Transport Assessment Health Warning

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1.0 INTRODUCTION

A Transport Assessment (TA) provides detailed information on a range of transport conditions and related issues for the before, during construction and post-construction phases of proposed development.

A fundamental part of the TA report is the traffic impact (TI) study, which assesses the impact of traffic generated by the proposed development on local junctions for each of the above phases. Typically, developer consultants use one or more of the following software products to carry out the TI evaluations:

- Arcady (for priority roundabouts)
- Picady (for priority controlled Tee and Crossroad junctions)
- Oscady Pro (for stand-alone signal controlled junctions)
- LinSig2 (for stand-alone junctions and small networks of signal controlled junctions)
- Transyt or Transyt/TranEd (for small to large networks of signal controlled junctions)
- Transyt, Transyt/TranEd or LinSig2 (for signal controlled roundabouts)

The TI must demonstrate that the development will not cause problems of congestion or danger in the development area. The TA submitter draws important conclusions from the TI results. The receiving authority’s decision on whether or not to grant a planning application is influenced by these conclusions.

So where does the ‘damaging the public purse’ bit come in? There are two ways in which this can happen. These are illustrated in Table 1, and described below.

(i) Developer consultants submit poor and/or erroneous traffic impact evaluations as an integral part of their TA submissions. Because the errors make the traffic impact seem less than it actually will be, the receiving development control team accept the TI content ‘at face value’ and proceed towards granting the planning application. The authority then discovers that the proposed junction layout(s) cannot actually ‘work’. At this stage the development control team elects to get the original TI modeling checked by an experienced auditor. The auditor reports back that there are serious errors in the submission. Result: the ‘public purse’ now has to pay for an experienced traffic modeller and/or junction designer to redo the work correctly.

(ii) As above, developer consultants submit poor and/or erroneous traffic impact evaluations as an integral part of their TA submissions. The development control team wisely recognises that they do not have the expertise to properly check the TI content. Accordingly, they send this to an experienced traffic modelling auditor. The auditor reports back that ‘there are numerous errors, and, as a result, no value can be placed on conclusions drawn in the associated TA submission’. A cycle of ‘return/correct/re-submit/re-audit’ then commences. Result: it is the ‘public purse’ that has to pay for all the repeat audit work.

Table 1: The Current Process wrt Traffic Impact Evaluation

<table>
<thead>
<tr>
<th>A</th>
<th>OR</th>
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<tbody>
<tr>
<td>Developer Consultants</td>
<td></td>
<td>Developer Consultants</td>
</tr>
<tr>
<td>Produce and Submit a Traffic Impact Evaluation as part of the TA</td>
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<tr>
<td>Local Authority</td>
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<tr>
<td>Accept the Traffic Impact evaluations at ‘Face Value’, it is without having the work checked, and proceed towards granting the planning application</td>
<td></td>
<td>Send for Audit</td>
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<td>Cycle of Repeat Submissions and Audits</td>
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<td></td>
<td></td>
<td>Errors detected - return the TI part of the TA submission to the Developer Consultant for correction and re-submission</td>
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<tr>
<td></td>
<td></td>
<td>The LA may now proceed towards granting the Planning Application confident that the TI evaluation results are correct and that therefore they can rely on the conclusions drawn from them in the TA submission</td>
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<td>Risk Damaging the Public Purse as the Local Authority may have to pay an ‘Auditor’ for more than one submission of the traffic impact study cycle before the TI submission is deemed correct and or ‘fit for purpose’</td>
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Risk Damaging the Public Purse as the Local Authority may have to pay an ‘Auditor’ for more than one submission of the traffic impact study cycle before the TI submission is deemed correct and or ‘fit for purpose’
This state of affairs should not be allowed to continue. Accordingly, this paper endeavours to:

- illustrate ‘in what way’ Traffic Impact standards are slipping;
- suggest ‘how and why’ this might be happening; and
- propose a possible ‘better way forward’.

### 2.0 SLIPPING TI STANDARDS ILLUSTRATED

Typical modelling errors that ‘cross our auditing desk/s’, and conclusions that auditors must draw as a result, are presented below.

