fast-answers™ quick-junction

The new tool for

fast and agile

junction capacity assessment and design

About Us

At John Codd & Associates we specialise in fast and agile solutions to traffic and transport problems. We have over 25 years worldwide experience in solving transport problems and in supporting development plans. To help us deliver our fast and agile approach we have developed and market **fast**-answers **quick**-Junction software. **quick**-Junction quickly assesses the traffic capacity of junctions (capacity assessment). And this helps speed up the whole junction design process and evaluation of options.

quick-Junction

Our **quick**-Junction package is made up of three applications (available separately). These are:

- **quick**-Sig for signalised junctions
- **quick**-RA for roundabouts
- **quick**-PJ for priority junctions.

Table 1: Example of Quick-Sig output – with single click Print or single click Save Report

Signal Timings

Stage	Stage Start	Stage Stop	Green Start	Green Stop	Green Controlled By
1	0	23	6	23	traffic
2	23	39	29	39	traffic
3	39	56	45	56	traffic

Performance (peak 30 minutes)

Stage	Movement	Capacity	Res. Cap.	Queue	Delay	Deg. of Sat.
1	C-A	1,230	500	4	0.1	0.59
	A-BC	1,260	240	6	0.4	0.81
2	C-A					Overlap
	C-B	340	60	3	0.6	0.82
3	B-AC	750	130	5	0.5	0.83

Units are pcu/h, metres, numbers of lanes. Delay is in minutes. Signalling data and timings are in seconds.

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quick-Junction quickly ramps-up your technical agility and saves on professional time. The software is easy to use and requires the minimum of input data, facilitating the fast capacity assessment of existing and proposed junction designs. (We estimate up to 90% time savings on junction capacity assessments and design tasks when compared with *traditional* software packages.)

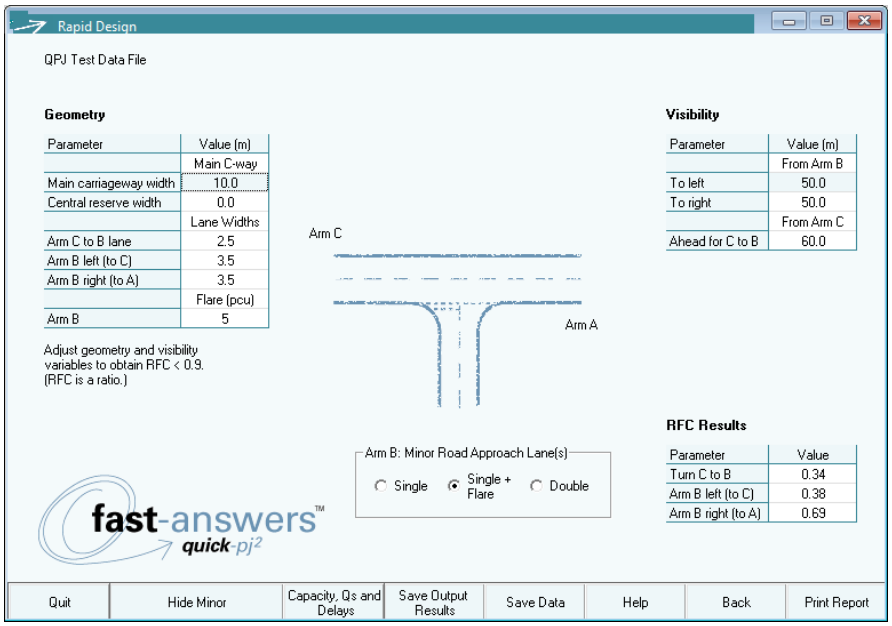

Figure 1: A snap-shot from the software showing the single screen design process for priority junctions

What **Does It Do?**

fast-answers software is designed to do just that – give you a fast answer. It's a productivity tool. This means you can work smarter and with greater agility. Agile junction design is all about being fast, efficient and effective. It's about simplicity too – we see that as the art of maximising the amount of work NOT done - so you don't get bogged down in unnecessary detail.

quick-Junction is:

- **the new tool for fast and agile junction capacity analysis and design**
- **easy to use** – accessible to more team members
- **good value for money** – fast payback – even in a matter of days on a busy project.

