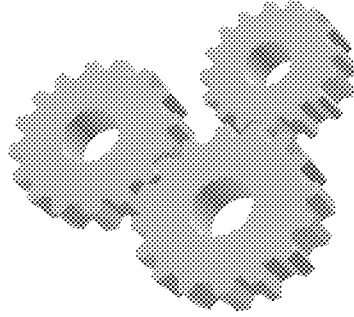


Edinburgh Tram Project

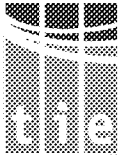
Improving design and engineering

Paper to DPD
13 February 2007



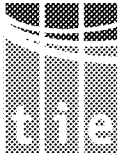
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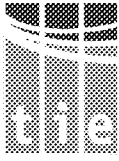
1. Summary
2. Methodology
3. The issues and constraints
4. What Tram needs
5. Improvement plan
 - 4.1 Organisation and culture
 - 4.2 Reprioritisation
 - 4.3 Process
 - 4.4 Critical issues
 - 4.5 Action plan
6. Recommendations



1. Summary of paper

Underlying Issues arise from:

- Project structure means tie doesn't always face up to asset ownership responsibilities
- Project prone to gridlocks through indecision and poor co-operation of stakeholders
- Some tie resource weaknesses and with a lack of engineering leadership
- Overly ambitious programme, with a disconnect to outputs
- Variable quality and processes + inconsistent follow through
- Design programme inflexible – unable to satisfy everyone



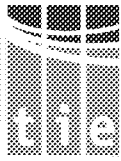
1. Summary of paper

Tram needs:

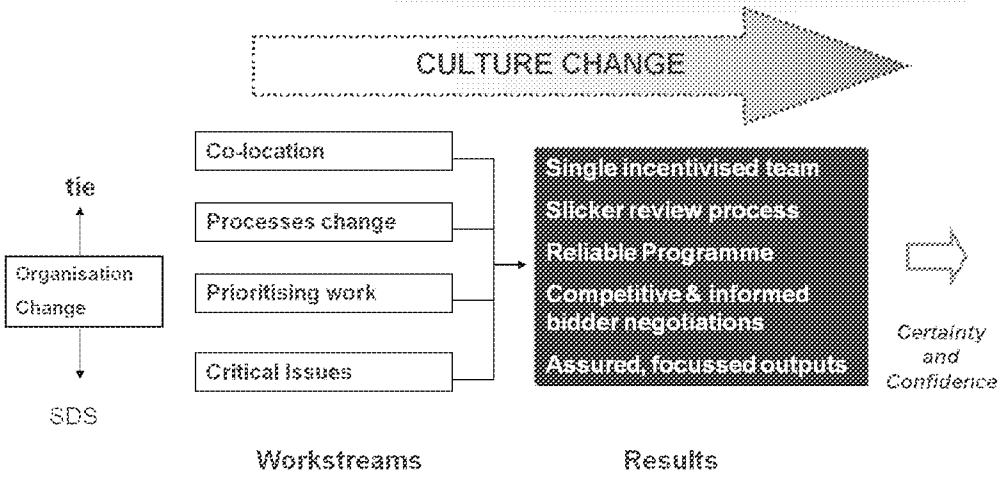
- Affordable, value engineered design, linked to bidders needs
- Appropriate levels of risk transfer
- Efficient and speedy review process
- Efficient and targeted use of all project personnel
- Motivated and empowered decision makers

Solution proposed

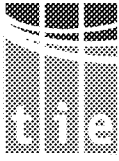
- Leverages existing Tram knowledge
- Overhauls processes and programme priorities
- Seeks to resolve critical path issues



1. Summary of paper



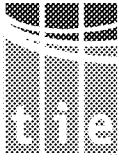
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2. Methodology

- Review and discussions with team and SDS
- Review contract Heads
- Consider SDS own structure, processes and management team
- Understand primary and supporting functions of the design
- Understand deliverables needed and programme drivers
- Qualitative evaluation of skills within tie and advisers
- Qualitative evaluation of management processes
- Assess delivered performance of SDS and tie

