Traffic Software News

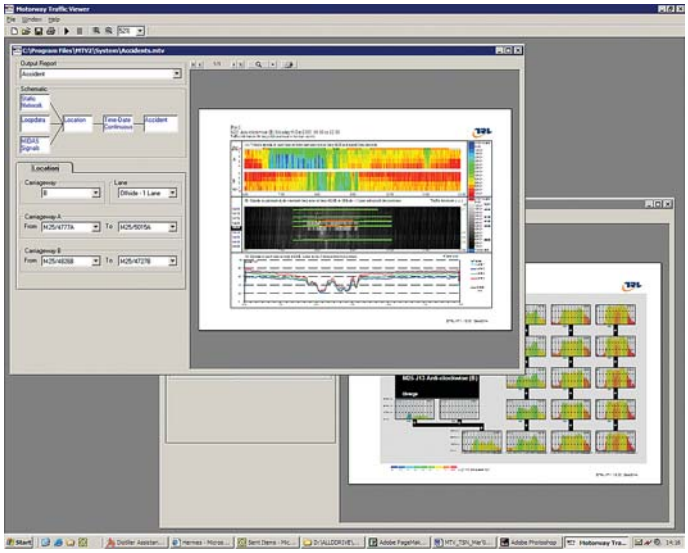
Quarterly Issue No. 33. March 2005 www.trlsoftware.co.uk TRL Limited

MTV2 – Released

TRL Software has completed a new version of MTV (Motorway Traffic Viewer), to be released in March 2005. MTV has been developed to meet current challenges of increasing traffic demand and the need to 'keep traffic moving' by examining motorway traffic under different traffic conditions. MTV 2 is a specialised graphical tool with advanced features to analyse and visualise motorway traffic and signal data obtained from MIDAS (Motorway Incident Detection and Automatic Signalling) loops. MTV 2 is aimed at traffic engineers, traffic officers, data supervisors and transport advisors working in the field of motorway traffic management and monitoring.

MTV 2 offers unique technological capabilities including:

- Binary conversion of Highways Agency Traffic Count Data in text/ASCII or formatted Excel file
- Network Editor facility to support the analysis of other MIDAS instrumented motorway data
- Daily Plot – for showing detailed traffic and signal data at appropriate locations as a way of investigating the interplay between traffic and variable speeds or flows
- The Accident Plot – for an overview of an incident or accident and its effects on both carriageways
- The Lane Distribution Plot – for traffic counts by lane at each loop site on links and through junctions in user defined intervals
- The Junction Plot – for an overview of flows (histogram) and speeds (by colour) by a user defined time period on a motorway
- The Hard Shoulder Running Plot – giving an indication when traffic flows are sufficient to benefit from the opening of an additional lane
- User friendly and intuitive graphical user interface

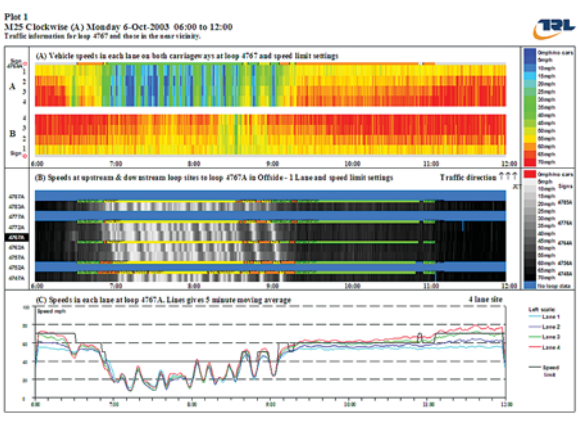


The MTV configuration panel

An M25 MIDAS system signal gantry

MTV offers innovative solutions in meeting customer needs:

- Use of MTV for incident management investigation e.g. prediction of traffic flow breakdown and tracking of shockwaves in time and space
- Use of MTV for journey times analysis and identification of congestion 'hotspots'
- Use of MTV to check operation of controlling motorway systems and hardware for optimal performance
- Use of MTV to evaluate Controlled Motorway (CM) performance (e.g. interpreting traffic conditions and signal settings to enable 'fine tuning' of system parameters)
- Use of MTV to examine traffic behaviour e.g. understanding lane changing behaviour

