Switching Options:

Assessment of Stakeholder Responses to Costs

Final Report

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1. EXECUTIVE SUMMARY

Context

1.1. In 2011, CSMG was engaged by Ofcom to create specification documents and cost assessments for consumer switching options considered by the Switching Working Group (SWG) for broadband and telephony services. The CSMG deliverables examined the expected impacts on industry in order to support evaluation of the selected options. CSMG's cost assessments and specifications were published alongside Ofcom's consultation document, "Consumer switching - a consultation on proposals to change the processes for switching fixed voice and broadband providers on the Openreach copper network" in February 2012.

1.2. There were a number of responses to the consultation document, including an assessment of the options' costs by PricewaterhouseCoopers (PwC). PwC was commissioned by BSkyB, British Telecom and Virgin Media to prepare an independent estimate of the costs to set-up and to operate a Gaining Provider Led Third Party Validation (GPL-TPV) process.

1.3. On behalf of Ofcom, CSMG has reviewed the PwC response. Specifically, Ofcom asked CSMG to evaluate if PwC's independent assessment of the GPL-TPV model could be utilised to refine the initial independent cost estimates of the GPL–TxC (Gaining Provider Led – Transfer Code) and LPL (Losing Provider Led) models provided by CSMG in February 2012.[1]

1.4. This report outlines this review of PwC's cost estimates and provides a revised set of estimates for these models. In addition, this report addresses responses by other industry stakeholders regarding security considerations.

Assessment of PwC Response

1.5. PwC's estimates for the GPL-TPV model were 42% higher (on a net present cost basis) than CSMG's estimates for the same model. All cost figures are reported on the basis of a 10 year net present cost[2] (NPC) in this document unless otherwise stated.

1.6. Based on the information provided by PwC, the cost variance appears to be due to:

1.7. PwC's inclusion of incremental costs not included in CSMG's original model e.g.

- Inclusion of costs for a Commissioning Board.
- Inclusion of costs for impacts to Bureau Service Third Party Integrators.

1.8. PwC's use of different input assumptions

- Use of significantly higher day-rates for IT staff and Customer Service Advisors than CSMG.

[1] CSMG produced two sets of estimates for Ofcom in February 2012. One set was an "independent" model and was based on CSMG's estimate of the impact and work required to transition to each of these models. The second set utilised an "industry" model which was based on CP responses elicited as part of the SWG process. The independent estimates are the focus of this report, and are the set of estimates which have been refined based on the PwC report. However, the central CAPEX and OPEX (e.g. cost of the Hub) in the industry model was based on independent estimates. As a result, the industry model figures have also changed based on the changes to these central CAPEX and OPEX figures.

[2] Net Present Cost (NPC) is calculated over 10 years at a standard discount rate of 3.5%.

- Estimating a greater number of man-days and hardware/software costs for Tier C setup.
- Estimating a greater number of man-days and hardware/software costs for the construction of the Hub.
- Assuming a larger team would be required to run the Hub services.
- Basing "Full" Third Party Integrator (TPI) costs on Tier C[3] Communication Providers (CPs) costs rather than Tier B CP costs.

1.9. CSMG assessed each area of variance in turn.

Areas of Agreement with PwC's Response

1.10. There were several areas where CSMG agreed with PwC's cost estimates for GPL TPV. In these cases, CSMG has updated its initial assumptions for the GPL TxC and LPL models. In some areas, such as in the example of data sanitisation costs, CSMG included this additional category into its estimates based on PwC's estimates of effort required.

1.11. In other areas, CSMG agreed with the principle of including certain costs but not the scale of the costs proposed by PwC. For example, in CP training costs, CSMG increased the number of CSAs that would require training in new switching processes. This was based on further research which indicated a broader group of CSAs was involved in switching than previously estimated. CSMG also changed its methodology of accounting for training costs to align more closely with PwC's methodology. However, as CSMG did not agree with the CSA training day-rate used by PwC, this resulted in a lower training cost than that estimated by PwC. The overall effect of these changes to the CP setup costs was to *reduce* the cost of setup for CPs by £1m in the GPL-TxC model and £0.4m in the LPL model.

1.12. CSMG also found that the inclusion of a Commissioning Board was a reasonable recommendation by PwC. Precedent for a Commissioning Board exists in the utilities sector and such an organisation has previously been proposed in the telecommunications sector. For example in the mobile communications sector, a UKPorting body was set-up to support the proposed move to a Gaining Provider Led (GPL) porting system. CSMG therefore estimated and included the costs of a Commissioning Board in its revised estimates for GPL-TxC and LPL. However, again, CSMG did not agree with the scale of the cost estimates suggested by PwC, particularly the estimates regarding the number and cost of the full-time employees who would form the project management team. PwC estimated the cost of the Commissioning Board at £5.4m. CSMG's revised estimates included a lower cost of £1.7m for inclusion of a Commissioning Board which was applied to both the GPL-TxC and LPL model estimates.

1.13. CSMG also made changes to its assumptions for the Hub. CSMG accepted PwC's proposal that a management structure would be required for the organisation that ran the Hub. CSMG estimated the roles required to fulfil this management responsibility and increased estimates for the on-going staff costs of the Hub accordingly. In addition, CSMG agreed with PwC's use of high-end software (e.g. Oracle Weblogic) within the Hub and increased the cost estimates for hardware and software costs in the Hub. These changes resulted in

[3] In CSMG's report of Feb 2012, CSMG classified Tier C CPs as large CPs, with generally over 1 million subscribers, and which had complex systems.

an additional £0.7m cost (in terms of setup costs) and an additional £6m (in terms of on-going costs) to the GPL TxC model. These changes also increased on-going costs in the LPL model by £0.6m (due to assumption of increased management staff in the Hub).

1.14. In some areas where CSMG adopted PwC's methodology for estimating costs, this resulted in a decrease in the initial cost estimates provided by CSMG; CSMG revised its estimates to treat training as a one-off cost rather than an on-going cost. This removal of on-going training costs resulted in a *decrease* in *on-going* costs of £5.1m and £1.5m to the GPL-TxC and LPL models respectively. This was in addition to the £1m and £0.4m decrease in *setup* costs due to the reduction in setup training costs mentioned in para 1.11.

Figure 1: Revisions to GPL-TxC and LPL models (Impact on NPC)

	Impact on GPL-TxC Model NPC	Impact on LPL Model NPC
Industry Setup Costs	-£1.0m	-£0.4m
Commissioning Board	+£1.7m	+£1.7m
Hub Setup	+£0.7m	No change
Hub On-going	+£6.0m	+£0.6m
Industry On-going	-£5.1m	- £1.5m
Total	+£2.3m	+ £0.4m

Areas of Disagreement with PwC's Response

1.15. In other areas, CSMG did not find sufficient evidence to accept PwC's assumptions.

1.16. Firstly, CSMG's research into the expected costs of TPIs (Third Party Integrators - both full and bureau service) suggested these organisations would not incur significant costs under GPL-TxC or LPL. Recent discussions with a Bureau Service TPI supported CSMG's belief that the inclusion of costs for these organisations was unwarranted. CSMG also contacted a large full-service TPI who suggested that CSMG's initial estimates (which were substantially lower than PwC's) were already higher than those estimated by the TPI. PwC stated that they did not contact any full or bureau service TPIs as part of their research. CSMG therefore did not revise its assumptions regarding TPIs. PwC estimated that these TPI costs would be £17.0m whereas CSMG's estimates remain at £1.8m.

1.17. Secondly, CSMG does not agree with the number of man-days or hardware proposed by PwC for Tier C setup. In terms of the tasks that were previously identified by CSMG, PwC estimates appear high given the level of work required. For example, PwC assumes 740 man-days for the development of Service Order Management changes relating to 21 new API calls. Based on CSMG's experience in conceptually-similar software development projects, a reasonable estimate would be approximately 210 days on the design, code and unit test of this area per service, plus some additional days for end point integration and deployment. CSMG's research (which used the same sources as PwC) also showed lower costs for hardware and software than those cited by PwC. As a result, CSMG did not change its man-day estimates for the majority of Tier C CP setup tasks nor the hardware and software estimates required. In total, PwC estimated over 2,600 days for a single Tier C CP setup (excluding training), whereas CSMG estimated 1,700 days.

1.18. Thirdly, CSMG found no evidence to suggest that the construction of the Hub would require significantly more man-days than previously estimated. Again requirements for tasks cited by PwC appear high given the specification of the Hub envisaged by CSMG. For example PwC estimated development of B2B interfaces in the Hub would account for 1,200 man-days. CSMG's experience indicated that the design, development and unit test of these interfaces would take 20 days for each of the 21 new API calls, plus time for detailed database design and Code Unit Test, along with time to handle endpoint management. CSMG conducted additional research to support its views on other tasks estimated. For example, CSMG contacted security experts who confirmed that O/S hardening / penetration testing for the Hub would likely take approximately 60 days rather than the 240 days estimated by PwC. Furthermore, CSMG's calculations of the capacity required by the Hub, suggests that the hardware and software architecture outlined in PwC's report was over-engineered and hence overstated the costs by £4.8m.

1.19. Fourthly, CSMG disagrees with PwC's average day-rate assumptions for IT resources. The PwC rationale for this "prime SI overhead" is that it covers the management that is required to ensure that a contractor is productive and delivers to time and quality. This additional management oversight has already been incorporated as part of our estimates for the number of days required to complete tasks and therefore we do not believe there is justification for including this additional labour into the labour rates. As a result we have not revised our figure from the original labour rate assumptions. PwC's use of higher day-rate resulted in an additional £15m of cost in their estimates.

Impact of Changes on GPL-TxC and LPL Models

1.20. Following the assessment of PwC's report, CSMG updated the assumptions identified above in the GPL-TxC and LPL models. The results of the changes can be seen in the table below.

Figure 2: Initial CSMG Estimates vs. Revised CSMG Estimates (NPC)

	GPL-TxC	LPL
Initial CSMG estimates (Feb 2012)	£41.3m	£65.5m
Revised CSMG estimates (Sep 2012)	£43.6m	£65.9m
Change	+£2.3m	+£0.4m

1.21. As can be seen in the table, CSMG increased its NPC estimates for GPL-TxC over a 10 year period to £43.6m[4]. This was due to: the inclusion of a Commissioning Board; changes to Tier C, Tier B and Tier A setup costs (based on increased numbers of CSAs, accounting for training costs in a different way); increases in Hub setup costs (inclusion of CP on-boarding /endpoint management and including use of more expensive software); and increases in Hub on-going costs (increased number of staff in the Hub). The revised estimates also took

[4] These costs are based on an assumption of 2.1m switches per year, which was the estimate used in the original model supporting the consultation document. In response to the consultation, Charles River Associates quoted a higher Openreach figure of 2.6m switches. If this figure is used, the 10 year net present costs for GPL-TxC and LPL are £40m and £74m respectively. Since writing this report, CSMG has conducted further analysis for Ofcom on the cost of various switching models, in its report "Switching Models: An updated cost assessment of options". In this report, the higher assumption of 2.6m switches is used as the basis for cost estimates. However, as PwC based their estimates on the original 2.1m switches per year figure, CSMG decided to continue to use this as the assumption in this report for the sake of consistency. For this reason, the cost figures in this report, and the later CSMG report differ slightly

into account the decrease in industry on-going costs resulting from the change in the way that training costs are now accounted for in the model (one-off cost only).