Anecdotal feedback often revealed the most telling issues

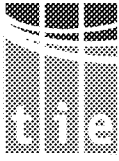


3. Issues & constraints

Underlying difficulties

tie

- tie has insufficient technical resource to process reviews and queries
- In past tie has been unable to encourage other Stakeholders to speed up – though this is now improving
- There has been prevarication and indecision
- tie has relied on others to 'own' engineering matters (TSS)
- Sheltering behind the presupposition that risk will be, or has been transferred

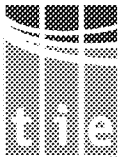


3. Issues & constraints

Underlying difficulties

SDS

- Depth and geographical spread of team
- Compression of programme to meet tie's needs
- Unrealistic planning and understanding of reviews
- 2 week delays between reporting and master programme update
- Variable quality of outputs in order to meet programme
- Unable to respond to ad hoc support requirements

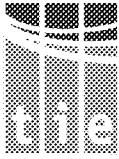


3. Issues & constraints

Practical difficulties

SDS

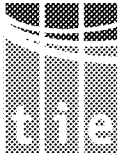
- Lack ability to move quickly due to slow change control process
- Project Review Procedure adds 20 days to delivery timescales
- Meetings overload
- Log jams in Design issues charettes, structure charettes.
- Extremely challenging programme requires task decision making
- SDS has to progress utilities design to maintain MUDFA programme



3. Issues & constraints

Impact on programme

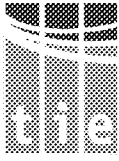
- Log jam decisions required to unlock design process
- Delayed decisions for single disciplines eg. Roads design cascade delays through the disciplines eg. Permanent way, OLE, Utilities
- Slow change control means unnecessary work and delays further the submission of deliverables
- MUDFA programme drives design plan to ensure minimal risk to MUDFA deliverables and programme
- Unable to respond to unpredictable designs events
- Design deliverables not always connected with schedule priorities
- Bidders information not always matched to expectation



3. Issues & constraints

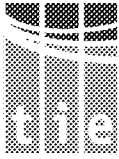
Previous attempts to improve

- Re-costing of SDS programme to meet MUDFA timescales
- Planning summits attempt to secure decisions from CEC to identify preferred solutions
- Charettes – sometimes can result in diversion and delay
- Quality presentation by SDS and a refocus on quality across the board
- Greater pressure between senior managements to 'up the game' – but failure to follow through
- Increasing adversarial approach between parties



4. What Tram needs

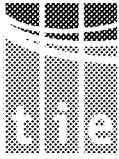
- Affordable design and value for money
- Appropriate long term risk allocation
- Value Engineering support
- Feeding the MUDFA programme
- Pro-active process with Tramco & Infracore procurements
- Technical experts to drive down bidders costs
- Formal review and approval of design
- **Tie** Engineering dept to start to own asset risk



3. Issues & constraints

Constraints

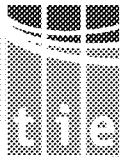
- Number of stakeholders
- Space in office
- Project structure
- SDS contract
- Duty of care
- Ensuring risk transfer position
- Statutory responsibilities of CEC
- Reserved matters per TPB Governance