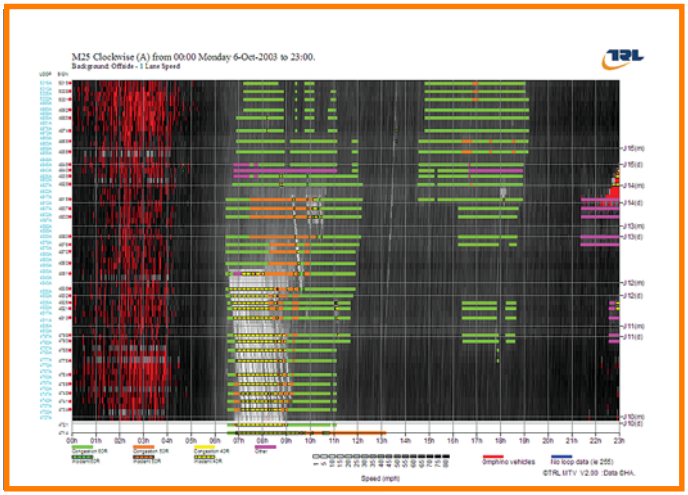


The Accident Plot

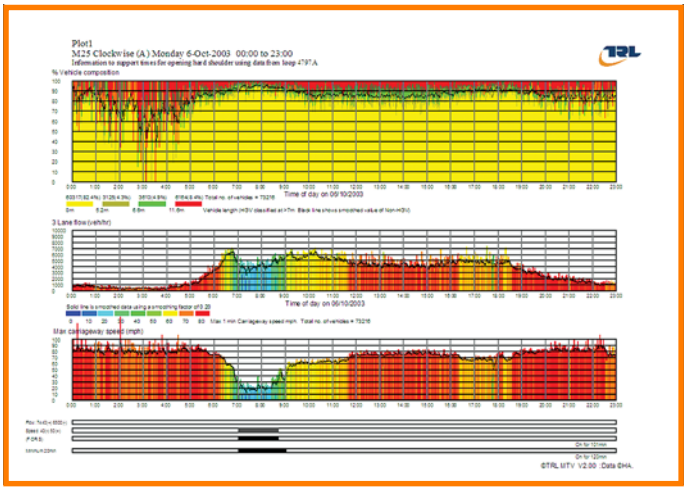
Continued...

Software Bureau

For more information on MTV 2 training courses please see overleaf



An MTV Daily Plot



The Hard Shoulder Running Plot

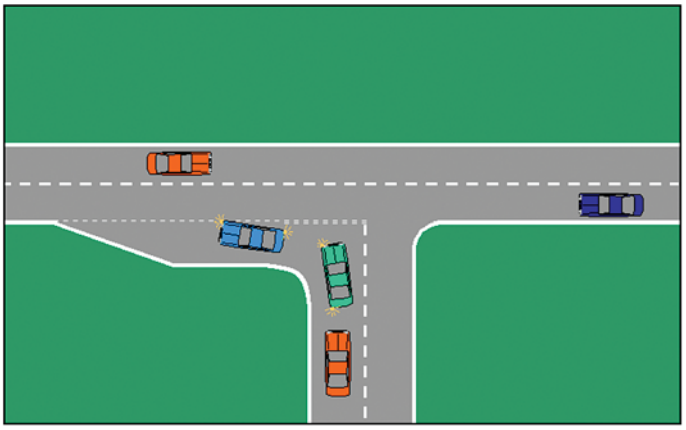
In conjunction with the release of MTV 2, we are offering 1 day training courses on MTV 2
TRL can also offer motorway traffic data analysis and visualisation services using MTV 2
For more information on any of these services, please contact: Software Bureau

Carole Dixon, email: cdixon@trl.co.uk, Abs Dumbuya, email: adumbuya@trl.co.uk

PICADY
Modelling a minor road acceleration lane

Acceleration lanes are intended to promote a degree of merging behaviour for left-turning minor road vehicles, and should in principle increase capacity. However, the TRL Supplementary Report SR582 indicated that no evidence was found of an association between capacity and the main dimensions of the acceleration lanes provided at the junctions studied. Without further research in this area, our suggested approach is as follows: Measure the lane widths as best you can using the described method in the PICADY application guide, i.e. lane widths >5 metres are reduced to 5 metres before averaging the five measured values. This lane width reduction should be done despite the presence of the acceleration lane giving extremely large initial values.