#### 2.1 Arcady – evaluation of priority controlled roundabouts

Common TI submission errors are:

- Geometric input data measurements that appear to be simply ‘guessed’ or are poorly executed – a description of their measurement is provided in the TRL Arcady Application Guide, AG49. (The Arcady measurements require careful geometric constructions using a protractor, compass, scaled curves, and scale rule on 1/500 and 1/1000 scale drawings);
- Measurements of ‘I’, the length over which the flare develops - often out by a factor of up to 2 times;
- Measurement of ‘e’, the normal width of the approach arm at the entry to the roundabout. This value is often over-estimated. Arcady capacity predictions are particularly sensitive to the input ‘e’ values. Specifying values that are ‘too large’ produces over-optimistic Arcady results!
- No account made for ‘approach lane starvation’ and/or ‘unequal lane usage’ in each of the peak hour periods modelled. Failure to properly account for this produces over-optimistic Arcady results, (ref TEC, Arcady Health Warning, TEC, March 1997).

#### 2.2 Transyt or Transyt/TranEd – evaluation of networks comprising linked traffic signal controlled junctions

Common TI submission errors are:

- Omission of the link/node diagram or stage diagrams;
- Incorrect representation of the network in the Transyt or TranEd link diagram;
- No provision of modeling assumptions – these often have to be requested;
- Submission of ‘failed’ Transyt models – ie Final Link prediction tables that exhibit excessive degrees of saturation and/or blocking-back (ie small crosses appearing in the mean max queue column);
- Incorrect modelling of give-way links and/or signal controlled opposed right-turners;
- Incorrect measurement of TRL RR67 Saturation Flow values;
- Failure to convert vehicle count data to pcus prior to specifying in Transyt or TranEd;
- Failure to ensure that source flow and leaving flow on a link add up to the total link flow;
- Incorrect modelling of flared approaches;
- Failure to properly model 2 to 1 exit merges (ie Funnels);
- Failure to recognise blocking back occurring, and to deal with it using the Transyt program’s ‘excess queue limit’ facility;

#### 2.3 LinSig2 - Evaluation of stand-alone or small networks of signal controlled junctions

Common TI submission errors are:

- Derived Saturation Flow Values – these are often too generous because of a failure to measure the input geometric parameters correctly from drawings and/or understand when and where to designate nearside lanes;
- Use of 5 second intergreen values throughout;
- Failure to specify any link minimum times;
- Incorrect calculation of stage minimum times;
- Failure to understand the difference between link delays and ‘bonus greens’ in TranEd;
- Failure to properly understand the various uses of stage delays in Transyt.

**Training Note:** Transyt modellers require a proper understanding of traffic signal terminology and methodology, leading to:

- Stage diagrams with ‘impossible’ traffic control sequences;
- Use of 5 second intergreen values throughout;
- Failure to specify any link minimum times;
- Incorrect calculation of stage minimum times;
- Failure to understand the difference between link delays and ‘bonus greens’ in TranEd;
- Failure to properly understand the various uses of stage delays in Transyt.

**Training Note:** LinSig2 modellers require a proper understanding of traffic signal terminology and methodology, followed by specific training in use of the TRL Transyt software program. Transyt/TranEd modellers require the same training as for Transyt, followed by TranEd training.

#### 2.4 Design of signal controlled roundabouts

In recent years, the need and/or desire to signal control many of the UK priority roundabouts has grown considerably. Unfortunately, many UK developer consultants mistakenly believe that learning how to use traffic modelling computer software, is sufficient training for the design of signalled...
to have been modelled by someone who has no prior experience of the Transyt software. (The need to acquire Transyt training prior to using TranEd should be well understood from the information available);
• The work has not been subject to meaningful final inspection or quality assurance.

