

**Edinburgh Tram – Lessons Learned**

The contract was bid in May 2005 and awarded in September 2005 and awarded in mid-2005 and work commenced in September 2005. The work is split into four phases: Requirements Definition, Preliminary Design, Detailed Design and Construction Period Services. To date, the first three have been authorised by the client and are set up and funded in Oracle. The last phase - by contract – provides for PB's contract being novated to the Main Works Contractor. PB is the prime consultant and has several subconsultants, most notably Halcrow working on the project on back to back terms with the prime contract. The project experience includes:

PB Factors	TIE Factors	General Observations
<ul style="list-style-type: none"> <li>• Changed Pmtwice?? two times Yes, Calver, someone who's name I can't remember McCauley and Chandler.</li> <li>• Non-resident PICs he ever resident? Agree, better description would be 'ineffective' I would say the PIC was unable to establish an effective working relationship with the client. The PIC failed to educate the client as to how the scheme would be engineered and was unable to work with the client to agree a workable delivery plan.</li> <li>• First major multi-office design delivery I think the key issue here is that it was the first LRT detailed design delivery project (for a rail-inexperienced client)</li> <li>• No significant local presence prior to this contract</li> <li>• A major subconsultant not co-located with Pbis this key? It is if you don't effectively measure and control his production.</li> <li>• Inability to comply with contract administrative requirements</li> <li>• Resource constraints (type &amp; number)</li> </ul>	<ul style="list-style-type: none"> <li>• Newly formed entity</li> <li>• First time delivery of a project with this scope for many key members of team</li> <li>• Convoluted/fragmented delivery model there was no model There was no practical model, the model they developed was flawed and we walked right into an almost situation. There was a model – it was spelt out in detail in the Business Case, but tie has been unable to provide the robust programme management required to deliver it. (and continues to show weakness in this area leading to the need to define any novation requirements very carefully)</li> <li>• Changed out management team at least twice (including owner of delivery model)</li> <li>• Politically charged environment with uncertainty of funding</li> <li>• Inability to influence independent approving parties</li> <li>• No experience of delivering complex major projects</li> <li>• No experience of the implementation of light rail systems</li> <li>• Lack of understanding of the programme management function for which tie was responsible</li> <li>• Inability to manage stakeholders and interested third parties</li> </ul>	<ul style="list-style-type: none"> <li>• Very difficult T&amp;Cs, scope/proce/contingency mismatch. The T's and C's may have been onerous but we should have recognised from the outset the need for dedicated commercial management on the team. With the client in disarray the T's and C's should have provided us with an opportunity. In reality our approach to change control through detailed design was poor.</li> <li>• Mis-aligned expectations between PB and TIE on deliverables, hence no kick off, alignment meetings, should be in recommendations, bilateral and internal to PB</li> <li>• Ineffective progress reporting structure</li> <li>• Poor environment for critical issue resolution</li> <li>• The extended period of negotiation pre-contract meant that contract award was delayed beyond the client's business case aspirations. The client enforced an unreasonably short period of time for the requirements definition phase and this was signed up to by PB. There was insufficient time for orderly mobilisation</li> </ul>

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		<p>and quality and timeliness of deliverables suffered. As a consequence PB's reputation suffered and the client's perception of PB's poor performance carried through into preliminary and detailed design.</p>
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At FY07 P10, PB wrote down the margin at completion on the entire agreement by £1.2 M (from + £916 k to - £436 k). chuck, this is the crux of upiur confused conversation son louc maybe? The forecast out turn is negative 1.3, hence erosion is 2.2 The entire project consists of three Oracle projects. We took a £1.49 M hit in P10 on the detailed design project. This included £1,030 k erosion and a £457 k LOUC, resulting FROM the predicted margin at completion of -£1,333 k for the detailed design phase. The entire tram project (all three phases combined) is forecasting a margin at completion of -£436 k (better than the detailed design phase due to the positive margin booked on the requirements gathering and preliminary design phases).