In order to decide whether a single lane approach is appropriate or not you should look at what is happening at the giveway line. If vehicles at the giveway are queuing side-by-side, and not just behind each other within the acceleration lane, this constitutes two traffic streams and hence it should be modelled as either a 'one lane + flare' or 'two-lane' situation as appropriate. If the queueing within the acceleration lane is simply one vehicle behind the other, then only one traffic stream exists and hence it is best modelled as a single lane. If the junction does not yet exist professional judgement will be needed to determine the most likely scenario.



Minor road acceleration lane

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Editorial

Focus on.....

TRL Software Website – Our new website has been operational for almost a year now and past TSN issues have featured articles on the website to highlight some of the website's features and functionalities. We continue to make improvements on the website; such as browsing through our products providing general information and technical details, software demo downloads, secure on-line ordering, help on FAQs and many more facilities. Many of you are now using the website to find out about our products (please read Graham Burtenshaw's article on website usage)

ARCADY 6 Released – As most of you are probably aware by now, ARCADY 6 with its new features was recently released and an article featured in TSN 32. The enhancement to ARCADY is partly based on customer feedback and our continued effort to add value to our products, for example, the prototype visualisation utility to allow you the user to create a more realistic 'visualisation' of the roundabout layout and create a 3D animation showing the roundabout in the operation.

Spring Training Courses – The spring training courses have also been revised to incorporate the latest information on the development of ARCADY 6 and we look forward to seeing you there. Meanwhile, you can visit the website for details on ARCADY 6 promotional price discounts before the expiry date of **31st May 2005**. If you have any feedback regarding ARCADY 6, please send your comments to the Software Bureau team: softwarebureau@trl.co.uk.

Abs Dumbuya
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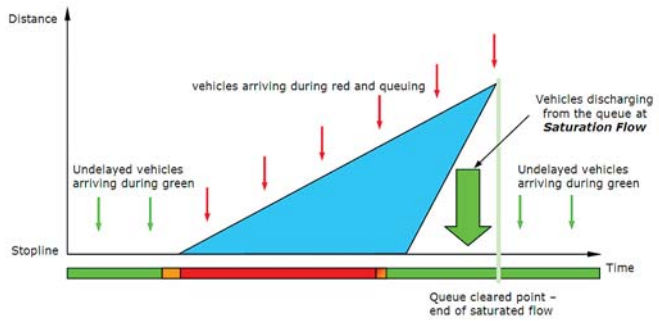
Saturation Flow – Food for Thought

At the recent well attended TRANSYT User Group some attendees were asking for clarification on values to use for saturation flow. Over the years the precise values to use have been a subject of much debate. This is not surprising since many proposals for schemes can be influenced significantly by the capacity of the surrounding road network. Those proposing a scheme may (understandably) elect to be optimistic about capacity (and to a large extent the saturation flow defines the capacity of signal controlled junctions). Conversely, others may tend to adopt more conservative values.

Before discussing the issues, let's remind ourselves what saturation flow is precisely. It is the discharge of vehicles across the stopline of a signal controlled junction whilst there are still vehicles stationary in a queue. The following diagram shows in graphical form what happens:



From the above it can be seen that the value of saturation flow dictates how many vehicles can get across a given stopline within the green time (hence capacity). Stated the other way, the saturation flow dictates the length of green time needed to cater for a specific vehicular flow-rate.

TRL is only too aware of the controversial nature of saturation flows: in Research Report RR274 – 'The use of TRANSYT at signalised roundabouts' there were two examples quoted of saturation flows as measured at a particular roundabout. These 'examples' seemed to become the de-facto standard for many. There have been many occasions when engineers have asked for confirmation that they are the values to use whilst others would want us to confirm that higher values were acceptable! Our advice now is to refer to the revised text that appears in AG48 'TRANSYT 12 User Guide'. AG48 does not refer at all to saturation flow values, leaving it up to the traffic engineer to decide what values to use and to argue the case as necessary.

We are also often asked (as we were at the User Group meeting) whether RR67 'The prediction of saturation flows for road junctions controlled by traffic signals' gives sensible answers for most situations, given the age of the data it was based upon (now more than 20 years old) on the one hand, but on the other its seemingly optimistic values that some argue are not normally seen in practice on the other.

