

We've got a cunning plan....To really get more for less!

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Introduction

In 2010 when UK Chancellor George Osborne unveiled the biggest spending cuts in decades it was clear that councils were going to be at the front line. Cuts in both Capital and Revenue budgets and shedding of experienced staff are inevitably presenting particular challenges to all local government departments including Development Management and Highways departments. The drop off in construction spending has already resulted in many major consultancies reducing staffing levels and asking retained staff to take on additional duties.

As always we have a duty to ensure that Traffic Signal schemes offer safe and efficient solutions but there is also an added emphasis now on minimising operating costs. To maximise the chance of winning funding for new schemes our proposals must be fit for purpose and deliver maximum benefit. At this difficult time there should be an added emphasis on cost saving but endemic and wasteful problems in the design and planning process prevail with many schemes failing to offer safe or efficient solutions and others un fit for purpose. We've got a cunning plan to address the problem.

The Problem

The world of signal design is a specialist one. Usually by accident an engineer will dip their toe in the signal design pond and some will paddle in the waters for the rest of their career, but many will recoil and others pass the pond by altogether. To an outsider signal design often seems either impenetrably complicated or so simple that anyone can do it, both perceptions cause problems. Be it a development or a local highway improvement scheme most projects will start with a Transport Planner and decisions made in the earlier stages are often flawed. Particularly where it is perceived that there is a "signals solution" the decision to include or alter traffic signals in a scheme is too often made with insufficient investigation, modelling, knowledge or skill and the political and financial costs can be huge. Even when recognising that specialist signals input is needed into early decisions planners often lack the experience to select an appropriate source of expertise or to sensibly review their outputs. From the selected "experts" point of view there is often a naivety of thinking with a concentration on what will fit, not what will work. Despite being flawed scheme designs often progress significantly before fundamental errors are discovered (if at all) and it can be very difficult to re visit schemes once they have been through consultation, been sanctioned by elected members and even granted planning permission. Too often experienced signal engineers are only called in at the delivery end of a scheme and as such problems where they

exist, or missed opportunities, are spotted far too late when there is no opportunity to make changes.

What happens?

A hypothetical example (but one grounded in many experiences) may be that of a development which may have a modest impact on an already overloaded and adjacent four arm un signalled roundabout. An immediate reaction may be to draw up designs for signalling the existing roundabout. In principle this may work as it has been established that a signalled entry to a roundabout will more than likely have a greater throughput of traffic than it did when un signalled and signals bring the opportunity to offset some of the negative effects of un balanced entry flows. In terms of establishing positions for street furniture and lining a signalled roundabout may be seen as simple to design and phasing, staging and intergreens are all relatively simple. There may therefore be a temptation to see the overall design process as simple and relatively inexperienced engineers let loose on the problem. If associated with a planning application the engineer is likely under a brief to keep costs to a minimum so the easiest course of action will be to propose a few stop lines, place some primary and secondary signals on a drawing and trust to luck. Incredibly the proposal often gets tabled with little, inaccurate or no modelling taking place and it is only after the concept has been discussed and largely agreed that any serious testing of the proposal begins. Alternatively what may be proposed is a slash and burn approach. A desire to include pedestrian and cycle facilities in this hypothetical scheme may for example lead to an early decision to replace the un signalised roundabout with a large signalled cross roads and once again all too often a drawing is produced before any serious testing takes place.

Typical examples of the failings of designs may include:

- a) Poor layouts;
 - Resulting in efficient and potentially unsafe designs;
- b) Badly developed and inefficient staging:
 - Resulting in loss of capacity and potential safety issues;
- c) Solutions that cannot be built:
 - No consideration is given to the 'practical' aspects such as locating traffic signal heads;
 - Pedestrian crossings are taken off too sharp radii etc;
- d) Poor modelling over estimating benefits:
 - Saturation flows over estimated;
 - Conflicting phases running together etc;
- e) Lack of appreciation of how to model Puffin facilities:
 - The benefits of on-crossing detection are not modelled;

What should happen?

What should of course happen is the early involvement of an experienced signal engineer with a track record for solving similar problems. There are of course many experienced signal engineers who are experts in for example complex configurations but may not spend much time looking at more strategic problems. In our hypothetical example for instance a signals engineer with experience in this field would not consider putting pen to paper or mouse to AutoCad before establishing worst year counts and conducting appropriate modelling. It is after all through the modelling that a design should develop and this includes refining the layout and staging to find the optimum solution. When and only when there is a working model which can deliver acceptable reserve capacity across the flow groups will the experienced engineer will examine the envelope of opportunity and begin to work up a detail design. In our example, if there is a solution by signalling the existing roundabout for example then it will likely involve only signalling three or less arms, this will only become apparent through the modelling process. There are also ways of incorporating pedestrians and cyclists into signalised roundabout schemes often at significantly less expense than replacing the roundabout with a signalled junction (which will in all likelihood be less efficient anyway).

How do we make it happen?

We won't bring about the necessary changes by simply complaining about the situation. Planners who have been burnt by poor advice and corner cutting are unlikely to repeat the experience but the dominance of framework agreements sometimes mean decisions on who to use and when are often taken out of project sponsors hands. What is needed is a broad brush approach to create a long term change in the approach to traffic signal development and design, including:

- a) Informing colleagues:
 - Seeking to 'educate those we work with;
- b) Educating:
 - Papers and articles on the design process and successes achieved;
 - Briefing notes, e.g. modelling Puffins;
- c) Institutions:
 - ITE – possibly taking a leadership role;
 - Transport planning institute – meeting with them and agreeing a strategy;
 - IHT and ICE – briefing these institutions;
- d) Central Government:
 - Informing Dft/Transport Scotland/Transport Wales/Northern Ireland Office;
 - Encourage them to reject schemes that include traffic signal designs that are not fit for purpose;

- e) Local Government
 - Liaise with the County Surveyors Society; and
 - Set standards for schemes;
- f) Black list of schemes:
 - 'name and shame'; and
 - Provide a list of bad examples
- g) We need to recognise that within signals engineering itself there are many areas of specialisation and different engineers bring different skills to the table

What will be the benefits?

The obvious benefits are better schemes, delivered quicker, more efficiently and therefore cheaper to install and operate. Not to mention ancillary benefits such as much less stressful design process without the significant lapses in trust and confidence which often ensue. Quite simply More for Less (it's a cunning plan!)