

THE BRIEF

SOUTH GRAFTON TRAFFIC STUDY

CONTRACT NRG07/71

SPECIFICATION FOR THE ENGAGING OF CONSULTANTS FOR RTA WORKS

1. INTRODUCTION:

The Roads and Traffic Authority of NSW Northern Region (The RTA) in partnership with Clarence Valley Council (The CVC), is seeking the services of a suitable contractor to carry out a Traffic study of the South Grafton area to assess current and future vehicle / cycle / pedestrian movements, and to recommend traffic management options for improved network and safety performance.

While the study area focuses on the Bent Street precinct of South Grafton, an essential element is to predict impacts from external areas, such as the adjacent Clarenza urban release area. Connectivity to this and other areas will be important in achieving the best possible traffic management result. The extent of the study is shown on the attached plan. (Attachment A)

2. BACKGROUND:

The Bent Street precinct of South Grafton is subject to fronting development and increasing traffic. This area includes the junction of three (3) State Roads – HW10 Pacific Highway; HW12 Gwydir Highway and MR83 The Summerland Way (Bent Street). Bent Street links to the Grafton Bridge over the Clarence River which is the only link between Grafton and South Grafton within the Grafton urban area. Recent changes to flood levee protection and subsequent rezoning have seen an increase in and changes to land use development patterns.

The other area of interest is the adjacent Clarenza sector. This has been identified as a major urban land release area and is also the location of three (3) private school developments. Access to this area is via Duncans Lane and Centenary Drive as identified on the plan.

Further growth in the vicinity is expected in South Grafton and Waterview Heights in both zoned and unzoned urban residential and rural residential lands.

The volumes and composition of traffic movements will alter with the proposed land use and population changes. These changes will be reflected in access to and between the respective areas.

3. OBJECTIVES:

The purpose of this study is to develop a comprehensive traffic management scheme for the South Grafton area that will identify key improvement works required, both now and in the future.

In addition, other specific objectives of this project are to:

- Evaluate the current performance of the network and assess the latent capacity. This evaluation should also include cyclist, pedestrian and public transport needs.
- Assess the impact of planned (approved) and future development on the existing network. The level of impact for specific developments is to be utilised to develop Section 94 Contribution Plans
- Determine key network infrastructure requirements for vehicles, pedestrians and cyclists, based on predicted growths.
- Assess the actual impacts of nominated recent developments. This will include a peer review of assumptions made in previous traffic studies.
- Provide a network micro-simulation model that can be used to make predictions & investigate the potential for improvements, based on a number of given scenarios.

4. STUDY TASKS:

It is envisaged that the Study will be undertaken over several phases. The following tasks are the minimum that is expected to successfully complete this project:

- Review previous studies and data supplied by The RTA and The CVC
- Identification of current travel patterns and volumes in the study area based on collected and collated data, and the potential impact of future land use and transport development scenarios in the area. It is envisaged that the successful contractor will need to undertake additional counts at specific locations in order for an accurate model to be created. The proponent is to specify the location and type of traffic counts proposed. A detailed Origin – Destination (OD) Survey will be needed to determine existing travel patterns in and through the study area. Cycle and Pedestrian movements are also to be recorded.
- Analyse individual intersection and network performance and safety and identify deficiencies for the following timeframes:
 - Existing network
 - Short term (5yrs)
 - Medium Term (10 yrs)
 - Long Term (20yrs)

Such identification should be assessed against industry standard performance measures such as traffic volume (AADT), levels of service, peak period delays, queue lengths, vehicle kilometres travelled, travel time, and road safety performance, etc.

- Develop a model to identify & test the operation of key infrastructure needs for the timeframes listed above. The engineering feasibility, potential environmental issues, estimated cost and general risks associated with proposed infrastructure should be investigated and documented.