One point to remember about the data collected for RR67 is that all the sites used were classified as 'good' or 'average' as originally suggested by Webster and Cobbe in their book 'Traffic Signals' published in 1966. The following table is a slightly modified version of the one produced by those Authors all those years ago

Webster and Cobbe also related the expected saturation flow of good and poor sites with average: good sites would be expected to be 20% better than average, and poor sites 15% worse. The saturation flow per 'standard' lane for an average site at the time (mid 1960s) was 1,800 pcu/hour. However, RR67 data was based on a combination of average and good sites. Therefore the standard lane (which is defined in RR67, but not in Webster and Cobbe) value of saturation flow of 2,080 pcu/hour is likely to apply to an approach which is better than average, but not as good as 'good'.

Site designation	Description of site characteristics
Good	Dual carriageway No noticeable interference from pedestrians, parked vehicles, right-turning traffic (either owing to their absence or because of special provision made for them) Good visibility and adequately large turning radii Exit of adequate width and alignment Good quality road surface
Average	Some characteristics of good sites and poor sites
Poor	Average speed low Some interference from standing vehicles, pedestrians, right-turning traffic Minor entries and exits either/both upstream or downstream Poor visibility and/or poor alignment or intersection Busy shopping street with high pedestrian activity Poor road surface Traffic calming measures on either/both entry or exit Where congestion or downstream queuing discourages drivers from pulling away cleanly

Therefore, when it comes to estimating the saturation flow, a 'rule-of-thumb' for today's conditions might work as follows:

- For a site that is definitely poor, a value calculated from RR67 may need to be reduced by something in the range 15 to 25 percent
- For a site that is average, a value calculated from RR67 may need to be reduced by something like 5 to 10 percent
- For a site that is clearly good, the range may be from the value calculated by RR67 to a value possibly greater by 10 percent

Some sites may be better classified by approach rather than site – there are situations where the main road is 'good' but the side roads poor. Main road straight-ahead traffic may have a saturation flow higher than the side roads or main-road turning traffic, if it has dedicated straight-ahead lanes.

MOVA sites may also have a noticeably higher saturation flow – MOVA is believed to have quite a noticeable effect on saturation flow. It appears that, over time, drivers change their behaviour, probably subconsciously, as they try to ensure they get through the current green. Saturation flows of around 2,500 pcu/hour are believed to be achieved at 'good' MOVA sites (and TRL measured 2,800 pcu/hour on one lane at the old Hockley cross roads near Winchester, before the M3 link between there and Southampton was completed!)

Is the above of much help when deciding what saturation flow is appropriate for any given situation? Well, the idea is to provide food for thought and ideas that you can use to back-up your own judgement, which, ultimately you will have to use. We would fight shy of giving anything that is more prescriptive than that as it can be taken in the wrong way, sometimes wantonly, other times through lack of understanding perhaps. However, we are happy to debate the issue, and if anyone cares to share any measured data that they may have collected, it may be possible to refine the way saturation flow is estimated in the future.

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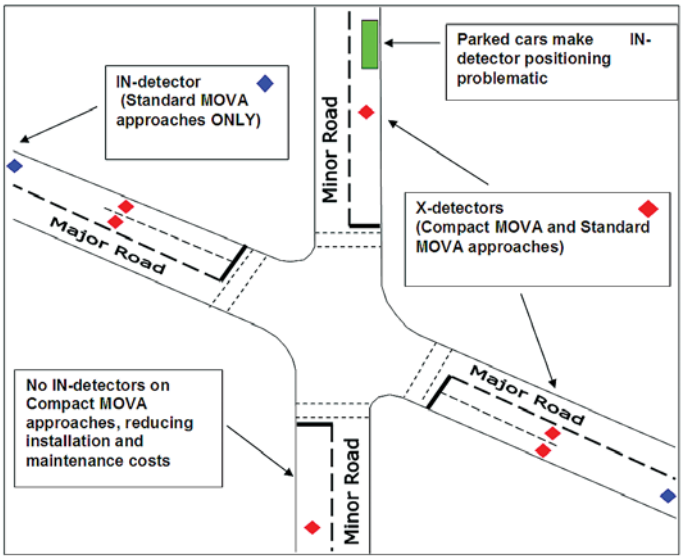
MOVA M5.0: Released to MOVA Manufacturers

The latest version of TRL's innovative and adaptive traffic signal control system, MOVA M5.0, has been released to the MOVA manufacturers for integration and distribution.