### 3.0 SLIPPING TI STANDARDS – POSSIBLE CAUSES

#### 3.1 Developer Consultants

One or more of the following may be a contributing factor:

(a) Failure to recognise the need to ‘buy in’ expertise for the service if insufficient expertise is available in-house;
(b) Investing ‘minimum effort’ in the traffic impact submission in the belief that the receiving authority will (as possibly before) redo the work at cost to the ‘public purse’, rather than the submitting consultant or their client.
(c) Failure to keep abreast of the ever-growing technical and numerate skills required to properly apply the new generation of traffic control software programs, and ensure adequate training for traffic modelling teams.
(d) Insufficient resource allocation to annual training budgets.
(e) Lack of knowledge amongst training officers regarding the logical order in which courses should be attended. Table 2 provides this information for persons seeking training in Arcady, Picady, Transyt, TranEd, LinSig2, to develop successful traffic control software design.

#### 3.2 Auditor Conclusions

In the light of the findings described above, auditors might be forgiven for assuming, and therefore reporting that:

• The submitter cannot have received any formal training in the use of the applied software (ie Arcady, Picady, Transyt, LinSig etc) and/or the design of signalled roundabouts;
• The TI modeller exhibits little or no understanding of basic signal control terminology and methodology;
• The submitted TI work has not been checked, and/or supervised during its production by a more experienced modeller;
• In the case of TranEd submissions, the network appears to be incorrectly inputted, which will not work on the basis of false assumptions.

#### 3.3 Public Purse’ Incurred as a Result of Sub-Standard Traffic Impact Evaluations

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<thead>
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#### Table 3

**A Better Way Forward?**

- **Prepare the TA**
  - Assign experienced staff to prepare the Traffic Impact Evaluations
  - Ensure that new trainees have access to an experienced traffic modelling ‘mentor’ until they gain confidence and experience on actual schemes.
- **Audit the TA**
  - Errors detected - LA to return the TA for re-submission.
  - More Errors - Developer Consultant to address TI Errors and then re-submit to Local Authority.
  - LA may now proceed to process the TA Submission confident that there will be no financial ‘Damage to the Public Purse’ as a result of sub-standard Traffic Impact evaluations from the submitting Developer Consultant.

**Training Note:** TRL offer some guidance in their Transyt/12 Application Guide AG48. Specialist training providers BCC and JCT offer 1-day courses in the design of signalled roundabouts. You can view details at www.ahead4transport.co.uk.
4.0 IS THERE A BETTER WAY FORWARD?

The author believes that a better way forward might be as follows (ref Table 3):

Consultants should ensure:

i) When building their traffic modelling teams, that they actively seek persons who are highly numerate and can demonstrate good problem solving skills.

ii) When organising training, that they pay more attention to advertised ‘prior requirements’, ie the logical order in which training courses need to be attended for the different software products (ref Table 2).

iii) Ensure that trainees newly returned from courses have access to an experienced ‘mentor’ for a short period of time.

iv) Ensure that all traffic impact calculations are checked by an experienced modeller before work is signed off as ‘fit for purpose’.

v) Consider building up internal expertise in the traffic modelling field of work, by rewarding talented modellers in a way that makes it worth their while to stay ‘hands-on’ rather than feel obliged to ‘seek managerial posts’ to progress their careers.

Local Authorities should:

vi) Consider informing all submitting consultants at early scoping meetings, that they are expected to employ the services of an experienced traffic modeller for the TI work. Accordingly, consider requesting that the consultant complete an ‘Experience Declaration Form’. Table 4 suggests a possible format for this form.

vii) Ensure that submission-receivers (ie Development Control and/or Transport Planning Departments), understand that they have a responsibility to send the traffic impact content to be checked by an experienced traffic modeller prior to their progressing the TA. If no such expertise exists in house, then the Authority should make provision to employ and pay an external auditor to fulfil this role.

viii) Set up a mechanism, whereby, following the first cycle of ‘submit and audit’, any further auditing is paid for by the Consultant, and not the Authority.

The above is intended to ‘pave the way’ towards ensuring that it is the ‘perpetrator’, rather than the ‘public purse’ that pays for sub-standard traffic impact submissions!

Do you have a view?

ACKNOWLEDGEMENTS

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REFERENCES

Arcady/6 User Guide; TRL Application Guide 49.
Arcady Health Warning: Account for Unequal Lane Usage or risk damaging the public purse! TEC, March, 1997.