1.22. CSMG also applied the relevant changes in assumptions to the LPL model. As can be seen above, this resulted in an increase of £0.4m in the 10 Year NPC (resulting in a LPL estimate of £65.9m). This was primarily the result of: the inclusion of the Commissioning Board (which would be required to oversee the transition to a harmonised LPL process using the TxC, and the setup of the Transfer Code Issuing Authority - TxCIA); the inclusion of management staff in the organisation that runs the TxCIA; and the treatment of training costs as a one-off cost.

2. INTRODUCTION AND APPROACH

Introduction

2.1. In February 2012, Ofcom published CSMG's report, "Switching Options: An Assessment of Potential Costs".[5] An accompanying spreadsheet provided costs for several potential switching models including "Alternative TPV", "GPL-TxC", and "LPL". The net present cost over a 10 year time frame calculated for these models was £97.9m, £41.2m, and £65.2m respectively. The report and accompanying spreadsheet were published alongside Ofcom's consumer switching consultation document.[6]

2.2. In response to the consultation, PricewaterhouseCoopers (PwC) (on behalf of BT, Sky and Virgin Media) submitted the report, "Ofcom customer switching consultation: An independent cost assessment of the alternative GPL-TPV model".[7] In its report PwC provides net present cost estimates of £140.0m over the course of a 10 year period for the GPL-TPV model[8]. This was 43% higher than the comparable independent estimate calculated by CSMG for this model.

2.3. In the PwC report, the authors stated that the reason for the difference in cost was because "[they] identified cost areas that were not included in the CSMG analysis (such as the Commissioning Board) and have gathered an evidence base of inputs used in our cost assessment that is at variance with those adopted by CSMG".

2.4. Ofcom engaged CSMG to:

2.5. Review PwC's response and assess the validity of these identified cost areas and also the different inputs used in the PwC cost assessment

2.6. Assess the extent to which these cost areas and different inputs (for the alternative GPL-TPV model) would be applicable to the GPL-TxC and LPL processes.

2.7. The analysis for this report was conducted between September and December 2012.

PwC vs. CSMG GPL-TPV Analysis

2.8. In order to understand the differences, CSMG conducted a variance analysis of the components that made up these GPL-TPV cost estimates. The results of this analysis can be seen below (the main areas of difference are highlighted).

[5] http://stakeholders.ofcom.org.uk/binaries/consultations/switching-fixed-voice-broadband/annexes/csmg_report.pdf
[6] Consumer switching - A consultation on proposals to change the processes for switching fixed voice and broadband providers on the Openreach copper network Feb 2012.
[7] http://stakeholders.ofcom.org.uk/binaries/consultations/switching-fixed-voice-broadband/responses/PwC.pdf
[8] This figure was initially cited as £138.9m but was subsequently increased to £140.0m by PwC to correct summing errors in their document.

Figure 3: Variance Analysis PwC vs. CSMG Alt-TPV Net Present Cost over 10 Years

Cost Category	PwC Alt TPV	CSMG Alt TPV	Delta (PwC and CSMG)
Industry Setup	40.3	24.1	-16.2
Tier C	13.0	5.7	-7.3
Tier B	4.2	5.1	0.9
Tier A	0.9	2.2	1.3
Full TPI	10.9	1.7	-9.2
BS TPI	6.1	0.0	-6.1
AO and WP	5.2	9.4	4.2
TPV Costs	54.0	40.8	-13.2
Commissioning Board	5.4	0.0	-5.4
Hub Setup	7.1	1.6	-5.5
Hub On-going	13.9	7.4	-5.4
Industry On-going	19.3	24.0	4.7
Total	140.0	97.9	-41.0

2.9. The analysis showed that PwC identified two cost areas which were not included in the CSMG analysis. These were the Commissioning Board and Bureau Service Provider TPIs. In addition, PwC estimated higher costs in five other areas: Tier C setup costs, Full Third Party Integration (TPI) setup costs, TPV costs, Hub Setup and Hub On-going costs. These higher cost estimates were mainly the result of PwC utilising different input assumptions.

Report Structure

2.10. The report is split into five sections.

2.11. *Assessment of new / incremental cost areas and impact upon GPL-TxC*. The report first evaluates new areas of costs identified by PwC which were not included in CSMG's original analysis. Based on this evaluation and the extent to which these new costs also impact the GPL-TxC model, CSMG has presented its updated costs for GPL-TxC.

2.12. *Assessment of input assumptions used by PwC and impact upon GPL-TxC.* After evaluating the new areas of costs highlighted by PwC, this section analyses the different input assumptions used by PwC. Again, revised figures are presented for the GPL-TxC model based on this analysis.

2.13. *Impact of New Cost Areas and Revised Input Assumptions on LPL model.* Several of the revisions to the GPL-TxC model also impacted the LPL model. This section provides more detail as to these impacts and presents revised figures for the LPL model.

2.14. *Assessment of Other Industry Responses.* Other stakeholders provided responses on the consultation which potentially impacted cost estimates. This section provides CSMG's evaluation of these.

2.15. *Impacts on GPL-TxC Model and LPL Model.* This section summarises the impacts of changes to the cost estimates and presents the revised figures for the GPL-TxC and LPL models.

3. Assessment of New / Incremental Cost Areas – Impact on GPL-TxC

Commissioning Board

PwC's Estimate

3.1. PwC propose that a Commissioning Board would be required in order to provide governance of the industry project. In its "Response to CSMG questions" dated 26th Sept 2012, PwC elaborate on the role of the Commissioning Board as:

- To act as a steering board during implementation
- Post implementation, to fulfil a board of governors function to ServCo (the company that runs the Hub)

3.2. PwC outline that the Commissioning Board would consist of part-time director-level industry stakeholders and a full-time project management group. The programme management team would be responsible for managing day-to-day delivery: providing information to the Commissioning Board to enable it to direct the programme and managing delivery to time and budget.

3.3. PwC assume that post implementation, the full-time project management team would no longer be required, and that the board would evolve to a smaller board "secretariat". In this role, the Commissioning Board would be responsible for the continued governance of ServCo e.g. ensuring SLAs are met, reporting functions and the continued meeting of industry stakeholders.

3.4. In its analysis PwC estimate the costs of the Commissioning Board to be £5.4m, including £4.4m in setup costs, and £1m of on-going costs.

Figure 4: PwC Commissioning Board Setup Cost
(from assumptions provided in report and further responses)

Item	Per Unit	Days	Cost
8 FTEs in programme office	£1550/day	2,736	£4.2m
10 steering group FTEs	£658/day	270	£0.2m
Total		3,006	£4.4m

CSMG's Assessment

3.5. CSMG accepts that a Commissioning Board would greatly facilitate transitioning to the GPL-TPV model. Precedent for this exists in the energy sector (in the Central Integrated Design Authority project run by Gemserv) as well as in the mobile communications sector where the aborted UKPorting body was set-up to support the proposed move to a Gaining Provider Led (GPL) porting system. It is therefore reasonable that an independent body be created to support the design of the switching process, selection of ServCo, and the on-going governance of this provider.

3.6. As the GPL-TxC design also includes a central Hub, it is reasonable that a Commissioning Board would also be required in the GPL-TxC model.

3.7. Having determined the relevance of the Commissioning Board to the GPL-TxC model, CSMG considered the incremental cost of this function.

3.8. The revised estimates are provided below. We propose that 3 full time employees (as opposed to the 8 FTEs assumed by PwC) would be sufficient to fulfil the programme management function. These roles would include:

- A Managing Director with responsibility for liaising with industry and Ofcom and to be a point of escalation and decision maker.
- A Technical Director to own the Hub system requirements, assess the ultimate design and provide technical and architectural guidance to ServCo.
- A Project Manager to manage ServCo during the execution of the Hub build project.

3.9. Our estimates for a more streamlined organisation than PwC are the result of using an outsourced model for support functions such as legal and human resources, as well as the lack of a TPV function in the GPL-TxC model (i.e. a contact centre workstream lead would not be required).

3.10. Furthermore, we believe that these roles can be sourced at significantly lower cost than PwC have estimated. PwC estimate a £1,550 per day cost for these programme office roles based on management consultancy rates. This equates to a cost of approximately £350,000 per annum per FTE. We instead assume an average of £150,000 per annum for these FTEs which equates to £658 per day.

3.11. Industry stakeholder participation will also be required to ensure industry consensus. Estimates for industry stakeholder costs were therefore also included. In addition, we have included costs for travel subsistence, office accommodation and professional service support for the Commissioning Board.

Figure 5: CSMG Commissioning Board Setup Costs

Item	Cost per Unit	Units	Cost
Managing Director	£658/day	342 days (18 months)	£225,000
Technical Director	£658/day	342 days (18 months)	£225,000
Project Manager	£658/day	342 days (18 months)	£225,000
Industry stakeholders for periodic meetings (10 persons @ 1 day per month)	£658/day	270 days (18 months)	£177,660
Legal advice	£3,000/day	15 days	£45,000
HR advice	£1,000/day	20 days	£20,000
Other professional services	£1,000/day	20 days	£20,000
Travel & subsistence expenses	£300/day	3 people x 5 days per month x 18 months	£81,000
Office accommodation	£100/day	3 people x 10 days per month x 18 months	£54,000

Travel & subsistence expenses for industry stakeholder steering meetings	£300/day	2.5 people x 2 meetings per month x 18 months	£27,000
Office accommodation for industry meetings	£1,000/day	2 per month x 18 months	£36,000
Miscellaneous office admin expenses (estimated)	£1,000/month	18 months	£18,000
Total Net Present Cost over 10 years			£1,115,060

3.12. In terms of the revised estimates for on-going costs, the full-time roles in the Commissioning Board are assumed to end (similar to PwC's assumption) after the setup of the Hub and database is complete and the system transitions into operational use. The industry stakeholder component of the former Commissioning Board would however continue in its role and meet regularly. It would provide supervision of ServCo and a forum for the management and discussion of any future switching issues.

Figure 6: CSMG Commissioning Board On-going Costs

Item	Cost per Unit	Units	Cost
Industry stakeholders for periodic meetings (10 persons @ 1 day per month)	£658/day	120 days per year	£78,960
Total Net Present Cost over 10 years			£656,679

3.13. Based on these assumptions, the inclusion of a Commissioning Board increases the cost of the GPL-TxC model by an additional £1.7m vs. CSMG's original estimates.