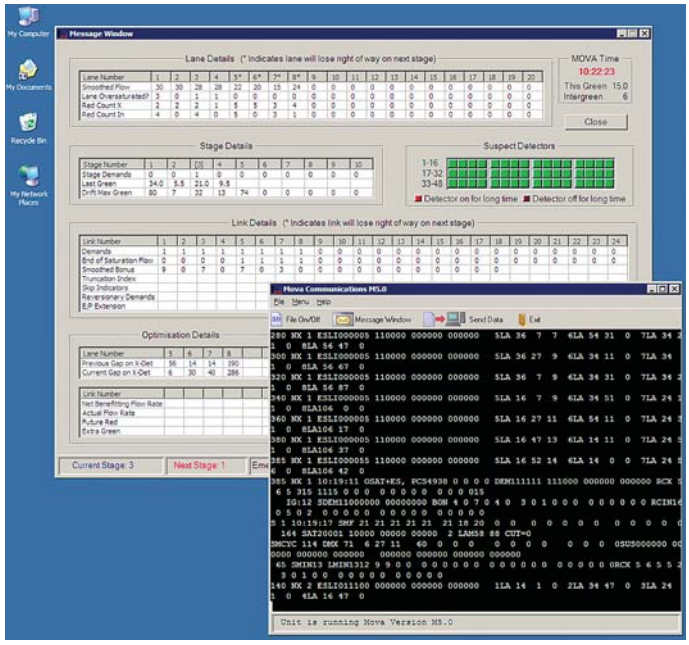
MOVA M5.0 is designed to be easier to use, with new configuration data functionality, expanded data capacity, and 'Compact' MOVA facilities. Error handling has been improved, and existing experimental enhancements (such as Puffin facilities) consolidated. In addition, the MOVA configuration and communication tools have been updated, and the MOVA application guides revised. These can be downloaded from TRL's software website, www.trlsoftware.co.uk. Here is a summary of the new features in MOVA M5.0:

- 'Compact' MOVA functionality, allowing MOVA to work effectively without the more distant IN-detectors. A hypothetical junction with Compact MOVA approaches is shown below. Although Compact MOVA has been tested in simulation and on-site, TRL will need to be involved in some of the early implementations to formulate exact guidance on how and when to use it. Please contact us if you are planning to use Compact MOVA facilities.
- Support for datasets with up to 10 stages, 30 lanes, 60 links, 64 detectors and 31 confirms for stages and phases. The increased number of links will make it possible to configure virtually any conceivable junction, even those with many pedestrian phases.
- Improved data handling capability, making working with datasets more transparent. Summary information and full site data can be displayed for every dataset held by a MOVA unit, not just the one currently in use. The changes are also designed to make it easier for engineers to use different time-of-day configurations in MOVA; something thought to be of more benefit than has previously been believed.
- The ability to download site configuration data remotely to a MOVA M5.0 unit, and to upload site configuration data from a MOVA M5.0 unit, either locally or remotely, for editing in the configuration program, MOVA Setup.
- The MOVA communications program, MOVA Comm M5.0, has been completely rewritten to include a Windows user interface, improved functionality for displaying MOVA messages, and flexible terminal settings. These include the use of any COM port, speeds up to 57600 baud and support for USB-serial adaptors. A screenshot of the new communications program is shown below.



An example Compact MOVA junction showing IN and X detectors

- The MOVA configuration program, MOVA Setup M5.0, is now fully compatible with earlier versions of MOVA and works under all recent Microsoft Windows operating systems. Setup M5.0 can load and save datasets in M2.x, M4.0/1, M4.2 and M5.0 formats, and can convert backwards and forwards between those formats. Both this and the communications program use a standard Windows setup program for quick and easy installation.
- Revision of the MOVA application guides: MOVA Traffic Control Manual (AG44) and Guide to MOVA Data Set-up and Use (AG45); these revised and expanded user guides will be easier to use and understand. Note that full advice on Compact MOVA will be formulated once experience is gained with the first on-street installations.



MOVA Comm M5.0 with MOVA message output

The latest versions of MOVA Setup, MOVA Comm and the MOVA application guides can be downloaded free of charge from TRL's software website, www.trlsoftware.co.uk. Please contact the MOVA manufacturers (Microsense, Peek and Siemens) regarding the availability of MOVA M5.0 itself.

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Heavy Vehicle Crash Injury Study

The Heavy Vehicle Crash Injury Study (HVCIS) is managed by TRL on behalf of the DfT. The project aims to determine the likely causes and personal injury consequences of accidents involving HGVs and other commercial vehicles including buses, coaches, minibuses, vans and agricultural vehicles. This information is ultimately used to promote safer commercial vehicle design. Clearly this is of great importance, especially to public service vehicles such as buses and coaches: firstly due to their high occupancies and secondly because of their greater potential impact on other vehicles in the event of a crash.

