

# Mark Bourke

## General and Introduction

1. Please provide a copy of your up to date CV.
  
1. This is provided separately.
  
2. When did you start at TIE? How were you recruited? Were you recruited specifically as a risk manager? If not, what other job title(s) did you have before your appointment as risk manager? When recruited, was your role specifically in relation to the tram project or did it extend to the other projects being managed by TIE?
  
2. Unfortunately, I am unable to recall when I was employed by TIE in 2003. I was recruited specifically as a risk manager to support the early development phases of a TIE's projects that initially comprised the Edinburgh Congestion Charge Project and Edinburgh Tram Line 1 and Line 2 projects. I clarify that prior to being directly employed by TIE, I was seconded from Mott MacDonald to TIE for a number of weeks to provide risk management support on these projects. I do not recall having any other job title, however, prior to employment by TIE, my title was Senior Consultant. My role included risk management to the wider projects where TIE had responsibilities including the Tram Line 3 project, Edinburgh Guided Busway project, Edinburgh Airport Rail Link project, Cross Forth Ferry Feasibility Study project and Forth Road Bridge Remedial works project.
  
3. It is apparent from the documents that you came to have the title, "Risk Manager". Despite this, it is clear that you also had a role in relation to procurement, contract negotiation and contract placing. Can you explain all the various matters that were your responsibility and how they changed over time? What role did you undertake in relation to contracts and procurement? If you were engaged as a risk manager, how did it come to be that you were engaged in procurement?

3. My role evolved over time, building on my initial role to develop risk management processes, project risk registers and introduce reporting on the management of risk across projects. This included developing the process to estimate Optimism Bias (OB) and working closely with colleagues and advisors to produce and maintain a project risk register. Unfortunately, I am unable to recall all various matters that were my responsibility and how these evolved over time. However, my duties included supporting in business case production in relation to risk; and leading the procurement and management of business and project insurances. I supported colleagues in stakeholder engagement with City of Edinburgh Council, Transport Scotland and Scottish Government on risk matters and I appeared as witness with colleagues presenting business case before two Scottish Parliament committees. As the portfolio of TIE's projects grew, I became responsible for the management reporting of aggregating risk management across the programme of projects. This was complimented with the introduction of in-house Tram Risk Manager who initially reported to myself and later directly to Commercial Director in the Tram management team. I supported the specification of scope of service particularly in relation to risk management and selection of legal, technical, financial and specialist consultants across projects. I additionally provided support to project management colleagues in market sounding events with prospective bidders, evaluation of Tenders at prequalification and tender stages. I would clarify that my input in relation to the Tram project for evaluation of prospective bidders and tenders related specifically to the adequacy and sufficiency of their Insurances, for which I had the support of our Insurance Brokers in evaluating. I would also clarify that I had no role in direct role in contract negotiation with potential service providers other than those in the contract placement of our Insurance Brokers, the Tram Owner-Controlled Insurance Programme (OCIP) and Active Risk Manager (ARM) software. I clarify that contract negotiations for suppliers were the responsibility of Project Directors, Project Managers, and Commercial colleagues. I drafted and liaised with colleagues and advisors to produce our corporate policies for risk management, procurement and health & safety, which defined roles and responsibilities in line with good practice.

4. Apart from you, which persons and organisations had responsibility for risk management? In particular, what role(s) were played by Nina Cuckow and Turner & Townsend? In the pack of papers for the DPD meeting of June 2007 (CEC01522629), there is a note that TIE had recently appointed an in-house risk manager (Mark Hamill) to replace the service previously provided by Turner and Townsend (page 30 of pdf). How did this fit with the work that you were doing? What service had been provided by T&T and why was the decision taken to discontinue?
4. Apart from myself, risk management responsibilities were assigned to SDS, following their appointment, however, this was later amended to bring the role in-house. Following the creation of the role of Tram Risk Manager the responsibility for day-to-day risk management was with them. The role of Tram Risk Manager was initially fulfilled by a TSS colleague, Nina Cuckow, and then later by my colleague, Mark Hamill. I recall Neil Harper of Brian Hannaby & Associates producing a QRA for the project. Similarly, I recall Paul Whitehill of TSS leading the production a QRA analysis for the project and supporting the further development of the risk register with the support of his colleagues. I also recall Paul Jobling of SDS fulfilling the leading role the fulfilment of their risk management remit. From the appointment of SDS, I recall having the support of TSS colleague, Nina Cuckow, to review their progress in implementing risk management remit. I also recall that Nina Cuckow led the migration and development of ARM Risk register and reporting of risk for the project. Overall responsibility for risk lay with individual Project Directors who had to consider the adequacy of mitigation plans and the potential cost of implementing mitigations and that individual members of staff and our advisors had a responsibility for risk management where they were designated as having lead responsibility, or risk ownership, for specific risks. These individuals contributed to the risk identification and mitigation planning. Further to this, I had the support colleagues, namely, a Tram Insurance Manager who was employed around the time of the placement of an Owner-Controlled Insurance Programme and an Assistant Risk Manager who supported me working across the wider portfolio. I recall, with the support of Assistant Risk Manager, regularly seeking a summary of key business and project risks from Tram Risk Manager to help in the consideration of aggregating

business and programme risks for consideration and reporting to the Board. In practice, the lines of reporting were amended after Nina Cuckow's engagement as Tram Risk Manager to directly report to the Tram Commercial Director. I recall the project team considering internalising a number of full-time roles that were fulfilled through TSS and this included the Tram Risk Manager role and believe that the decision was made on this basis.

5. When and why did you leave TIE?
  
5. Following the success of the SNP in the 2007 election and the subsequent Scottish Government decision to cancel the majority of TIE's projects, my post in the considering business and portfolio risk became redundant and I left TIE around July or August 2007.

#### **Risk Management – General**

6. Can you explain the processes for risk assessment and management that were used by TIE? This should include what reports were prepared in relation to risk, by whom and how they were prepared, to whom they were sent and what was done with them or on the basis of them. Who were the key personnel? What were the key documents produced as part of the strategy to assess and manage risk? What was your role in relation to these processes and what tasks were undertaken by others?
  
6. Risks were assessed in a number of ways. These included qualitative assessments of (i) the timing when that risk could feasibly occur during the project lifecycle including procurement, construction, operation stages; (ii) potential impact areas including capex, programme, opex, quality, approvability; (iii) potential Optimism Bias risk impact areas; and (iv) likelihood of occurrence and level of impact to assess significance prior to and following mitigation. The last of these allowed the identification of those risks where mitigation plans would not be sufficient. The overall management of risk included (i) the engagement with the project team and advisors to identify new risks; (ii) the review their potential impacts; and (iii) the

development of risk mitigation plans. The process for this assessment and planning included consultation with colleagues and seeking views from allocated risk owners to help develop the understanding of the risk and its implications and progress towards implementing risk mitigations. As the project developed and we implemented Active Risk Manager (ARM), we developed the assessment of risk further. I cannot recall all the risk assessment features that were considered with ARM, however, I recall that these included similar assessments to those listed above. I recommend that Nina Cuckow and Mark Hamill be asked to clarify the assessment and reporting aspects of ARM. The outputs from this process included risk reports that formed part of briefing to the Board and then the Tram Project Board (TPB) following its formation. The reporting to TPB included extracts of key risks, referred to as Primary Risks, which were considered most significant to the project and an explanation of the progress towards treating these risks. Key personnel throughout the process were the Project Director and the Commercial Director. The primary document produced to assess and manage risk was Risk Register that moved from a Microsoft Excel based register to a web-based register under Active Risk Manager. Other key documents included risk reports referred to above, and QRA analysis to assess the risk contingencies. At the early stages of the project, my role was to facilitate the risk management process to identify risks, assess potential impacts, plan mitigations and monitor the implementation of mitigation to allow me to report on progress of risk management. My role also included the assessment of Optimism Bias. My role was also to bring the support of TSS and Brian Hannaby & Associates to undertake QRA analysis. Following the appointment of SDS, and with the support of TSS, my role was to oversee SDS risk management services. Following the decision to bring risk management in-house, I drafted the risk management development plan to clarify roles and responsibilities. Following the decision to appoint TSS's Nina Cuckow as Tram Risk Manager, and subsequently Mark Hamill, the procedures outlined within the development plan were implemented by them.

7. What Risk Registers were there? How and by whom were the Risk Registers compiled? It appears that the scope of services for the SDS providers at least initially included provision of risk registers (see email to you dated 28 April 2005

CEC01866257 - and attachments - CEC01866258 and CEC01866259). The last of these documents includes this obligation at 4.1).

7. At the early stages of my involvement, I recall that I developed TIE's Project Risk Register for Line 1 and 2 Tram Projects with contributions from colleagues and advisors. I recall that I later developed separate Risk Registers for Line 3 and wider TIE projects. These were Microsoft Excel based registers and were developed by myself with inputs from colleagues and advisors providing periodic updates including new risks that were identified and progress in the mitigation of risks. I recall at later stages that this included the support of TSS colleagues, namely, Paul Whitehill and Nina Cuckow. As the project further progressed, we sought to develop the management of risk through SDS and incorporated within their Management Services a requirement to provide extensive risk management services and deliverables, which I had drafted, as outlined in Section 4.2 (pages 19 – 22) of their Scope of Services. This included the production and maintenance of a Project Risk Register. I recall that SDS colleagues including James Kimmance and Paul Jobling undertook this. I also recall that we took a decision, following poor performance of SDS in the execution of these services, that we would develop this in-house with the support of TSS, who provided Nina Cuckow to fulfil the role of Tram Risk Manager. At a later point in time, we took the decision to directly employ a dedicated Tram Risk Manager, Mark Hamill. We also took the decision to develop the project risk register on Active Risk Management (ARM) software. As I recall, the ARM Project Risk Register was compiled and developed from the existing Excel-based risk register by N Cuckow and later M Hamill. From the project risk register developed on ARM, we filtered a Primary Risk Register that I recall was included in TPB reports. This Primary Risk Register was initially prepared by myself and later by N Cuckow and then M Hamill. I also recall specifying the remit for MUDFA and Infracore to contribute to the management of risk. Beyond this, I maintained a Corporate and Programme Risk Register that encompassed business risks and those risks aggregating across the project portfolio.

8. How was use made of the Risk Registers? As far as you are aware, what role did consideration of risk play in management and board decisions? Would you agree? When / where / by whom were the Registers scrutinised and/or discussed? In the TPB minutes for April 2007 (in the May papers - CEC01015822) it is noted that the risk register was taken as read. This seems inconsistent with it being scrutinised or being used to inform decisions.

8. Risk Registers were fundamentally used to help communicate the risks affecting the Tram project. They formed a record of the risks identified and allowed an assessment of their significance in terms of areas of potential impact and likelihood of occurrence. The Risk Registers recorded our planning for mitigations for addressing each risk along with an assignment of responsibility for managing each risk. The Risk Registers allowed us to escalate those risks that were not being mitigated sufficiently or on time and most importantly reporting on those key risks to be escalated within the organisation and reported to Funders. I am unable to comment on the role of the consideration of risk played in management and Board decisions as I was not present at Board meetings and believe that this question should be directed to Board members. However, I would highlight that the progress of risk management was a key part of reporting to the TPB. Risk registers were scrutinised throughout the project delivery. I recall risk registers contributions being sought from risk owners on a regular basis with discussions with colleagues and advisors practically on a daily basis. I also recall risk registers receiving external scrutiny including TS's consultants. However, for a detailed picture of this scrutiny and discussions I recommend that this question be directed to N Cuckow and M Hamill. In relation to the TPB minutes for April 2007 it is noted that the risk register was taken as read at Item 5.18 and it also noted by the Chairman regarding the level of risk reporting and discussion at TPB, and it agreed by the Board that a more detailed discussion should take place at DPD. I was not present at TPB meetings, with the exception of one that I attended to record the minutes, and am therefore unable to give an opinion as to degree of scrutiny or how it was used being used to inform decisions. I would therefore recommend that this question be directed to members of the TPB.

9. Can you explain QRA and Monte Carlo Analysis, how they were carried out and what results they provided?
9. Quantitative Risk Analysis (QRA) is a standard and conventional method of evaluating the cumulative effect of the risks within a risk register. In relation to capital cost, this enables a large number of individual risks with different potential cost impacts and likelihoods of occurring to be appraised on an aggregated basis. One method of performing QRA is to use a Monte Carlo simulation. I recall that our consultants performed our QRA analyses and unfortunately I am unable to recall the specific results that they provided. However, I recommend that this question be directed to N Cuckow, who I believe would be able to provide a response to this question.
10. Did Transport Scotland or City of Edinburgh Council impose any requirements as to how risk was managed?
10. Both TS and CEC imposed requirements that risk be undertaken in accordance with best practice. I recall that TS had specific requirements that the project be appraised in accordance with Treasury and Scottish Government STAG Guidelines and that Business Cases include risk management and analysis. I recall that CEC sought the regularly reporting on risk and had senior representation at Board level as well as having Project Managers liaising directly with the project on a day-to-day basis. Beyond that, I am unable to recall any imposed requirements as to how risk was managed.
11. How did the approach to and management of risk in TIE compare with other organisations for which you have worked? Was the assessment and management of risk undertaken well at TIE?
11. The approach to and management of risk in TIE compared well to the other organisations that I have worked for and advised as I believe that there was a strong senior level commitment to identify and mitigate risk with the support of advisor

expertise. I believe that there are a number of key features that make me conclude this (i) there was heightened awareness of the potential risks affecting tram schemes and how these could be mitigated at a strategic level through the adoption of an innovative procurement strategy; (ii) there was a conscious decision to develop a unified project risk register with the support of colleagues and advisors to ensure a common language and focus on risk; (iii) a risk management policy was developed to demonstrate Board level organisational commitment to the management of risk; (iv) there was a broader focus to examine the areas that had led to the causes of increased project delivery and those presented by Optimism Bias; (v) TIE invested in dedicated risk management resources and sought to implement leading edge technology to help manage risk through investment in Active Risk Manager; and (vi) the effect of our approach to risk management included greater on-going attention to risk management and greater dialogue resulting in risk forming part of most discussions.

