

THE BRIEF

GRAFTON BRIDGE TRAFFIC STUDY 2009

CONTRACT 08/2545/2864

SPECIFICATION FOR THE ENGAGING OF CONSULTANTS FOR RTA WORKS

1. INTRODUCTION:

The Roads and Traffic Authority of NSW Northern Region (RTA) is seeking the services of a suitable contractor to carry out a Traffic study of the options for the proposed second Grafton bridge and to assess current and future vehicle / cycle / pedestrian movements for each option. The study should recommend traffic management options for improved network and safety performance.

While the study area focuses on the Grafton and South Grafton precincts, an essential element is to predict impacts from new internal developments, such as the new shopping complex, and external areas, such as the adjacent Clarenza urban release area.

The various bridge options for the study are shown on the attached plan. (Attachment A)

2. BACKGROUND:

In May 2002 a public meeting was held regarding an additional crossing of the Clarence River. Following the meeting the State Government allocated funding to a feasibility study for an additional crossing of the Clarence River in the vicinity of Grafton. The feasibility study commenced in July 2002.

The primary objective of the study was to identify feasible locations for a second crossing of the Clarence River, taking into consideration community needs and traffic and environmental issues.

The RTA implemented a large-scale, high profile community consultation program, which considered the views and opinions of the wider Clarence Valley community.

The following tasks formed the main part of the traffic investigations:

- Review of existing data
- Urban population growth
- Future traffic growth up to 35 years
- Formulation of a traffic analysis model that took into account safety, travel time, road user costs and ferry replacement costs at Lawrence and Ulmarra
- Use of a model to analyse strategic locations
- Benefit-costs

The purpose of the environmental investigations was to identify the environmental issues that would need to be considered when investigating strategic locations from an additional crossing

- On Friday 21 February 2003, Premier Bob Carr MP, announced that the State Government would build a second two-lane bridge across the Clarence River. The Premier advised that a final location was yet to be decided. The original strategic cost for the project was estimated to be between \$40-\$70M and was based on set unit rates for a 2-lane bridge. In this estimate very little was allowed for road approach costs, including any potential property acquisitions.
- An options short listing workshop was held in November 2003 to evaluate 7 broad localities between Susan Island and Elizabeth Island to short list the options that were worthy of further investigations.
- The localities downstream to Elizabeth Island and upstream at the Prince Street and Susan Island localities were not recommended for further investigation because of anticipated increases in noise; environmental impacts; impacts on the local community; potential increases in flood levels and predicted higher crash rates. These proposals were also not expected to significantly reduce the delays at the existing bridge.
- The route options were placed on display in April 2004 to invite further comment from the community.
- The recommended location was immediately downstream of the existing bridge, however, the decision on construction of a 2, 3 or 4 lane bridge was not determined. A final decision on location is subject to heritage, technical and environmental considerations. As well, a decision on the role of the existing bridge has not been determined.
- This project has been affected by the previous Federal Government's 2005 AusLink arrangement with NSW which had an impact on funding availability. In 2005 it was announced that as a consequence, this project would be deferred at least four years.
- The RTA project team at the time was also requested by the Major Projects Review Group to investigate a 3-lane and a 4-lane bridge option. This was due to the existing 2-lane bridge being owned by the Rail Infrastructure Corporation and because the additional cost benefits associated with the provision of 3 and 4 lane options warranted further investigation.
- The most recent estimates for the bridge range between \$93M (2 lane bridge) and \$120M (4 lane bridge). These estimates include a contingency of 40%. These estimates remain strategic and are based on unit rates only.
- The preferred option has not been officially announced, however, the recommended location is known within the community. This has enabled the RTA to approach the NSW Heritage Office and Rail Infrastructure Corporation to seek their views on the preferred location.
- In July 2005 the NSW Heritage Office, in principle, supported the recommended location of a new bridge.
- In July 2008, the then Mayor of Clarence Valley Council, Mr Ian Tiley, met with the Minister to discuss the current status of the proposed new bridge. The Minister advised that although funding was not available to progress the planning and construction of the new bridge, he committed the RTA to a review of the current status of the project.
- The new Mayor of Clarence Council, Ritchie Williamson, has indicated through media outlets that he is interested in pursuing the issue of funding for a second Grafton Bridge.

3. OBJECTIVES:

The purpose of this study is to develop a comprehensive traffic management scheme for each of the proposed bridge options and configurations that will identify key infrastructure improvement works required, both now and in the future.