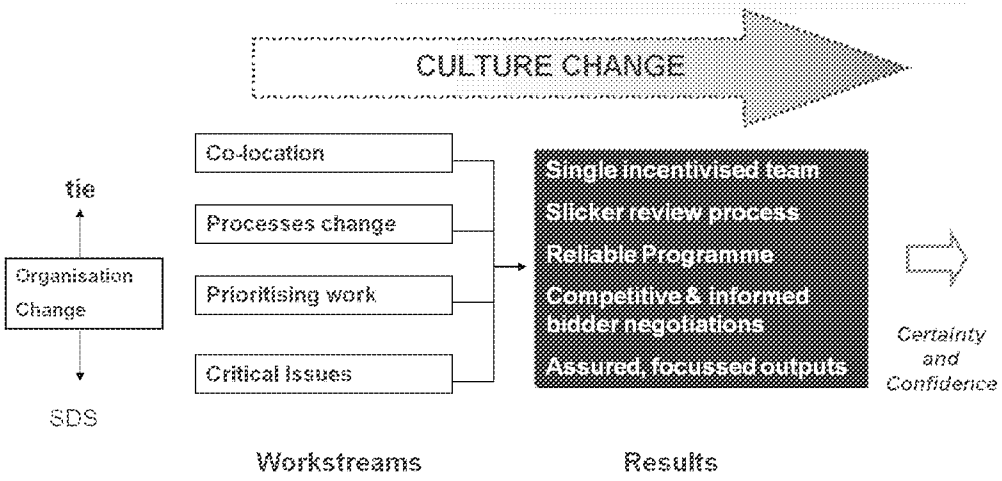
3. Issues & constraints

Constraints

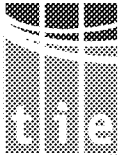
- Novation encourages
 - conservative design
 - decisions to be pushed back onto tie
- Contract imbalance causes
 - defensive approach
 - poor incentives to excel
- Current financial position means
 - rush to finishing line
 - contractual claims risk
- Inefficient processes between the parties



5. Improvement Plan *Solution overview*

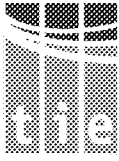


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5. Improvement Plan *Solution overview*

- New senior management and personnel
 - fresh approach
 - new methods
 - buy-in
- Greater integration of project team
 - Faster decision making
 - Key stakeholders in one place
- Improved coordination and resource utilisation
- Empowered decision making and no blame culture
- Ability to 'flex' as a team



5.1 Organisation and culture

*Fixing tie's own management
and resources*

- Increase tram knowledge resource
- Improve efficiency through internal resource review
- Clarification of roles
 - of TSS/TEL/Transdev
 - of CEC
- Clear linkage of engineering into procurement
- More accountability and authority of individuals
- Acceptance of long term engineering asset ownership
- Rapid response
- Front foot not back foot approach



5.1 Organisation and culture

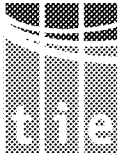
Organisation focus and change

Core project deliverables/ functions

		Engineering, assurance & approvals	Delivery & programme	Operations & Maintenance	Commercial, procurement & risk	Finance & Business case
Facilitation and support	Trust					
	Project strategy					
	Stakeholder management					
	HR Development					
	Operational systems					
	Project support					

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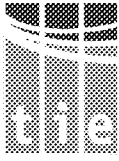
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5.1 Organisation and culture

SDS management changes

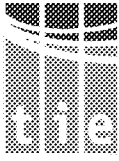
- Refocusing the management of the SDS project at the highest level within Parsons Brinckerhoff Ltd
- Appointment of new Project Director – Steve Reynolds, Board Director and Head of Infrastructure, Parsons Brinckerhoff Ltd
- Remit to work closely with Matthew to promote the Integrated Management Team culture
- Steve responsible for pulling together all the strands of the SDS project team.
 - Working with the PBL Board to ensure prioritisation of effort
 - Working with the PM Jason Chandler to ensure the project vision is translated into reality to the satisfaction of tie/stakeholders.



5.1 Organisation and culture

Changing our culture

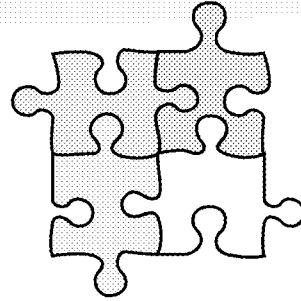
- Removing barriers to communication
- More cross functional teams
- Galvanising people to drive forward decisions
- Collective understanding of the impacts of failure (and success)
- Developing values that get to the heart and soul of the project team
- Having more fun together
- Loosing the silo culture

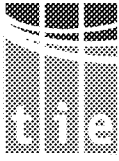


5.1 Organisation and culture

Co-location

- Multidisciplined CEC team
- Little need for outside help for decisions
- Greatly improved working environment and culture
- More space!
- 'Locked' in together -- no excuses

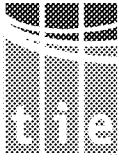




5.1 Organisation and culture

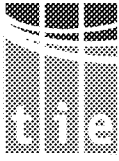
Desirable end game

- SDS effectively becomes tie's engineering department
- tie decisions are made with confidence (underpinned by expert advice)
- Synchronised design, reviews and approvals
- Self assured designs mean fewer, focused risk-based reviews
- Increased confidence of Stakeholders, management team and programme
- Value engineered, de-risked and low price of bids
- tie act for public sector as asset owner (assuming risks as steward of last resort)

