

Technical Note

USE OF OVERSEAS EMISSION MODELS TO PREDICT TRAFFIC EMISSIONS IN URBAN AREAS

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A previous Technical Note (Smit and McBroom 2009a) has commented on potential discrepancies between traffic emissions predicted by microscopic simulation models and those actually measured under Australian conditions. This Note will explore potential discrepancies between Australian test data, a newly developed Australian emission algorithm and predictions from two commonly used international traffic emission models. These emission models require input that can readily be extracted from macroscopic traffic models. We have found substantial discrepancies, i.e. mean NO_x prediction errors for a stretch of freeway are a factor of 1.6 to 2.0 higher for overseas models, when compared to an Australian average speed model that was developed using Australian test data.

INTRODUCTION

Overseas traffic emission models such as COPERT in Europe and MOBILE and EMFAC in the United States are well-known and often used in practice. This is particularly so for the development of urban emission inventories as they require input that can readily be extracted from strategic planning models such as EMME2 (Smit, Dia and Morawska 2009). An important feature of these models is that emission factors (g/km) are a function of average speed, where average speed is defined as the overall speed on a section of road or for an entire journey – hence the term ‘average speed model’. Average speed generally shows a significant (but not perfect) correlation with emissions and fuel consumption, but does not explain all variations in the test data as will be discussed later.

Information on average speed is relatively easy to obtain as it can be sourced from traffic models or travel time surveys. This partly explains its historic and common use in traffic emission modelling. Apart from their own jurisdictions, COPERT and