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

- Evaluate each of the bridge options for the current performance of the network and assess the latent capacity. This evaluation should also include cyclist, pedestrian and public transport needs.
- Reduce delays at the existing Grafton Bridge in peak hour to a Level of Service C in 30 years after opening (or agreed equivalent measure)
- Assess each of the bridge options for the impact of planned (approved) and future development on the existing network..
- Determine key network infrastructure requirements for vehicles, pedestrians and cyclists, based on predicted growths for each of the bridge options.
- Assess the actual impacts of proposed and recent developments on each of the bridge options. This will include a peer review of assumptions made in previous traffic studies.
- Provide a network micro-simulation model for each of the bridge options that can be used to make predictions & investigate the potential for improvements, based on a number of given scenarios.
- Provides adequate vertical clearance for heavy transport on the Summerland Way
- Reduces the volume of through traffic, including heavy vehicles, from the CBD
- Reduce the potential for road accidents and injuries for the bridge and approaches to the additional crossing, including the connecting intersections
- Minimise flooding impacts caused by the project
- Minimise the impacts on the social environment
- Minimise the impacts on access for the community
- Provides improved opportunity for economic and tourist development for both South Grafton and Grafton
- Minimise the impacts on the natural environment
- Minimise the impacts on heritage
- Minimise the impacts of road traffic noise on existing noise sensitive developments

4. STUDY TASKS:

It is envisaged that the Study will be undertaken over two stages.

Stage 1 - The first stage of the Brief is to produce a transport model of Grafton and its surrounds, taking into consideration local traffic i.e. South Grafton, Junction Hill, Clarenza, Maclean and regional traffic from areas outside the Clarence Valley Council area.

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The transport model is to analyse the existing traffic (2009) and the predicted traffic volumes for 2019 (10 years), 2029 (20 years) and 2039 (30 years) and its ramifications on the existing network.

From this base model it is then proposed to develop a transport network that will return on balance the optimum position and arrangement for the additional crossing of the Clarence River and to recommend long term strategies. For the purpose of the transport model it is assumed that the new bridge will be downstream of the existing bridge, ranging from 10m to 200m.

Stage 2 – The second stage of the Brief is to produce micro-simulation models of the various options for the proposed bridge (see Attachment A) and its connections to the Grafton and the South Grafton area.

The proposed options will be confirmed after the RTA review of the transport model and the recommendations. Any additional option modelled (more than 6) will be treated as a variation to the contract.

The following tasks are the minimum that is expected to successfully complete this project:

- Review previous studies and data supplied by RTA.
- 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:
 - o Existing network (2009)
 - o Short term (10yrs - 2019)
 - o Medium Term (20 yrs - 2029)
 - o Long Term (30yrs - 2039)

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.

Model specification

The preferred Micro-simulation Model is PARAMICS. The Contractor shall obtain any required software licenses for any and all modelling work at no cost to The RTA. PARAMICS 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 heavy vehicle operations on the network. 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 B, C and D (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. 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 Transport Model and the Traffic Model base case, following validation. This will enable a “sanity” check to be carried out with RTA staff to assess expected results.

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The Contractor acknowledges that RTA 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 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.

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;

- Transport Model
- 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

5.1 *Intellectual property*

The RTA 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 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 will provide a range of available information including:

- Previous traffic 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 E).
- 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.** The report will comply with the RTA Style Guide.

Six (6) 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. 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.
- Detailed break down of cost against work components and hourly rates for the purposes of any variation works

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.

9. TIMETABLE:

9.1 Submission Deadline

Proposals must be clearly marked and forwarded to: *“Grafton Bridge Traffic Study - 2009”*
Tender Box
Roads and Traffic Authority
31 Victoria Street
GRAFTON NSW 2460

The closing date for submission of proposals is 3.00pm Friday 16 January 2009

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 27th Jan to 2nd Feb 2009. It is expected that the meeting would last for approximately 2 – 3 hours including a site inspection.

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
Transport Model development	Week 5
Base Model Development	Week 5
Hold pending RTA acceptance of Base network models (including audit)	
Assess Future Performance	Week 8
Determine Infrastructure Requirements	Week 10
Draft Report	Week 11
Final Report	Week 13

A Draft Report is to be forwarded to the RTA for comment at least two (2) 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 12 May 2009.

10. CONTACTS:

The RTA contact person for this Traffic Study is Stephen Williamson (02) 6640 1018
Stephen_Williamson@rta.nsw.gov.au

ATTACHMENT A

Proposed Bridge Location Options



ATTACHMENT B

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 C

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 D

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.

ATTACHMENT E

2004 AADT Data