12. Are you aware of other ways in which risk might be assessed and / or managed at the time of the tram project? What are they and what is your experience of them? Can you comment on how appropriate / useful the TIE approach was?
  
12. I am unaware of the other ways in which risk might be assessed or managed that could be considered more appropriate. I found the approach taken by TIE to be appropriate at the early development stages of the project in view of the efforts to identify, assess and plan the mitigation of risk. At the procurement stage, it was planned that SDS would take on the central responsibility for the risk management and included this within their remit. The logic behind this was (i) a recognition that there needed to be a development in risk management using advisor capabilities and resource and that SDS as designer would be central to this; (ii) the need for development would only increase through the execution of the procurement strategy as it was implemented; (iii) SDS would be managing design development risk would be central to de-risking the project and would have a direct influence on MUDFA, Tramco and Infracore; and (iv) a recognition that SDS would remain central to the development of the project post-novation to Infracore. TSS were intended to

provide a review role. Due to SDS poor performance in relation to risk management, a decision was made to bring this back in-house and develop our risk management with the support of TSS help directly manage the risks on the project.

13. Have there been any developments in the procedures generally for assessment and management of risk since 2007? If so, can you provide an outline of them and give your view as to whether they would have been of any assistance in the tram project?

13. I believe that the general practices in relation to risk management remain largely the same in relation to project risk management in that the key deliverables used to manage risk remain the same, namely, risk management plans, project risk registers, QRA analysis, risk reporting et al. There have been additional project development and risk management guidance published in a number of sectors. Generally, I believe that there is a greater awareness of risk in relation to governance issues affecting businesses and there have been developments in the appraisal of strategic risks particularly for international schemes. However, as I am unaware of all the emerging practices I am unable to confirm whether there are specific developments that would have been of assistance.

14. What was the ARM software (see TRS00004079, page 30)? What did it do? It may assist to look at CEC01441488 which has some screen shots. Had you used it before? Did it work well?

14. Active Risk Manager (ARM) software creates a web-based platform for the management risk. I am unable to recall all of the features or capabilities of this software and had not personally used it before. I note that the reference CEC01441488 does not contain ARM screen shots. However, I recall my concerns that using Microsoft Excel spreadsheet as this created inefficient administration in compiling updates restricted the process of managing risk. I also recognised that as SDS, MUDFA, Tramco, Infracore came on board that there was a significant advantage in having all parties using the same risk management platform. I recall visiting the developers of ARM in Wimbledon to better understand its capabilities. I cannot

recall when I became first aware of ARM, however, I recollect producing a paper that considered the options available in the market place and finding that ARM was being utilised to support large infrastructure developments and making a recommendation that we use it for Tram. A wider consideration was also its scalability to consider wider TIE projects including the Edinburgh Airport Rail Link. I am unable to comment on the value of its implementation and recommend that the opinions be obtained from N Cuckow and M Hamill, who administered ARM in practice.

15. What was your understanding as to how risk allowance would be 'used' once the contract was awarded? From time to time the TPB approved risk drawdown (for example, see CEC00843272, page 19). What option was there but to approve it? What would have happened had they refused the request?
15. Unfortunately, I am unable to comment on risk drawdown relating to TPB papers and the approval process relating to this report, dated July 2009, as this was prepared some time after I left TIE.
16. The reports in the TPB papers routinely note that risks have been reviewed. What did this entail? Who did it and what records were kept of this? What was the purpose of the exercise? Was it to identify new mitigation measures or was it intended to quantify the risk presented to the project and make adjustments to the budget estimates? There is reference in the Report with the June papers to the purpose being to ensure that the QRA output was as accurate as reasonably possible (CEC01021587, page 17). What did this involve?
16. Unfortunately, I am unable to comment on the risk review process relating to TPB papers and inter-relationship with budget estimates and in particular QRA output relating to this report, dated June 2009, as this was prepared some time after I left TIE.
17. Were the Risk Treatments mentioned in the Risk Registers evaluated to assess whether it was likely that they would be able to mitigate risk or whether they were

in fact doing so? Is so, who did this and when? Were *you* happy that the Risk Treatments were appropriate means of addressing the various risks? Looking at risks 343 and 1101 on page 43 of CEC00983221 (Papers for early July meeting) how do the various risk treatments operate to ameliorate the risks?

17. The risk treatments were the activities and plans to manage risk to reduce its potential impact or likelihood of occurrence, and to consider how the risk could be transferred to another party better placed to manage it. The risk treatments were reviewed by those allocated with responsibility to consider additional mitigation measures necessary and progress to implementation of those risk measures. I recognised that there would a need to be further development in the risk treatment planning once the design stage commenced with the aid of suppliers. I am unable to comment on the effectiveness of the proposed risk treatments for these two specific risks as this report, dated July 2009, was prepared some time after I left TIE. However, I recommend that this question is directed to my colleague S Bell, the Risk Owner for 343, and my colleague A Sim, the Risk Owner for 1101, or the action owners referred to.
18. The TPB Papers for August 2006 (CEC01688881) contain a risk register (page 11 and following). Do you consider that the risks facing the project at that time are adequately identified there? In relation to the risk of poor project governance (page 11), there is no reference to the complexity of the structures and the danger that they gave rise to a situation in which it was not clear which party or parties had responsibility for particular issues. In your view were these problems? The risk of late provision of design on page 16 is coded green. Was that reasonable in view of the comments at the start of these papers as to SDS performance.
18. The risk register contained within the TPB papers is a Primary Risk Register identifying those key Stakeholder Risks and Project Risks to the project. There are approximately 25No. risks identified within this Register, which as I recall, represented those risks considered to be the most important at the time, that is, potential showstopper and highly significant risks. The Primary Risk Register was

therefore not a full representation of all the risks affecting the project but a 'sifted' summary. The wider risks facing the project were more sufficiently included in the Project Risk Register. I believe that the issues you refer to in terms of ambiguities in governance are represented by the overarching risk of poor project governance. This specific risk highlights the need to develop governance arrangements with Funders and the project team and proposes that the delegated authority arrangements are clarified with Funder representatives at the meeting. I recall the concerns within the project team as outlined in the 'Effects' box that there could be insufficient information flow, slow or overturned decision making and a failure to grasp or create opportunities and a concern as to how this related to dealing with design development and change. I recall at the early SDS design development stages, this specifically creating difficulties in developing an efficient procedure to deal with design development and change control with Funders. In my view, governance arrangements were challenging to the project, however, I recommend that the opinion be sought from my colleagues G Bissett and G Gilbert who were managing this specific risk. In relation to the risk of late provision of SDS deliverables, reported in the Primary Project Risk Register, I clarify that the green rating relates only to the progress in implementing the treatment plans. This rating should not be confused with the risk significance.

### **Risk and Optimism Bias**

19. What is optimism bias ("OB") and how does it relate to risk, contingency and provisions when preparing estimates of costs? What is the purpose in making an estimate of the effect of optimism bias? Is it managed in the same way as risk?
  
19. Optimism Bias (OB) is fundamentally the tendency, particularly at early planning stages, to underestimate the final out-turn capital cost and programme to deliver a project. From Guidance, this underestimation has been shown to be due to a number of Risk Areas that have emerged during the execution of projects that have not been adequately appraised at the early stages of project development. In relation to the Tram project, a standard civil engineering project, this has been

shown to relate to specific risks relating to procurement, project and client issues, environmental issues and external influences. I recollect that OB is estimated as percentage of the base costs, that is excluding contingencies to avoid double counting, and calculated as a value from defined percentage starting values depending on the degree of mitigation that has been implemented. Contingency is directly related to base costs for the project and is estimated either as a percentage allowance for each component of the project depending on the confidence and allowances made in base costs, and aggregates to form an overall contingency for the project, or in more detail through QRA review. Contingencies sit above base costs. My commercial colleagues and TSS would be able to provide more detail in relation to the basis of estimating base costs, contingency allowances and QRA analysis. The purpose of OB is to ensure that public sector projects consider and appraise the potential exposure increased capital costs and a longer delivery programme and demonstrate that the economic and financial case is robust. This in turn allows Funders make due consideration for cost and programme creep prior to committing to a project. Risks relating to OB are fundamentally managed the same way. By this I mean, that through broader assessment to identify the potential risks that have lead to OB, that these risks can be incorporated into a project risk register, be appraised for significance and be managed through treatment strategies.

20. Were you engaged in making estimates of optimism bias for the tram project? If not, are you aware who did this?
  
20. I was directly involved in defining the procedure, methodology and calculations to estimate OB on the Tram project. I recall undertaking this in relation to both Line 1 and Line 2 Tram projects, initially in October 2003, to support the inclusion of OB within STAG Appraisals for the two projects. I also recall updating the estimated OB on a number of occasions in 2004.
  
21. How familiar were you with use of Optimism Bias in relation to assessment of building / engineering projects when you started work with TIE?

21. I was quite familiar with the Treasury 2002 Guidelines, as when this guidance was published it had a considerable impact on the development considerations of public sector procurements. I also recall considering the issues of OB in the consideration of other projects seeking to be delivered by PPP/PFI where I was providing technical advice and in particular the advantages of over traditional public procurement.
22. How was optimism bias assessed and how was allowance made for it in the tram project?
22. OB was assessed at the initial development phases of the Tram project and in accordance with Funder requirements, considered in relation the STAG Appraisal for the Line 1 and 2 Tram projects. An initial assessment of OB was undertaken for the STAG appraisal and the Preliminary Financial Case in October 2003. This was periodically re-assessed in March, May and November 2004 as a way of measuring progress in the overall mitigation of risk. I recall that OB was assessed in accordance with Treasury's 2002 Guidance that indicates with the applying industry best practice including improved scheme appraisal, risk management and cost control, it should be possible to effectively mitigate project risks and reduce any likely optimism bias. In particular, Treasury's 2002 Guidance for calculating OB that I extract from page 34, that outlines the overarching methodology for estimating OB, namely, "Reduce this upper bound optimism bias according to the extent to which the project risk areas are managed (see Sections 4.1 to 4.4 for examples). The project risks within each project risk area can be managed. If the project risk areas for a project have only been partially mitigated then the contribution to optimism bias can be reduced proportionally to reflect the amount that each project risk area has been mitigated. When calculating optimism bias, the extent to which these risks are mitigated is measured by a mitigation factor. The mitigation factor has a value between 0.0 and 1.0. Where 0.0 means that risks in a project risk area are not mitigated, 1.0 means all risks in a project risk area are fully mitigated and decimal values between 0.0 and 1.0 represent partial mitigation of the risks within a project risk area. Ideally, the optimism bias for a project should be reduced to its lower bound optimism bias before contract award if the cost of risk mitigation is less than the cost of managing

the residual risk.” Rather than using an overarching judgement to select an mitigation factor for each risk category, that would be in effect a guesstimate that may have been subject to challenge, I developed a more detailed approach to consider each of the risks identified within the risk register and by allocating them to the respective OB risk areas and by averaging the individual mitigation factors for each risk was able to develop an auditable and repeatable process to estimate OB.

### Optimism Bias Guidance

23. As the tram project progressed, guidance as to optimism bias and how it should be applied in projects was given in the following publications:

- Mott MacDonald’s Review of Large Public Procurement in the UK, carried out for HM Treasury in July 2002 [CEC02084689].
- HM Treasury’s 2003 Green Book [CEC02084256].
- Supplementary Green Book Guidance [CEC02084818]
- The Department for Transport’s June 2004 Guidance on “Procedures for Dealing with Optimism Bias in Transport Planning” [CEC02084257].
- The STAG guidance issued by the Scottish Government in 2003 (updated 2005) [CEC02084489]
- The Department of Transport’s, Transport Analysis Guidance on “The Estimation and Treatment of Scheme Costs” issued in September 2006 [CEC02084255]).

In an email to Paul Jobling dated 12 January 2006 (TIE00055472) you indicated a number of these sources had been taken into account in the risk management aspects of the trams. What parts did you use and what use was made?

23. I cannot recall the specifics of each of the above Guidance documents that were used to inform our approach and development of risk management. Generally, I recall considering the entirety of Treasury’s 2002 Guidance in relation to OB estimation. I also recall reviewing Annex 4: Risk and Uncertainty of Treasury’s 2003 Guidance in relation to OB and vaguely remember this influencing the development of a TIE’s Risk Management Policy. Similarly, I recall reviewing the entirety of

Treasury's 2003 Supplementary Guidance in relation to causes and estimation of OB. I vaguely recall reviewing Scottish Government's 2003 STAG Guidance in relation to Risk and OB. I recollect reviewing DfT's 2004 Guidance in relation to causes of OB. For clarity, DfT's 2006 Guidance was not yet published at the time I sent this email and I do not specifically recall reviewing it.