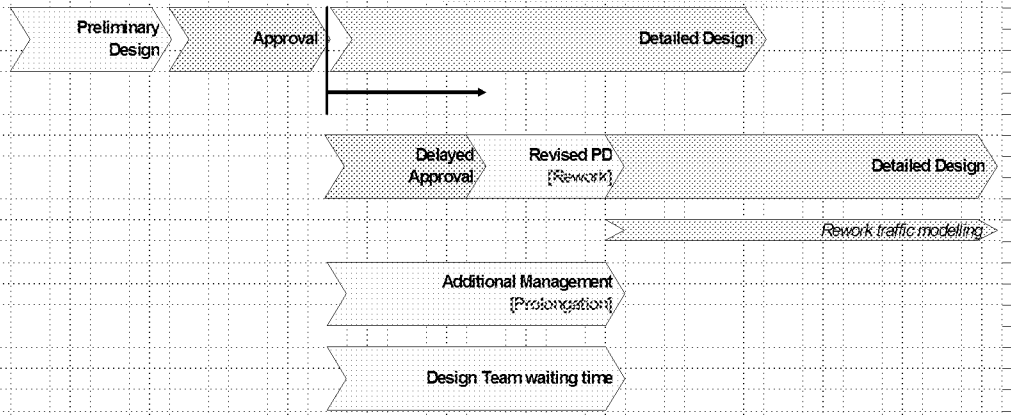


5.2 Reprioritising the programme

- Maintain and reaffirm the business case reference for all activities
- Improve co-ordination of the interface between the Section Design Managers and Design Team Leaders across all PB sites
 - Agreement of all parties on the priorities for execution of the remaining tasks
 - Agreement on the scope of design required for each task to ensure compliance without over-engineering.
- Increase focus on alignment of the SDS deliverables with the downstream infraco contract
- Consideration of the options for deferral of some scope and deliverables
- Realistic review of the programme schedule less design – more advice



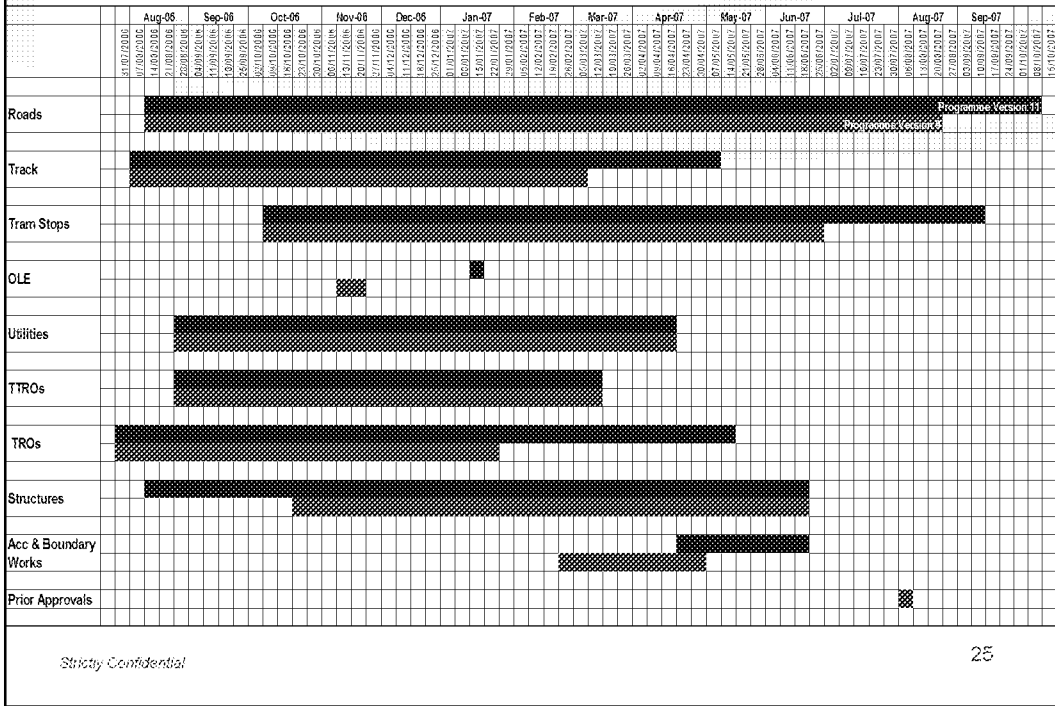
5.2 Reprioritising the programme SDS Contract Programme Sub-section Schematic