Bureau Service Provider TPIs

PwC's Estimate

3.14. PwC included estimates for costs relating to Bureau Service TPIs (BS TPIs) to integrate with the Hub. It is stated within PwC's report that changes will be required to both CRM and billing implementations, although what these changes involve is not specifically stated. PwC assume that the cost of making these changes will mirror the front-end change costs incurred by a Tier C operator.

CSMG's Assessment

3.15. BS TPIs were excluded from the initial cost estimates as the impact on these organisations was assumed to be minimal. BS TPIs provide CRM and/or billing bureau services only which are not significantly affected. They do not directly provide provisioning services, although they may indirectly provide these services through partnership with a Full TPI (Full TPI cost impacts are considered separately).

3.16. CSMG has consulted with a Bureau Service TPI who agreed with this assessment. CSMG therefore did not include any costs for BS TPIs in its revised cost estimates.

Summary of New / Incremental Cost Categories

Figure 7: Impact of New / Incremental Cost Categories Proposed by PwC on GPL-TxC Model (NPC)

Item	PwC	Original GPL-TxC	GPL-TxC
Commissioning Board	£5.4m	Nil	£1.7m
Bureau Service Provider TPIs	£6.1m	Nil	Nil
Total	£11.5m	Nil	£1.7m

3.17. Having reviewed the new/incremental cost categories put forward by PwC for GPL-TPV, CSMG revised its GPL-TxC and LPL estimates (revised LPL estimates shown in Section 5) to include Commissioning Board costs (albeit with lower cost estimates for its setup than those suggested by PwC). However, CSMG did not find evidence to justify the inclusion of costs for Bureau Service TPIs in its revised estimates. These revisions therefore resulted in an overall increase in NPC of £1.7m for the GPL-TxC vs. our original estimates.

4. ASSESSMENT OF INPUT ASSUMPTIONS USED BY PWC – IMPACT ON GPL-TXC

4.1. Our analysis of PwC's response revealed that PwC utilised different input assumptions to derive cost estimates for Tier C Setup costs, Hub Setup costs, Hub On-going costs and Full TPI costs[9]. This has resulted in PwC producing higher cost estimates in these areas. The assumptions related to:

- Labour rates
- Number of man-days
- Hardware costs
- Methodological assumptions

Labour Rates

PwC's Estimate

4.2. PwC used a blended mix of industry full-time employees and contracting staff day-rates in its estimate of GPL TPV costs. The IT contractor rate is partly sourced from the website "itjobswatch.co.uk". The report states these are "based on an itjobswatch.co.uk search where average UK, contractor rates are between £1000 and £350 per day." PwC also states it has assumed a "50% prime SI overhead". PwC state that this "prime SI overhead" relates to a management layer of oversight of contractors.

4.3. For the industry FTE cost, PwC has estimated £440 per day, based on £100,000 annual payroll cost per employee (including national insurance contributions, pension benefits and other direct staff costs).

4.4. Assuming a 3:1 ratio of contractors to FTE, this results in a day-rate of £710.

CSMG's Assessment

4.5. Using itjobswatch.co.uk[10] (the same source utilised by PwC in its analysis) and taking the average from roles and their salary band[11], CSMG found an average contracted role of £427 and a full time daily cost of £330 (including benefits and allocated overheads). Using the same 3:1 contractor to full time employee ratio used by PwC this results in a £400 blended day rate.

[9] Different input assumptions were also utilised for TPV costs. However, as the TPV function is not present in the GPL TxC and LPL models (which were the focus of the revised costing exercise), PwC's TPV assumptions were not analysed.

[10] Search conducted on 28th Aug '12.

[11] CSMG analysed the industry rates for various roles and was able to find an average rate for each. This involved searching for job titles that matched roles defined by CSMG. A comprehensive list was created and a weighted average for contractor and FTE rates was determined based on the mix of roles identified.

Figure 8: Day-rate Comparison

	PwC (May 2012)	itjobswatch.co.uk	CSMG Original (Jan 2012)
Contracted Role	£800	£427	N/A
FTE Cost Per Day	£440	£330	N/A
Blended Day Rate	£710	£400	£500

4.6. The £400 figure suggests that CSMG's initial assumption of a £500 blended-day-rate was an appropriately conservative estimate.

4.7. PwC has made an assumption that a "prime SI overhead" would apply for all labour conducted. The PwC rationale for this "prime SI overhead" is that it covers the management that is required to ensure that a contractor is productive and delivers to time and quality. This additional management oversight has already been incorporated as part of CSMG's estimates for the number of days required to complete tasks. It is therefore unreasonable to include this additional labour into the labour rates. Including an overhead to the labour rate that represents additional man-days would lack transparency and is potentially confusing.

4.8. As a result we have not revised our figure from the original assumption of £500 per day.

Summary of Labour Rates Analysis

4.9. We do not find sufficient justification in PwC's analysis or in other supporting research to suggest that the labour rates in our initial estimates should be changed. PwC's use of a higher day-rate resulted in an additional £15m of cost in their GPL-TPV estimates.

Tier C Setup Costs

Labour

PwC's Estimate

4.10. In total PwC estimated 4,737 man-days per Tier C CP to adopt the GPL-TPV process. This represents a £3.1m cost per Tier C CP in PwC's assessment (£12.4m in total).

4.11. The majority of the man-days are for training the CP customer service advisers (CSAs). PwC estimates that 4,000 CSAs would each require half a day of training. Additionally, 56 days are allocated for the training of staff.

4.12. In their report, PwC criticised CSMG for not including planning, design and testing. However, as will be seen below, these tasks were included in the CSMG estimate, although they were not specifically split out. The breakdown of these tasks is included below.

CSMG's Assessment

4.13. A comparison of PwC and CSMG's cost estimates is presented in the following table. We discuss each of the cost elements in turn below. Note that while the CMSG model has included the project management and testing functions within the estimates for each

phase, they have been split out as individual tasks in the table below for ease of comparison with PwC's estimates. As can be seen, in total, CSMG's revised assumptions propose a similar number of man-days for Tier C setup as PwC.

Figure 9: Man-day Estimates for Tier C Setup - PwC vs. CSMG Revised Estimates

Cost Element	PwC	PwC Rate	Original CSMG	Original CSMG rate	Revised CSMG	Revised CSMG rate
CSA Training	2,056 days	£439	700 days	£500	3,030 days	£120
Service Order Management (Design / Build)	740 days	£710	300 days	£500	300 days	£500
SIT, UAT and OAT	686 days	£710	455 days	£500	455 days	£500
Project Management	650 days	£710	370 days	£500	370 days	£500
Data Sanitisation	60 days	£710	Nil	£500	60 days	£500
CPM, SPM	65 days	£710	100 days	£500	100 days	£500
Self Management	0 days	£710	55 days	£500	55 days	£500
COM and CRM	480 days	£710	330 days	£500	330 days	£500
Total	4,737		2,310	£500	4,700	

4.14. ***CSA Training:*** CSMG estimates 3,000 man-days for training (plus 30 days for trainers). CSMG's revised industry benchmarks estimate a total of 6,000 customer service advisors (CSAs) involved in the provisioning process across all 4 Tier C CPs – an average of 1,500 CSAs impacted per CP, with each CSA having 2 days of training (3,000 training days). This has been increased from our previous estimate of 350 CSAs per CP (700 training days). The reason for the increase is an acknowledgement that CPs generally utilise CSAs across the wider provisioning function, instead of having dedicated switching teams. As a result, a greater number of CSAs will require training.

4.15. PwC's assumed figure of 4,000 CSAs trained per CP appears high as this would mean that each CSA handled less than 1 switch per day, given PwC's assumptions of 561,600 switches per year per Tier C CP, 312 working days per year (6 days per week) and 50% of CSAs working at any one time.

4.16. CSMG estimated that 2 days of training are required per CSA to adopt the GPL-TxC process (which is higher than the 0.5 days of training that PwC assume is necessary to adopt the GPL-TPV process). Our approach is even more conservative when one considers that TPV interface processes will not need to be trained which may actually further reduce the requirements. However, CSMG estimated a lower daily rate cost for training CSAs than previously estimated (and significant lower than PwC's estimate). This is explained in paragraph 4.3 in more detail.

4.17. ***Service Order Management:*** CSMG did not see reason to change its estimate for Service Order Management (SOM) which was significantly less than PwC's estimate (740 days vs.

300 days). CSMG's SOM estimates were supported by itemising the development work required to support 7 use cases, with a total of 21 APIs. The design component was estimated at taking 5 days per API, for a total of 105 days. Code and unit test was similar at a further 105 days. 17 days were allocated towards integrating with a new endpoint, while another 22 days was assigned to deploy the solution. CSMG also allowed for a 20% contingency, resulting in a total of 300 days. This work included the design and build elements of the required SOM system changes necessary to allow the adoption of TxC.

4.18. ***SIT, UAT and OAT:*** CSMG did not originally split out testing as a separate category in its original costing work. However, as part of this revision, CSMG created estimates for developers to unit test code changes, along with specialised test teams to carry out System Integration Testing (SIT), User Acceptance Testing (UAT) and Operational Acceptance Testing (OAT). These estimates are proportional to the effort levels required for the design and development phases of the project. CSMG has assumed that testing will account for the industry standard 40% of the overall project days (excluding project management) – resulting in an estimate of 455 days. These are in line with our original estimates for these tasks.

4.19. ***Project Management:*** Similarly CSMG did not initially specifically split out Project Management. However estimates for this task were incorporated in the Project Management function within the costs to design and develop the changes required for the GPL-TxC process. In total 20% of the total man-days excluding testing (370 days) is estimated to be spent on project management. Again, this estimate did not change from our original assessment.

4.20. ***Data Sanitisation:*** PwC included costs for data sanitisation within the CP setup costs. In the original cost estimates, CSMG excluded data sanitisation as it was assumed to be an existing, on-going CP business cost. We have since taken a more conservative view and have now included this cost for each CP in our revised estimates. We have adopted PwC's assumptions regarding number of man-days required to perform data-sanitisation tasks for each CP.

4.21. ***CPM/SPM:*** CSMG estimates for the functional enhancements to the Customer Problem Management (CPM) and Service Problem Management (SPM) systems were higher in terms of total man-days to those of PwC (CSMG: 100 man days, PwC: 65 man days). We do not see any justification for changing these estimates.

4.22. ***COM/CRM:*** CSMG estimated 330 days for COM/CRM (Customer Order Management/Customer Relationship Management) vs. PwC's 480 days. This is based on an understanding of the effort required to make similar changes in past projects. It also appears that PwC may have double-counted COM in CPM/SPM as well, leading to the higher figure. This is shown in the fact that PwC provides an estimate for design changes to COM along with other areas of the system. Separately, there is a design estimate within the code and unit test function for COM.