24. Had optimism bias always been part of the budgeting process for the tram project? If not, when was it introduced? Had a budget / available funding already been established at that time? What was the effect on budget or finding of introducing considerations of optimism bias?
  
24. I am not able to recall when first considerations of OB began for the tram scheme. I would make the distinction, however, that OB allowances are not necessarily for budgeting purposes at project level and can be considered to be an additional contingency necessary at Funder level. I am unable to comment on its impact on funding as these matters were dealt with by other colleagues and suggest that this question is directed to my colleagues G Bissett and S McGarrity. I recall discussions with colleagues to consider whether OB should be considered at separately at Funder level. I would also recommend that the questions in relation to Funding and the inclusion of OB be clarified with Funders.
  
25. Did TIE have a strategy or approach that was to be adopted in relation to optimism bias?
  
25. TIE developed a risk management policy that I drafted. TIE's approach was to apply good practice in risk management and through proactive risk mitigation in those areas that had been found to cause OB, and through the estimation of OB using guidance, demonstrate a reduction in OB from upper bound allowances in capital

2004

26. TIE00058174 is an email dated 24 August 2004 from you to Martin Buck of Partnerships UK and TIE00058175 is the attachment to it. That attachment contains your responses to observations by Mr Buck on the risk section of an early draft OBC. PUK were doubtful about the 3-year construction period. Your response was to say that you would get the rationale for this period from Advisors. Who gave the advice and when? Did you retain a copy? Did the advisers expressly consider the points raised by PUK that no other tram project had been completed in that period? In similar vein, PUK noted that elsewhere there had been difficulties with utility diversions. In light of that, was any further works done to consider what had happened elsewhere and whether the same problems would arise in Edinburgh.
26. Unfortunately, I cannot recall who the advisors were who provided the programme advice for the proposed 3-year construction programme or when this was provided. I do not have a copy of this advice. Generally, I recollect that our advisors had been involved in previous Tram projects and we presumed that the learning from these would be factored in. Unfortunately, I cannot recall any specific discussions with advisors on construction rates in relation to other schemes. Our procurement strategy sought to de-risk the Infraco contract by the early involvement of the tram infrastructure designer, SDS. One key areas that this planned early involvement would allow was to enable utility diversion works, under a proposed single framework contractor (MUDFA) rather than have multiple contractors, for example, a single contractor would conduct the utility diversion works of several utilities in a staged and single exercise. I recall that this new approach to de-risking the route of the Tram in advance of the Infraco works and would enable both MUDFA and Infraco to conduct their works in a more efficient manner than previous projects.
27. In an email dated 31 August 2004 copied to you (included in CEC01858952), Willie Fraser noted that further work is required to get the OB figure down. He noted that if it cannot be brought down the project will be in jeopardy. Why was this so? Does the approach of working on OB to get it below a certain figure not create a danger

that the OB will not be properly assessed and that the allowance will not perform its proper function? It is being seen as an inconvenience to be removed rather than an assessment of possible costs. Do you agree?

27. The purpose of this email was to ensure that advisors gave attention to risk mitigation in the areas that they were responsible for on the Line 3 Tram project and by inference that if Line 3 was showing a higher OB than Lines 1 and 2 that this higher risk potential could be generally perceived negatively by Funders, impact the economic appraisal or require additional potential Funding allowances and therefore be considered to be less viable. The aim was to ensure that advisors were mitigating project risk. The aim was not to apply pressure to achieve a certain figure other than demonstrate the management of risk and calculate the relevant OB as required by guidance. However, without a driver to reduce OB then there is a danger that risks are not mitigated and that OB allowances would not be reduced. I do not consider OB to be an inconvenience, but rather an important factor to be considered in the planning of public infrastructure projects and one that should be actively approached to reduce through the mitigation of risks affecting projects.
28. A review of the Business Case conducted by Arup for the Scottish Parliament in October 2004 (CEC01799560) doubts the reductions made in provision for OB (see paragraph 8.7 and 8.8). Can you comment on this?
28. The Arup review highlights our advisors findings that cost over-runs on previous UK tram projects were up to 25%. Arup also note that as the cost estimates will not be as accurate as they would be at award of Infracore and as QRA risk analysis had yet to be undertaken then there could be potential for OB to be greater than 25% than estimated. Arup make reference to emerging DfT Guidance and that if unmitigated OB values were applied to a project then P50 or P80 allowances would result in potential increases of 40% or 57% to the £220m base cost of the scheme. I completely agree with Arup's point that both greater scheme development and risk analysis, including the use of QRAs, would be necessary to further substantiate further reduction in OB.

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29. The email string that makes up DLA00001901 includes an email from you to many people dated 28 January 2005 in which you note that many new risks have been identified and you also note a slowing in the pace of reduction of OB. Can you explain the contents of the email? How were the figures for OB being revised over time? Were you carrying out this work? What information did you rely on and what specific guidance was used?
29. The email circulated an updated copy of the project risk register to those with allocated responsibility for mitigating Tram project risks. I explain that the update accounts for development inputs from an earlier Operator and DLA review. By email request, the risk owners are approached to provide their updates to the project risk register that includes a request for them to provide updates in the form of 'new risks' that could have emerged in relation to the active workstreams and a request to updates to the position on 'existing risks' that were on the risk register. I provide a chart showing the periodic OB estimation and draw attention to the fact that OB reduction was reducing. As I recall, from the respective input of the risk owners, who advised on mitigation plans and their progress in implementing these to mitigate each risk, they provided me with their estimated mitigation factor. This mitigation factor, in effect, a reporting of a percentage complete in implementing the planned mitigation, was used in OB estimation. Thus as time progressed and new risks were identified or there was a slowing in the implementation of planned mitigation, then there would be in effect a slowing in the reduction of OB. I was conducting the calculations to estimate OB. I specifically relied on the inputs of colleagues and advisors to support the development of the risk register and their progress, and reporting of associated mitigation factor, to implement mitigation plans for each risk. The guidance being used was that published by Treasury in 2002 and 2003.
30. CEC01854757 is a document entitled, "Review of Trams Risk Register dated 25 January 2005". There is no express date but the footer contains a date of 10/2/05.

The author is not identified. Do you know who prepared it, when it was prepared and for what purpose it was prepared? In relation to cost increases due to planning permission requirements and construction cost overrun, it is noted that DLA should be secondary support for mitigation. In relation to construction cost overrun, this is so that they could participate in contract drafting. What was done to implement this? In relation to cost overrun from PU (? Public Utility) information, it is stated that the mitigation involved transfer of risk to INFRACO. How was it intended that this would be done? Was it done and, if not, why not?

30. Unfortunately, I do not recall this document or who within CEC contributed or when it was prepared. Similarly, I cannot recall the purpose of this review, however, the commentary suggests areas where further risk mitigation could be carried out. I am unable to recall if and how DLA were specifically instructed to implement contract drafting in relation approvals for changes arising from design requirements of CEC Planning and others giving approvals. In relation to the unreliability of PU information, and CEC's suggestion that DLA incorporate a drafting to Infraco contract to allow for them to undertake advance separate works, I am not aware of how DLA were specifically instructed. I am unable to comment on how CEC envisaged this would be done other than the overarching suggestion that there be an inclusion for a change control procedure whereby additional works could be specified to Infraco. I am unable to comment as to how change control drafting was developed to specifically address these two areas of potential change as the commercial colleagues in conjunction with DLA directly managed the development of contracts. I therefore recommend that these questions be directed to the Project Director and my commercial colleagues managing the development of the Infraco contracts and A Fitchie and S Fitzgerald of DLA.

31. That email string is an attachment to an email from Raymond McMaster to various people including you dated 11 February 2005 (DLA00001900). An Excel file with a risk register (DLA00001495) is also attached to this email. In that document, can you comment on risk 200 in relation to design changes? Can you explain both the risk and the intended mitigation in more detail? Can you do the same with risk 21 in

relation to construction cost overruns, Risk 25 (Utility Delays), Risk 28 (Construction cost overrun due to changes) and Risk 169 (Cost overruns due to poor management). How do the various proposed mitigations work to reduce the risks identified? Who assessed whether and to what extent the suggested treatment strategies would remove or mitigate a risk? Could you explain what you meant by Risk 204 – ‘If grounds of Termination are ambiguous then the contract may be unworkable’? What scenario was anticipated here?

31. Risk 200 relates to the risk of design changes being required by CEC/tie to address specific design amendments for CEC’s requirements. I recall that this would include changes that could arise from CEC’s various responsibilities as (i) Planning Authority; (ii) Roads Authority; and (iii) Local Authority and/or those emerging in the design development process that could be required by the Operator in their considerations of creating a safe and efficient operational tram system. The specific risk relates to the changes that could emerge in preliminary and detailed design with resultant impacts of additional costs and programme delays. The mitigation proposes the inclusion of contractual provisions to address mechanics. By this, it is meant that there needs to be a clear change control drafting. It also outlines the need for procedure for the allocation of costs arising from changes. By this, it is meant that the change control procedure should consider the appropriate approval process to implement change. Finally, the mitigation plan is to allocate adequate budget contingency to each contract for internal management. By this, it is meant that contingencies should be ring-fenced to each respective contract to ensure clear management. This risk was not considered to be avoidable and therefore the above mitigation plans work to manage the risk by recognising the need for sufficient and appropriate contingencies above cost allowances to be managed during contract implementation; developing a workable change control process in conjunction with Funders; and through incorporating clear contract drafting to clarify change requirements within the contract avoid the risk of delayed decision making. Risk 21 represents the risk of unplanned construction cost over-runs for Line 2 that could emerge over and above the budgeted allowance. The mitigation plan for Risk 21 is to define a contingency allowance to be allowed for in the construction costs. The

steps considered to defining the contingency are outlined. It proposes that a review is carried out to consider the potential to transfer this risk to Infraco. By this, it is meant that a review of the risk allocation being sought through the Infraco contract to identify those additional design and construction risks that could be transferred to Infraco. It also proposes that the cost estimates are developed in further detail supported by undertaking a thorough risk assessment. The mitigation also proposed is to improve clarity of requirements in both contract and a design manual. Finally, the mitigation also proposes the appointment of a competent and experienced contractor. The above mitigations recognise that contingencies will be necessary and that it was not possible to fully eliminate this risk and therefore management efforts centre on the further development of the scheme, costs and contingencies. By selecting a competent and experienced contractor, we aimed to appoint contractors who would mitigate design and construction risk through their co-ordination of activities based on their understanding and experience of developing tram infrastructure. Risk 25 relates to the risk of programme delays due to extended utility diversion works. I believe that the mitigation plans are quite self-explanatory and include (i) undertaking early engagement with PU companies (ii) review and appraisal of the programme implication of the works; (iii) review certainty of routes and information available on services; (iv) co-ordinate diversionary work with PUs to avoid re-opening the highway several times for diversions in the same location; (v) recommend programme contingency allowance for unknowns; (vi) consideration of the possibility of an advanced works contract; (vii) development of 1:500 layout drawings and obtain preferred routes from PUs; (viii) overlay alignments and review the need for advance works; (ix) develop side agreements; (x) procure advance investigatory works and advance utility diversion works; (xi) develop a Construction Strategy Report to confirm programme for PUs; and (xii) undertake a detailed investigation in all city locations and input into the design process at the earliest possible stage. The various proposed mitigations work to reduce programme risks of delays due to PUs in four key areas, namely, (a) improving our understanding – by obtaining the available information on services for the Tram route; then overlaying alignments and review the need for advance works; and undertaking advance investigatory works to improve information where necessary; (b) improved co-

ordination – through early engagement with PU companies; review and appraisal of the programme implication of the works; development of 1:500 layout drawings and obtain preferred routes from PUs; undertake a detailed investigation in all city locations and input into the design process at the earliest possible stage; (c) improved co-operation - co-ordinate diversionary work with PUs to avoid re-opening the highway several times for diversions in the same location; and develop side agreements; and (d) reducing areas of potential compromise to the planned programme – consideration of the possibility of an advanced works contract, recommend programme contingency allowance for unknowns; develop a Construction Strategy Report to confirm programme for PUs. Risk 28 relates to the risk of Line 1 construction cost over-runs arising due to planning and client changes. By this, it is meant to include those changes instructed to the design process that could result in additional construction costs that would be instructed by the public sector client body and specifically those necessary to accommodate CEC Planning Authority requirements. The mitigation plans are self-explanatory and are propose (i) to define the contingency to be allowed for in the construction costs; (ii) review the potential to transfer this risk to Infraco; (iii) develop a detailed cost estimate; (iv) carry out a thorough risk assessment; (v) ensure clarity and precision in contract and design manual; (vi) appoint a competent and experienced contractor; (vii) monitor the market; (viii) market and manage risks prior to receipt of bids; (ix) monitor the next tram bid costs; (x) develop a Construction Strategy Report for programme review and clarity of phasing; (xi) combine cost planning and design functions from the outset of the project and monitor changes providing feedback on alternatives and contingency management; (xii) de-risk the main works through creation of separate workstreams associated with 3rd parties, investigations, design, land acquisition, utility diversion, vehicle procurement and combined Infraco & Integco procurement; (xiii) obtain benchmarking information on other tramway procurement (especially market price of trams) from the Operator; and (xiv) carry out as much design as possible prior to tendering to reduce the risk of scope creep and additional cost. The various proposed mitigations work to reduce of the risk of Line 1 construction cost over-runs arising due to planning and client changes in four key areas, namely, (a) improving our understanding – obtain benchmarking