4.1 Model specification

The preferred Micro-simulation Models are PARAMICS or VISSIM, however other modelling packages will be considered. The Contractor shall obtain any required software licenses for any and all modelling work at no cost to The RTA. Where PARAMICS is selected for the model platform, the software used shall be Version 5.2.2 of Quadstone PARAMICS together with the R-Bundle plug-in set (distributed by Masson Wilson Twinney)

Based on the inventory, the network models should accurately represent the operational characteristics of the road system. They must represent bus movements and traffic signal operations where such facilities exist. The network models should be capable of modelling movement by all road borne modes.

The model network is to include all public roads in the modelled area. The model road networks shall be spatially accurate and built using The RTA Lamberts 94 projection. The road networks shall include all parking and other signposted restrictions by time of day and be annotated as such.

Within the model, the coded link speed shall be that of the posted speed limit. Link speeds must not be varied in order to calibrate the model. Node point coordinates are to be in the RTA Lamberts 94 coordinate system and include a "Z" value to represent height above mean sea level. The network shall extend to points where there are no unreleased vehicles waiting to load into the network at any point in time for the base case model.

One model shall be built to include each peak time period. The AM and PM peak time periods shall be determined by The RTA Contact Person. Additionally, the models shall include a warm-period prior to the beginning of the period to ensure the model is valid 5 minutes into the nominated periods. The model should use vehicle types based on the standard RTA vehicles file. A traffic profile will be created based on a time of day by origin basis, with a maximum interval of 15 minutes.

Statistical validation measures (such as Mean Absolute Difference or GEH statistics) are to be reported for link volumes and average speed, junction delays, turning volumes, bus delays and route travel time (Industry Standard Performance Measures). The Contractor is referred to the UK Design Manual for Roads and Bridges (Vol 12, Section 2, Part 1 – Traffic Appraisal in Urban Areas) for guidance on model validation. The Contractor may be required to demonstrate that the model validation is sufficiently robust to ensure that modelling error is unlikely to affect the conclusions of the study. This shall be reported at time of delivery of the base model.

All assumptions for calibration purposes are to be noted and reported and are subject to agreement by The RTA Contact Person and the proponent. The calibration of the model shall include the effects of pedestrians and on-street parking in order to create the required "friction" in shopping / commercial precincts and areas of high parking turnover and pedestrian movements. These effects must not be achieved through changing link speeds or creating end speeds or stop times.

The models shall be run with 5 separate Standard RTA seed values for calibration and validation to show that the model is robust. As well as the evaluation / comparison of the options against the Base model, the reported results should be the average of the five model runs (per option and base model) using different random number seeds supplied by The RTA. For each model, the report should also identify "hot spots" where serious congestion, queuing or delay is predicted.

A detailed report is to be prepared, recording the model development, validation and operation, including comprehensive user documentation for RTA staff or agents who may be required to use the model. In addition, Road / Transport Network Data, Model Calibration and Model Operation Reports are to be prepared as detailed in Attachments C, D and E (resp.).

4.2 Meetings

Three (3) meetings are proposed as part of this study. All meetings will be held at the RTA Regional office in Grafton. Note that one (1) additional meeting may be required for The Contractor to re-present the base models, modified to the satisfaction of the RTA & CVC. The Contractor should include this cost as a separate item within the fee proposal.

An Entry Meeting will be held prior to commencement of the study to clarify project objectives and discuss any concerns that The Contractor may have.

The Contractor is also required to make a presentation of the Traffic Model base case, following validation. This will enable a “sanity” check to be carried out with RTA & The CVC staff to assess expected results.

The Contractor acknowledges that RTA & The CVC staff may require adjustments to the model operation, such that it should accurately reflect local traffic patterns and conditions based on local knowledge / experience. These adjustments shall be made to the satisfaction of The RTA & The CVC and shall be at no cost to The RTA. The Contractor may be required to attend and re-present the revised base model (noted above).

Future-year modelling and development of traffic management options will not progress until the base model has been validated and calibrated. It is not expected that the presentation of the base model would include a draft infrastructure improvement strategy. This improvement strategy is to be developed after the base model has been accepted by The RTA and The CVC.

A presentation of the Final Study Report and ALL traffic models will be required.