The lessons learned and changes to be incorporated into business practices are derived from the following observations about PB's approach to the project and performance of the work:

- Not responsive to (even dismissive of) client messages. I think that this is overstated, we were not dismissive, the client was disparate and disorganised, so failure to perceive this - yes My comment is specific to Rail's early response; nothing was Rail's fault (subsequently proven to be otherwise - eg resources, quality, progress assessment, etc). Agreed - Rail failed to acknowledge reasonable client concerns; failed to work with the client to improve understanding; and failed to communicate problems up the PB management line.
- Overly optimistic view of ability to deliver under these conditions inability to foresee the measure of the slippage maybe It goes further than that, this is the crux of the recommendations to independently review pre-contract risk assessments for large/complex projects, clarity on and control of contingency set aside, etc. The inability to foresee CEC modus operandii was one point and this could have been picked up by proper risk assessment. Coupled with that tie's inability to control CEC (and TEL) aspirations has been the primary cause of the slippage.
- Little rigour applied to reviewing cost against physical progress at a more basic level, deliverables and wbs not in sync, hence cost losed schedule was a spoon fed exercise, P3E not used properly, and no summary, dashboard reporting on a simple basis until too late in the project To me the basic failure here was the 10,000 + line WBS. The client may require this for reporting (as tie did), but our basic failure was either being under-resourced to effectively use a 10,000 line WBS or not preparing our own (that meshed with tie's) at a more appropriate level of detail. This is the key area in my view. Inability to use the tools effectively. In future we should be looking to an integrated project planning /controls/ financial system which relies on a single (common) database of project information which can then be used for reporting as required by the different functions. Maintenance of the WBS, (more like 5000 activities than 10000 by the way), requires some review going forward on other projects. Most importantly, though, we need to establish project control systems which allow us to get ahead of the client and forecast future performance in a robust fashion. For far too long on this project "controls" were focused on reporting historic progress two weeks out-of-date
- Poor subcontract management, particularly on progress assessments and quality true, but I do not think key to the financial outcome Certainly a problem that is driving tie's view of the quality of our deliverables and which led to Andie Harper's threats of 'step in' rights on managing our production. Halcrow Structures and Roads have been much better over the last six months, although Utility designs have been poor.
- Commercial naivety and poor risk management results, mainfestation of the above

Measures being taken to avoid/mitigate future repeats: ON MAJOR PROJECTS, to be defined

- The role of the PIC will be re-established. This starts with selection (the right person with stature, access to the client), defining the requirements and holding him/her accountable for performance. The project Manager should be accountable for performance; the PIC for client relations and definition and agreement with the client of all aspects of the project.
- BU Directors (and/or as appropriate EA MD/Ops Director) will be more visible/engaged with client management throughout the project.
- Pre-contract risk assessments on projects over £2 M gross revenue will undergo assessment by appropriately qualified people independent from the proposal team (perhaps incorporated into Red Team requirements). At what juncture? If too early, then what did Red team do?, if too late?? I believe Red Teams should have a three part remit: Did we answer the mail, is the proposal a winner (delivery plan, people selection, level of effort) and have we addressed PB's risk? For the last part, the Red Team should at least vet the proposal team's risk register. I've seen some very short Red Team sessions in EA and would expect for projects of this size that a two day Red Team is required allowing time for all these to be accomplished. This combined with more focus on the risk register at PRB should provide the independent review that's needed.
- Residual risk contingency on all large fixed price projects will be identified and tracked separately from other budgets. Use of this contingency will be controlled by someone other than the PM (eg PIC, BU Operations Director, BU Director, etc).
- The practice of physical percent complete tracking on all large production projects will be established with staged completion percentage definitions (eg not started, underway, preliminary, pre final and final) agreed at the start of the project, audited at key points during execution and used to produce earned value indicators for progress reporting. Large projects definition required, £2mm may be a rod for the Ops D's back Don't think so as all fixed price production projects should have a periodic assessment of physical percent complete by the PM – this is a matter of improving the standard of practice at the project level. This also should be part of the BU Ops Directors reviews each period. Using a standard definition of physical progress will facilitate this. For the handful of large fixed price production projects, EA Ops Director should supplement the BU reviews by looking at all over the course of a quarter. See above re project controls – not just progress but control over work to go.
- A PPM and support staff (administrative, project controls and technical as needed) independent of the project team will review the project setup, control system (WBS, programme, budgets, subcontractor management), resource plan and delivery plan for all large fixed price projects. Cf Service Line centre-of-excellence on PM /CM
- All fixed price projects over £5 M will have a full time PB Risk/Commercial Manager built into the cost who will report directly to the PIC and the BU Director. Roving QS, fine but where are they? I have been awaiting for 6 months for signs of life from Richard Blythe I'll talk to Richard, but I don't the people he's talking about are the same kind I'm talking about.