4.23. ***Self-management Portal:*** CSMG included an estimate to make changes to the customer self management portal in order to allow customers to continue to utilise it with the new GPL-TxC process. These changes were estimated as taking 55 days to complete and have not been changed from the original estimates.

4.24. Having reviewed PwC's report, CSMG increased the number of man-days per Tier C CP for setup significantly to 4,700 (from 2,000) in CSMG's revised cost model for GPL-TxC. The majority of the increase in man-days was driven by an increase in the number of training days (see above). However, CSMG revised its methodology (see below para 4.3) for calculating training costs, which resulted in a much lower cost of training per CSA per day. As a result, there was little significant change between the original Tier C setup cost estimates and the revised estimates.

Hardware and Software

PwC's Estimate

4.25. PwC have provided estimates for new hardware and software required to support additional capacity in B2B systems interfaces, resulting in a cost of £580,000 across the four Tier C operators. This cost includes the addition of a single Sun T4-2 server (£45,000), along with four licenses for Oracle Weblogic (£25,000), as this software is licensed per processor and PwC has assumed that the T4-2 server will have four processors.

CSMG's Assessment

4.26. CSMG originally estimated £560,000 across all four Tier C CPs for hardware costs for the GPL-TxC model.

4.27. CSMG acknowledged PwC's hardware specifications and proceeded to cost a similar system for comparison purposes. CSMG's research determined a Sun T4-2 server can be purchased for £22,370[12]. CSMG's research also found that the UK price of Oracle Weblogic software is £16,758 per processor[13]. Furthermore, although the PwC report states that four such licenses will be required, as shown in the configuration link references below, the Sun T4-2 server has a maximum number of 2 processors and therefore would only require 2 licences. Therefore a similar specified system to that in PwC's report would cost £55,886 per CP (or approximately £225,000 for all 4 CPs), rather than the £145,000 per CP estimated by PwC. As a result, we are confident that the figure we have specified in hardware and software costs for Tier C CPs is reasonable.

4.28. It should be noted that any provision for additional hardware is already a conservative estimate. The incremental load imposed by the GPL-TxC model is quite low, and as such, Tier C CPs may already have extra capacity in their current hardware to accommodate this data load.

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Customer Service Advisor Salaries and Training Costs

PwC's Estimate

4.29. PwC assumed a CSA salary of £30,000 a year, with the equivalent fully allocated cost rising to £47,000 a year. PwC utilised the salary of a CSA to calculate the opportunity cost component of training costs (i.e. the day-rate of a CSA multiplied by the number of training man-days). In addition, PwC included a day-rate cost for trainers providing the training.

CSMG's Assessment

4.30. The average salary of a CSA is in the region of £15,000, according to totaljobs.co.uk. Therefore, we have continued to assume a CSA salary of £16,000 in the revised cost estimates. CSMG previously calculated training costs using a fixed "training day rate" of £500 per CSA per day. However, CSMG has revised this methodology, in agreement with PwC's method of calculating training costs based on CSA salaries (as well as "professional trainer" day-rate costs). Our estimate of the day-rate of CSAs is therefore now £120 per day which is based on the assumed CSA salary of £16,000 (£25,000 fully allocated cost divided by 220 working days).

4.31. CSMG believes it is more accurate to account for training costs for CP staff using this method of estimating the CSA daily salary as well as additional trainer costs, than the previous fixed "training day-rate" which was previously assumed. The previous methodology was also less transparent as it combined both the trainer costs and CSA salary.

4.32. Using this new methodology had the overall effect of reducing the cost of training for Tier C CPs, as well as Tier B and Tier A CPs.

Figure 10: Estimates for Industry Training Costs

Cost Element	PwC	Original GPL-TxC	GPL-TxC
No. of CSA training days per Tier C	2000	525	3000
Annual CSA Salary (Fully allocated)	£46,000	£25,000	£25,000
Training Cost per CSA per day	£439[14]	£500	£120
Additional Trainer Costs	£40,000	Nil	£15,000
Total	£920,000	£350,000	£375,000

[14] It is unclear how PwC have derived a cost of £439 per day for CSA training, based on a fully allocated cost of £46,000. Assuming 220 working days a year this gives £209 per day

Summary

4.33. PwC proposed a higher number of man-days for Tier C setup for GPL-TPV when compared with CSMG's original estimates. Based on our analysis of PwC's response we have increased our estimates for the number of man-days required by Tier C CPs to set-up under the GPL-TxC model. These increases were due to: the addition of the data-sanitisation tasks and; significantly increasing the man-days required for training as a result of assuming that a greater number of CSAs were assumed to be impacted.

4.34. However, adopting PwC's methodology of using CSA salary costs to drive the training costs resulted in a lower cost per training day than was previously estimated. The net effect was that, although the number of days increased significantly, the overall increase in cost compared to our original estimates was relatively small (+£0.4m) for Tier C CPs. In Tier B and Tier A CPs, the cost of training actually decreased vs. CSMG's original estimates. This resulted in a decrease in overall CP setup costs (across all Tiers) of £1m.

Figure 11: Estimates for Industry Setup Costs

Item	PwC	Original GPL-TxC	GPL-TxC
Tier C Setup Costs	13.0m	5.0m	5.4m
Tier B Setup Costs	4.2m	4.6m	3.9m
Tier A Setup Costs	0.9m	0.6m	0.4m
Total	18.1m	11.0m	10.0m

Hub Setup Costs

Labour

PwC's Estimate

4.35. PwC assumed 5,000 man days for construction of the Hub. A breakdown of man-days by activity is presented in the table below.

Figure 12: Man Day Estimates for Hub Setup - PwC vs. CSMG

High Level Task	Cost Element	PwC	Original CSMG	Revised CSMG
Draft High Level Design (HLD) to drive RFI	Requirements analysis and SLA development	48	Was not provided	48
	RFI analysis and initial High Level Design	58	Was not provided	58
RFP issued and suppliers selected	High Level Design with detailed API specification	160	Was not provided	160

	RFP issue, analysis and preferred supplier selection	80	Was not provided	80
Infrastructure Installation	Hardware installation and facilities preparation	120	Was not provided	67
	O/S hardening and Security Testing	270	Was not provided	62
	PMO for Infrastructure	160	Was not provided	63
System Design, Code and Unit Testing	B2B interfaces and Hub database	1200	Was not provided	625
	TPV Customer Relationship Management System	280	Was not provided	0
	ServCo. Enterprise	280	Was not provided	42
	ServCo. Collaboration Platform	160	Was not provided	20
	Environment build and release programme management	400	Was not provided	168
System Integration, User Acceptance and Operational Acceptance Testing	Test Planning	240	Was not provided	80
	System Integration Testing	420	Was not provided	140
	User Acceptance Testing	420	Was not provided	140
	Penetration testing and Operational Acceptance Tests	280	Was not provided	90
	Operator/TPI Onboarding	N/A	Was not provided	220 (revised from nil)
	Development Resource Support for Test and post go-live	264	Was not provided	105

	Environment build and release programme management	400	Was not provided	210
Documentation		N/A	16	16
Customer Cancel Service		N/A	500	500
Total		5,000 days	2,516 days	2,754 days

CSMG's Assessment

4.36. CSMG initially estimated 2,516 days for the construction of the Hub and Customer Cancel System (2,016 for construction and documentation of the Hub and 500 days for construction of the CCS system). As part of this initial work, CSMG did not provide a detailed breakdown by task area of the man-days required. In response to PwC's report, CSMG has revisited its cost assumptions and now estimates that the Hub infrastructure would require 2,754 man days to implement. In support of this, CSMG has provided a breakdown of tasks by man-days in the same categories as those provided by PwC. For the most part (except for Draft HLD and RFP areas), CSMG has estimated a significantly lower number of days than PwC for each task. The rationale for each task is provided below.

4.37. In addition, it should be noted that Gemserv, in their response to the consultation, indicated that CSMG previously over-estimated the level of effort required to develop the Hub and that the number of days required should be lower.

4.38. ***Draft HLD and RFP:*** CSMG agreed with PwC's man-day estimates for the tasks contained within "Draft High Level Design (HLD) to drive RFI" and "RFP issued and suppliers selected".

4.39. ***Hardware Installation and Facilities Preparation:*** We estimate that on average, 3 days per server would be required for hardware installation and facilities preparation. With 21 servers, this gives 63 man-days of effort to which we have added 4 days contingency to be conservative. Under these assumptions, the costs of installation and facilities preparation are less than 20% of the total hardware costs which appears reasonable.

4.40. ***O/S Hardening and Security Testing:*** CSMG concluded that 62 days would be sufficient to complete the task (75% lower than PwC's estimate). This is based upon the assumption that it will take 2 days on average for each of the 21 boxes, plus 20 days of testing.

4.41. ***Project Management Office:*** For the system integration, user acceptance and operational acceptance testing, CSMG estimates that this function could be carried out by two people, allowing for one month for each of installation, hardening and testing and finally for contingency. This would result in 168 man-days for PMO for the system design, code and unit testing phase. For the infrastructure installation phase, this is estimated at one person for 63 days, based on one month installation, one month hardening and testing and one month contingency.

4.42. ***System Design, Code and Unit Testing:*** A full, bottom-up estimation was carried out by CSMG for the B2B interfaces and Hub database. 21 services have been identified, and we

have allocated 5 days design, 5 days development and 10 days test per service. 100 days of detailed database design and CUT (code and unit test) have also been specified. We have also allowed extra days specifically to handle endpoint management - 5 days per CP/TPI (Tier C x 4 + Tier B x 10 + TPI x 5 + BS TPI x 2) accounts for a further 105 days, giving a total of 625 days. In our experience this is an accurate reflection of the effort required. We have not accounted for the TPV Customer Relationship Management System, as this functionality is not required in the GPL-TxC model.

4.43. ***Enterprise Systems:*** CSMG estimated that it would take two people two months to carry out the installation and setup required for the ServCo enterprise systems (42 man days), based on the wide availability of suitable cloud options. While PwC asserted that it will take two months duration, PwC did not specifically indicate why 280 days would be required to carry out this task. In our experience, there is little justification for six or seven people to be assigned to this task.

4.44. ***ServCo Collaboration Platform:*** CSMG have estimated 20 days; this is a realistic figure to set up the required off the shelf systems for a small number of projected users (e.g. less than 20).

4.45. ***Environment builds and programme management:*** PwC estimate that the B2B interfaces and Hub database will take 4 months to complete, during which the ServCo Enterprise and ServCo Collaboration Platform could also be created in parallel. Therefore an estimate of 400 days for build and programme management over this period of time indicates that 5 people will be fulfilling this function (400 man-days divided by 80 days elapsed time). In contrast, CSMG estimates it will require a team of two to carry this out, using past projects as a guide. This relatively simple system would be managed by one full-time PM and one full-time dev lead/release manager, resulting in a total man-day estimate of 168.