The general timing of these meetings is set out in section 9.2 of this Brief.

5. OUTPUTS:

At a minimum, the following outputs would be expected;

- Study Report, including priority infrastructure needs
- Traffic Modelling outputs for industry standard performance measures
- RTA standard Model reports, as detailed in Attachments C, D and E
- Detailed impact assessments of individual planned development which will enable the production of a Draft Section 94 Contribution Plan. As a minimum this would include:
 - Existing and predicted traffic volumes
 - Prioritised works required, including indicative cost

5.1 Intellectual property

The RTA and The CVC retain the right to the working traffic models, including all input files, trip tables, parameter files and control files etc. necessary to enable the model to be re-run or modified by The RTA and / or The CVC at a later date.

5.2 External auditing

The Contractor accepts that The RTA will submit the network models and model documentation to an un-named external peer (The Auditor). The external peer will conduct an audit of the model and model documentation to determine its fitness for purpose as a micro-simulation model. Any deficiencies identified by the auditor shall be corrected by The Contractor to the satisfaction of The RTA and The Auditor and at no cost to The RTA.

6. SUPPLIED MATERIAL:

The RTA and The CVC will provide a range of available information including:

- Previous studies / reports done in conjunction with development applications, as relevant, in the Study Area
- General traffic (AADT) data for the Pacific Highway, Gwydir Highway (Ryan Street) and Bent Street (locations shown on map – Attachment B).
- Maps showing approved and proposed development & general land use areas
- Any recent traffic data within the study area
- Available ortho-rectified aerial photography (in RTA Lamberts94)
- Crash data

7. STUDY REPORT:

This report is to be A4 size and printed double sided in keeping with the Authority's policy in this regard. **Colour photographs or colour photocopies of photographs are to be used in all final reports; Black & White photocopies are not acceptable.**

Three (3) bound copies of the A4 double-sided report will be forwarded to the RTA Contact Person along with the unbound original of the material to allow further copies to be made by The RTA if required (total number of Reports presented to be four (4)). In addition, an electronic copy of the Final Report, including all tables, spreadsheets and images is to be provided. The main body of the report is to be in Microsoft Word format, with all spreadsheets in Microsoft Excel.

Any graphical information should be capable of being reproduced and / or photocopied in black and white without losing legibility.

8. STUDY PROPOSAL:

The Contractor's proposal will contain

- An appreciation of the brief
- A study methodology
- Study personnel, including details of the individuals who will conduct the study, their previous experience in this type of work and a statement regarding their availability to work on the project.
- A schedule of events including confirmation of the ability to complete the task to the stated timetable and also attend an entry meeting (as per section 9.2) and presentation of the Draft and Final Report findings at the RTA Northern Region Office in Grafton.
- A detailed bid for the study – this should indicate the time spent on the project by the individuals nominated for the study and their hourly or daily charge rate. The bid will also list other costs identified with the study that have contributed to the final lump sum fee estimate.
- Network model platform to be used and The Contractor's previous experience with this package.
- Proposed methodology to demonstrate successful validation and calibration of the model.
- Details of the method of data collection used for the Origin-Destination survey and proposed locations for the collection of additional traffic data.

8.1 Selection

All proposals will be assessed on the following attributes:

- Relevant experience
- General track record
- Technical skills
- Management
- Methodology
- Time performance
- Price

Weightings will be given to the above attributes based on the Association of Consulting Engineers Australia (ACEA) Value Selection Guidelines.

9. TIMETABLE:

9.1 Submission Deadline

Proposals must be clearly marked and forwarded to:

"South Grafton Traffic Study"
Tender Box
Roads and Traffic Authority
31 Victoria Street
GRAFTON NSW 2460

The closing date for submission of proposals is 5.00pm Thursday 13 September 2007

No facsimile or email proposals, either in part or in full will be accepted.

