Switching Options:

An Assessment of Potential Costs

Final Report

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1. EXECUTIVE SUMMARY

Background

1.1. In September 2010, Ofcom, the UK communications regulator, published a consultation document reviewing switching processes in the UK communications sector[1]. The aim of the review was to identify the key issues and problems with the current switching processes and set out a strategic vision for a preferred model of a switching process. Ofcom's overall objective was to ensure that switching processes deliver positive consumer and good competition outcomes for single and bundled services.

1.2. Following this consultation, Ofcom set up a Switching Working Group (SWG) with the Office of the Telecommunications Adjudicator (OTA) and industry stakeholders in order to discuss and assess potential switching options for fixed line voice and broadband services on Openreach copper loops. The SWG developed three models for consideration, two Gaining Provider Led (GPL) models and one Losing Provider Led (LPL) model. The models were:

1) "USN" – A GPL model which utilised a Unique Service Number (USN) which would be provided to customers on their bill, and which would assist providers in identifying the service to be switched and in authenticating the customer;

2) "TPV" – A GPL model which utilised a Third Party Validation (TPV) provider to record a customer's consent to switching of the service; and,

3) "LPL" – A LPL model where a customer would contact their current provider first in order to request a code which they could then provide to their new provider to begin the switching process. From a customer-facing perspective, this would be similar to today's MAC process utilised in broadband switching.

1.3. Each of these models would be supported by a new back-end process, the "TxC mechanism", which would help ensure the correct assets were switched.

1.4. This report assesses and compares the cost and impact on industry of transitioning to each of these three different models (USN, TPV,LPL) for fixed voice and broadband.

Objectives

1.5. CSMG was engaged by Ofcom to support the SWG process in two ways. Firstly, CSMG was asked to document a set of specifications for each of the recommended switching models developed by the group. The SWG was engaged in the development of these specifications and input from the group was included in the final specification documents. The purpose of the specifications was to provide sufficient information to SWG members to effectively conduct their own assessments of the incremental costs and implications of adopting these models.

1.6. These industry assessments of costs were provided to Ofcom to enable it to develop a clearer view of the potential costs to industry of transitioning to these models.

[1] Ofcom: Strategic review of consumer switching – September 2010.

1.7. CSMG's second objective was to analyse the responses from members of the SWG, and to develop an estimate for the total incremental cost to industry, for each of the three models. In addition to the costs for communication providers, CSMG estimated the central cost elements of each model, and included these in its total industry cost estimates.

1.8. CSMG developed two costing methodologies to analyse total incremental industry costs under each of the proposed switching models:

1) An Industry Cost Methodology based primarily on normalised[2] cost inputs received from Communication Providers (CPs) as part of the SWG process;

2) An Independent Cost Methodology, based on independent bottom-up estimates of potential costs for all CPs. This consisted of a thorough review of all material changes to a CP's systems and processes, and estimates based on the development, infrastructure and personnel requirements to effect and support these changes.

1.9. The scope of the work conducted covers processes related to the switching of fixed line services (voice and broadband) on Openreach copper loops. In the first consultation these were identified as the areas which currently had the most problems. SWG members were asked to only focus on these services for the purpose of the development of potential models, as well as when returning cost estimates. As a result, all process documentation and related costs are specific to the switching of fixed line (voice and broadband) services on Openreach copper infrastructure.

1.10. The total industry costs are presented on a net present value basis using a 5 and 10 year timeframe. The costs are discounted using the social rate of time preference of 3.5% in real terms (published by HM Treasury[3]).

1.11. The cost estimates for each of the three models inform Ofcom's cost-benefit assessment, which is included in the second consultation document on switching processes published alongside this document. CSMG was not instructed with assessing the benefits of the switching models and Ofcom has done this as part of the impact assessment in the second consultation document.

Key Findings

1.12. Both the Industry and Independent Cost Methodology found that the LPL model had the lowest cost. Under both methods, the TPV model was the most expensive. On the whole, the independent method produced similar costs to the industry method for USN and LPL models; however, the industry cost estimate for the TPV model was higher than the independent estimate.

1.13. In addition to the original three models, we also considered an alternative TPV model which enables a lower order handling time by not requiring the GP agent to hold on the line while

[2] To ensure consistency between industry responses, CSMG adjusted CP responses to remove costs which were not part of the formal switching process, where possible. This is further explained in Section 4.3 and a full list of adjustments made is contained within Annex 1.