4.46. ***Testing:*** There is a large delta between the PwC and CSMG estimates for the System Integration (SIT), User Acceptance (UAT) and Operational Acceptance Testing (OAT) phases of the project. CSMG estimated testing on a *pro rata* basis of 40% of total design, development and testing activities, allocated as appropriate across the various test activities. It is possible that the discrepancy between the two estimates is due to the overall effort estimates for design and development being higher in the PwC report.

4.47. ***Operator/TPI Onboarding*****:** Since the publication of the initial cost report, CSMG has revised the GPL-TxC estimates to include resources for Operator/TPI Onboarding, which will ensure that the industry systems that the Hub will interface to are capable of communicating correctly, using the documented interfaces. PwC did not include these costs. This will include the creation of test cases, creation of the on-boarding process and documentation, setting up the on-boarding environment and systems, maintaining the environment and systems throughout the process, as well as liaising with CPs for the data load.

4.48. ***Development Resource Support for Test and post go-live:*** CSMG have estimated that it will take 105 days to support test and post go-live. We have assumed one resource working 21 days per month over the four month test window, and a further one month post go live. This figure is significantly lower than the PwC estimate of 264 days.

4.49. ***Environment build and release programme management:*** Based on our experience of similarly sized projects, this function will require a full time PM, along with a full time

development lead/release manager. Assuming 21 working days per month and a four month test window, along with an extra month post go-live, this equates to 210 days. The PwC estimate for this element is 400 days.

4.50. The result of PwC's 5,000 man-day estimate vs. CSMG's 2,754 day estimate is that PwC's labour costs for setup of the Hub are £3.1m higher than CSMG's revised estimates.

Hardware and Software for Hub Setup

PwC's Estimate

4.51. PwC hardware and software capital expenditure requirements are specified in the tables below.

Figure 13: Hardware Capex for Hub in GPL-TPV - PwC Assumptions

Cost Element	Unit Cost	Units	Total Cost
Internet Installation	£15,000	1	£15,000
Cisco ASA 5550 firewalls	£15,000	4	£60,000
Cisco ACE30 load balancers	£25,000	2	£50,000
Cisco 6509 LAN switch	£65,000	2	£130,000
Sun T4-2 middleware servers	£45,000	3	£135,000
Sun M4000 database servers	£65,000	2	£130,000
IBM XIV storage system	£200,000	1	£200,000
infrastructure servers	£3,000	7	£21,000
Dev / Test HW costs	£323,000	1	£323,000
Ancillary IT costs, racking	£10,000	1	£10,000
Development and testing of BC/DR plans	£112,000	1	£112,000
Cold site DR contract	£192,250	1	£192,250
Datacentre hosting costs during development	£45,000	1	£45,000
Total			£1,456,250

CSMG's Assessment

4.52. CSMG has revised its initial estimates for the hardware and software costs of the Hub. These revised costs take into account the use of more expensive software e.g. Oracle rather than other off-the-shelf products. However CSMG estimates are still lower than PwC's as a result of CSMG assuming:

- A less powerful design specification for the Hub
- Lower prices for hardware and software

4.53. CSMG carefully analysed the requirements of the Hub and central database in order to develop an estimate of the hardware needed to support these. The Hub needs to cater for roughly 2.1 million switches each year[15], each of which will result in a number of system calls to the Hub. Assuming an average of 10 system calls per switch (or cancel), there are 21 million calls per year to and from the Hub, which when spread evenly across regular office hours equates to 3 per second. By modern standards, this does not constitute a high load on the Hub database. A system with lower specifications than that specified by PwC would be sufficient to handle a peak load of 10 times this figure (i.e. 30 calls per second) [16].

4.54. During the research for this report, CSMG explained this analysis to PwC. PwC responded stating that it had concerns around the systems specified by CSMG, specifically for the following reasons:

a) During a sales call, there will be two way communications between sellers' systems and the Hub. Given sales conversion ratios and the nature of inbound and outbound campaigns, this may result in a higher volume of traffic on the Hub than specified by CSMG.

b) The system must deliver a highly available service with appropriate redundancy and protection from total loss of service.

c) The system must also maintain records of all services provided on the copper Openreach network.

d) PwC state that the Hub must interface with all customer records held by the CPs themselves.

e) The Hub must maintain synchronisation of records between the Hub, CP and BT EMP, generating additional material traffic and processing on the system.

4.55. We address each of these concerns in the paragraphs below.

a) *Additional B2B calls may result due to unsuccessful sales*: In the processes defined by CSMG, there is only a single B2B call to the Hub prior to the customer providing final confirmation to the GCP that they wish to proceed with the switch. The other B2B calls occur after this point. Thus it is not envisaged that this will result in a significant number of system calls to the Hub.[17]

b) *Requirement for high availability:* The systems specified by CSMG have a large amount of additional capacity, along with defined disaster recovery and backup systems that will ensure high availability of the system.

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[15] See para 1.21 more information on number of switches.

[16] For example, PwC have specified a Cisco ASA 5550 firewall, whereas CSMG's calculations show that the more cost effective Cisco ASA 5520 would more than suffice, given its minimum firewall throughput of 225 Mbps.

[17] The design proposed by CSMG shows that a single initial check (B2B call to perform a validation and data lookup) with the Hub is carried out during a normal switch, prior to the customer agreeing to complete the switch. It is expected that before this stage is reached, the GCP would have informed the customer of all costs etc. associated with switching. However, it is possible that customers will contact a CP in order to switch, only to discover after an initial check with the Hub that they are unable or unwilling to switch via this method. An example of this scenario includes Sky and Talk Talk MPF customers who wish only to switch their broadband. We estimate that this scenario will result in 334,980 extra B2B calls to the Hub (assuming 80% MPF penetration rate). There is also the possibility that some customers will change their mind in the period between the Hub validation being carried out and the GCP confirming the sale. Assuming this occurs at a rate of 10% of total switches, this will account for 210,191 B2B calls per annum. Virgin Media cable customers will also be unable to switch via the Hub. This could result in an additional 500,000 calls to the Hub before the GCP is aware that the customer is unable to switch using this method. This equates to just over 1,000,000 extra B2B calls per annum, or an extra 5% of B2B calls generated as a result of checks for customers who are unable or unwilling to switch.

c) *Requirement to maintain records of all services:* This is an inherent requirement and has been included as part of the design of the system specified by CSMG.

d) *Requirement for the Hub to interface with all CP customer records:* This will be taken into account during the initial data load, which will take place before the system is operational.

e) *Requirement for synchronisation of records:* the Hub has been designed in such a way as to be able to modify its own records, as the CPs will be required to inform the Hub as to which services have been ceased and added. Thus the vast majority of synchronisation will be achieved via the switching process.

4.56. Having determined that the requirements of the Hub were lower than those specified by PwC, CSMG reviewed the components required to fulfil these. These are shown below.

Hub Hardware Costs

4.57. CSMG's research produced a revised estimate of £622,062 for the total cost of hardware components. This represented a significant increased from the original GPL-TxC estimates which assumed £300,000 in total costs for both hardware and software. In developing these new estimates, the prices of components were sourced from various reputable hardware vendors.

Figure 14: Hub Hardware Components and Costs PwC vs. CSMG

Environment	Hardware Category	Amount	PwC Hardware	PwC Unit Price	Total PwC Price	CSMG Hardware	CSMG Unit Price	Total CSMG Price
Production	Internet Installation	1		£15,000	£15,000		£15,000	£15,000
	Firewall	4	Cisco ASA 5550 firewall	£15,000	£60,000	Cisco ASA 5520	£2,273	£9,092
	Load balancer	2	Cisco ACE30 load balancer	£25,000	£50,000	Cisco ACE30 load balancer	£32,114	£64,228
	LAN switch	2	Cisco 6509 LAN switch	£65,000	£130,000	Cisco 6509 LAN switch	£26,040	£52,080
	Middleware server	3	Sun T4-2 middleware server	£45,000	£135,000	Sun T4-2 middleware server	£22,370	£67,110
	Database server	2	Sun M4000 database server	£65,000	£130,000	SPARC Enterprise M3000	£13,957 - £26,693	£53,386
	Storage system	1	IBM XIV storage system	£200,000	£200,000	IBM x3755	£12,835	£12,835
	Infrastructure server	7	Infrastructure server	£3,000	£21,000	Infrastructure server	£3,000	£21,000
	Ancillary IT costs, racking	1	Ancillary IT costs, racking	£10,000	£10,000	Ancillary IT costs, racking	£10,000	£10,000
	Cold site DR contract (25% of total)	1	-	£195,250	£195,250	-	£72,433	£72,433
CCS	Customer Cancel Service hardware	Nil					£125,000	£125,000
Dev/Test	Dev / Test of BC/DR	1		£120,000				N/A[18]
	Middleware server	1	Sun T4-2 middleware server	£45,000	£45,000	Sun T4-2 middleware server	£22,370	£22,370
	Database server	1	Sun M4000 database server	£65,000	£65,000	SPARC Enterprise M3000	£13,957 - £26,693	£26,693
	Storage system	1	IBM XIV storage system	£200,000	£200,000	IBM x3755	£12,835	£12,835
	Infrastructure server	1	Infrastructure server	£3,000	£3,000	Infrastructure server	£3,000	£3,000

[18] This process cost is included in the number of man-day estimates for Hub build in CSMG's estimates rather than being included in hardware costs.

	Ancillary IT costs, racking	1	Ancillary IT costs, racking	£10,000	£10,000	Ancillary IT costs, racking	£10,000	£10,000
	Hosting	1		£45,000				£45,000
					£1,456,250			£622,062

4.58. CSMG decided upon hardware configurations after consulting with various suppliers regarding the specific demands that will be placed on the Hub systems. IBM, for example, advised that the IBM XIV storage system chosen by PwC was "massive overkill" for these requirements, and instead recommended a System X server, specifically either the X3550 or X3650. We conservatively decided upon a more powerful x3755, with 8x1Tb 6Gbps HDDs, high spec network adapters and maximum power redundancy. Oracle too recommended that the Sun M4000 database server was unnecessary, and proposed either a T4 server or the M3000. CSMG again chose the most powerful option of those given, deciding upon a top specification M3000 as the preferred database server.

4.59. One component that was required in the GPL-TxC model which was not required in the GPL-TPV model specified by PwC is the Customer Cancel System. CSMG estimated the cost of this component at £375,000.

4.60. These hardware specifications resulted in a total cost of hardware infrastructure which was 40% less expensive than PwC's hardware configuration.

