supply of these strategic minerals can be maintained, **it is recommended that new reserves of High Specification Aggregates should be permitted at a faster rate than has been the case over the last ten years.**
- 8.13 This need has to be seen in the context of the Government's move away from the ethos of 'Predict and Provide' to the modern concept of 'Plan, Monitor and Manage' – the intention being to limit future aggregate provision (in general) to the rates of production that can be sustained by the source areas involved without undue impacts on the environment (especially in protected areas), rather than necessarily providing for the anticipated level of demand.
- 8.14 In applying such principles to High Specification Aggregate resources, however, it must be recognised that these are a national, strategic resource with limited occurrence and that the materials concerned are an essential component of national policies to provide and maintain a safe highway network. As this study has confirmed, relatively few geological formations possess all of the characteristics needed to meet HSA requirements. Moreover, very few of these occur in locations where their extraction would be both economically justified and environmentally acceptable. In the wider interests of sustainability (i.e. to meet the needs of future generations as well as those of the present), these limitations on the availability of *exploitable* resources need to be taken into account in planning for the future supply (and safeguarding) of these important minerals.
- 8.15 To facilitate this, **it is recommended that Mineral Planning Authorities should differentiate between reserves of High Specification Aggregate and those of other, more general purpose aggregates, with separate landbanks being maintained for each.** For MPAs in England, the Category (1) sites listed in Table 7.1 of this report, and the English Category (2) sites in Table 7.5 are the ones which need to be considered in this respect. For other parts of the UK, those listed in Tables 7.2 to 7.4 (as appropriate) will need to be considered, along with some of the Category (3) sites listed in Table 7.6.
- 8.16 In considering the future need for High Specification Aggregates from a sustainability point of view, much greater attention needs to be focused on the longer-term perspective of the way these aggregates are used in road surfacing materials. Hitherto, attention has, understandably, been focused on skid resistance and noise reduction. Durability has clearly also been considered but mainly from the perspective of ensuring that materials are fit for purpose and provide acceptable value for money. In future, much greater consideration will need to be given to the long-term durability of different aggregates and the materials in which they are used, (including the potential benefits of mechanical retexturing). These factors directly influence the frequency of replacement and thus the frequency with which all of the impacts associated with aggregate extraction, transportation and installation are experienced.
- 8.17 Regrettably, this is an area where very little robust empirical evidence is available. The limited evidence that does exist, including the findings of this study, suggest that thin surfacings may prove to be less durable than hot rolled asphalt. If this were the case, then the switch from HRA to thin surfacings may well prove to be a less sustainable solution in the longer term, despite the obvious short term benefits of speedier installation and reduced noise. Much of the growth in thin surfacings, however, has been at the expense of surface dressing and here, the situation could

be reversed. Current evidence suggests that properly laid thin surfacings are likely to have a much longer life expectancy than most surface dressings and, if so, this could compensate for, or overshadow, the increased aggregate required per application. **It is recommended that further research be undertaken on the in-service durability of different aggregates and surfacing materials, using existing data (where this can be found, among local authority and Highways Agency records) and / or new information collected in future years.**

- 8.18 Another aspect of sustainability that needs to be tackled is that of over-specification. Evidence obtained in this study suggests that, despite national guidance that provides the flexibility to use lower PSV aggregate where it has proved effective, most local authorities conform to the maximum values advised in the Highways Agency standard, largely for fear of litigation claims for inadequate skid resistance (but also for pragmatic reasons in the very common situation where recommended PSV requirements vary over short distances). Among those which do take advantage of the flexibility to depart from the national standards, the overall tendency has been to increase the PSV requirements further, rather than to relax them. This again reflects the fear of litigation, at least in part, but it also reflects the fact that most Local Authorities are not yet using Pavement Management Systems properly to assess the performance of different materials. Those authorities are therefore unable to develop the evidence-based policies that the Highways Agency is seeking to encourage.
- 8.19 All of this reinforces the urgent need (as recommended in para. 8.6, above) for robust performance data to be recorded and used, through the proper use of Pavement Management Systems by Local Highway Authorities, and by the Highways Agency, so that more sustainable solutions and evidence-based policies can be developed.