information on other tramway procurement (especially market price of trams) from the Operator; monitor the market including the next tram bid costs; (b) improved co-ordination – ensure clarity and precision in contract and design manual; develop a detailed cost estimate; de-risk the main works through creation of separate workstreams associated with 3rd parties, investigations, design, land acquisition, utility diversion, vehicle procurement and combined Infraco & Integco procurement; develop a Construction Strategy Report for programme review and clarity of phasing; carry out a thorough risk assessment; combine cost planning and design functions from the outset of the project and monitor changes providing feedback on alternatives and contingency management; (c) improved co-operation – market and manage risks prior to receipt of bids; and (d) reducing areas of potential compromise to Line 1 construction cost over-runs arising due to planning and client changes. – carry out as much design as possible prior to tendering to reduce the risk of scope creep and additional cost; review the potential to transfer this risk to Infraco; define the contingency to be allowed for in the construction costs; and appoint a competent and experienced contractor. Risk 169 addresses the risk that poor management of interfaces resulting in cost over-runs or delays. This risk specifically is an issue in relation to co-ordination of activities at the interfaces of the Line 1 and 2, which during the development stages were being progressed by TIE with different consultants and separate Bills. The mitigation planning outlined to address this risk were management focussed and outlined as (i) define TIE delivery organogram to manage interfaces; (ii) define roles and responsibilities to include interface management; (iii) convene a working group to manage interfaces; (iv) define interfaces and advisor remits to input to each; and (iv) ensure that adequate costs and resources have been set aside for the management of interfaces. As outlined in the Steps To Optimism Bias tab of the Project Risk Register, the project team including advisors determined the assessment of potential risk mitigation strategies for each risk. These were later developed with those allocated lead responsibility for mitigating the risk, that is, those listed in Responsibilities tab of the Project Risk Register and also developed further by myself. Those allocated lead responsibility for mitigating each risk assessed the adequacy of mitigation plans. In practice, TIE project managers and myself supported this assessment. In relation to Risk 204,

which concerned the risk that if grounds for contract termination were ambiguous then the contract may become unworkable, I recall our concerns relating to the ability of the public sector to terminate contracts should the supply chain not perform and therefore the grounds (range of conditions) and the mechanism to terminate had to be clear. I had in mind, that the drafting for termination by the public sector would be developed in conjunction with DLA and commercial colleagues managing the development of contracts.

32. Can you explain what is shown in the OB Profile part of the Excel file? Where did the figures come from for OB as at December 2002? On what basis had they been reduced as shown. What was the intended end result of this? Can you explain the part entitled 'OB Calc'? How were the figures shown there produced? What is the mitigation referred to there? Can you explain the part entitled "Steps to Optimism Bias"? Are these various steps derived from published guidance and, if so, can you identify what guidance and what parts of it? Who produced these steps for calculation? In particular, how is the risk register used to calculate OB?
32. The chart shown represents the OB as a percentage of capital base cost and planned programme duration for Line 1 and 2. The initial values used in December 2002, when I understood that initial work commenced on the project are the upper bound 'starting values' for a standard civil engineering project, that is, 44% for capital cost and 20% for programme as outlined in Table 4: Current Practice Optimism Bias of the Treasury's 2002 Guidance. The profile shows four points where OB was estimated using the procedure outlined in "Steps to Optimism Bias" and shown for as individual calculations on the relevant dated OB Calc tabs. The OB Calc tab outlines the findings. Each individual risk within the risk register was attributed to one of the OB risk areas and categories identified as contributing to OB in line with Treasury Guidance of 2002 outlined on page 33-34 and further illustrated by example calculations thereafter on p.35-38. Reductions in OB were made as progress in mitigating risk reported by risk owners using their individual judgement in relation to individual mitigation factors for each risk. By averaging the individual mitigation factors for that applied to each risk area and category I was able to apply guidance

that notes the OB for a project should be reduced to its lower bound OB before contract award. The intended result of this was to record the progress toward active management of risk on the projects. I believe that you are referring to the "The OB can be estimated from the above assessment of 'mitigations' as follows" and by 'mitigation' it is meant the progress towards mitigating the risk. In relation to the Steps to Optimism Bias, which I originated, I refer to the tab that summarises these and highlight that these are all self explanatory as a procedure that from identification of risks, confirmation of impact to capital cost or programme, development of risk mitigation strategies, allocation of risk to the OB risk categories, and determination of mitigation factor for each risk allows OB to be estimated. The Upper Bound OB starting values are attributed to each Risk Category to show their contribution of OB and are modified by the Mitigation Factor for each Risk Area. This procedure follows the step procedure in Treasury Guidance from 2002 outlined on page 33-34 and further illustrated by example calculations thereafter on p.35-38.

33. The DfT Guidance from 2004 (CEC02084257) says that OB is difficult to remove totally (section 1.3). Is the TIE approach apparent from the above emails consistent with that? On pages 9 to 10 of the Guidance there is a note that the exercise of placing the project on an appropriate point within the reference class distribution is itself susceptible to optimism bias. What was done to address this?
33. The DfT Guidance from 2004 notes that OB can be reduced and that it is difficult to remove OB entirely. Treasury Guidance from 2002 highlights a similar conclusion that it may be difficult to reduce OB below lower bound values. TIE's approach was entirely consistent with this in seeking to manage risk and reduce OB. In relation to reference class distribution, I recall that colleagues supported by advisors spent considerable effort examining the lessons from previous Tram schemes including their out-turn costs. I recall this from sight of the Arup Review report that makes highlights that the STAG appraisal reported that construction cost overruns for operational tram schemes in the UK have been up to 25%. I also recall the reference class review from the NAO'S Improving public transport in England through light rail, which also included wider benchmarking to international schemes. I recommend

that the extent of reference class forecasting used in the appraisal of capital costs are raised with commercial colleagues and advisors.

34. At page 43 to 44 of this guidance, there is an analysis of the dangers inherent in the situation in which funding is sought from a national agency. It notes that the focus of the promoters may be to meet the funders' tests rather than to scrutinise the project for risk. To what extent do you consider that this criticism was applicable to the Tram Project?
34. I am unclear as which guidance that is referred to as thisp.43-44 of the previously mentioned DfT Guidance does not make mention of this. I consider my objective was to assess the risks affecting the project and support the case for the Tram project that would secure funder support for the scheme. I am unable to give an opinion on the tests being applied by funders as I am unfamiliar with those specific tests and as these matters were dealt with by colleagues, I recommend that this question is directed to G Bissett and S McGarrity.
35. On 17 May 2005 you received an email and attachment from Neil Harper of Brian Hannaby & Associates regarding risk analysis (TIE00056276). This gave QRA figures for risk values on Line 1. What was the role of Brian Hannaby and Associates in evaluating risk? Can you explain QRA and the output figures in the attachment?
35. I recall the role of Brian Hannaby and Associates to support our QRA analysis, however, I cannot specifically recall how they were introduced to the project team. I do recall that their previous experience in Tram project delivery in the UK was one reason that their advice was sought. I do not have access to the attachment to this email. However, I recommend that you obtain the advice of Neil Harper at Brian Hannaby to outline the basis of the QRA calculation and its output.
36. On 23 May 2005 you sent an email to Andrew Fitchie in which you summarised the risks which DLA were to have a part in managing (CEC01857533). In relation to the possibility of design changes (Risk 200) you note that they had responsibility to

provide contract provisions to address this. What did you have in mind? Can you explain the entry in respect of risks 204 and 203?

36. In relation to my email to DLA and with respect to Risk 200, that covered the risk of potential public sector design changes including those that could be prompted by the Operator, I requested that DLA incorporate contractual provisions to encompass this. I had in mind that drafting of contracts would have to incorporate a clear Client Change Control procedure. In relation to Risk 204, which concerned the risk that if grounds for contract termination were ambiguous then the contract may become unworkable, I recall our concerns relating to the ability of the public sector to terminate contracts should the supply chain not perform and therefore the grounds (range of conditions) and the mechanism to terminate had to be clear. I had in mind, that the drafting for termination by the public sector would be developed in conjunction with DLA and colleagues managing the development of contracts. In relation to Risk 203, I raised the potential of dispute between TIE and Infracore and the need to use of dispute resolution procedure (DRP). I had in mind an escalation process between organisations and the development of a clear DRP.
37. CEC01875336 is a copy of the Draft Interim Outline Business Case dated 30 May 2005.
- What was your involvement in preparing this? In particular, did you draft the sections on risk and OB (Section 6, page 77)? If not, do you know who did? Did you provide information to be used by the drafter of the OBC?
  - What exercise(s) were carried out to detect whether any risks had been omitted from the Risk Register?
  - In section 6.2 there is reference to guidance from the National Audit Office, and Audit Scotland. What guidance was this?
  - There is also reference to the report of the Holyrood Inquiry. What lessons did you take from the Report of the Holyrood Inquiry?
  - What did you envisage was included in the headings "Failure to Design to Brief", "Continuing Design Development", "Changes in Design Required by the

Operator”, “Changes in Design Required by CEC/TIE” and incorrect cost estimates” in the table on page 78?

- What was the basis for the view that submission of a robust OBC in February 2006 would mitigate development risks (Page 82)?
- Paragraph 6.3.5 lists a number of risk management deliverables which it is said that TIE had entered into contracts for. Which of them were provided by the parties contracted to provide them? What was your role in relation to these deliverables?
- Paragraph 6.4.1 sets out the contingency for risk that has been allowed. How was this determined? Can you explain the comment, “Each consultant has benchmarked risk from their own cost analysis”? Did you see / approve these analyses?
- Paragraph 6.4.3 deals with OB. Were you involved in determining the reference class? Why was “standard Civil Engineering” chosen? How does that fit with the identification of what makes a project “non-standard” on page 33 of the Mott MacDonald guidance (CEC02084689)? Why was a reference class chosen from the Mott MacDonald guidance rather than the more recent DfT guidance (CEC02084257) or the Supplementary Green Book Guidance (CEC02084818)? What sort of projects had been used to provide the cost overrun data for standard civil engineering projects?
- The paragraph notes that the reduction in allowed figure for OB “demonstrates” that risk has been actively measured. Could you explain this?
- Were you involved in making the decision as to by how much the provision by OB could be reduced from month to month? What material did you rely upon to make the reductions?
- Where, in the Guidance, there is a recommendation that a percentage be applied to the estimate, to what stage of the project does it envisage that the uplift will be applied?
- In a draft of the risk chapter of the OBC dating from a few weeks before (CEC01873849), the conclusion was that the Treasury starting values for OB were high estimates and could be reduced with the application of procurement,

project and risk management best practice (paragraph 1.7.5). Was this your view? Why was this text omitted from the later version?

- The later report also omitted the section from the earlier draft on lessons from the Scottish Parliament Building (section 1.7.6). Why was that omitted?
- In the same vein, the earlier draft had referred to the need for an 'outside view' of these matters and that it was not appropriate for the Project Team to take a definitive view on OB (last paragraph in section 1.7.7). It was intended that TSS and a Peer Review Group would be used for this purpose. Why was this omitted? Were TSS and the Peer Review Group used in the manner described?
- Please explain the contents of paragraph beginning "Tie's technical advisers have" on page 92. Was there any concern that as is shown in the third last paragraph on page 15, if the full OB uplift was allowed, the cost estimate would exceed available funding (then £375m)?
- What risks did you consider were mitigated by the proposed procurement route and how did it work to mitigate them? Were you involve in considering the consequences for this on the choice of from of contract?
- In paragraph 6.5.4 there is reference to design development as being a risk retained by the public sector What did you mean by this? The following page notes the possible consequences of Operator requested change post contract award. What consideration was there to changes requested other than by the Operator? What assumptions are made in this OBC as to the state of design when the contract is awarded? How was it that the intended procedures for design sign off would minimise the potential for change?