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And that makes it great for:

- quickly assessing junction capacity – it's even possible to deal with queries on the spot - in a meeting for example
- quickly establishing the big picture - work smarter
- quick checks and screening – quickly providing an indication of the type and extent of junction required
- fast evaluation and turn-around of options – quickly evaluating junction design scenarios and the impact of future traffic
- dealing with peak workloads – quickly increase productivity and make better use of key staff
- dealing with widespread traffic problems, for example in rapidly developing economies – quickly develop local analysis and design capability
- speeding up development control – fast assessment and checking of the operational capability of junctions, as required in transport assessments and for planning consent
- fast design of traffic management arrangements during the construction of large junctions.

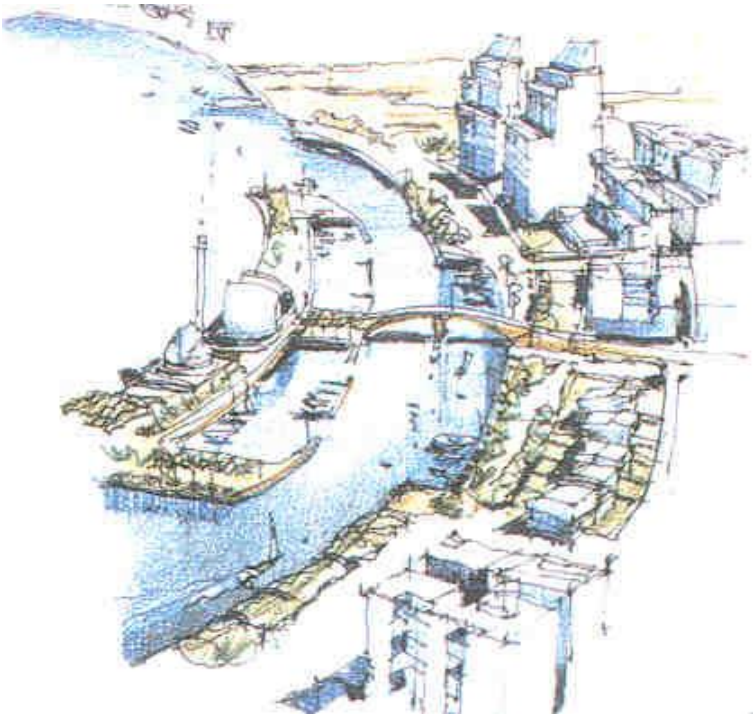

Figure 2: **quick**-Junction: supporting new development proposals and the fast checking of TAs

(Sketch by Asad Shaheed, Dubai Creek Study, CH2m Hill, formerly Halcrow, for DM)

State-of-the-Art Technology

We have a policy of continuous improvement taking into account the latest advances in traffic engineering technology and by responding to design improvement requests from our customers. For example, the **quick**-Sig signals optimiser is the result of R&D together with the Transport Research Institute and the Institute of Informatics and Digital Innovation at Edinburgh Napier University.

How it all works

- **quick**-Junction is built around making decisions, decisions that need to be made early on in the planning and design process **– the important decisions**
- **quick**-Junction fits the design process around you (not you around the process)
- The software is based on
    - long term research into junction capacity and design at TRL (Transport Research Laboratory). We pay TRL royalties to use the best of their research findings
    - decades of practical experience applying this research both in the UK and globally
    - tried and tested methodologies

Accuracy

Capacity estimates using **quick**-Junction and using *traditional* packages are similar to within a few percent (see TN1: Quick-Junction Comparison with Traditional Software. Download from **fast**-answers.com) and **quick**-Junction capacity assessment is normally marginally conservative. In any event, these small differences in analysis methods do not normally have any practical significance and are dwarfed by errors in the assessment of:

- traffic data from surveys
- traffic data from traffic models
- daily and seasonal variations in traffic volumes
- forecast traffic volumes (highly vulnerable to inaccuracies)
- trip generation and attraction volumes.

Note that capacity assessment methods themselves are also subject to error (see TN1 which reports 15% standard error in some *traditional* packages).

For practical purposes most design decisions are usually clear cut. For example the number of approach lanes at signals may need to be one lane or may need to be two lanes. The situation of 1.5 lanes is not an option. In a few cases the designer may not be sure whether to implement one or two lanes: a sort of designer's *grey* area. Where design decisions are clear cut (not in the grey area) any debate over differences in estimates between methods is irrelevant.

In any event, in the light of the above considerations, the output from any junction capacity analyses model needs to be interpreted with caution. The real question is - how well does the output from *any* of the capacity assessment methods reflect actual traffic capacity and delay at junctions?

