



Do you know TRANSYT?

Everyone knows TRANSYT – Right? It's a macroscopic software package for studying large signalised networks, isn't it? It has been very successful throughout the world for the past forty years or so, and still is, but crucially that's not all...

TRL's relentless re-investment in our products, particularly in the past three years, has seen it extend its modelling horizons and gain many new customers as a result. A new graphical interface for the 21st century, and new modelling capabilities was the focus for TRANSYT 13 in 2008. TRANSYT 13.1 shipped in 2009 with added functions, and was also joined by new modules linking TRANSYT to two of the most popular microscopic models, Aimsun and VISSIM. The most recent work on TRANSYT 14 extends its capabilities significantly further than previously possible. Read on to see how:

Roundabouts and Priority Junctions

TRANSYT 13 is already well known for its design capabilities and modelling of signalised roundabouts, but what happens if you have a primarily unsignalised or even a fully unsignalised roundabout within your network? TRANSYT in conjunction with an ARCADY licence will for the first time allow you to model all roundabouts from fully signalised to fully unsignalised. The platooning effects of other parts of a network will be taken account of in the model.

What about other priority junctions? – These can also be modelled using a PICADY licence. Geometric parameters can be specified directly within TRANSYT and stored within the TRANSYT file. Give-way coefficients are then calculated and assigned by TRANSYT to your network structure.

As many traffic engineers already have licences for ARCADY, PICADY and TRANSYT, this integration of software functionality will provide a sum greater than the individual component parts. When using the latest versions, users will also be able to utilise their existing licences without the need for new purchases and, this allows TRL to keep the price of TRANSYT low.

This brings us to another important change – the TRANSYT link structure. Users have a choice between the traditional link structure, or use TRANSYT 14's new lane and Traffic Stream structure. In many cases this reduces the number of connections that need to be set up and allows a direct 'one TRANSYT lane' to 'one real lane' relationship to be used. The grouping of lanes into Traffic Streams allows all situations to be modelled in the correct manner, where multiple lane choices are present.

When wishing to model priority situations in the most accurate manner it involves the definition of a detailed model which takes account of all movements that influence each other – by extending TRANSYT's conflict model to allow for as many conflicts as you need, the many conflicts requires can now be defined. Wherever possible we have tried to keep TRANSYT's models as generic as possible. As an example, the give-way model can be easily set up to deal with non-UK situations where priorities (rules-of-the-road) may be different.

Signalised Junctions

Standard signalised junction modelling has many new enhancements. A new controller stream object separates out the signal data from the network structure and phases are now separately defined and referenced by links or traffic streams making for a more intuitive way of working. Staging data is now more easily manipulated graphically using enhanced stage sequence diagrams and signal timing diagrams with both phase or stage manipulation modes, or by typing in timings data directly. Phase delays, etc can now be stored for all possible transitions allowing MOVA/SCOOT related data to be stored and presented in the output Report.

Various complex situations were always difficult to deal with – no more so than the dreaded "mutualopposition"! With substantial changes under the bonnet, this can now be modelled in TRANSYT 14, along with complex flared situations.

TRL has also brought smart technology into TRANSYT, by way of efficient routines, to enhance the phase and stage optimisation capabilities of TRANSYT.

No longer should TRANSYT be considered just a network tool - TRANSYT 14 is designed specifically for the easy assessment of isolated signal-controlled junctions, in addition to its more traditional roles. With the integration features of TRLs priority junction capabilities you now have a tool that will perform detailed, uncompromised analysis of any junction - it is now a case of one tool fits all.

Reporting

Reports have not been neglected either – don't want HTML? – Then simply export to Word or PDF format directly from within TRANSYT. TRANSYT file comparison capabilities have also be added providing an easy way to see what's changed between one file and another.

A number of useful new output tables are also provided, e.g. Stage-to-stage interstages and phase delays, etc.

The Optimiser

So far we've said quite a lot about the model but there is one other 'BIG' part of TRANSYT – The Optimiser. In TRANSYT 13.1 we introduced the "Enhanced Optimisation" to take advantage of the speed of modern processors, and the "Extended green splits" options to help when using the new links to micro-simulation. But now with the advent of TRANSYT 14 we are embracing the power of your PC with two new optimiser options. In addition to the standard "Hill-climb" there is now the additional option of either "Simulated Annealing" or "Shotgun Hill-climb".

The original hill-climb is very good at providing efficient timings quickly, but not necessarily the best timings. Investigations have shown how different starting points effect the results and it is this affect that is 'cured' by the introduction of the "shotgun hill-climb" process which allows you to set how many runs from different starting points (different timings) you wish to run. Typically 10 to 20 runs will give worthwhile improvements in network performance for most networks. The Simulated Annealing process also offers you control over its optimisation, so that the balance between speed and performance can be set by yourself to suit your particular requirements.

These two processes will often produce significantly better results and crucially will always produce better results than you have already.

From discussions with some of our customers, we have come to recognise that in congested conurbations it can be more important to find a good solution that keeps the main arterial routes (corridors) running well at the expense of less critical parts of a network than finding the best overall solution.

To this end we have introduced the concept of Degree of Saturation limit penalties. These allow upper and lower limits to be specified on individual lanes or links, with associated penalties when these are exceeded. This gives TRANSYT users the ability to encourage the optimiser to provide solutions that keep the main arterials running, improving journey time reliability settings on corridor routes, something that has a strong political will in many geographies.

Miscellaneous

In addition to everything listed, we have also revised fuel consumption calculation; modelling of indirect traffic control; RR67 calculations assigned per lane; constant red or green signals tolerated; phase minimums and maximums; improved modelling of oversaturated conditions; new NetCon PDF flow animations and many GUI enhancements.

We are sure that TRANSYT 14 won't disappoint!