Figure 15: Hub Software Components and Cost PwC vs. CSMG

Environment	Software	PwC Amount	PwC Price	Total PwC Price	CSMG Amount	CSMG Price	Total CSMG Price
Production	Oracle Weblogic	4	£25,000	£100,000	6	£15,700	£94,200
	Oracle Enterprise Edition	8	£47,000	£376,000	2	£30,000	£60,000
Dev/Test	Oracle Weblogic	Not stated	Not stated	Not stated	1	£15,700	£15,700
	Oracle Enterprise Edition	Not stated	Not stated	Not stated	1	£30,000	£30,000
							£45,700
				£1,261,373			£245,600

4.61. CSMG's estimates for software costs were also significantly lower than PwC's (80% lower).

4.62. Software costs (e.g. Oracle) are driven by the number of processors in the system – they are based on a per-processor licensing model. As, in fact, the Hub will require much less processing power than that envisaged by PwC, this means that fewer software licences are required.

4.63. PwC also specified the dollar value of this software as pounds sterling, without applying any currency conversion[19]. Furthermore, the cost of licencing Oracle Enterprise Edition was reduced due to CSMG (in association with Oracle) identifying a more suitable hardware solution. This had the effect of requiring fewer processor licences and further reducing the cost of Oracle licencing.

4.64. The overall impact of differences in hardware and infrastructure specifications and costs resulted in PwC's estimates being £1.8m higher than CSMG's.

4.65. Although CSMG's infrastructure costs remain significantly lower than PwC's, the revised hardware and software costs are higher than CSMG's previous estimate. Part of the reason for this, was the updating of hardware and software assumptions based on reviewing PwC's analysis. For example, previously CSMG assumed the use of off-the-shelf products rather than Oracle software. As a result, the infrastructure costs have increased vs. CSMG's original estimates (See Figure 16).

Summary of Hub Setup Costs

4.66. Having analysed PwC's estimated GPL-TPV costs, CSMG increased the estimated Hub set-up costs for the GPL-TxC model. The number of man-days for the construction of the Hub was increased slightly to account for CP on-boarding and endpoint management. The hardware and software costs have also been increased in the revised estimates, taking into account PwC's design (e.g. use of Oracle software rather than off the shelf products). This resulted in an increase in GPL-TxC costs of £0.6m vs. original estimates.

4.67. However, CSMG does not find support for PwC's architectural design of the Hub, nor the reference pricing provided, and as a result has favoured a less powerful, lower cost solution. Overall, PwC's overstating of the requirements of the Hub (in terms of both the man-days required to implement and the infrastructure required) resulted in PwC's costs being £4.8m higher than CSMG's revised estimates for GPL TxC.

Figure 16: Estimates for Hub Setup Costs – PwC vs. CSMG

Item	PwC	Original GPL-TxC	GPL-TxC
Hub labour costs	£4.4m	£1.3m	£1.4m
Hub hardware/software	£2.7m	£0.3m	£0.9m
Total	£7.1m	£1.7m	£2.3m

[19] PwC has provided sources for its software and hardware costs (e.g. the source of Oracle Database Enterprise Edition is http://www.oracle.com/us/corporate/pricing/price-lists/index.html). On this site, the price is given as USD $47,500, however PwC have cited this as GBP £47,000 in their report, without accounting for the USD-GBP exchange rate. CSMG found this component to be priced as £31,839 at https://shop.oracle.com/pls/ostore/f?p=700:6:0::::P6_LPI:4509382199341805719938

Hub On-going Costs

PwC's Estimate

4.68. PwC's Hub on-going costs are made up of outsourced provider costs, software licences and maintenance and hardware refresh. These figures can be seen, compared to the CSMG figures below. In contrast, CSMG utilised an estimate of 20% per annum of infrastructure capital costs to estimate the hardware and software maintenance costs, as well as estimates for staff and technical costs.

4.69. PwC criticised CSMG's use of a flat 20% assumption to estimate on-going infrastructure costs, arguing that this methodology was not transparent.

Figure 17: Hub On-going Costs – PwC vs. CSMG

	PwC	Original CSMG	Revised CSMG
Staff / Technical Costs and process documentation	£0.4m	£0.6m	£1.1m
Hardware/Software maintenance costs	£1.1m	£0.3m	£0.4m
CCS Staff and process documentation	N/A	£0.09m (did not have staff)	£0.2m
Total annual costs	£1.5m	£1.0m	£1.7m
Total 10 Year NPC	£12.8m	£8.4m	£14.3m

CSMG's Assessment

4.70. Three revisions were made by CSMG to its original figures. The change in these assumptions resulted in an increase of £6m in cost in terms of on-going costs to the Hub.

4.71. Firstly, hardware and software maintenance costs were increased in line with the increase in the overall hardware and software capital expenditure detailed above.

4.72. Secondly, an additional £50,000 of on-going cost was included in the model to account for the inclusion of 2 live agents in the Customer Cancel System.[20]

[20] The Customer Cancel System is designed to replace the Cancel Other process, enabling a consumer to directly cancel their own switch in flight without requiring them to speak with either the GP or LP. Although the CCS is viewed to be primarily IVR-based, it was agreed that a fall-back live operator option would be required to ensure a decent customer experience. The number of live agents needed was estimated based on: 2m switches a year, 7% cancelation rate, giving c. 150k cancels a year, 80 cancels per working hour. Assumes 10% of customers opt to speak to CSA rather than IVR - 8 calls per hour required to be answered. Assume CSA can answer 6 calls an hour, and has 80% utilisation - gives approximately 1.5 CSAs. It should be noted that PwC have argued that the cancellation rate should be 13% based on Openreach data. Assuming a higher cancellation rate would increase the number of CSAs required to deal with cancellations in the CCS. If using 13%, an additional CSA would be required at a cost of £50k per year or less than £0.5m in NPC over 10 years which represents an increase of less than 1% of overall cost.

4.73. Thirdly, CSMG assumed higher staff costs in the Hub as a result of including a management layer in the Hub organisation. This was the result of CSMG agreeing with PwC's report which included a management structure for the Hub company (ServCo).

4.74. However CSMG did not agree with the scale of PwC's organisation structure for ServCo. This is discussed in the section below.

4.75. Finally, CSMG did not find sufficient justification for changing its methodology of using a flat 20% of capital costs for estimating on-going infrastructure costs. Firstly, this approach is similar to that used by PwC, which stated that it used a figure of 20% for estimating hardware and software maintenance as this is an "industry recognised figure". A potential reason for the difference in on-going costs is that CSMG has estimated a much lower capital setup cost than PwC. Secondly it should be noted that although CSMG's estimates for on-going costs for the Hub based on this methodology were lower than PwC's; CSMG's estimates for industry on-going costs related to hardware and software were substantially higher. Therefore, it is not the case that the use of a flat 20% benchmark necessarily overestimates the on-going costs.

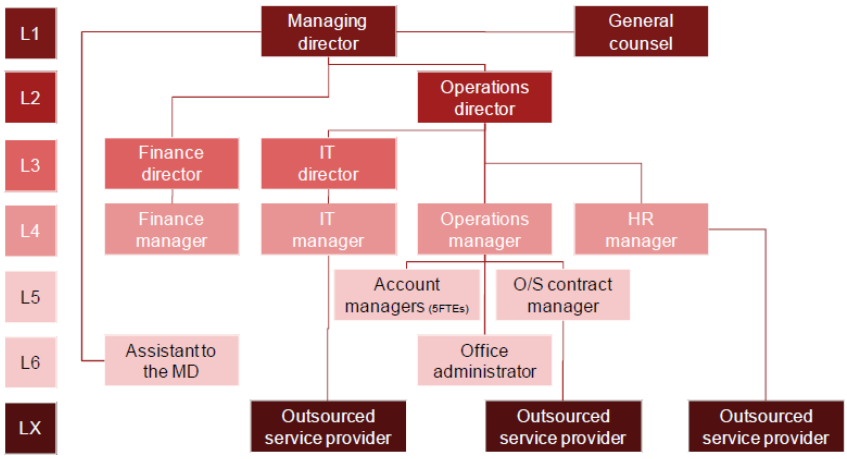
ServCo Organisation

PwC's Estimate

4.76. The structure proposed by PwC for the ServCo organisation is comprised of managers with responsibility for overseeing the outsourced service providers responsible for the day-to-day running of the Hub. This structure is headed by a Managing Director into whom reports a General Counsel, Operations Director and Finance Director. Beneath these directors sit a Finance Manager, IT Director, IT Manager, Operations Manager and a HR Manager. These are followed by 5 fulltime Account Managers and an Outsourcing (O/S) Contract Manager. Finally there is an Assistant to the MD and the Office Administrator. In total PwC details 17 full time staff, not including the technical staff.

4.77. These full-time staff costs are included in PwC's estimates for the TPV. As the TPV function does not exist in the GPL-TxC model, CSMG has included these management costs (albeit at a smaller scale) in the Hub on-going cost category. The rationale for the smaller scale is described below.

Figure 18: Organisation Chart Proposed by PwC for ServCo



CSMG's Assessment

4.78. PwC appears to have assumed that ServCo's operational structure will resemble a new entity, requiring multiple levels of management and support functions.

4.79. In contrast, CSMG assumes that an existing managed service provider will be selected to run the Hub. We believe this is a more plausible scenario. This model reduces the requirement for dedicated management positions within the organisation structure, and is likely to be the most efficient. Therefore we have only considered incremental staff costs, and have assumed that full-time support roles and a management-heavy organisation will not be required.

4.80. CSMG therefore assumed an additional six roles (as opposed to 17) will be required to manage Hub on-going operations. These are:

- Managing Director
- Finance Manager
- CTO
- Account Manager / Service Delivery Manager (x3)

4.81. As a result of the increase in management staff, CSMG assumed that the annual payroll cost of staff would increase from £60,000 to £70,00021, including pensions, benefits and overheads etc. This is higher than the initial CSMG estimate due to the increased management in the Hub (management are assumed to have higher salaries and therefore increases the average salary across the whole staff in the Hub).

Figure 19: Comparison of Staff Numbers Proposed by PwC vs. CSMG Initial and Revised Estimates

	Number of Staff	Utilisation Rate	Salary	Total	NPC over 10 years
PwC Hub Management Staff	15-17	100	£60,000	£988,154	£8.0m
CSMG Original Management staff	Nil	Nil	Nil	Nil	Nil
CSMG New Hub Management Staff	6	100	£70,000	£420,000	£3.5m

4.82. These revisions resulted in an increase in staff costs in the Hub of £3.5m (on a 10 year NPC basis). This increase in staff costs contributed the majority of the overall increase in Hub on-going costs of £6m.

[21] Based on a blend of average itjobswatch.com salaries for similar roles and assuming a 40% margin for benefits, national insurance and overheads.

