Transport Modelling for Project Managers

9 July 2020
Today’s moderator

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Austroads acknowledges the Australian Aboriginal and Torres Strait Islander peoples as the first inhabitants of the nation and the traditional custodians of the lands where we live, learn and work. We pay our respects to Elders past, present and emerging for they hold the memories, traditions, culture and hopes of Aboriginal and Torres Strait Islander peoples of Australia.

Austroads acknowledges and respects the Treaty of Waitangi and Maori as the original people of New Zealand.
About Austroads

The collective of Australasian transport and traffic agencies

- Transport for NSW
- Department of Transport Victoria
- Department of Transport and Main Roads Queensland
- Main Roads Western Australia
- Department of Planning, Transport and Infrastructure South Australia
- Department of State Growth Tasmania
- Department Infrastructure, Transport, Regional Development and Communications Northern Territory
- Transport Canberra and City Services Directorate, Australian Capital Territory
- Department of Infrastructure, Transport, Regional Development and Communications
- Australian Local Government Association
- New Zealand Transport Agency
Our structure

Austroads Board

Austroads National Office

Transport Infrastructure
- Assets Task Force
- Bridge Task Force
- Pavements Task Force
- Road Tunnels Task Force
- Project Delivery Task Force

Transport Network Operations
- Network Task Force
- Freight Task Force

Road Safety & Design
- Road Safety Task Force
- Road Design Task Force
- Registration and Licensing Task Force
- Austroads Safety Barrier Assessment Panel

Future Vehicles & Technology
- FVaT Task Force

NEVDIS
- Vehicle governance
- Licensing governance
Housekeeping

Presentation = 40 mins
Question time = 15 mins

Type questions here
Let us know the slide number your question relates to
Today’s presenter and agenda

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**Bryan Li**  
Associate Director  
GTA Consultants  
E: bryan.li@gta.com.au
Project background and introduction
Bryan Li
Introduction to the team

Project Team

- Austroads Project Manager
  - Richard Delplace
- Project Manager, Transport for NSW
  - Jarrad Bromly
- Technical Lead, GTA
  - Bryan Li
- Technical Reviewer, GTA
  - Robert Dus

Review Team

- Austroads
  - Working Group (including ATAP representative)
- Austroads
  - Traffic Management Working Group
- Austroads
  - Network Task Force
- Austroads Board
Austroads Working Group

Austroads Working Group

ATAP Steering Committee (led by Peter Tisato)
• Traffic and transport modelling assessments are becoming more in demand – sometimes a compulsory requirement for a project to obtain approval.

• Vast quantity of technical material is available for model users to develop models to a standard suitable for the respective agency.

• Austroads also has some technical modelling guidelines, but there is a general lack of guidance in the industry to assist with the management of modelling studies.
Purpose and objectives

• Consistency across jurisdictions in descriptions of key elements of modelling practice.
• Common definitions and terminology.
• Identify where material differences exist in terms of advice and guidance for those undertaking and managing transport modelling.
• Provide appropriate national best practice principles and/or clear explanations to support best practice in modelling, drawing on the existing guidelines where relevant.
• Complement the existing suite of guidance to assist managers.
• Encourage collaboration with internal technical experts when developing and managing modelling contracts.

Refer to Chapter 1.3
Target audience

• The below figure illustrates a typical Project Team structure.

• The target audience for the Austroads Guidance is the overall Project Manager (i.e. client) with limited modelling experience.

The target audience may work in various agency areas / sections, such as (but not limited to) the below.
Project methodology
Bryan Li
Approach to guidance development

**Industry Research and Review**
- Literature Review
- Collaboration with ATAP (Australian Transport Assessment and Planning) Guidelines
- Industry Survey

**Draft Guidance Outline**
- Prepare outline / structure of document for agreement amongst Working Group

**Draft Guidance Report**
- Multiple drafts prepared seeking feedback from Working Group, NTF, etc. and improve content

**Final Review and Publication**
- Final stages of guidance for Austroads’ endorsement and publication
- Training webinar

Austroads Building Transport Modelling Management and Capability Guidelines
Guidance aimed at Strategic models:
- For ATAP Guidelines – to be integrated into pending update of ATAP Part T1 Travel Demand Modelling.

Guidance aimed at Simulation and Intersection models:
- Austroads Report AP-R621-20
- Primary focus of this webinar
Key outcomes from industry survey

1. Different model types – terminology, definition
2. Limitation of models / managing expectations
3. Brief preparation – level of detail
4. Purpose of models
5. Interface between different model types
6. Data availability and purpose
7. Consistency between jurisdictions
8. Understanding model outputs
9. Budget / timing requirements
10. Communicating model outputs
Send us your questions

Type questions here

Let us know the slide number your question relates to
Guideline overview
Bryan Li
## Overview of guidance content

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<td>Project Manager Consideration: Early planning stages of model requirements is key as it shapes the way the model can be developed, or how much effort is put into the various components of a model build. This will ensure that there is no wasted effort on insignificant items for the purpose of the investigation – for example, an assessment of freeway systems requires effort on the driving behaviours and not interaction with pedestrians.</td>
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Typical modelling process

Refer to Chapter 6

Pre-engagement

Model purpose and objectives
- Why is modelling required?
- What will the model inform?

Scope / Brief preparation
- Provide guidance on modelling requirements.
- What is required from the respondents?

Tender Evaluation / Procurement
- Selection of an appropriate candidate to undertake modelling investigations.