There are two separate aspects to the project:

- **Fatals**: retrospective analysis of police records, from detailed police investigation, of accidents involving fatalities; assessment of potential countermeasures,
- **Truck Crash Injury Study (TCIS)**: in-depth examinations of vehicles involved in accidents and its injuries suffered by vehicle occupants. (not necessarily involving fatalities).

The research data collected is used to provide an in-depth understanding of accident causes and consequences, and to assess the effectiveness of potential countermeasures. Detailed understanding of real world accidents plays a vital role in the development of effective and pragmatic solutions to accident problems.

Data entry and analysis is slow and cumbersome when working directly with database tables. To improve the existing situation, TRL's Software Unit was commissioned to develop new software products: a Browser and Data Input System for each of the two studies. The Fatals software has been completed and delivered, and work on the TCIS software is currently ongoing.

Truck Crash Injury Study (TCIS)

In contrast to the Fatals project, TCIS includes accidents of all severities. The data is more detailed than the Fatals project and includes the recording of, amongst others, the layout of seats and decks, emergency exits, details of injuries and photographs collected at the scene. The data from this aspect of the project provides an indication of specific issues arising in accidents involving heavy vehicles.

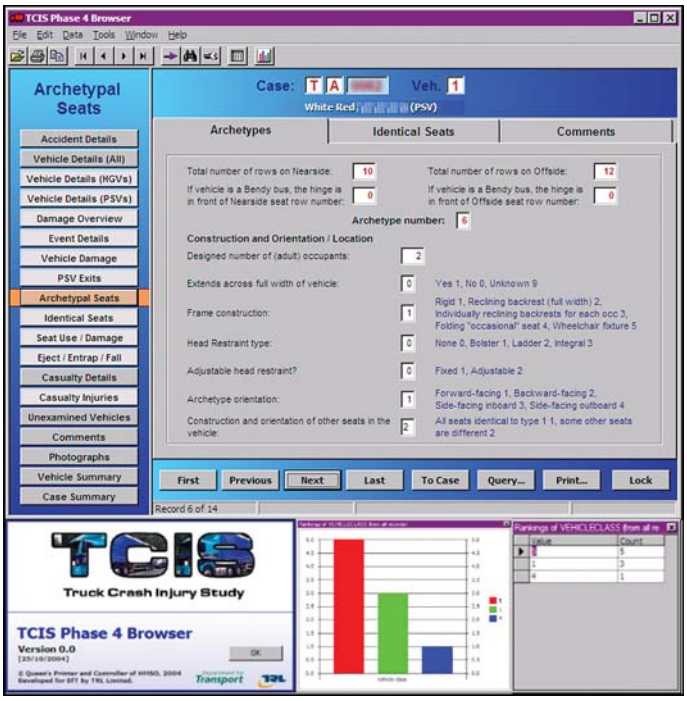
Highly trained vehicle examiners work with the police to obtain information regarding the location and nature of the accident. This is followed by a detailed examination of the vehicles involved. The information collected includes:

- **Accident** – general information about the accident (road classification, vehicles involved, road and vehicle layout, etc),
- **Vehicle details** – details about each of the vehicles involved in an accident, including details of the vehicles' loads, towing information, and seating data,
- **Event details** – information relating to each distinct event occurring in an accident: impacts (and details of objects hit), rollovers (with precipitation sequence), and occupant fall (e.g. ejected from a bus) events,

For both systems, the data input screens have been specifically designed to provide an intuitive and ergonomic method for entering data into the systems. The input screens are linked to provide clear instructions for the users, with coding sheets, and help information built into the process.

The data browsing systems provide an intuitive approach to displaying and using the data by researchers and persons not so familiar with the data, so that maximum use can be made of this high quality data source. Queries, charts and printing tools are included.

These new software products allow project stakeholders to easily view and analyse data, ensuring that TRL continues to provide DfT with high quality data provision and management services.



- **Vehicle damage** – details of the damage sustained by each vehicle,
- **Casualties** – details of injured occupants and pedestrians, and the injuries sustained by them, including surroundings and antecedents.

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Successful MOVA Conference

The TRL MOVA and Adaptive Traffic Signal Control Conference on February 10th 2005 was a great success, with over 100 delegates in attendance at the Copthorne Hotel, Birmingham. A strong line up of eminent and distinguished speakers from across the profession provided the delegates with informative presentations on the latest technical developments, policy guidance, and practical design and implementation issues.

