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Measuring recent change in the soiling of historical walls in Oxford, England

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Soiling of urban stonework has been linked to air pollution, especially from sources such as heavy industry and traffic. In Oxford, many historical buildings were refaced or cleaned in the 1960s with the expectation that soiling would be reduced as coal burning plummeted. However, by the end of the 20th century it was apparent that traffic levels and soiling were both increasing. The Oxford Transport Strategy (OTS) was designed to reduce traffic in the city centre and the EU-Life programme funded Environmental Monitoring of Transport Strategies (EMITS) project aimed to assess the environmental benefits of the OTS, including any reductions in soiling. As part of this EMITS project repeat photographs were taken of sample roadside walls. This paper reports on a quantitative assessment of soiling from these images using the integrated digital photography and image processing (IDIP) method with greyscale calibration of lightness. Images acquired at 30 roadside sites in three photographic surveys of walls were examined in Lab mode for lightness. A quantitative comparison of surface soiling using the calibrated sets of photographs and histograms measuring lightness across images was conducted according to the established methodology. The first surveys in 1997 and 1999 convey soiling before the implementation in June 1999 of the OTS, and the final survey taken in 2003 portrays walls after the OTS. The results show lighter surfaces post-OTS in 2003 possibly conveying reduced soiling on walls following the restriction of private vehicles into the city centre.