Who Can Benefit

quick-Junction has been designed to be easily operated by personnel associated with traffic engineering work – not just mainstream traffic engineers. This means overstretched traffic engineers can more easily delegate work and be effectively assisted by numerate support staff. Equally, managing consultants who may have lost touch with the workings of complex, *traditional* junction capacity assessment software can quickly and easily run fast-answers checks on team output. Similarly transport planners and analysts, who are not very familiar with the *traditional* traffic engineering software, can easily operate **fast**-answers software without getting bogged down in too much detail. Under the supervision of experienced traffic engineers this speeds up workflow whilst ensuring quality work, on-time, and within budget.

A similar situation exists with professionals from associated disciplines. The software can be efficiently used by numerate architects, planners or civil engineering contractors to help with the early stages of junction layout and design.

Thus the software can bring direct benefits and be used by:

- traffic engineers and traffic planners
- numerate support staff, modelers and managing consultants
- planners and urban designers
- development control officers
- architects
- road construction contractors
- highway engineers
- property developers, and
- house builders.

quick-Junction

the essential tool for productivity

It is emphasised that in each case, designs are checked and finalised by experienced traffic or highway engineers. This is especially important in the finalisation of intergreen timings at traffic signals, to ensure the implemented on-street timings are safe.

Management Benefits

- improved staff efficiency, teamwork and output
- optimised use of key professional staff, and better use of support staff
- maximised output at peak workloads and bottlenecks, helping hit targets and meet deadlines
- profitability.

Figure 3: Enhanced technical agility enables efficient teamwork and improved profitability

Fast Intergreen Design at Traffic Signals: fast-answers **Innovation**

John Codd & Associates have developed several innovative techniques to enable productivity improvements and enhanced technical agility. The most notable is fast intergreen design. Intergreen design requires painstaking measurement of traffic clearance so that the traffic engineer can ensure safe clearance distances between stopping and starting traffic streams at a stage (or phase) change.

By estimating intergreen time *behind the scenes* the fast-answers user is not impeded by this cumbersome process. This is especially useful in the early stages of planning and design. However the engineer is still required to design / approve safe intergreen times prior to final implementation on street – ensuring that the estimated intergreen times are safe for implementation.

The benefit here is that detailed intergreens are not required during the planning and early design stages. Only when the design is finalised do the intergreens require checking prior to safe implementation.

Field Testing and Applications

The **quick**-Junction software has been deployed in UK (England and Scotland), India, Indonesia and the South Pacific for over a decade. Users are from both public and private sectors. In addition to the checks comparing **quick**-Junction with the *traditional* packages (see TN1 *ibid*) some companies have performed their own checks comparing output from **quick**-Junction with the *traditional* packages and positive feedback has been given in all cases. Occasionally the application of **quick**-Junction has been challenged. All such challenges have been successfully defended (as reported in Codd, Lawson, Mullen and Saleh, Fast-Answers: the quickest means of junction analysis. Traffic Engineering and Control, forthcoming).

Note: **quick**-Junction applies to stand alone junctions but can be applied skilfully, by experienced practitioners, to groups of junctions in specific circumstances. **quick**-Junction is not appropriate though for complex junctions such as large signalised roundabouts.

Features:

- a clear and simple help system
- one click reporting
- analysis and design completed in as little as three or four steps
- wizard quickly deals with pedestrians and inter-green times at signals
- quickly compare signal control with roundabout or priority junction layouts
- easy analyses of base year, future years and development generated traffic
- add-on module allows for the quick evaluation of output from area-wide transport planning models. This enables extremely quick and efficient iteration of options with junction design feedback
- licence transfer to another PC.

Internationalisation:

- right and left hand drive
- red to red/amber or red to green signalling systems
- change length of amber
- permit or disable opposed turns.

Support, Updates and Training Available

- step by step on-line traffic engineering training workbook and / or in-house training
- support plans and updates.

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Figure 4: **fast**-answers was originally designed to help speed up master planning projects

Practical Applications

The **fast**-answers **quick-** software tools are fast and agile. Because of fast turn around and high productivity they are the essential tools for:

- Transport assessments – fast appraisal of development traffic
- Master planning – fast assessment of size and scale of junctions
- Traffic planning strategy – fast assessment of existing and proposed networks
- Traffic management studies – fast appraisal and design of traffic management measures
- Modelling – fast turnaround of junction layout options
- Development control – fast checking of transport assessments
- Major improvements and road works at junctions – fast design of traffic control measures.

MORE INFORMATION

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