[3] See http://www.hm-treasury.gov.uk/d/green_book_complete.pdf, p98.

the customer goes through the TPV. Over a 10 year net present cost this produced a total cost estimate which was 23% lower than the original TPV model.[4]

1.14. Our high level results are shown in the table below.[5]

Figure 1: Net Present Cost of Each Option over a 5-Year and 10-Year Time Frame

	USN	TPV	Alternative TPV	LPL
Industry - 5 Year	£56m	£103m	-	£49m
Independent - 5 Year	£57m	£81m	£65m	£43m
Industry – 10 Year	£73m	£156m	-	£66m
Independent – 10 Year	£81m	£128m	£98m	£65m

Figure 2: Net Present Cost of Each Option per Year (over 10 year Time Frame)

	USN	TPV	Alternative TPV	LPL
Industry – 10 Year	£7.3m	£15.6m	-	£6.6m
Independent – 10 Year	£8.1m	£12.8m	£9.8m	£6.5m

1.15. Annualising the net present cost over a ten year period, shows that the estimated cost of the models ranges from £7m to £16m per year (Figure 2).

1.16. Figure 3 shows that both TPV models were estimated to have higher on-going costs than the USN and LPL models. This is primarily due to the on-going cost of paying for a third party agent to validate each customer switch[6]. The initial cost to implement the USN and TPV models was higher than the LPL model, as the USN and TPV models require the construction of a central database as well as greater changes to existing CPs' systems and processes.

[4] We did not ask for an industry cost estimate for the alternative TPV model. For more information of the Alternative TPV model, see Section 5 - Independent Cost Methodology.

[5] We developed a low, mid, and high case for our independent cost methodology. The figures shown relate to the mid case. These cases are explained in further detail in paragraph 5.11. The "Industry Cost" figures shown are the results utilising 'normalised' CP responses.

[6] The TPV fee is assumed to have a 33% profit margin.

Figure 3: Setup and On-going Costs for Each Option

	USN	TPV	Alternative TPV	LPL
Industry –Setup Costs	£35m	£39m	-	£28m
Industry – Annual On-going Costs	£5m	£14m	-	£5m
Independent - Setup Costs	£28m	£26m	£26m	£18m
Independent – Annual On-going Costs	£6m	£12m	£9m	£6m

1.17. Showing the 10 Year Net Present Cost on an annualised basis, the costs range from £0.33 to £0.80 per year per residential line (See Figure 4).[7] This compares to average annual revenue per residential line of £260[8]. The annual costs of implementing each model therefore represent around 0.13% to 0.31% of average annual revenue per residential exchange line (Figure5).

Figure 4: NPC per Fixed Residential Line over a 10-Year Time Frame(Annualised)

	USN	TPV	Alternative TPV	LPL
Industry - NPC per line	£0.38	£0.80	-	£0.34
Independent – NPC per line	£0.42	£0.66	£0.50	£0.33

Figure 5: Cost of Models as % of Average Annual Residential Line Revenue

	USN	TPV	Alternative TPV	LPL
Industry – cost as % of fixed line revenues	0.14%	0.31%	-	0.13%
Independent – cost as % of fixed line revenues	0.16%	0.25%	0.19%	0.13%

[7] This is based on 19.4 million Openreach residential lines.

[8] This is based on annual residential network revenues for all fixed operators of £6,094 million in 2010 and 23.4 million residential lines (includes Virgin's cable network). Source: Ofcom telecommunication market data tables Q42010 available at http://stakeholders.ofcom.org.uk/binaries/research/cmr/Q4_2010.pdf .

2. PROJECT APPROACH

2.1. CSMG's assignment followed a seven-stage approach (See Figure 6).

2.2. The first stage involved designing a set of specifications[9] for each of the models developed by the SWG. The specification documents contained use-cases (e.g. "Customer switches service", "Setup of CP on Central Database/Hub") for each switching model and included detailed process diagrams and steps for each use-case. In addition, alongside each use-case, CSMG provided a list of the expected impacts to interfaces. Potential deviations from the happy path[10] of each process were also considered. CSMG was supported by its sister company, Cartesian, in the development of these specifications.

2.3. The specification documents were provided to SWG members primarily to support CPs' cost estimates for the three models. It is important to note that they do not represent final process designs.

2.4. The second stage of the project involved gathering cost-estimates from industry. CSMG supported Ofcom in developing a cost-template which was provided to SWG members in order to facilitate the collection of this information. CSMG structured the template using the TM Forum frameworks for business processes (eTOM) and applications (TAM) to enable consistency across operators.[11] A copy of this template is included in the Annex.

2.5. In the next stage, CSMG analysed and compared the various industry responses received by Ofcom.

2.6. Concurrently with the industry cost analysis, CSMG developed its own independent cost estimates for a set of hypothetical providers transitioning to the proposed switching models. CSMG's sister company Cartesian was involved in determining these cost estimates.

2.7. Finally, CSMG developed estimates for the total costs to industry under each switching model, by extrapolating the results of CP responses. An independent assessment of total industry costs was also developed utilising the independent estimates made by CSMG. The results of the two methodologies were then compared and validated against each other.