37. I recall drafting the majority of Section 6 Risk Management of the Draft Interim Outline Business Case (dated 30 May 2005) with the support of our Financial Advisors, PwC. I cannot recall who all the specific contributors and approvers were to this OBC. I cannot recall all the measures taken to confirm the detection of relevant risks within this OBC but these included dialogue with colleagues and advisors. The National Audit Office publication that I referred to was Improving public transport in England through light rail. The Audit Scotland publication that I

was referring to was Management of the Holyrood building project. I recall reviewing both of these publications in the consideration of risks affecting the project. I recall reviewing the lessons learnt after publication Audit Scotland and summarising this as part of a Risk Report to the Board. In relation to the Holyrood Inquiry publication, I recall reviewing the lessons learned after publication and then later briefly summarising these in an early draft of the OBC (CEC01873849, Section 1.7.8). I envisaged the development stage design risk that SDS potentially being unable to develop and finalise their design in a manner that would comply with the design specification that we were preparing by "Failure to Design to Brief". I recall that a key mitigation being the review role of TSS to ensure compliance with the specification. By "Continuing Design Development", I envisaged the risks associated with development of preliminary and detailed designs, in effect an evolution from the outline designs undertaken to support Parliamentary approval processes, that could occur during the SDS design development process both pre and post-novation. With respect to "Changes in Design Required by the Operator", I envisaged the changes that could be potentially requested by the Operator, who was engaged early as consultant during this phase, during the SDS design development process in order to optimise the operational efficiency of the Tram network. Similarly, in relation to "Changes in Design Required by CEC/TIE" I envisaged the changes being requested by CEC/TIE in relation to their requirements, for example, amendments to improve system integration and in relation to necessary adjustments to secure consents, approvals and permissions e.g. planning authority requirements, road network efficiency, and the management of interfaces with other projects. For Construction Phase "incorrect cost estimates" I envisaged both the risks in relation to the MUDFA works that would retained by the public sector and the construction risk that would be effectively transferred to Infraco through executing the planned procurement strategy. The basis of the view that submission of a robust OBC in February 2006 would mitigate development risks was that we anticipated that the approval of the OBC would allow us to proceed with implementing the procurement strategy that sought to mitigate key development risks including early design work by SDS, early utility diversion by MUDFA, and as I recall early property acquisition relating for the proposed new tram stop at Haymarket. My role included defining

the risk management deliverables from our suppliers. In relation to those listed at Paragraph 6.3.5, I recall that SDS, MUDFA and Infracore and Tramco would all contribute to these deliverables each came on board, with the core responsibility for co-ordination being with SDS who be responsible for all of these deliverables with the exception of the Revenue Risk report that would be undertaken through JRC. We would also be supported by TSS who would have a role in reviewing each of these deliverables in terms of quality and fitness for purpose. My role would be to ensure a consistent framework of identification, management and reporting of risk, for example, through the review each of the outputs from suppliers and support the management of public sector risks including internal reporting of risks. I cannot recall how the contingencies referred to in Paragraph 6.4.1 were determined other than these contingencies would have been determined by colleagues in conjunction with our supporting advisors providing cost advice. I do not recall seeing or approving the outputs from "Each consultant has benchmarked risk from their own cost analysis". I was involved with determining the OB reference class to be used and determined that it should be classed as a "Standard Civil Engineering" as this seemed the most appropriate for the scope of works being contemplated. I recall that this further reinforced by the example projects used to categorise a "Non Standard Civil Engineering" Project that included complex, first of kind unique, or incorporated high risk construction elements including tunnelling works. As I recall, the OB classification of the project was undertaken with reference to all the relevant guidance from Treasury. I do not recall if TS had a specific requirement to apply DfT guidance in favour of Treasury Guidance that had been applied or there being any debate in relation to potential discrepancies in relation to project classification. I generally recall that with the support of our advisors we benchmarked our costs to the cost of other UK and European light rail schemes. At Paragraph 6.4.3, I noted that risk management being "actively measured" and by this I meant that we were recording a range of parameters including risks, mitigations, progress in mitigating risks, estimating necessary contingencies and OB. I illustrated the reduction in OB, that had been estimated on four occasions in the 17-months since submission of Parliamentary Bill in December 2003 that demonstrated a progress though the implementation of planned mitigations that had resulted in increased mitigation

factors resulting in a reduction of estimated OB. I was involved in the process to estimate OB in the communication with Risk Owners to understand their progress in mitigating the risk and implementing their mitigation plans. I recall that determining the average mitigation factors used to estimate OB. From these discussions, that considered the evidence in a number of ways e.g. in relation to progress in relation to procurement. The Treasury 2002 and 2003 Guidance identified and the measured OB from strategic outline case or OBC stages for traditionally procured projects (as opposed to PPP/PFI projects). Figure 5 of the 2002 Guidance illustrates the application of OB relative to the project lifecycle and demonstrates that with no risk management that this would be applicable at all stages of the project lifecycle, however, it also demonstrates that with risk management, the development of the project design and case that it is possible to achieve the 'lower bound' OB values at Contract Award (i.e. the appointment of Infracore). In relation to the earlier draft of the Risk Management section, at Section 1.7.5. I argued that Treasury starting values for OB were high due to eight factors, and could be reduced with the application of procurement, project and risk management best practice. I recall that this section was removed as this was arguing that the starting point for Upper Bound value could be considered to be lower, however, as the method of calculating OB relied on mitigation factors from published Upper Bound starting values then this text was considered not necessary. In relation to Section 1.7.6., outlining some of the lessons from Audit Scotland's review of the Scottish Parliament Building, I unable to recall why this Section was removed. In relation to 1.7.7., the earlier draft referred to the proposed recommendations from emerging guidance, in gaining an 'outside view' on OB from TSS and a Peer Review Group. I do not recall why this was not included in later drafts. However, TSS did provide review and I vaguely recall this later complimented by TS's consultants. A specific Peer Review Group was not used. On page 92 of the May 2005 Draft OBC, I note that tie's Technical Advisors have carried out an initial QRA analysis that assess the extent of contingency and that assuming a P95 probability the level of contingency required would be £50m that equates to 22% increase in the base costs of the Line 1. This analysis considered a broad range of risks and showed high probability contingencies were far less than the OB starting value. On page 15 of the earlier draft version, I recall including the estimate of the

full OB uplift for reference purposes only. I do recall concerns that there was a limited funding commitment. However, I also recall that colleagues held discussions with Funders in relation to retained 'funder level' contingencies to account for potential OB allowances that would sit above estimated contingencies at project-level. I recall highlighting that should Phase 1 proceed with the inclusion of full allowance of OB on estimated c£220m Phase 1 that this would not have exceeded funding of £375m. The key risks that I recall being mitigated by the adoption of the proposed procurement strategy, included improved scheme definition through early design and Operator input that in turn would reduce the risk of claims, help secure approvals, and provide a robust basis for Infraco pricing. In addition, design risk relating to utility diversions would be mitigated through early design development by SDS that in turn would allow the ability us to de-risk the Main Works through early MUDFA works. The procurement strategy was developed prior to me joining TIE. The selection of the forms of contract used to implement the strategy was led directly by the Project Director with the support of commercial colleagues and legal advisors. I had no direct input to the selection of the bespoke or standard forms of contract that were used, however, my primary concern was ensuring that understanding and mitigation of those risks that would retained by the public sector, securing the transfer of risk to the private sector as planned, and ensuring that those risks related to legal aspects were considered by those drafting the contracts. At Paragraph 6.5.4, reference is made to design development being retained by the public sector. By this I meant that the risk of design was not transferred entirely to the public sector as there could be changes introduced to the design development through a number of sources being managed by the public sector including Operator requirements, design adaptation necessary for the vehicles selected under Tramco, CEC Planning and Roads Authority required changes, and those potentially emerging from the MUDFA works. The early involvement of SDS sought to mitigate the risk of design change during the construction phase. The assumptions made in relation to design were that following appointment of the SDS in June 2005, that SDS would progress the design development of the Tram project progress prior to the appointment of the MUDFA, 10-months later in April 2006, and 24-months prior to the appointment of Tramco and Infraco in June 2007. It was intended that the

design development process by SDS would be significantly mitigated by the early involvement of the Operator and their design development that they would undertake in consultation with CEC. Procedurally, it was anticipated that a project change control process would be implemented to identify those changes that would be either be rejected or require access to contingencies in order to implement, or would require additional funding to support their inclusion within the project.

38. The Flyvbjerg/COWI guidance on OB from 2004 (CEC02084257) notes that there is a requirement to have incentives for promoters to exercise prudent cost control during project implementation to avoid the situation in which the allowance for OB works against tight cost control (page 5). What was done in this regard on the Tram Project? How did it work and how well did it work? At page 33 of that guidance, there is a suggestion that OB may be reduced by a percentage equivalent to the percentage of total project expenditure incurred. It notes that this reduces the scope for optimism bias operating even in the process of reduction of estimates of optimism bias. Why was the approach in this guidance not adhered to? At page 34, it notes that there is a danger that, if downward adjustments are made to the allowance for OB, the bias will once again creep in. What was done to consider this before making the downward adjustment to OB for the ETN? Was any reference made to the identified causes of OB when deciding to reduce the allowance or was it all on the basis of confidence as to the figures being provided? In particular, was attention given to the role of governance and decision making structures in the likelihood of OB? Was any consideration given to the warning that had been given in the Guidance?
38. The guidance identifies a concern that through the introduction OB could bring a complacency in cost control and risk management and therefore highlighted a concern that should allowances be made that there could be an undesired effect that in knowledge of large contingencies that there could be a reduced effort to maintain prudent cost control. The approach taken on the Tram project aimed to identify risks, make suitable risk allowances and through risk mitigation seek to reduce risk and if possible to reduce the level of OB. Unfortunately, I cannot

sufficiently recall and comment on the overall process for cost control on the project or give an opinion on its adequacy as colleagues managed this workstream. In relation to the Guidance's indication that OB could be reduced in proportion to expenditure, I highlight that this refers to post-approval reduction in OB and proposes a simple model to estimate the reduction of OB in proportion to expenditure. I cannot recall TS proposing to allow for additional Funding for OB or proposing this method. I recall that we spent appropriate time to understand the drivers and risks relating to OB and its application the Tram project. Our approach considered a broad range of risks, risk owners and mitigations. I recollect that the mitigation factors we used to estimate the reduction of OB were reviewed and not driven by a few risks whereby a single individual could over-claim reduction in a risk and bias the estimates to reduce OB. The guidance raises the risk of OB being reduced beyond that which could occur. I recall our defences against this included review. We assessed the risks identified and how they related to the contributory factors of OB directly within our Risk Registers, namely, procurement, project specific, client specific, environment and external influences. I cannot recall if we incorporated specific in risks in relation to governance and decision making structures, however, I recall this being an area of learning from Holyrood and recall effort being undertaken to define the governance arrangements with stakeholders in relation to the formation of TEL and to manage the decision making risks in relation to consents, scheme definition and project support. Unfortunately, I am unclear as to the specific warning that you wish me to comment on in relation to governance and decision making structures.

39. In a presentation given in September 2005 you said that OB "captures all our risk" (TIE00057303, page 34). Please explain what you meant by this?
  
39. I referred to OB capturing all our cost and programme risk. By this I meant that OB comprises three components of risk, namely those known, those unknown that could emerge and the market risks that could present themselves to us during the project lifecycle.

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40. On 13 March 2006 you emailed Stewart McGarrity and Miriam Thorne with comments on the OBC and, in particular, comments regarding contingency and risk (TIE00054115). What was your reasoning for supporting the maintenance of OB at 24%. What did this mean in practical terms? Your note that the QRA indicated that for a 95 percentile confidence level, the OB would be 22%. Can you explain this? How does that result pertain to OB? The provision for contingency appears to be at the P50 level. Could you explain this? The table in your email has rows for Inferred Specified Contingency and Inferred Optimism Bias. Can you explain what these are and how they are derived? Why is the position on specified contingency under greater pressure than that of OB?
40. My reasoning for maintaining the level of OB at 24% was outlined in the email that the limited scheme design or construction development had taken place since the last estimation. I recall this being a conservative position as I anticipated that there would have been some mitigation over the past months securing the Parliamentary powers. In practical terms, I was referring to the progress of design development and the early advance works. In discussion with approving stakeholders we argued that due to the breadth of risks that we had identified that encompassed those areas that were shown to have accounted for OB. Building on this we also argued that a credible basis of calculation would be to consider the 'high confidence' estimate of required contingency from the QRA analysis. I referred to a recent informal QRA exercise conducted by TSS and tabulated the findings. To illustrate, considering Line 1 to be constructed at £302m, I noted that P50 specified contingency of £47.9m would equate to approximately 16% increase in base costs. I also noted that selecting a P95 would equate to £71.8m, which represents an increase of approximately 24% above base costs. The P95 is taken as incorporating potential OB. I do not recall any specific pressure being applied on specified contingency, rather a pressure to ensure that suitable allowances were made and that a clear understanding of movement in base costs, contingencies and the need for care in their management.

41. In the March 2006 OBC (CEC00380898), in paragraph 5.3.3, there are figures for 'Specified Contingency' and 'Incremental Optimism Bias (Inflated)'. Can you explain these? They are referred to in more detail in paragraphs 5.3.5 and 5.3.6. There is a note that the OB figure terms of guidance was 24% (see paragraph 5.3.6). It then says that because there is a Specified Contingency of 10% for risk, the OB is reduced to 14%. Can you explain this? Section 8.3.7 returns to the issue of deliverables to support Risk Management. Which of these deliverables were actually provided by SDS, TSS or JRC? Where they were not so delivered, what arrangements were put in their place? Can you explain what is meant by the second paragraph and final in section 8.4.3 on Optimism Bias Contingencies? In relation to the ongoing design risks borne by the public sector (see paragraphs 8.5.1, 8.5.2 and 8.6.1), to what stage did you envisage design would be taken at the time that contracts were awarded for the works?
41. The March 2006 OBC considers the increase of OB of 24% above base costs and that the specified contingency was a sub-set of this valued at 10%, again, sitting above base costs. I recall that the specified remit was for SDS to provide all of these risk management deliverables with the exclusion of the Revenue Risk Report. The intent was that the Revenue Risk Report would be developed by JRC and with the support of Operator and advisors. It was intended that TSS would provide independent review of these deliverables. I cannot recall the details of each deliverable but I recall that the SDS deliverables were developed later than expected, with omissions, focussing only on their design related risks and that the quality was less than expected. The consequence was to consider an alternative arrangement whereby SDS would contribute to deliverables maintained by TSS on our behalf. At the 2<sup>nd</sup> paragraph of 8.4.3., I noted that in accordance with Treasury Guidelines, Optimism Bias has been shown to be driven by a number of contributory factors. Each risk can be allocated to the contributory factors. From assessing the respective mitigation against risks, reductions in OB can be made against each contributory factor. OB is calculated by estimating the degree of mitigation by implementation of treatment strategies for each risk in relation to each contributory factor. At the final paragraph of 8.4.3., I noted that our technical advisors have undertaken a QRA assessment to

confirm the potential increases to the capital costs based upon the risks identified in the project risk register in order to estimate the maximum increase. By this I meant, that with the occurrence all risks at their maximum value of impact that this would account for OB. I then go on to explain that we would continue to develop this further with SDS and TSS. By this, I meant that SDS would support us to develop the principal risk deliverables and that TSS would provide independent review. I expected design to be developed to a substantial level of detail over the full route of the Tram prior to works commencing and principally to mitigate approvals risk, client design acceptance, minimise risk of post novation design development or public sector design changes that could occur post novation; be sufficient to allow MUDFA to execute early advance works; and fundamentally to provide Infraco a design to price the planned works to greater certainty.