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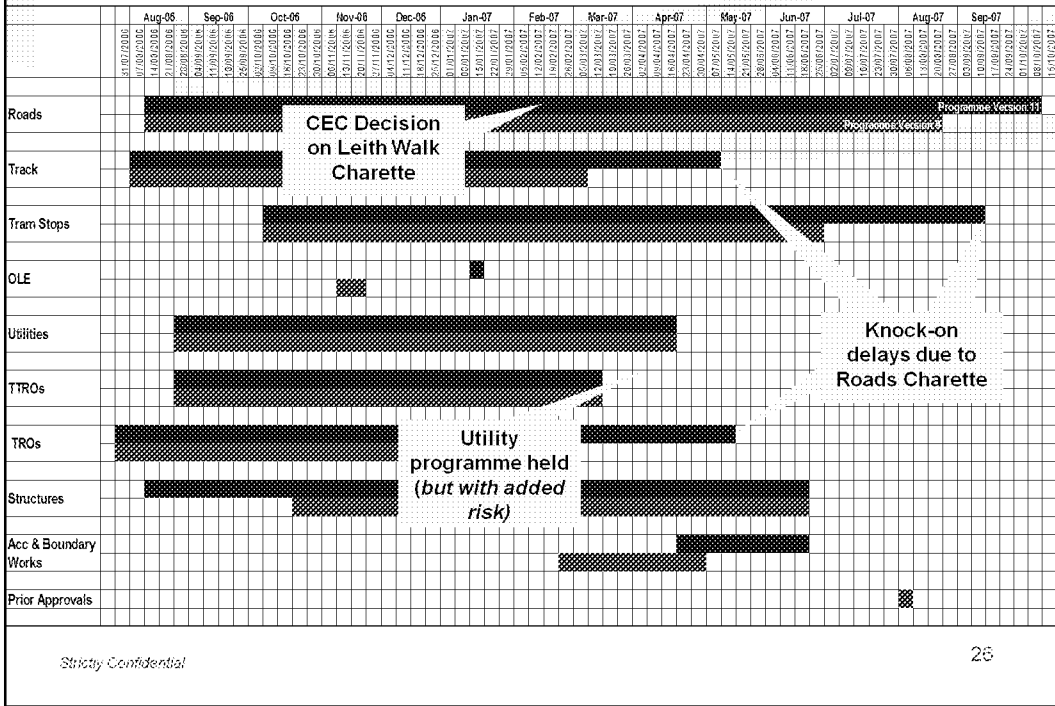
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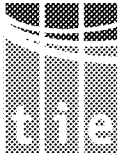
SDS Programme – Section 1B



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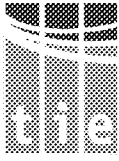
SDS Programme – Section 1B





5.3 Process improvements *Review philosophy*

- Designs issued by SDS will need less review due to the increased involvement of tie in the development of the designs
- Consequently the review process can be
 - targeted
 - quicker
 - reduced in scope, and
 - reduced in cost