Full TPI Setup Costs

PwC's Estimate

4.83. PwC has made the assumption that Full TPI systems are similar to Tier C CPs. PwC states that TPIs will be required to modify both their front office and fulfilment systems. Changes will be required to their CRM and billing implementations, along with their customer order and service order interfaces as integration with the Hub will be required.

CSMG's Assessment

4.84. CSMG does not agree with PwC's view that Full TPI systems are similar to Tier C CPs systems. Tier C CPs are more likely than any other category to have multiple provisioning systems due to legacy requirements (e.g. through corporate acquisitions). This increases the complexity of integrating with a new system. The Tier C impact assessment reflects this complexity.

4.85. CSMG assumed in its initial estimates that TPI system costs for integration can be assumed to be similar to Tier B CP systems costs. This was based on an acknowledgement of TPIs' specialist skills in this area and an understanding that TPIs will have a streamlined provisioning system which will be simpler to integrate than Tier C CPs.

4.86. CSMG's recent discussions with a Full TPI (in addition to conversations with the Bureau Service Provider TPI mentioned above) support the assumption that no significant changes would be required by TPIs to integrate with the new processes. The cost estimated by CSMG was viewed as conservative by the TPI. As a result CSMG has not changed its initial estimates for Full TPI costs.

Industry On-going Costs

4.87. In addition, training costs are also now regarded by CSMG as a one-off cost (in line with PwC's treatment of training costs). Previously on-going costs had been allocated towards continuous training; however it is now assumed that this will form part of regular CSA re-training and therefore not constitute an incremental cost on and on-going basis.

Figure 20: Estimates for CSA Training On-going Costs

Cost Element	PwC	Original CSMG	Revised CSMG
CSA Training On-going Costs	Nil	20% of initial training costs per annum (£5.0m of cost)	Nil

4.88. This has the effect of reducing industry on-going costs in the revised estimates by £5.0m.

Summary of Assessment of PwC Input Assumptions

Figure 21: Revised Estimates Based on Review of PwC's Different Input Assumptions in Its Report

Item	PwC Alt-TPV	Original GPL-TxC	Revised GPL-TxC
CP Setup Costs	£18.1m	£11.0m	£10.0m
Hub Setup Costs	£2.3m	£1.7m	£2.3m
Hub On-going Costs	£7.1m	£8.4m	£14.3m
Full TPI Setup Costs	£10.9m	£1.8m	£1.8m
Industry On-going Costs	£19.3m	£9.1m	£4.1m
Total	£57.7m	£32.0m	£32.5m

4.89. Based on a review of PwC input assumptions, CSMG revised some of its input assumptions for the GPL-TxC model (in particular, the Hub hardware and software costs, and the Hub management costs). This resulted in the cost impacts shown in the table above (this table is similar to the cost impacts shown resulting from new/incremental cost categories in Figure 7 – together they show the total revisions made to original estimates).

4.90. Having reviewed, PwC's input assumptions, the largest difference in comparable costs[22] that remains between the PwC estimates and CSMG estimates is the higher CP setup and on-going costs assumed by PwC. In addition, the Full TPI setup costs are also assumed to be significantly higher than CSMG's estimates. As discussed above, CSMG does not find evidence for accepting the higher man-day or labour rate estimates assumed by PwC that contribute to these higher setup costs.

4.91. Finally, PwC's higher TPI estimates are based on interviews conducted with Tier C CPs, rather than actual conversations with TPIs. In contrast, CSMG asked a TPI to provide feedback on the cost estimates for the changes required and therefore remains confident in the original assumptions.

[22] Comparing PwC's on-going industry cost estimates to CSMG's (in figure 22) shows that PwC's figures for the GPL-TPV model are significantly higher (£15.2m) than CSMG's revised GPL-TxC estimates. The reason for this is that CSMG assumes significant cost-savings (£1.6m per year or £13.3m 10 year NPC) from moving to a harmonised GPL process under GPL-TxC. These arise from moving from the current un-harmonised processes (which have a blended average order handling time of 14.5 minutes, to a harmonised GPL process with an average order handling time of 12 minutes). This results in significantly less CSA time needed to process switches and represents a cost-saving for CPs in CSMG's model.

5. IMPACT OF NEW COST AREAS AND REVISED INPUT ASSUMPTIONS ON LPL MODEL

5.1. In addition to revising the GPL-TxC model based on PwC's report, CSMG also provided a revised set of LPL estimates. There were a number of key areas where revisions to the GPL-TxC model were also applicable to the LPL model. These were:

- Inclusion of Commissioning Board
- Change to methodology of calculating training costs for CP CSAs
- Training treated as one-off cost rather than on-going
- Increase in salary costs of staff in the Hub / TxCIA

5.2. Commissioning Board: A Commissioning Board function would also be required in the proposed LPL process, to support design of the TxC specifications, to choose a service provider for the TxCIA (Transfer Code Issuing Authority) and to ensure on-going governance of this provider. The responses from industry indicated that the total time estimated to implement changes was very similar for both GPL and LPL models under consideration. CSMG therefore included the same Commissioning Board cost estimates used in the GPL-TxC model for the LPL model, as the costs of the Commissioning Board are a direct function of how long the model takes to implement.

5.3. Training Costs: The methodology for calculating training costs was revised in the CSMG GPL-TxC model. The same methodology was applied when calculating the revised LPL costs (e.g. training costs were reduced and only treated as a one-off cost rather than an on-going cost as had been the case previously).

5.4. Salary Costs: In the GPL-TxC model, additional management roles were included in the Hub organisation which resulted in the average salary costs of the staff in the Hub increasing. For the LPL model, CSMG did not increase the number of staff required but did include an increase in the average salary costs to reflect the requirement for management oversight.

6. ASSESSMENT OF OTHER INDUSTRY RESPONSES

6.1. Alongside PwC's cost assessment report, various bodies from the telecommunications industry provided feedback on the proposed GPL process. In particular, issues around the security of the data in the Hub were highlighted.

Security Concerns Raised by Stakeholders

6.2. Sky raised the point that there is a larger potential impact of a security breach on a centralised database versus a breach on one of the independent CPs. A detailed checklist of specific areas that should be considered was also provided.

6.3. In addition, C&WW cited research showing that consumers were worried about which organisations will have access to the Hub data, along with whether customer data could be queried by law enforcement.

CSMG's Assessment

6.4. CSMG agrees with Sky that security considerations will need to be factored into the design of the Hub. The issues highlighted by Sky would need to be addressed during the detailed design phase of the project. We assume the design would incorporate:

- Secure infrastructure (firewalls, VPN, OS hardening, etc.).
- Secure communications (SSL certification, HTTPS and client and server side authentication).
- Activity logging within the Hub.
- A secure front-end interface for CSAs with a database designed with user account privileges in mind, to ensure that only the necessary data can be obtained by users.

6.5. Furthermore, addressing CWW's point, only ServCo and the CPs will have access to the Hub data. There is no reason the introduction of the Hub will change what access law enforcement have to customer data. Also, the Hub will not store Customer Data Records, only customer details such as names, addresses and providers.

6.6. CSMG had previously accounted for these security requirements in its initial cost estimates for GPL-TxC and LPL and therefore no revisions were made to estimates as a result of these responses.

7. IMPACTS ON GPL-TXC MODEL AND LPL MODEL

Revised Cost Estimates for GPL-TxC

7.1. Based on this latest analysis, CSMG has revised its net present cost estimates (over 10 years) from £41.3m to £43.6m for GPL-TxC.

Figure 22: Initial vs. Revised GPL-TxC Cost Estimates – 10 Year NPC

Cost Category	GPL-TxC (Feb 2012)	Revised GPL-TxC	Impact
Commissioning Board	Nil	£1.7m	+£1.7m
Bureau Service TPIs	Nil	Nil	No change
Tier C Setup	£5.0m	£5.4m	+ £0.4m
Tier B Setup	£4.6m	£3.9m	- £0.7m
Tier A Setup	£1.4m	£0.6m	- £0.8m
Full TPI	£1.7m	£1.7m	No change
Hub Setup	£1.7m	£2.3m	+ £0.6m
Hub On-going	£8.4m	£14.3m	+ £6.0m
Industry On-going	£9.1m	£4.1m	- £5.0m
TPV	Nil	Nil	No change
Access Operators and Wholesale Providers	£9.4m	£9.4m	No change
Total	£41.3m	£43.6m	+ £2.3m

7.2. These revisions are based on the following changes:

- Inclusion of setup and on-going costs for a Commissioning Board
- Increased Tier C setup costs
  - Increased costs due to data sanitisation
  - Increased costs due to increase in assumed number of CSAs
  - Decreased costs due to using PwC's methodology for calculating CSA training
- Decreased costs in Tier B and Tier A setup based on:
  - Increased costs due to data sanitisation
  - Decreased costs due to using PwC's methodology for calculating CSA training
- Increased Hub setup costs
  - Included more expensive software costs
  - Included additional man-days to account for on-boarding
- Increased Hub on-going costs
  - Included cost estimates for account management and supervisory roles in the Hub
- Decreased industry on-going costs
  - This is the result of following PwC's methodology of treating CSA training as a one-off cost

Revised Cost Estimates for LPL Model

7.3. As discussed, some of these revised assumptions also impact CSMG's estimates for the LPL model. As a result, the revised cost estimate for the LPL model over a 10 year NPC is £65.9m (initially £65.5m).

Figure 23: Initial vs. Revised LPL Estimates - 10 Year NPC

Cost Category	LPL (Feb 2012)	Revised LPL	Impact
Commissioning Board	Nil	£1.7m	+ £1.7m
Bureau Service TPIs	Nil	Nil	No change
Tier C Setup	£2.3m	£2.3m	No change
Tier B Setup	£2.5m	£2.3m	- £0.2m
Tier A Setup	£0.4m	£0.1m	- £0.3m
Full TPI	£1.1m	£1.1m	No change
Hub Setup	£0.4m	£0.4m	No change
Hub On-going	£4.2m	£4.8m	+ £0.6m
Industry On-going	£43.8m	£42.3m	- £1.5m
TPV	Nil	Nil	No change
Access Operators and Wholesale Providers	£10.9m	£10.9m	No change
Total	£65.5m	£65.9m	+ £0.4m

7.4. The revised estimates that impact the LPL model are:

- Inclusion of setup and on-going costs for a Commissioning Board
- Decreased costs in Tier B and Tier A setup (decreased training costs)
- Decreased industry on-going costs (training treated as one-off cost)
- Increased Hub on-going costs due to increased salary costs of staff in the Hub/TxCIA

8. CONCLUSIONS

8.1. PwC's estimate of the alternative TPV model was significantly higher than CSMG's estimate (43% higher). [23]

8.2. The PwC response highlighted some additional cost components/tasks which are reasonable (e.g. Commissioning Board, data sanitisation) and are relevant to the GPL-TxC and LPL models. CSMG has included these in its cost estimates for GPL-TxC and LPL models accordingly, although at a lower cost than that calculated by PwC.

