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Project Appraisal Guidelines for National Roads Unit 5.4 - Transport Modelling Report

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1. Introduction

1.1 Overview

This Unit of the Project Appraisal Guidelines (PAG) provides guidance on the structure and content of the Transport Modelling Report (TMR). The TMR is a key deliverable of the project appraisal process and is required to be developed and updated as the project moves through the various project phases, as per the guidance set out in PAG Unit 2.0: Project Appraisal Deliverables.

The TMR is produced after the transport modelling work has been completed. The purpose of the TMR is to describe the work that has been undertaken and to make the case for using the transport model as the basis for the appraisal of the scheme. It therefore needs to describe in some detail the way in which the model has been built and provide evidence that it is sufficiently capable of reflecting observed conditions relating to transport and traffic flows. The TMR should also make clear the basis for any projections produced by the model and provide a clear view of the impact of the scheme that is being assessed on the direct vicinity of the project and its greater surrounding area.

2. Contents of the Transport Modelling Report

The detailed requirements of the Transport Model Report are specified in the TMR Checklist in Table 5.4.1, but the structure of the document should, as a minimum, cover the following elements:

- Introduction;
- Data Collection;
- Network Development;
- Matrix Development;
- Model Calibration & Validation; and
- Travel Demand Projections.

Further information on the TMR content is outlined below.

2.1 Introduction

A description of the scheme, its location, and the objectives that it is required to address. Any information on previous analysis or studies relevant to the scheme should also be noted.

2.2 Data Collection

The data collection section should provide a summary of any transport data that has been collected in order to build the models. This will include project specific surveys (e.g. traffic counts), data collected from other sources (e.g. census data) as well as information obtained from other models (e.g. regional / national models or earlier versions of the scheme model). It should enable the reader to understand what data has been used in building the model and what the quality of that data is.

2.3 Network Development

This section should clearly describe the nature and extent of the model network and zoning system. The methodology used to verify the model network should be described in detail. The data used to identify the extent of the model cordon should also be described. Zone plans should be included as legible diagrams within the report.

2.4 Matrix Development

The matrix development section should summarise the process by which the relevant trip matrices were constructed using the available data. It should show how the various data sets have been used to construct the matrices, and any necessary processing of such data where necessary.

2.5 Model Calibration and Validation

The model calibration and validation section should describe how the model was built and provide evidence that it is capable of reflecting conditions as they are observed on the network. It will therefore contain comparisons of model output to a number of observed data sets such as link counts, turning counts and journey time surveys. The validation standards that are expected of models are set out in PAG Unit 5.1: Construction of Transport Models. Ultimately the report needs to demonstrate that the model can be used as a sensible basis for informing the decision making process.

A detailed schedule of the required content of the TMR is outlined below in Table 5.4.1. All raw data used in the development of the models, as well as the models themselves, should be provided to the TII Strategic & Transport Planning Section along with the draft Transport Model Report for review.

A sample Transport Modelling Report can be downloaded from the “Downloads” section of the TII Publications website under section PE-PAG-02018_Unit 5.4.

Table 5.4.1: Transport Modelling Report Checklist

Chapter	Details
Introduction / Context	<ul style="list-style-type: none"> • Description of project phase and overview of the scheme(s) being assessed. • References to all other relevant reports and background data.
Data Collection	<ul style="list-style-type: none"> • Overview of the data collection process. • Description of existing data sources and available modelling tools (i.e. National Transport Model). • Details of traffic surveys undertaken (including location maps and tabulated summary results). • Presentation of base year flows (peak hour and AADT).
Matrix Development	<ul style="list-style-type: none"> • Background / justification for choice of future year(s) and modelled time periods. • Tabulation of growth rates used & confirmation of their agreement with TII. • Description of how specific developments are reflected. • Explanation of how the various sources of growth are reconciled. • Details of the allocation of future growth (zone based models) • Specification of any demand constraint mechanism employed. • Results obtained from any demand constraint mechanism including quantification of numbers of suppressed / induced trips. • Consideration of all the above for "high" and "low" growth sensitivity scenarios.
Network Development	<ul style="list-style-type: none"> • Description and supporting diagrams of Do-Minimum and Do-Something schemes. • Justification for inclusion of all the above schemes (including references to official documents and key correspondence). • Description of changes made to the forecast model networks to represent these schemes. • Assessment of the effect on base year model validation of any forecast network changes which is not part of the proposed scheme itself but which have been introduced to ensure meaningful modelling of the scheme (e.g. addition of minor side roads in the forecast year to model the impact of junction improvements). • Explanation of any sensitivity tests to investigate the impact of uncertain schemes.

Chapter	Details
Forecast Assignments	<ul style="list-style-type: none"> • Assignment approach used (fixed demand / variable demand). • Confirmation that assignment approach used is compatible with base year. • List of deviations from any default parameters used in the assignment software. • Justification of deviations from any default parameters used in the assignment software. • Comprehensive list of assignments undertaken. • Statement of convergence stability (usually P>98% for 4 iterations) - N.B. May need to be higher for variable demand assessments. • Statement of convergence proximity (usually δ or GAP <1%). • Comparison of convergence with base year equivalent model.
Presentation of Travel Demand Projections	<ul style="list-style-type: none"> • Diagrammatic presentation of projected flows (Peak Hours and AADT) on key links. • Presentation of any alternative projections (e.g. feeding operational / environmental assessments). • Derivation of any factors used (e.g. to generate AADT) • Diagrammatic presentation of key flow differences arising from the scheme. • Consideration of select link analyses on the key scheme link(s). • Discussion of scheme impacts in terms of key link flows and changes in key journey times. • Comparing Do-Minimum conditions with projected growth, against base year conditions. • Comparing Do-Something conditions against Do-Minimum conditions.
Miscellaneous Issues	<ul style="list-style-type: none"> • Check maps and plans are legible and colour figures are reproduced accordingly. • Check that all outputs have been presented for each time period, future year, growth scenario and (if relevant) vehicle type.



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