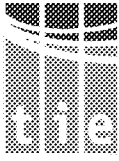


5.3 Process improvements *New review process*

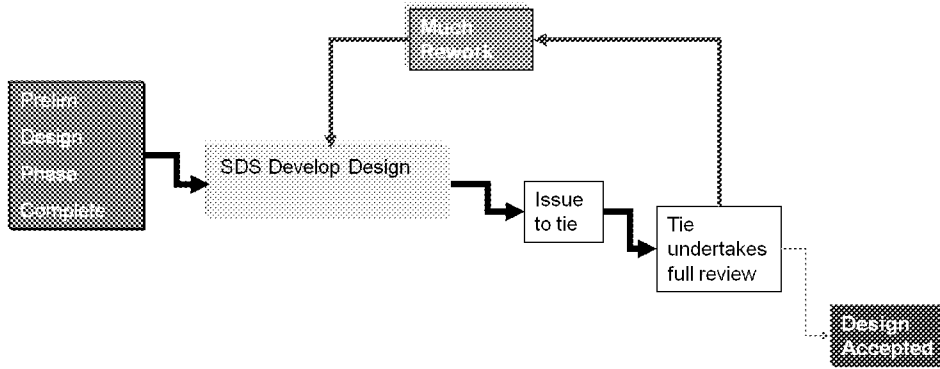
- Schedule of SDS deliverables is assessed by expert panel from tie/TSS/Transdev/CEC and:
 - Reviewers identified
 - Reviews undertaken on a predetermined sample basis
 - Sampling determined on a risk basis, based on expert judgement by tie/TSS/Transdev
- Undertaken by those with the necessary skills and experience
- Provision of focussed administrative support
- Feedback from actual reviews to further inform the selected sampling rates
- Management and progress reports generated through the admin process

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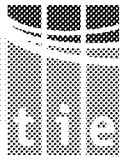


5.3 Process improvements Current design reviews

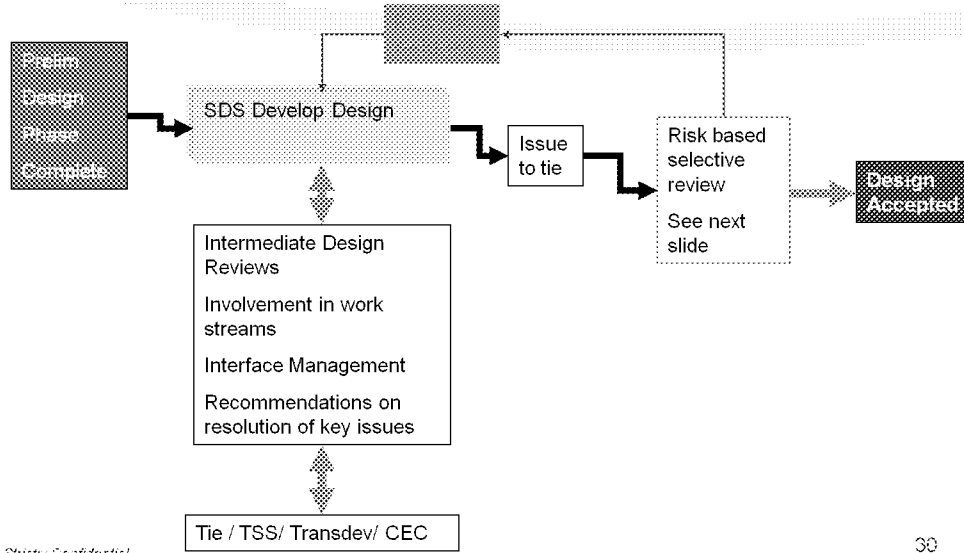


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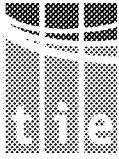
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5.3 Process improvements *Proposed design reviews*



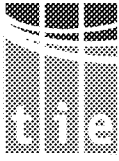
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5.4 Critical issues resolution

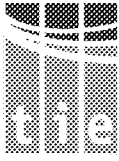
- SDS visual map to be used as basis
- Prioritisation and colour coding to focus effort
- Systematic process to close down issues
 - Offsite workshop with empowered individuals to deal with top
 - Targeted weekly issues meetings to close 2-3/week
- Use of facilitator to deal with major issues (+involvement of Willie G and Andrew H)

Dealing with critical issues will free-up time and resources



5.5 Action plan

- Commence joint workstreams to deliver 4 work streams - underway
- Changes to management and organisation - underway
- Team event to engage and motivate – Thursday 15th planned
- Secure additional space at Citypoint – lease negotiated
- Conclude and implement improvement of processes
- Instigate off-site critical issues close out programme
- Instigate decision day to agree programme and priorities
- Plan for co-location
- Move CEC into offices
- Orientation and culture training for all team members



6. Recommendations

- The Board is asked to:
 - acknowledge the issues
 - support the implementation of the changes planned
 - to encourage a full involvement of all key staff and resources
 - And recommend paper to Tram Project Board