Project inception
- Seek common agreement on model process, assumptions and expectations.

Transport data collection
- Obtain transport data to inform the modelling investigation.
- Analysis the data.

Delivery of modelling service
- Development and assessment of the models.

Peer reviews / audit
- Independent review of model process and outcomes and key stages.

Post-engagement

Model outputs and reporting
- Communicate model results and outcomes (written and verbal).

Model completion and review
- Exchange model data.
- Review the successfulness of the modelling investigation.
Pre-engagement stages

Refer to chapters 6 and 7

Pre-engagement

Model purpose and objectives
- Why is modelling required?
- What will the model inform?

Scope / Brief preparation
- Provide guidance on modelling requirements.
- What is required from the respondents?

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Transport models – current situation

Current Situation / Common Problems

- Issues and limitations with existing guidelines
- Inconsistent approaches
- Relevance of advice on data
- Enhancing the collective use of various models
- Communicating model outputs.

The development of these guidelines have been prepared to address these issues.
Transport models

**Model Type** | **Sub-category** | **Key Features**
--- | --- | ---
Simulation Models | Mesoscopic models | Simplified simulation of individual vehicles by the propagation of flow in discrete time intervals along a sequence of links. Static and Dynamic traffic assignment.
Intersection Models | Intersection models | Detailed simulation of individual vehicles and their interactions with each other. Static and Dynamic traffic assignment.
Model briefs and evaluation

Refer to chapters 6 and 7

Scope / Brief Preparation

• Project managers should make their priorities for the study clear within the model brief.

• Ensure clarity in the model requirements for service providers to respond, and at times prescribe what they perceive as the most appropriate approach.

• Also consider the level of ‘creative freedom’ they are willing to give to the consultant throughout the project lifecycle (and the potential financial risks associated with this).

Evaluation

• Commercial Criteria
  • E.g. cost, time, value, insurances etc.

• Non-commercial Criteria
  • E.g. appreciation and understanding of project requirements, methodology, work program, experience, capability and capacity, etc.
Post-engagement stages

Refer to Chapter 6

Post-engagement

- **Project inception**
  - Seek common agreement on model process, assumptions and expectations.

- **Transport data collection**
  - Obtain transport data to inform the modelling investigation.
  - Analysis the data.

- **Delivery of modelling service**
  - Development and assessment of the models.

- **Peer reviews / audit**
  - Independent review of model process and outcomes and key stages.

- **Model outputs and reporting**
  - Communicate model results and outcomes (written and verbal).

- **Model completion and review**
  - Exchange model data.
  - Review the successfulness of the modelling investigation.
Transport data collection

- Importance of data and its impact on the delivery of successful models.
- Challenges in collecting suitable data.

- More reliance and availability of large datasets to complement traditional methods:
  - Open source data, road and transport agency data (SCATS, permanent counts, etc.), GPS, Bluetooth, etc.
- Summary of various transport data types and typical use in various model categories.
Simulation and Intersection models

Key content in these chapters:

• Selecting Model Extents
• Composition of Transport Network
• Modelling Process and Timeframes
• Key Features for Base Model Development
  • (including references to Data Collection – Chapter 8)
• Future Year Assessment
• Model Outputs
  • (also refer Chapter 9 for a guide to Reporting requirements)
Integrated modelling approach

Refer to Chapter 5
Peer review / audits

Peer review

• Engaging modellers not directly involved in the project to review the model at key milestones within the project. The peer reviewer should be selected at the commencement of the project, to maintain a continuous understanding of the model development.

Audit

• Review of the model and documentation is undertaken after completion of the model.

• Review process should be undertaken in a collaborative manner with the objective to assist rather than hinder the project/model.

• Independent review or agency review or both.
Model reporting

Typical model reports include:

- Model Scoping Report
- Base Model Calibration and Validation Report
- Option Assessment Report.

Refer to Chapter 9
Key points

• Guideline prepared to assist Project Managers (or similar) in their respective agency in better understanding and managing model processes and projects, not to replace the need to consult internal technical experts.

• Guideline supplements current suite of Austroads traffic modelling guidance.

• Guideline does not replace the need to refer to specific jurisdiction requirements that road and transport agencies may already have in place. Rather, it is intended that these guidelines will complement existing guidance and fill any gaps (if relevant). Discretion by the reader is required.

• Guideline not intended to replace detailed technical guidelines for model users, which should still be referred to in their relevant area of assessment.
Worked examples
Bryan Li
Worked example 1 – Pre-engagement

Project Manager of a major infrastructure project requires traffic modelling services to inform their traffic and transport assessment.

He/she has no modelling experience and limited knowledge of its capabilities, however, has been nominated to lead the procurement of a suitable modelling consultant to assist with the projects needs.

How can they use this guide to assist them in developing a successful project brief? Specifically what chapters should they refer to?
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Worked example 2 – Post-engagement

A road/transport agency representative with some knowledge of modelling capabilities has moved interstate.

In their first encounter with modelling on a project, he/she has been included into a team mid-project and has noticed that the general operations are different to what they have experienced previously. In addition, he/she is unaware of a modelling team / representative within their agency to refer to.

How can this guideline assist them and provide confidence that they are following the correct procedures and gathering the correct data to inform the model?
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Questions?

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## Upcoming Austroads webinars

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Thank you for participating
Watch our webinar recordings when and where it suits you

There are more than 80 to choose from at austroads.com.au/webinars