42. In June 2006 you were involved in briefing Transport Scotland ("TS") on the approach to estimation of OB adopted by TIE (see meeting acceptance dated 23 June 2006 - TIE00053178). What did you tell TS? Did you discuss reductions to the base figures for OB? Did you discuss whether it could be eliminated from the budget altogether?
42. Unfortunately, I cannot recall the details of this specific meeting to discuss the approach to our estimation of OB with TS. I recommend that Paul Whitehill of TSS be asked if he recalls the details.
43. CEC00943372 is a paper on Procurement Policy prepared by you on 5 July 2006. What was your role in procurement?
43. I recall drafting our original policy for procurement in 2004, but not this amended version of 2006. My role provided support to planned Tram procurement being directly managed by the Project Director and commercial colleagues. With regard to advisors (SDS and TSS) and contractors (Infraco and MUDFA) I contributed to procurement documentation in specifying their risk management remits and their insurance requirements. During evaluation stages, I recall contributing in discussions

with colleagues and advisors during prequalification and main procurement stages and specifically evaluating bidders proposed insurances and with the support of our Insurance Brokers, considering the adequacy of these. I developed the initial strategy for Project Insurances with the support of our business insurance brokers, Marsh. This led to me taking direct responsibility for procuring our insurance brokers and the project insurances, namely, the Tram's Owner's Controlled Insurance Programme (OCIP). I worked closely with DLA Piper to ensure compliance with public procurement regulations, and led the evaluation, interview and selection of our insurance brokers and then with their close support, organised a market awareness day for potential insurers, and evaluation and award of our project insurance programme.

44. In an email exchange from August 2006 (CEC01877024), Sharon Fitzgerald asked for the Risk Register so that it could be used in the context of drafting the Infraco contract. What was intended in this regard?
44. It was intended that DLA Piper would review the identified risks and consider the implications on risk transfer within the Infraco contract. Ideally, if a risk was identified and there was an unclear risk allocation under the contract then DLA would clarify this within the Contract, with the desire to transfer risks most appropriate to private sector. I anticipated that following review that DLA would share their findings and discuss the implications with commercial colleagues. I recall this being the case and a discussion with DLA Piper that it would also be of value to receive their contribution to identify new risks and expansion of existing mitigation.
45. On 17 August 2006 you received an email (TIE00053472) from Marwan Al-Assawi at Scott Wilson which considered among other things the OB process for the trams. The email notes that you had instructed him to review the OB process used for the project and the implications for the business case. Why did you give these instructions? What concerns did you have as to its implications for the business case? What effect would OB have on the business case? Was the model for OB different or EARL? If so, why was there a difference?

45. I believed that there significant learning from the Tram project that I was keen to build on for the EARL project and I felt that peer review was would bring considerable value, particularly as both projects could have a potential influence on each other. I had no underlying concerns regarding the approach taken for Trams; however, I was keen to obtain the views of wider TSS team of consultants, who were also directly involved with the EARL scheme. The economic case for the Tram project at PFC stage was demonstrated with an OB allowance. I therefore had no concerns about the economic case being undermined by a lesser OB value at Final Business Case Stage as the expectation was that with the consideration of wider risks that had led to OB and application of good practice risk management techniques that OB could at least be lowered to the minimum value estimated by guidance. The key implication for the inclusion of a greater OB value than estimated would be (i) the need for additional funding; (2) require reduction in the scope of the project; (iii) potentially the need to adopt a lower quality specification and further value engineering; or (iv) delaying the construction of elements to a later stage. I recall that both OB estimation models were fundamentally the same in the determination of mitigation factors applied to contributory factors of OB, however, the EARL model was more complicated as it contained elements of standard and non-standard civil engineering works.
46. On 6 September 2006 Graham Nicol sent you an email with an attachment considering options in relation to SDS (TIE00053587 and TIE00053588). These related to their failure to produce risk management materials. Could you explain what had happened and what action was taken in response? What effect did the absence of these materials have?
46. I requested Graham Nicol to prepare a paper considering the options we had in relation to SDS's risk management remit. I recall that this was prepared for discussion with senior colleagues as we had reached a point where the quality and omissions in their deliverables was compromising the quality of risk management on the project. The paper was prepared in consultation with colleagues and TSS and recommended that we bring the majority of risk management responsibilities in-

house with the aim that SDS continue to contribute to risk deliverables particularly on design related matters pre and post novation. It was recognised that this in-house option would require additional support from TSS and increased resourcing. I recall that this led to decision to amend the arrangements that led to additional TSS support. The SDS risk management deliverables were considered to be significant documents to help us to manage and reduce risk within the project. In their absence, late provision and in a quality less than required from the remit they effectively compromised our ability to manage risk.

47. By email of 21 September 2006, you were given advice by DLA as to withholding payment from SDS (TIE00050517). What prompted you to seek this advice? What did you do with it? Were any payments withheld? What was your role in relation to determining what payments should be made under that contract?

47. I was prompted to obtain this advice for DLA Piper in consideration of our options due to the failure of SDS to deliver risk management services. I discussed this with a colleague who was considering overall commercial position with SDS and the implications of their poor performance and failure to deliver their risk related remit. I am unaware if any payments were withheld from SDS and confirm that I had no role in relation to determining what payments should be made or withheld. I recall from discussions with colleagues that this would be factored into wider performance discussions with SDS.

48. On 2 October 2006 Nina Cuckow sent a Risk Register to Fiona Duncan and copied it to you (TIE00050012, TIE00050013 and TIE00050014). Was this material that would otherwise have been prepared by Parsons? What was your role in preparation of this? The risk in relation to SDS Deliverables is rated green (page 5). Standing the email above, why was this so?

48. I recall specifying the remit for SDS in relation to their risk management deliverables. The intent was for SDS to produce a project risk management plan, production and maintenance a project risk register, undertake QRA analysis to assess extent of

project risk and reporting on the progress of risk management on a monthly basis. My original intent was that TSS would provide an overview and independent review role in relation to risk. My intention was that myself would undertake overall reporting on risk management progress with the supporting inputs from SDS and TSS. In view of the SDS position on their remit, I secured the support of TSS to undertake the role and effectively co-ordinate risk management matters. The first piece of correspondence indicates the need to produce monthly briefing reports on progress on risk management, implementation of Active Risk Manager (ARM) and a summary of the top risks. The original intent was that SDS would produce reports in relation to these matters. I recall discussing requirements with Project Director and discussing the requirements for content of the reports with Nina Cuckow. The second reference was the Register that comprised stakeholder risks and project risks. Again, it was originally anticipated that SDS would report on the key project risks as part of their role including the facilitation of those stakeholder risks that tie was managing. Nina Cuckow as the Tram Risk Manager prepared the Functional Managers Risk report. I do not believe that the SDS remit include a specific Functional Manager's report, but rather a progress report in relation to risk. The risk in relation to SDS Deliverables is reported in the Primary Project Risks. For clarity, the green rating relates only to the progress in implementing the treatment plans. This rating should not be confused with the risk significance. Indeed, I recall that subsequently, we revised and enhanced the format of the Primary Risk Register further.

49. Also on 2 October you sent a PowerPoint presentation to Emiko Priest (TIE00050606 and TIE00050607). Who was he and why were you sending the presentation?
49. I recollect that Emiko Priest was an event organiser. She was compiling presentations for an event being hosted by one of the Rail Industry bodies as myself and colleagues were invited to provide presentations. I was presenting an overview of our approach to risk management and sent a copy of my presentation to her in advance of the event.

50. In your email to Nina Cuckow of 9 October 2006 you raised the issue of whether the DRP in the contract was understood, practical and workable (TIE00050023). No clear answer is given. Did you pursue this and if so, with whom? What was done to ensure that this issue as addressed in the contract was drafted as it would only be then that you could assess the adequacy of the procedure?
50. After attending a Risk Management and the Delivery of Major Projects Conference in early October 2006, I shared some observations that seemed particularly relevant to the project. One of these was to share views at the conference stressed the need for a workable DRP which led me to raising the question if the Infraco DRP was understood, practical and workable. I vaguely recall that a risk was added to the project risk register in relation to DRP; however, I do not recall pursuing this specific matter other than being aware that commercial colleagues in conjunction were developing the DRP with DLA Piper.
51. In an email of 9 October 2006 to Nina Cuckow (TIE00050665), you noted that for the Final Business Case it would be necessary to show that risks had been considered and costed. You refer to QRA and OB. You note that the bidding market may have more aggressive pricing and therefore a mixture of base and contingency. What did you mean by this? Also, you note that risk allocation may not be achieved at financial close as there may be material points to resolve. What did you have in mind? Who was in charge of risk at this time? What was the role being performed by Nina Cuckow?
51. I sought to develop an updated risk management section for incorporation within the Final Business Case and provided an introductory overview of activities required in advance of a planned discussion with Nina Cuckow. I highlighted that QRA and OB assessments would require to account for any newly identified risks and those closed. I highlighted that we were in the unusual position of not have received bidders feedback on the proposed risk transfer under our proposed Infraco contracts and had not fully concluded negotiations with Infraco and Tramco. This was relevant, as the draft risk management section would therefore have to be based on

a proposed risk allocation, rather than a concluded position with preferred bidders that would be normal for a Final Business Case. I refer to the potential for bidders to adopt 'aggressive pricing' for their base costs and risk pricing. My concerns were that as there were aspects not yet fixed and a very real potential for push back from Infracore and Tramco on proposed risk transfer, in effect bringing more risk back to the public sector, that this would influence the cost and necessary contingencies. I recall having further concerns that the bids received may exceed our base costs and could erode our existing contingency allowances, particularly in view of reduced progress in SDS design and MUDFA advance works. I was further concerned that bidders could submit low value bids then we may require to increase overall contingencies with base cost savings and planned contingencies. There remained an issue of the adequacy of cost and risk allowances should a different risk allocation be achieved and be reported in the Final Business Case. I therefore made the point in my email that there would be a need to introduce caveats (as there could be material changes in relation to risk allocation) in the risk management section of the draft Final Business Case highlighting that there were aspects that remained in dialogue with bidders. At this time and throughout the project the overall person in charge of risk was the Project Director. I had the responsibility for the overall risk management system, planning and reporting on the Tram and other projects. At this time I was supported on a day-to-day basis by Nina Cuckow, from TSS, who fulfilled the role of Tram Risk Manager. In turn, the responsibilities for managing individual risks are assigned to the risk owners identified in the risk register.

52. On 10 October 2006, Geoff Gilbert circulated a paper you had prepared on the Risk Management Development Plan for the Tram Project Board (CEC01795915 and CEC01795914). Does this reflect the failure of SDS to provide the material expected of them? Can you explain what it was intended that should happen? How did the proposals in the paper differ from what had been happening up until then? Were the procedures in this paper implemented? Was any record kept of the monitoring by you or your successor as Risk Co-ordination Manager of the progress made in mitigating risk or the quarterly reviews?

52. I prepared the Risk Management Development Plan to principally clarify the roles and responsibilities for the management of risk on the project in conjunction with the Commercial Director. I recall the drivers for creating this Development Plan included revisions to the delivery team structure and staffing that resulted as result of growth in our resourcing to prepare for implementation phase. This was undoubtedly influenced by both the performance issues SDS and their position to deliver the risk management services that we sought. The creation of the Development Plan also sought improvements in reporting of risk to ensure appropriate escalation of primary project risks and the implementation of Enterprise Risk Management software, Active Risk Manager. It was intended that following approval of the Risk Management Development Plan that a Risk Management Plan would be developed to capture the roles, procedures and requirements in relation to those activities outlined in the RACI Chart, in particular to recording risks maintaining the project risk register, generation of QRA for assessment of cost and programme contingencies and Optimism Bias, allocation of risk allowances and transfer under Contracts. Procedural changes were significant due to aspiration to provide a single platform for risk management in Active Risk Manager and a specific assignment of responsibilities that could have been previously assumed to be unallocated to commercial colleagues generally e.g. specific roles for the Estimating Manager and Procurement Manager. As far as I can recall, the activities were implemented. I am unfortunately unable to recall how quarterly reviews of the progress made in mitigating risk, however, this was a task that was frequently undertaken with Risk Owners and assigned Risk Treatment Owners in relation to due dates for completion of treatments. The progress on the implementation of treatment strategies were frequently updated and reported on a monthly basis for Primary Risks along with a colour coding to indicate complete, active and those treatments were behind. I recall this particularly as the progress on the Primary Risks was reported monthly.
53. In an email to you from Nina Cuckow of 18 October 2006 (TIE00050747) she expresses the view that the procedure for drawing on risk (ie the Change Procedure) is not suitable for purpose. Did you agree and what were the reasons for your view? What changes were made to this before the commencement of works? The previous

day she has emailed you expressing concern that TS appeared to have different requirements for risk drawdown (TIE00050028). Did you agree? Were the two brought into line or, if not, which approach was ultimately preferred?