9.2 Entry Meeting

An entry meeting is to be held at the RTA Regional Office, 31 Victoria Street, Grafton prior to the commencement of the project. The purpose of the meeting is to give some background on the project and discuss / clarify any other aspects that may concern The Contractor. Final details will be determined after discussion with the successful proponent, however an indicative timeframe for the meeting would be during the week of 24th to 28th September, 2007. It is expected that the meeting would last for approximately 2 – 3 hours.

9.3 Project Timeframe

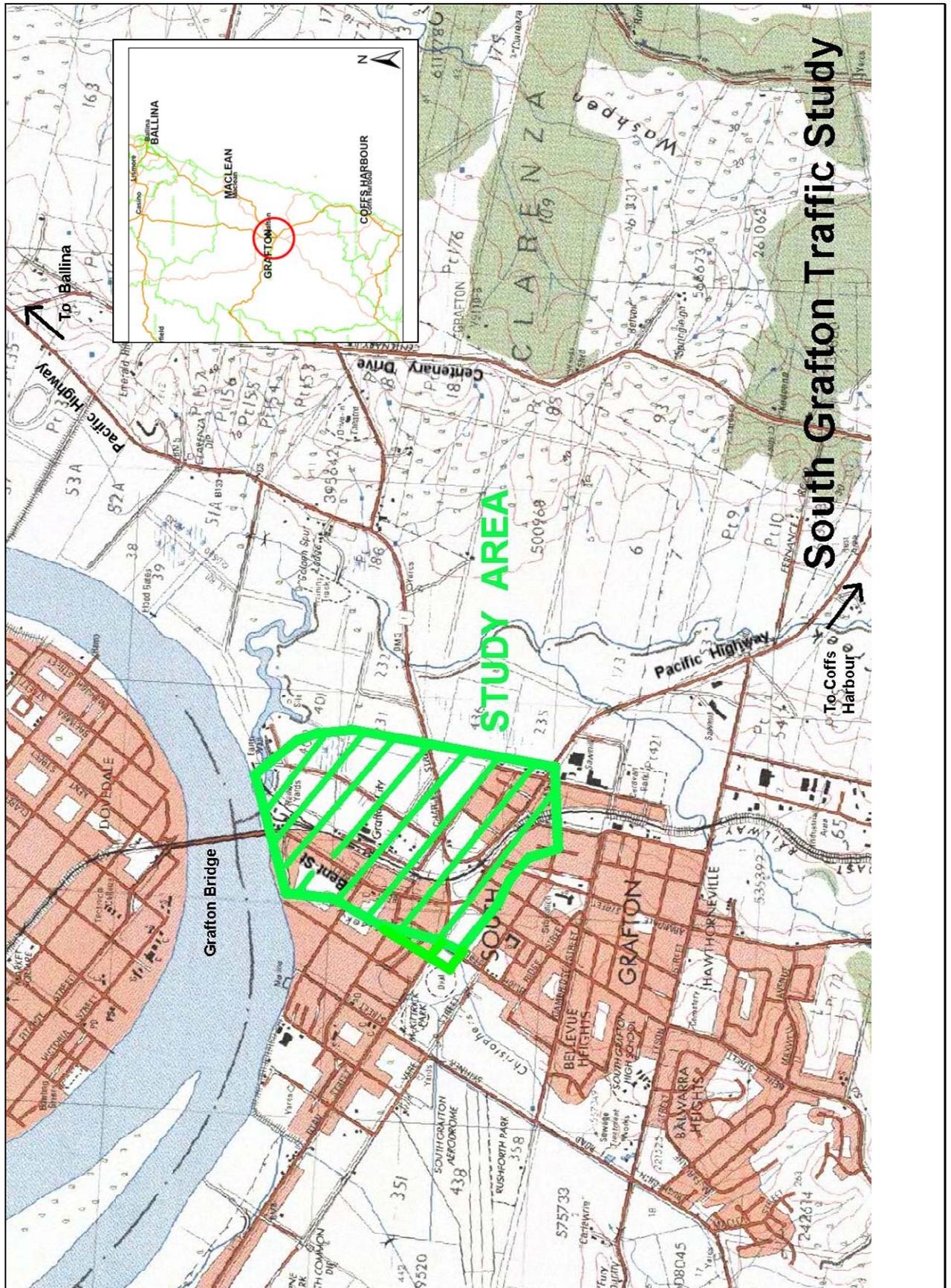
Commencement of the project is to be determined by The Contractor based on their available resources and ability to meet stated time frames. However The Contractor should consider the timeframes below when preparing the proposal:

Task	Date
Tender Awarded	Week 0
Data Collection	Week 2
Base Model Development	Week 5
Hold pending RTA & CVC acceptance of Base network model (including audit)	
Assess Future Performance	Week 8
Determine Infrastructure Requirements	Week 10
Draft Report	Week 11
Final Report	Week 14

A Draft Report is to be forwarded to The RTA for comment at least three (3) weeks before the Final Report presentation to allow for amendments. The Final Report and Model, including any amendments is to be submitted to The RTA no later than 18 January, 2008.

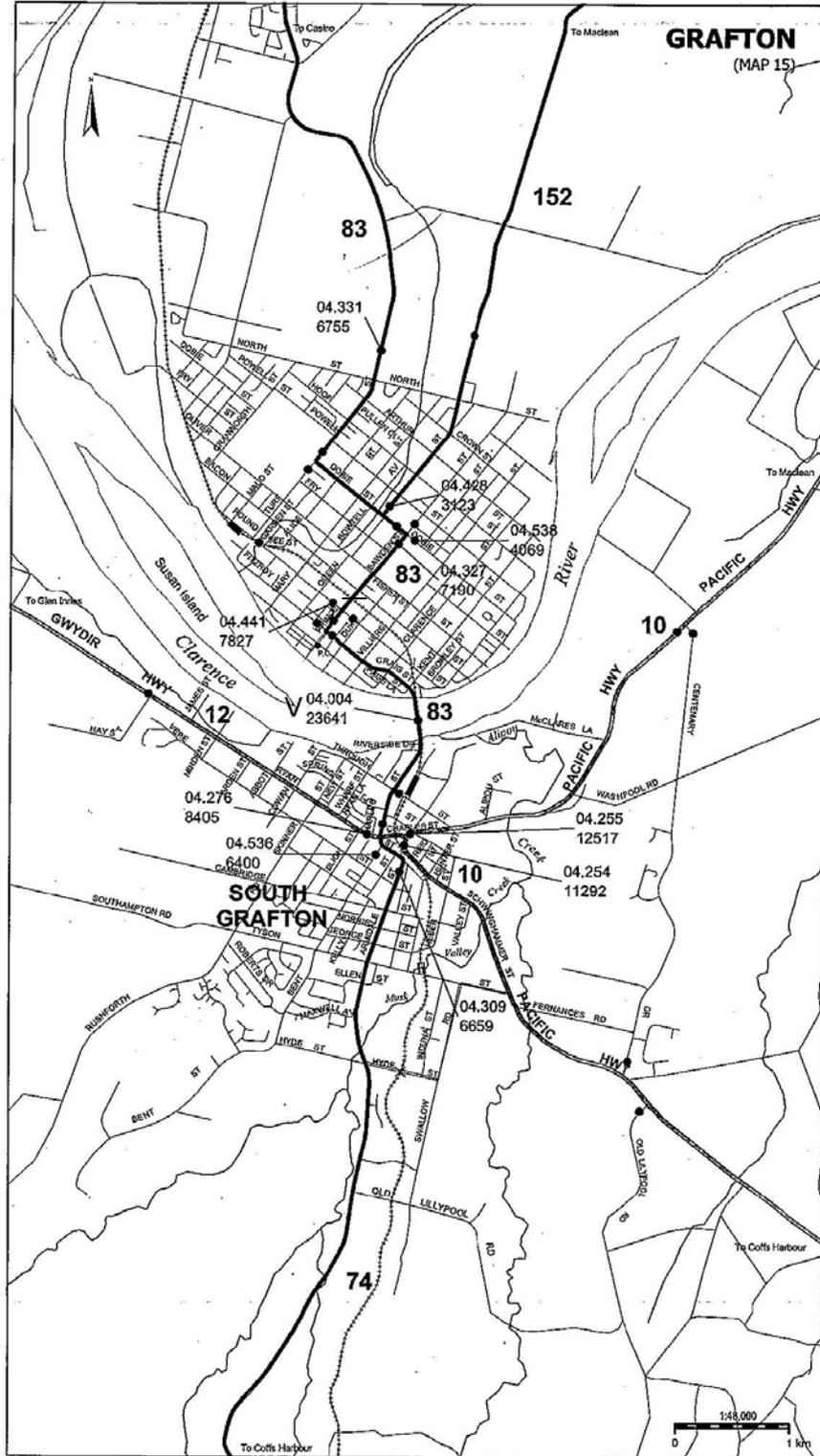
10. CONTACTS:

The RTA contact person for this Traffic Study is Tony Donohoe (02) 6640 1047



ATTACHMENT B

2004 AADT TRAFFIC COUNTS



ATTACHMENT C

Road / Transport Network Data Report

This report is to contain at a minimum:

- A title page including the date completed.
- A declaration to state that an inventory of the road / traffic network was undertaken.
- A table of contents.
- A table of maps and figures.
- A map showing the extents of the road / transport network under consideration at a scale of no more than 1:10000.
- A summary and explanation of the traffic data used in the construction and calibration of the model.
- A map showing the locations for each piece of data collected for each data type (e.g. tube survey, intersection turning count).
- The time for which each piece of data was collected.
- A copy of any traffic count undertaken for the project (in appendices, cross referenced to the map and any associated tables).
- How any gaps in the data were filled and the locations of the gaps.

The data report and any spreadsheets with collected traffic count information are to be supplied in both hard and soft copy.

A Road / Transport Network Data Report template will be provided.

ATTACHMENT D

Model Calibration Report

The model calibration report shall include at a minimum:

- A title page including the date completed
- A declaration stating that the model meets the requirements of Design Manual of Roads and Bridges Vol 12 – Traffic Appraisal of Road Schemes (DMRB12) and any other calibration requirements as set out in the brief.
- A table of contents.
- A table of maps and figures.
- A summary and explanation of the traffic data used in the construction and calibration of the model.
- A map showing the model network at a scale of 1:10000 maximum.
- A map showing the location of any information used in the calibration of the model; its temporal and volume information. One map shall be provided for each information type.
- A report outlining where the road / traffic network operations were varied from the provided / inventory data set and a justification for each and every modification.
- A list of plug-ins used and the reasons for their use.
- A completed Model Variation Statement.
- An explanation of any variations between the DMRB12 / RTA calibration requirements and the model.
- A summary of model stability including current NV and current mean speed graphs.
- Tables showing the comparison of link flows, turning movement flows, cordon flows, screen line flows, travel time comparison using the DMRB12 Requirements.

A Model Calibration Report template will be provided.

ATTACHMENT E

Model Operational Analysis Report

The model calibration report shall include at a minimum:

- A title page including the date completed.
- A declaration that both the Road / Transport Network Data Report and the Model Calibration Report have been accepted by The RTA Contact Person.
- A table of contents.
- A table of maps and figures.
- A map showing the model network at a scale of 1:10000 maximum.
- A map showing the performance (through the capturing of hotspots) for all major intersections and any intersection where there is spillback queuing.
- A summary table showing the results from the TripStats and / or Network Evaluation plug-in. This table shall include the following information.
- Total trip time; Mean speed; No of unreleased vehicles; Mean PT speed; No of Stop; Network operational cost.
- Average delay per period for all major intersections and any intersection(s) or link(s) nominated by the project manager.
- Any sites within the model, where additional network changes (including those nominated by the project manager) may be included to improve the road / transport network operations.
- Analysis of options and comparison with the base models.
- A recommendation as to a preferred option.

A Model Operational Analysis Report template will be provided.