Thanks go to all the speakers for making the event such a success, and to Traffic Engineering & Control, and the Institution of Highways and Transportation for their support of the event.

Glyn Rhys-Tyler of TRL sharing the platform with Peter Davies of Surrey County Council at the recent MOVA conference

TRAINING COURSES, SEMINARS & USER GROUPS 2005

TRANSYT
2 DAY TRAINING COURSE
5th - 6th April 2005
Course Fee £500
(£450 Maintenance Holders)
if first fully booked, the 2nd course will be held on
7th - 8th April 2005

ARCADY & PICADY
2 DAY TRAINING COURSE
17th -18th March 2005
Course Fee £500
(£450 Maintenance Holders)

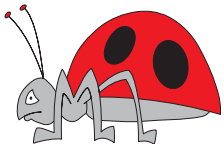
OSCADY
2 DAY TRAINING COURSE
12th -13th April 2005
Course Fee £500
(£450 Maintenance Holders)

SCOOT
2 DAY TRAINING COURSE
10th -11th May 2005
Course Fee £700
All prices exclude VAT

Places are limited (9 delegates for each course) so if you are interested please register now to avoid disappointment

Contact the Software Bureau

BUG BOX



No Bugs to report

WEBSITE USAGE
On the increase

More and more of you are now using our website, www.trlsoftware.co.uk to get the latest information on our products and find out more about our many other services. We continue to make improvements to the website, for example, online ordering and invoicing facilities are now available. Website usage includes:

Products

Not surprisingly, the most viewed product pages are TRANSYT and ARCADY. The full list is, with the most views, in order:

TRANSYT, ARCADY, PICADY, OSCADY, SCOOT, MOVA, MAAP, BUNDLE, SafeNET, TPM, COBA, CONTRAM, PERS, STM, MTV, QUADRO.

Out of the main product sections, Junction Design remains the most heavily viewed, with Environment the least. Given TRL's green credentials, we only hope that this doesn't reflect too literally the priorities of our visitors!

Referrals

By far the most popular referrer (i.e. website linking to www.trlsoftware.co.uk) is Google in its various forms. A significant number also come from www.trafficlinq.com, which is a site designed for transport professionals and which has a comprehensive listing of links.

Searches

As well as searches that have been entered into search engines such as Google, we've also had around 2000 unique search terms entered into the 'Search' box at the top-right of the website. Our search engine works by searching *every* page (including the software bulletin pages – but not the TSN archive) for any occurrence of the search words, and has a degree of intelligence in that, for example, searching for the word **light** will also search for **lights, lighted, lighting** and so on. If you enter more than one word, all pages containing both words will be found. If you enter a phrase in speech marks, only the exact phrase will be found. So, for example, entering **traffic lights** will find pages that refer to both traffic and to lights (light vehicles?), whereas entering **"traffic lights"** will find pages that specifically talk about traffic lights (i.e. the things that light up with red, amber and green, found near junctions).

A lot of searches are for items that are located not on www.trlsoftware.co.uk but on TRL's main web site, www.trl.co.uk. For this reason, a link to the main site's search page is shown at the foot of all search results. For instance, requests to purchase reports from our published series should be made to our main site, www.trl.co.uk.

Little known fact

Searching for 'nothing' (i.e. just click the 'Go' button next to the search box without typing anything in the search box) will list every main page on the site.

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CURRENT PROGRAM VERSIONS

ARCADY 6	V6.0 AA/1
PICADY 4	V4.1 AN/4
OSCADY 5	V5.0 AB/2
TRANSYT 12	V12.0 AC/3

(All above have Right/Left capability)

TPM	V2.1
STM	V4.4
BUNDLE 3	V3.0 Issue 2
MOVASETUP	V 4.0h
CONTRAM 8	V 8.2b
MAAP *for Windows*	4.30
*Safe*NET	1.03
PERS	1.1
MTV	V 2

Who's Who in Traffic Software

James Mason

James Mason graduated with a MChem (Hons) degree in chemistry from Exeter College, Oxford where he developed a molecular dynamics model for the movement of carbon atoms in an iron lattice using Fortran.

Since joining TRL last May, James has been involved in the testing and development of the TRANSYT 12 emission model, ARCADY 6 and the 3D visualisation tool. He is currently working on a new release of PICADY.

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