53. Nina Cuckow expressed a view that the change procedure was not suitable for drawing on risk contingencies. Nina notes that this view is shared with Fiona Duncan and that with whom, Nina was developing the risk drawdown procedures. I cannot recall in ways in which it was unsuitable, however, I supported Nina's view expressed at the time that there were aspects that were not suitable and these included the definition of what constituted a change and the procedure for seeking change approvals. In my response to Nina's email, I expressed a view that the development of this procedure for accessing contingencies would require the development of operating rules for Delegated Authorities and that this would required the input of S McGarrity as I was aware that this was an aspect he was reviewing with Funders. My recollection at the time was a concern that without clear delegated authorities that the decision making could be slower than needed by the pace of the project, that is, should CEC and TS approval be needed; and that a clear procedure to access contingencies was necessary to ensure that changes requiring additional funding, that is, where the change could not be justifiably argued as contingency then these would also need to be developed. Nina's correspondence of 17 October 2006 highlighted that discussions that were taking place within the project were planned to align our change control procedure to that of the funders requirements and that primary concerns relate to the efficiency of this procedure through clear delegated authority to the project. I recall being of the view that that this was a key project control that would be required to be resolved and put in place prior to seeking funding but was of the belief that a solution could be found through further dialogue with TS and CEC. I cannot recall the specific changes that were made prior to commencement of works, in relation to areas of compromise, however, a review of the change control procedure documentation in relation to risk drawdown should illustrate this. In addition, I recommend that my colleagues S McGarrity and F Duncan be asked to clarify this further.

54. You were copied into to OB estimates for EARL (see email from Michael Parker of Turner and Townsend to you dated 12 October 2006, TIE00028634 and attachments). There, the project was divided up into different components of Non-Standard Civils Works, Standard Civil Works and Others and different OB percentages applied to each. Why was that not done for Trams? OB figures were used as opposed to the situation in the Tram project where they were treated as zero. Both the EARL figures and the ETN figures seem to have come from or been agreed with Transport Scotland. Why was there a difference? In the EARL estimate, there was allowance for both risk and OB. This was not the case with ETN. Again, why was there a difference?
54. The tram project was appraised as a 'standard civil engineering project' as the scope and characteristics of the proposed construction works comprising roadworks, utility diversion and tram infrastructure that did not have unduly heavy risk elements. However, the EARL project contained elements of particularly heavy risk comprising the construction of a tunnel beneath the operating Edinburgh Airport and extension to and connections into the operating rail network. In line with HM Supplementary Guidance the EARL project was considered as different elements of non-standard civil engineering for the heavy risk elements and standard civil engineering for the conventional risk components. The projects cannot be directly compared in relation to Optimism Bias as both were at different stages of development, with the Tram at Final Business Case stage and EARL pre-Outline Business Case stage. The approach to determining Optimism Bias for Tram was discussed with TS from around October 2003 where Optimism Bias was calculated for inclusion in the STAG Appraisal and prior to preparation of the Outline Business Case. By Full Business Case, we considered that Optimism Bias had been removed and that the adoption of suitable base costs and with the adoption of P90 risk allowances that we would proceed to seek funding on this basis. As EARL, was at a relatively early planning stage, it rightly included contingencies and Optimism Bias above the base costs.
55. You were in attendance at the DPD at the end of 2006 at which concern was noted regarding the performance of the designer (TRS00003014 – Minutes of November

2006 DPD Meeting, item 2.3.1). These concerns are also noted in the Progress Report that was submitted with the papers (see page 12 of 127) and it was noted that this might affect the MUDFA works. In view of these concerns as to performance of the designers, what changes had to be made to the risk? What difference did this make to the views on OB and risk generally? In that the early completion of design and utility works were critical components of the procurement strategy and attempt to de-risk the project, did these delays require a re-appraisal of the risks in the project?

55. At the DPD Sub-committee meeting, the Project Director expressed his concerns regarding SDS performance in that their response had been less than adequate even after senior level engagement and in particular awaiting a response to shared concerns regarding the observed weaknesses in their internal planning and inaccurate reporting. As part of the current issues reporting at Section 3.2, a summary of the issues discussed on numerous occasions with SDS is given including progress, prioritisation, quality of deliverables, resourcing to meet programme and non-compliance issues. Further concerns are raised in relation to the potential impact on the MUDFA works, and in particular, the ability to meet their programme if the quality of designs was far below expectation. MUDFA committed to help mitigate this risk through engagement with SDS in the design process and contribution of value engineering. The significance of the risks remained of the highest importance. The effect was to maintain pressure on SDS and further involve MUDFA in the process. The resulting performance issues with SDS had the impact reducing confidence in the ability to achieve SDS novation and execute the MUDFA works on the planned timetable to effectively de-risk the works and compromise the procurement strategy. The performance issues of SDS did not trigger a full re-appraisal of risks in the project, however, in view of the perceived risk of impact to timetable and as the risk had become reality, it became a day-to-day management issue with the aim to recover the position.
56. A copy of the risk register is attached to papers for the November meeting. The risk concerning SDS is number 280. Can you explain the entries in relation to that? How

was it intended that the Treatment Strategy would assist? Had the same strategy been tried before and what difference did it make? Risks 139 and 164 concern the location of utilities. In that additional utilities were being discovered which has not been accepted, do this think that the table reflects the position accurately?

56. Risk 280 relates to SDS critical deliverables being of low quality and late in completion. The mitigation plans are to management focused to improve understanding and co-ordinating efforts through identification of the key areas that SDS require to give attention to; re-focussing SDS efforts; applying micromanagement to SDS delivery; and implementing weekly reviews to press for deliverables. These Treatment Strategies seek to apply pressure to SDS to ensure that SDS focuses their efforts on critical issues, bring closer direct management to their workstreams, increase our management activity and initiate a regular weekly formal progress review. The same strategy is regularly applied on projects by clients seeking to escalate, re-prioritise and bring direct and increased management focus to service providers. I can't specifically recall the impact that these Treatment Plans had and recommend that the Risk Owner, G Gilbert, confirms this. Risks 139 and 164 relate to uncertainties of location of and unforeseen utilities and proposes a broad range of treatment strategies including surveys; production of utility layout drawings by SDS; trial excavations by MUDFA; design review process; cost appraisal of additional work; design workshops with Utilities and MUDFA; the use of provisional sum allowances incorporated in MUDFA Contract, and a review process to scope additional works to ensure adequacy of MUDFA resourcing and re-programming to meet timetables. These significant and high risks included for the discovery of additional utilities.
57. This meeting considered your paper with the final version of the Risk Management Development Plan. In terms of this, you, as Risk Manager, would be responsible for meeting risk owners and assessing what mitigation measures were in place. Could you explain the role that is allocated to Bob Dawson in para 2.7? Why is this allocated to him rather than you as Risk Manager? Can you explain precisely what was the role in relation to risk of each of the persons referred to in paragraph 1.5? It

seems as if there are a lot of people involved. Did this introduce a situation in which there was scope for everyone concluding that someone else must be dealing with an important issue?

57. Section 2.7 of the Risk Management Development Plan outlines the roles and responsibility for the Procurement Manager (Bob Dawson) to review the risk register in conjunction with the Risk Manager and Risk Co-ordination Manager in order to ensure that the Contracts under preparation or negotiation adequately address the perceived risk exposures and the desired allocation is set out in the Project Procurement Strategy and Contract Documents. This responsibility appropriately allocated to the Procurement Manager as he had day-to-day direct responsibilities for the Contracts under preparation. The respective roles and responsibilities are detailed in a RACI Chart included within the Risk Management Development Plan. For clarity, at Section 1.5, the Risk Manager will be responsible for the implementation of the Development Plan. In course of implementing the Development Plan, the Risk Manager will consult with the Commercial Director. Ultimate accountability for the management of risk exposures to the project resides with the Project Director. The responsibility for managing individual risks and implementation of mitigation plans resides with Risk Owners. These Risk Owners would include Project Managers, Functional Manager or Team Principal Managers within the project team. There were a number of people involved, however, our aim was to fully engage the project team to manage the risks relevant to their specific workstreams. I do not believe that this introduced doubt as to ownership, rather it brought clarity. Risk Owners assigning responsibilities to various individuals for the mitigation plans further mitigated this risk of everyone concluding that someone else was dealing with it.
58. What oversight was there to ensure that important risks were not overlooked? That is, if there was an omission from the risk register because a risk was not recognised, what measures were in place to detect and correct it?

58. I believe that the approach that we took was geared to create a culture of active participation in the identification and management of risk. We aspired to be implement risk management best practice and apply an innovative procurement strategy. We spent considerable effort to learn the lessons of previous projects that led to a new procurement strategy that sought to de-risk the overall project to the public sector. In particular, we focussed on those risks that were shown to have contributed to Optimism Bias. Our governance oversight included participation from TS, CEC and Partnerships UK. We regularly sought the inputs of legal, financial and technical consultancy to advise us on the management of risk. Risk formed a key agenda item in most meetings. We briefed stakeholders including CEC, TS, and SG on our management plans, primary risks, and mitigation planning and proposed risk management. In addition, we sought independent scrutiny to verify our approach. Dialogue within the project team, including workshops, and our advisors considered management activities to ensure risk awareness risk management. If a new risk was identified it would be added to the risk register, appraised for significance, assigned a risk owner providing oversight to that workstream and the mitigation plans developed in conjunction with the risk owner including the allocation of responsibilities for implementing the mitigation plans. Once we invested in Active Risk Manager, to create a further integrated platform this led to further detailing of risk and planning.

59. In the Minutes of the November DPD meeting (in the TPB Pack for December - CEC01762248), you are noted as having said that there was a need for increased mitigation in those areas in which delays had arisen (see item 2.4.5 on page 8). What did you mean by this? What was done in practice?

59. I noted the need for increased mitigation to counter the risks that appeared to be worsening in relation to programme delays and potential cost increases arising from a number of sources including CEC statement on reserved matters; CEC planning risk; quality concerns and late delivery of SDS deliverables that could have a consequence of loss of opportunity to explore value engineering options. By increased mitigation, I meant that we should specifically improve the management

planning around these risks in order to minimise their impacts. I cannot recall the detail of what was done in practice for each of these aspects; however, a review of the correspondence and notes of meetings in relation to these matters would provide the details of what was done in practice.

60. A Draft Final Business Case was issued in November 2006 (CEC01821403). It appears that rather than risk estimates being determined by consultants, it is now produced from the QRA at an assumed probability level of 90% (paragraph 1.58). Is that correct? Were you surprised that this level of confidence was achieved on an allowance of just 12%. How did that sit with the forecasts that had been made before? The section on Deliverables to Support Risk Management is no longer included. Why was this? Paragraph 10.42 says that the difference in provision for risk between a P50 confidence level and a P90 level was just 3%. Did this surprise you? Was any work carried out to verify this? Paragraph 10.43 and 10.44 say that TIE has complied with HM Treasury Recommendations for Optimism Bias and that it is eradicated by "the Current Stage of FBC production". Can you explain this and identify the elements of the guidance to which reference is being made? As there were no contracts for the tram vehicles or the infrastructure works and the MUDFA works were on a re-measurement basis, what was the basis for the degree of confidence? As it consistent with what has been encountered by that date in terms of performance by SDS?
60. As outlined in the Draft Final Business Case (paragraph 10.40) the risk analysis was prepared with the support of cost consultants from TSS, SDS and independent review by Cyril Sweet. I was cannot recall being my reaction to the P90 value, as presumed that these matters were being managed directly by commercial colleagues supported by. Unfortunately, I cannot recall the outputs from previous analyses. Section 10.75 outlines the Deliverables to Support Risk Management. I refer to the Review of Large Public Procurement in the UK and Figure 5 which shows the Relationship between Cost of Risk Mitigation and Cost of Managing Residual Optimism Bias in relation to the project development phases and Upper and Lower Bound values to and Table 4 shows the Current Practice Optimism Bias values. I

quote from Section 4 Calculation of Optimism Bias (page 32) "The upper bound values recommended for use when calculating optimism bias represent the optimism bias level to expect for current projects without effective risk management and bad scope definition, and are the starting point for calculating optimism bias for projects. These upper bound values reflect the average historic values because the average historic values are similar to the highest values for optimism bias currently being recorded for recently completed projects that have experienced high levels of optimism in their project estimates. The lower bound values identified represent the optimism bias level to aim for in current projects with effective risk management by the time of contract award. Ideally by the time of contract award sufficient project risks should have been identified and effective risk management strategies developed to obtain the lower bound values for optimism bias during project appraisal. By identifying the project risks within each of the project risk areas for a project and adopting appropriate risk management strategies it is possible to gain a high level of confidence in the estimates for capital expenditure and works duration." The Treasury guidelines steps set out the steps to derive the appropriate adjustment and mitigation factors to determine Optimism Bias. Paragraph 3.15 states "Ideally the optimism bias for a project should be reduced to its lower bound optimism bias before contract award. This assumes that the cost of mitigation is less than the cost of managing any residual risks." The MUDFA Contract was in place. This framework in combination with SDS's early involvement and advance design would allow us to de-risk the main works by Infraco. As the SDS and MUDFA Contracts had been effected we were confident that we had the appropriate skills and capabilities to implement the procurement strategy and conclude the Tramco contract, particularly with the supporting involvement of the operator, Transdev. However, we were concerned about the risks of protracted negotiations delaying the agreement with Infraco particularly with the planned novations. In relation to concerns of the potential poor performance of SDS, I considered that post-novation the issues with SDS performance would be managed directly by Infraco who would be responsible for design and construction risk for the main works and that Infraco would be bound to deliver to programme with contractual remedies incorporated if

they did not perform or were late in their delivery. It was anticipated that the Draft Final Business Case would be developed further following tender returns.