8.3. However CSMG does not find evidence for using other PwC assumptions in the GPL-TxC and LPL cost estimates (e.g. day-rates, hardware costs and capacity of the Hub). Based on recent discussions with TPIs we also find no evidence to suggest that we should revise our previous estimates for TPI costs (either "full" or "bureau service").

8.4. Furthermore, CSMG made some revisions to input assumptions and methodology (e.g. training costs) which decreased some of the costs in the GPL-TxC and LPL models vs. previous estimates.

8.5. It can be seen in the table below that in both sets of estimates (initial and revised) the LPL model has a higher cost than the GPL-TxC model.

Figure 24: Range of GPL vs. LPL Cost Estimates – 10 Year NPC

	GPL-TxC	LPL
Initial CSMG estimates (Feb 2012)	£41.3m	£65.5m
Revised CSMG estimates (Sep 2012)	£44.3m	£65.9m

[23] When comparing CSMG's cost assumptions vs. PwC's assumptions, it should be noted that CSMG prepared two sets of estimates of costs for GPL TPV; an "industry" model (based on communication providers' responses) and an independent model. The CSMG models were approximately aligned (within 20% variance of each other).

9. ASSUMPTIONS

Below is a list of assumptions used in the GPL-TxC and LPL cost models. Revisions to assumptions are denoted by showing the original assumption as struck-out and the revised assumption below.

Figure 25: Market Size Assumptions

	Assumption	Source
Fixed Line OR residential customers	19.4m[24]	http://stakeholders.ofcom.org.uk/binaries/research/cmr/Q4_2010.pdf p9 (Q4 2010)
SME companies with Fixed Line	0.67m	*Ofcom, Sample Answers*
SME companies with Broadband Lines	0.58m	*Ofcom, Sample Answers*
Broadband OR customers (inc. SME)	15.4m	*http://stakeholders.ofcom.org.ukbinaries/research/cmr/Q4_2010.pdf p16 (Q4 2010)*
CPS only customers	2.8m	http://www.offta.org.uk/updates/otaupdate20110802.htm *(July 2011)*
Fixed line churn	6%	http://stakeholders.ofcom.org.uk/binaries/research/consumer-experience/tce-10/TCE10_Empowerment.pdf *figure 122 (2010)*
Broadband churn	6%	http://stakeholders.ofcom.org.uk/binaries/research/consumer-experience/tce-10/TCE10_Empowerment.pdf *figure 122 (2010)*
CPS only churn	6%	*Assumes same as Fixed and Broadband*
% Bundle including fixed line and BB	44%	http://stakeholders.ofcom.org.uk/market-data-research/statistics/?a=0
Bundle churn	9%	*Ofcom consumer experience 2010 (adjusted to exclude switching to or from Virgin Media)*
SME Fixed Churn	11%	*Ofcom 2010 Switching Report*
SME Broadband Churn	8%	*Ofcom 2010 Switching report*
SME Bundle switch %	9%	*Assumes same as consumer*
# of Tier A CPs (100 < 10k lines)	287	*Ofcom*
# of Tier B CPs (10k to 1m lines)	10	*CSMG estimate*
# of Tier C CPs (1m+ lines)	4	*Ofcom*
# of TPIs	5	*CSMG estimate*
# of Wholesale Providers	2	*CSMG estimate*
# of Access Providers	1	*CSMG estimate*

[24] Number of fixed residential lines minus the number of Virgin Media residential lines at Q4 2010.

Figure 26: General CP Sensitivities (For Independent Method and Central Costs)[25]

Sensitivities	Low	Mid	High
Day-rate for developer	£400	£500	£550
Training per CSA day	£400	£500	£550
Training per CSA day	£100	£120	£140
FTE Cost per year	£40,000	£60,000	£70,000
FTE Cost per year	£40,000	£70,000	£80,000
Opex to Capex ratio	15%	20%	25%
Cost per CSA minute	£0.20	£0.36	£0.52
% of switches through customer cancel	5%	7%[26]	10%

Figure 27: Market Channel Assumptions (For Independent Method Costs)[27]

% Telephone	60%
% Online	20%
% Retail	10%
% Door to Door	10%

Figure 28: General CP Assumptions

Current Call time blend (Gaining and losing provider)	14.48 mins

	Tier A	Tier B	Tier C
Size of customer base	5,000	300,000	5.5m
Switching customers as % of base[28]	7.2%	7.2%	7.2%

[25] Based on CSMG estimates. High cases and low cases represent reasonable assumptions given range of industry benchmarks.
[26] See para 4.72
[27] Based on weighted average of sample of CP responses.
[28] CSMG estimates. % of customer switching derived by estimating the total number of switches in the market (2.1m) and dividing by the estimated number of unique customers in the market (29.5m). Also, see para 1.21

Figure 29: Process Assumptions[29]

	GPL-TxC			LPL		
	Tier A	Tier A	Tier B	Tier C	Tier B	Tier C
~~# of CSAs to be trained*~~	~~5~~	~~5~~	~~100~~	~~350~~	~~100~~	~~350~~
# of CSAs to be trained*	5	5	100	1500	100	1500
# of training days for CRM	1	1	1	0	0	0
# of training days for CIM	2	2	2	1	1	1
~~# of process documentation days for CRM~~	~~0~~	~~15~~	~~15~~	~~0~~	~~0~~	~~0~~
# of process documentation days and trainer days for CRM	0	16	30	0	0	0
~~# of process documentation days for CIM~~	~~0~~	~~15~~	~~15~~	~~0~~	~~10~~	~~10~~
# of process documentation days and trainer days for CIM	0	16	30	0	11	25

*Note the number of CSAs to be trained was reduced for Tier C CPs to take into account economies of scale when training large numbers of CSAs.

[29] CSMG estimates.

Figure 30: System Assumptions[30]

	GPL-TxC			LPL		
	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C
~~# of days for delivery of CRM system changes~~	~~0~~	~~150~~	~~400~~	~~0~~	~~0~~	~~0~~
# of days for delivery of CRM system changes	2	165	460	0	0	0
Additional hardware required for CRM changes (£)	0	20k	50k	0	0	0
Additional hardware required for Billing changes (£)	0	0	0	0	0	0
Days for delivery of COM system changes	0	160	300	0	100	150
Additional hardware required for COM (£)	0	20k	50k	0	40k	70k
Days for delivery of SOM system changes	0	60	300	0	30	120
Additional hardware required for SOM (£)	0	10k	40k	0	10k	40k
Days for delivery of Partner Management system changes	0	70	150	0	70	150
Additional hardware required for Partner Management (£)	0	0	0	0	0	0
Days for delivery of CPM system changes	0	70	150	0	70	150
Additional hardware required for CPM (£)	0	0	0	11	11	11
Days for delivery of SPM system changes	0	20	60	0	10	40
Additional hardware required for SPM (£)	0	0	0	0	0	0
Days for delivery of Customer Self Mgt system changes	0	60	120	0	60	120
Additional hardware required for Customer Self Mgt (£)	0	0	0	0	0	0

[30] CSMG estimates. High cases and low cases represent reasonable assumptions given range of industry benchmarks. Tier B SOM and SPM costs are expected to be significantly lower than Tier C, as a large proportion of this cost will be borne by TPI partners.

Figure 31: Central Cost Assumptions and Sensitivities[31]

	GPL-TxC			LPL		
	Low	Mid	High	Low	Mid	High
~~# of days for delivery of Hub / TxCIA system~~	~~1,700~~	~~2,000~~	~~2,500~~	~~275~~	~~300~~	~~350~~
# of days for delivery of Hub / TxCIA system	2,000	2,250	2,500	275	300	350
~~Infrastructure costs (£)~~	~~150k~~	~~200k~~	~~225k~~	~~100k~~	~~100k~~	~~150k~~
Infrastructure costs (£)	350k	750k	1,000k	100k	100k	150k
On-going infrastructure support costs	15%	20%	25%	15%	20%	25%
~~# of staff in the Hub / TxCIA~~	~~15~~	~~20~~	~~20~~	~~10~~	~~15~~	~~15~~
# of staff in the Hub / TxCIA	10	16	22	10	15	15
~~% utilisation of staff in Hub / TxCIA~~	~~50%~~	~~50%~~	~~70%~~	~~50%~~	~~50%~~	~~70%~~
% utilisation of staff in Hub / TxCIA	100%	100%	100%	50%	50%	70%
Days to develop initial documentation, training, processes etc. for Hub / TxCIA	10	10	15	10	10	15
# of days for delivery CCS system	400	500	550	N/A	N/A	N/A
Infrastructure costs for CCS (£)	100,000	125,000	150,000	N/A	N/A	N/A
CCS on-going costs %	15%	20%	25%	N/A	N/A	N/A
# of staff in CCS	3	3	5	N/A	N/A	N/A
% utilisation of staff in CCS	50%	50%	70%	N/A	N/A	N/A
Days to develop initial documentation, training, processes etc. for CCS	10	10	15	N/A	N/A	N/A
~~# of CSAs in CCS~~	~~Nil~~	~~Nil~~	~~Nil~~	~~N/A~~	~~N/A~~	~~N/A~~
# of CSAs in CCS	1	2	3	N/A	N/A	N/A

[31] CSMG estimates. High cases and low cases represent reasonable assumptions given range of industry benchmarks.

10. TABLE OF ABBREVIATIONS

Term or Abbreviation	Description
AP	Access Provider
B2B	Business to Business
CIM	Customer Interface Management
CLI	Customer Line Identification
COM	Customer Order Management
CP	Communications Provider
CPM	Customer Problem Management
CRM	Customer Relationship Management
CSA	Customer Service Advisor
CCS	Customer Cancel Service
ETC	Early Termination Charges
eTOM	Enhanced Telecoms Operations Map
FTE	Full Time Employee
GP	Gaining Provider
GPL	Gaining Provider Led
GPL-TxC	Gaining Provider Led - Transfer Code
LLU	Local Loop Unbundling
LP	Losing Provider
LPL	Losing Provider Led
MAC	Migration Authorisation Code
NoT	Notice of Transfer
NPC	Net Present Cost
OAT	Operational Acceptance Testing
SI	System Integrator
SIT	System Integration Testing
SOM	Service Order Management
SPM	Service Problem Management
TAM	Telecom Applications Map
TPI	Third Party Integrator
TPV	Third Party Verification
TxC	Transfer Code
TxCIA	Transfer Code Issuing Authority
UAT	User Acceptance Testing
USN	Unique Service Number
WP	Wholesale Provider

11. CONTACT DETAILS

CSMG is a specialist strategic consultancy focused exclusively on the telecoms and digital media sectors. With offices in North America, Europe and Asia, we work for wide range of companies around the globe in these converging industries.

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