61. You were tasked with updating in the Risk Register every month. From looking at the registers, however, it appears that there was little change despite the worsening position. Can you comment?

61. Risk Registers were reviewed and updated on a regular basis considering potential new risks, progress in mitigation planning for identified risks and severity. Progress in mitigation was discussed with Risk Owners within the wider project team including advisors. One concern that I had was the ability to keep pace with the extent of risks and their mitigation in order to maintain risk registers and report on risks as we moved into design and construction stages. This resulted in my review of a number of Enterprise Risk Management solutions and following evaluation and consultation with colleagues led to the implementation Active Risk Manager. In addition, we revised reporting to include dashboard reporting on the numbers of new and closed risks and their mitigation plans.

62. You were Secretary to the DPD from August 2006. What were your responsibilities? What was the remit of the committee? How did it discharge it? Were you also secretary to the TPB – see pack for meeting in November 2006 (TRS00003014)? This appears to be the only time you performed this role. Why was this?

62. My responsibilities as secretary were largely administrative to support the Design, Procurement and Delivery sub-committee members with development of agenda, briefing papers and contribute to discussions on risk and to minute the actions arising from meetings. On one occasion I acted as secretary to the Tram Project Board as the regular secretary was unable to attend and I vaguely recall that this was because they were on holiday.

2007

63. On 12 January 2007, John Ramsey at TS was noted that there was a residual sensitivity on the part of TIE in relation to OB and the fact that TS wanted to use a higher figure – 20% at least. Can you comment?
63. I am unable to comment in relation to the level of OB as I would need to understand the basis of the 20% figure. However, if TS wanted to adopt a figure of 20% then this should have been instructed and a funding commitment put in place.
64. As early as February 2007, you were raising with Matthew Crosse that you thought additional risk could have to be borne by the public sector (TIE00051819). What did you have in mind?
64. My concerns were that there could be an erosion of effective risk transfer to the private sector compared to that planned and that this would result in risks being retained by the public sector. To illustrate, one consequence could be reduced design development there could result in delay in the progressing the early utility diversion works or a need to seek Infracore to undertake utility diversion works. This could also have a result of Infracore risk pricing and potentially risk that Infracore the planned novation may have restrictions placed that could bring risk back to the public sector. Specifically, Matthew Crosse and I discussed the consequences to Traffic Regulation Orders, a key workstream dependent on design development and the design solutions that SDS were adopting that may result in additional risk financing costs through TIE effecting a Project Professional Indemnity cover.
65. An email from Nina Cuckow to you dated 15 March 2007 (CEC01791794) notes that the reason that TIE took over risk management from SDS was that they did not accept that their responsibility extended beyond design risk. Is this correct? How had a situation come about in which there was disagreement about such a major part of the scope of works to be undertaken? This notes that TSS were providing risk management services. For how long did this go on? Why did it change?

65. I specified the scope of services for risk management within SDS incorporated in their contract with the ambition that SDS provide a holistic risk management support across the project. I felt that this would be a particular advantage, as they would be directly managing the primary development risks areas including design pre and post-novation to Infracore. I also sought to ensure that as the project moved into a more intense development phase that there was consistent risk management system used across the project and dedicated full-time resource for the management of risk. SDS failed to perform their risk management services to my expectation and were not prepared to take on the responsibility for risk management beyond those directly related to their services. Unfortunately, the situation only came to light after the appointment of SDS. I also included in the remit of TSS, a supporting consultant, the ability to call-off risk management support. This support ranged from workshop facilitation, risk register development and QRA analysis. I received support from a number of TSS staff on risk over a number of months but cannot recall their start and end dates. My former colleague, Mark Hamill, was appointed as Tram Risk Manager and took on day-to-day management of risk on the project and also received support from TSS on risk matters.
66. In the March 2007 TPB Minutes (TPB Papers – April 2007 - CEC00688584), can you explain Risk 870 and its treatment (page 25)? How does the treatment mitigate the risk? It does not seem to be that the ‘treatment’ could ever be said to reduce the risk or the consequence. Similarly, can you explain Risks 139, 164 and 280 and their treatments (page 26)? Did you have any further information as to how likely it was that these risks would materialise? How were these risks related? The micromanagement treatment for design was behind for months. Did this cause you concern and was it discussed?
66. I would highlight that the mitigation plans contained in a Risk Register do not a record of every management activity to address that risk. If the treatment specified in this brief summary report was reviewed in complete isolation, and considered in isolation of all management activities by the overall Risk Owner, Risk Action Owner

and Project Team, then it would appear that this does not fully mitigate risk. Risk 870 relates to risk that should SDS be late in the provision of design information to Infracore that there could be a delay in reaching contract close with Infracore (and consequently a delay to their works) and that there could be a need to appoint additional design consultants. The treatment strategy noted in this summary report is to review AIPs for structural information. I recommend that the importance of this treatment activity be discussed with the Risk Action Owner, G Easton, to fully appreciate its importance. However, the Progress Report at 1.1.1 (page 10 of 48) highlights the progress of SDS design proceeding in line with the revised programme and the on-going activities to manage critical design issues through planned meetings to manage the progress of SDS's designs. Risk 139 relates to uncertainties in utility location and the potential for encountering unforeseen utilities. The mitigation plan indicates management during design development and further engagement with utility companies and MUDFA to better manage this risk. I recommend that the importance of these treatment activities be discussed with the Risk Action Owner, M Hutchinson, to fully appreciate their relevance. Risk 164 relates to the risk of encountering unforeseen assets, obstructions or contaminated land with the mitigation plan to incorporate allowances for the potential consequences of re-design, investigations to quantify the extent and cost of additional works. I recommend that the importance of these treatment activities be discussed with the Risk Action Owner, M Hutchinson, to fully appreciate their relevance. Risk 280 relates to the risk of late or low quality deliverables produced by SDS and the potential implications to Infracore risk pricing and delay in achieving consents and approvals. The mitigation plans include close micromanagement of SDS, weekly reviews, and the identification of key areas requiring SDS attention. I recommend that the importance of these treatment activities be discussed with the Risk Action Owners, M Crosse and G Gilbert, to fully appreciate their relevance. The likelihood of risks occurring was directly appraised during the development of Risk Registers and discussed with Risk Owners. These risks are all directly related in their potential to compromise the procurement strategy, which sought to de-risk the main works, by Infracore through early operator and designer involvement and advance works to prepare the site through utility works clearance. The importance of the

SDS design was fully appreciated by all of the project team and concerns regarding their performance and actions to manage were discussed directly within the team on a daily basis. I recall my primary concern being that SDS performance was undermining the planned procurement strategy as delay in design development prevent de-risking the design prior to novation and would result in more utility works being undertaken by Infracore and could potentially compromise the planned novation of SDS into Infracore.

67. CEC01630338 is an example of a QRA analysis from June 2007. Could you explain the contents, the process used to compile it and the outputs derived? Some of the probabilities of risk are very high – 80% to 90%. At this level are they really risks or is the matter one of considering the probable outcome? Where there is such a high risk, say, of inadequate surveys (page 2 – risk 78), why is there not a decision taken to increase the level of survey? This QRA does not make any allowance for failure to transfer risk to the contractor or the problem of changes to scope after the contract is placed. These issues had been identified earlier. Why were they not included in the QRA?
67. I was not involved in the process to compile this analysis or appraise the outputs derived. I am unsure who the originator was or the contributors and I am therefore unable to address your questions. I kindly request that you direct these questions to the originator of the analysis to explain further.
68. In the pack of papers for the DPD meeting of June 2007 (CEC01522629), there is a copy of the Primary Risk Register. Risks 870 and 280 relate to SDS designs. By this time the delays with SDS were not truly a risk as they had become real. Despite this, they are still listed as a risk and there is no suggestion that the treatment tried to date have not worked. Why was this?
68. The management of these risks did not stop as the consequences of SDS late and inadequate design and poor performance had considerable ramifications. At the time of reporting, the mitigation plans are scoped to address the risks that are

occurring and on-going. The report highlights progress in mitigating the residual aspects of these risks.

69. Why was risk assessment transferred to the Legal Affairs Committee (minutes of 5 September 2007, TPB, USB00000006, page 6)? It does not sit well with the remainder of the remit of that committee noted on page 11.
69. I would recommend that this question be raised with members of the Tram Project Board who attended. I anticipate that they would be able to provide justification for this governance decision. However, I would observe that the Tram Project Board's decision to assign responsibility to a sub-committee of the Tram Project Board to review the contractual risk allocation when that sub-committee is considering all legal matters with CEC, the Final Business Case and the necessary approvals process would not appear to be inappropriate.
70. The MUDFA Risk Register for November 2007 (TIE00350880) includes a number of matters which had become a reality rather than a risk by that time. This was true of discovery of additional assets and need for different diversions as well as the inability / refusal of SUCs to turn around plans for approval within the require time frame. Despite this, they are still listed as risks and have an assessment of probability. Why was this? Also, at this time it was apparent that the design would not be completed to the extent planned at the time of conclusions of the INFRACO contract. What impact did this have on risk and OB and the documents that had been produced to analyse them? Did it indicate that risks had been underestimated or that there had been optimism as to the extent that they could be mitigated and/or the design process brought back on track?
70. Although this took place after I had left TIE, in practice, risks that are added to any Risk Register would be remain on the Risk Register until the phase of the risk exposure is completed. To illustrate, where there remained a risk of programme delay or cost over-run during the construction phase as a result of the on-going works being undertaken by MUDFA then there remains a risk that these could arise

across the works. The relevance of risks and the adequacy of planning actions to prevent the risk occurring, reduce its potential impact and manage the risk when it occurs were discussed with the Risk Owners and Tram Risk Manager.

71. In the PowerPoint presentation to the joint meeting of the TPB and TIE Board in October 2007 (CEC01358513), the estimate of £498m for Phase 1A is said to include 15% risk and contingency (page 51). Where did this figure come from and how was it made up? The next page has a different flat-rate figure of £49m. Where had it come from? There is reference to provision for risk on a P90 or P95 basis. Did you prepare figures on this basis?
71. This meeting took place after I had left TIE and I am unable to comment in any detail on the content of this presentation, as I did not provide input to the production or risk and contingencies quoted. As this section of the presentation appears to have been given by my former colleague, Miriam Thorne, whom I presume prepared this section of the presentation. I kindly request that you clarify the content and the sources of information with the presenter. However, it would appear that the contingency of £49m (that is circa 10% of the total Capital Costs of £498m) has been expressed as a percentage of the remaining capital costs at January 2008, that is, £498m minus £119m expended. There is no reference to P90 or P95 made.

## 2008

72. Although it was produced after you had left the Company, can you comment on the risk matrix that was produced for contract close (CEC01430993)? What was the intention behind it? Was it you or someone else that requested it? Was this what you wanted / expected?
72. The Risk Matrix summarises the risk allocation between public sector, private sector and those shared risks under the draft Infraco Agreement in December 2007. As a summary document this is readily reviewable. I recall requesting DLA Piper to provide a summary of the risk matrix to be prepared for a number of reasons.

Importantly, I hoped that the Risk Allocation Matrix would also summarise the successful risk transfer to the private sector of aspects that were critical to the success of the procurement strategy e.g. novation of SDS design contract. As the Infraco Agreement was bespoke, that is, it is not a standard form of contract, I wanted to ensure that those to ensure that those retained public sector risks were clear to the project team. I hoped that this in turn would provide clarity of those aspects that required to be managed by colleagues. I also hoped that the Risk Allocation Matrix would be incorporated in the Final Business Case for the project along with commentary on how those retained and shared risks would be managed to demonstrate to those approving the Final Business Case and committing to the contract that suitable plans were in place. I recall making reference to the published NHS Standard PPP Contract Risk Allocation Matrix as an illustrative model. The form and structure of the Risk Matrix appears to be well structured and detailed and in line with my expectation. There appears to be some areas in development and negotiation. The final risk allocation agreement is reached when the overall contract agreement is signed. I recommend that the opinion of commercial colleagues managing the development of the Infraco contract and DLA be obtained to confirm the areas where risk transfer was not achieved as planned.

I confirm that the facts to which I attest in this witness statement, consisting of this and the preceding 62 pages are true to the best of my knowledge, information and belief.

Witness signature.....

Date of signing..... 31 July 2017.....