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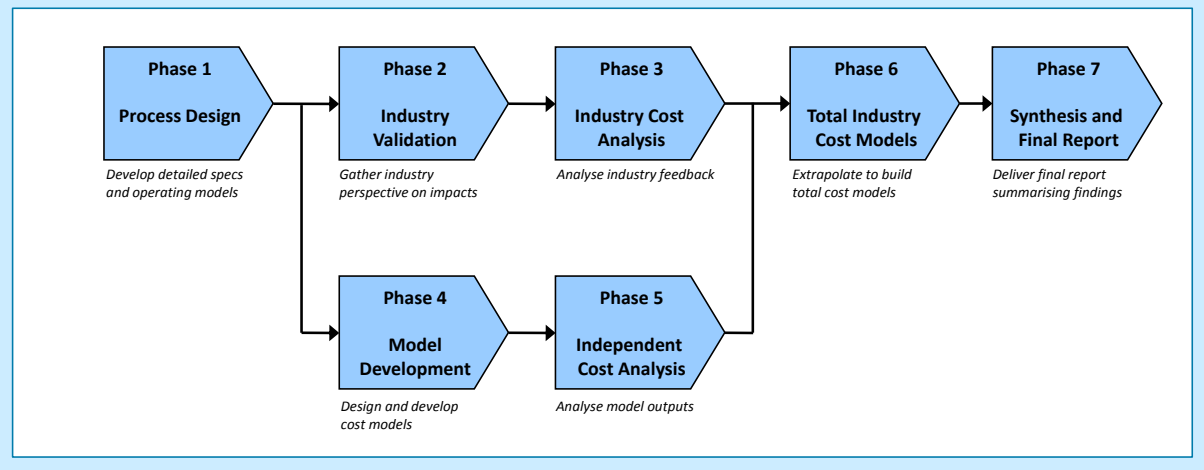
[9] These specifications can be found at http://stakeholders.ofcom.org.uk/telecoms/groups/switching-working-group/prcoesses-developed-swg/

[10] The "happy path" is the ideal process path as specified by the documentation. This includes aspects of the customer journey, customer interactions with the CPs, as well as the expected flow of the various systems involved. Deviations from the "happy path" are where the customer journey, or process flow does not follow the ideal process path, due to a variety of circumstances (e.g. system returns error, customer does not have correct information to hand to begin switch etc.). The potential deviations are listed in the process specification documentation – however these have **not** been included in our overall assessment of the costs of these models. See Section 5 – "Cost Modelling Principles" for more details.

[11] eTOM (Enhanced Telecom Operations Map) and TAM (Telecom Applications Map) are industry-standard frameworks developed by the TM Forum. For further information on the eTOM and TAM frameworks see http://www.tmforum.org/BusinessProcessFramework/1647/home.html and http://www.tmforum.org/BestPracticesStandards/ApplicationFramework/2322/Home.html respectively for more details.

Figure 6: Project Approach Outline



3. THE PROPOSED SWITCHING MODELS

3.1. The SWG proposed three models to be taken forward for consideration and cost assessment. Each of the three models shares a largely common asset-validation and back-end process, but differs in the manner in which the front-end customer-facing process is conducted. In addition, the proposed GPL models (USN and TPV) incorporate a new "Customer Cancel" process, where a customer is able to cancel the switch via an IVR (Interactive Voice Recognition) function or via the TPV. The following descriptions are based on the specifications as set out in the Ofcom documentation for each model.[12]

USN-Only

3.2. The USN-only switching process utilises a Unique Service Number for direct authentication and validation of the customer. The following provides a brief description of how the process would work.

3.3. Each of a customer's services would be identified by a unique number, the USN. This USN would be communicated to the customer by their current provider and printed on their bill. A customer wishing to switch a service would provide the USN to the Gaining Provider (GP) who would then enter the USN into an inter-provider hub ("the Hub"), enabling the Gaining and Losing Provider (LP) to identify the correct service to be switched. The Hub would hold a relatively simple, lightweight centralised database which would include a list of all UK fixed voice and broadband services, identified by the USN. This database and Hub would be utilised only for the consumer switching process. By providing their USN to the GP, a customer will be providing their consent for the switch to go ahead. If a customer is unable to provide their USN (e.g. they do not have the USN to hand in a retail environment), they will not be able complete the sale at that time.

3.4. After the GP had validated the USN, the GP would provide the USN to the Hub with a request for the asset validation to begin via the Transfer Code (TxC) process. Once the GP had received the TxC from the Hub they would be able to utilize this to begin the back-end switching processes. The TxC pinpoints and ensures that the correct asset is transferred. As this asset validation stage is common to all the models under consideration, we have outlined this process separately. (See Asset Validation sub-section).

3.5. To assist in ensuring data consistency, it is envisaged that this Hub would automatically update the USN database when customers migrate. CPs would only need to update the central database if there were changes to the service (e.g. disconnection, new service provision).

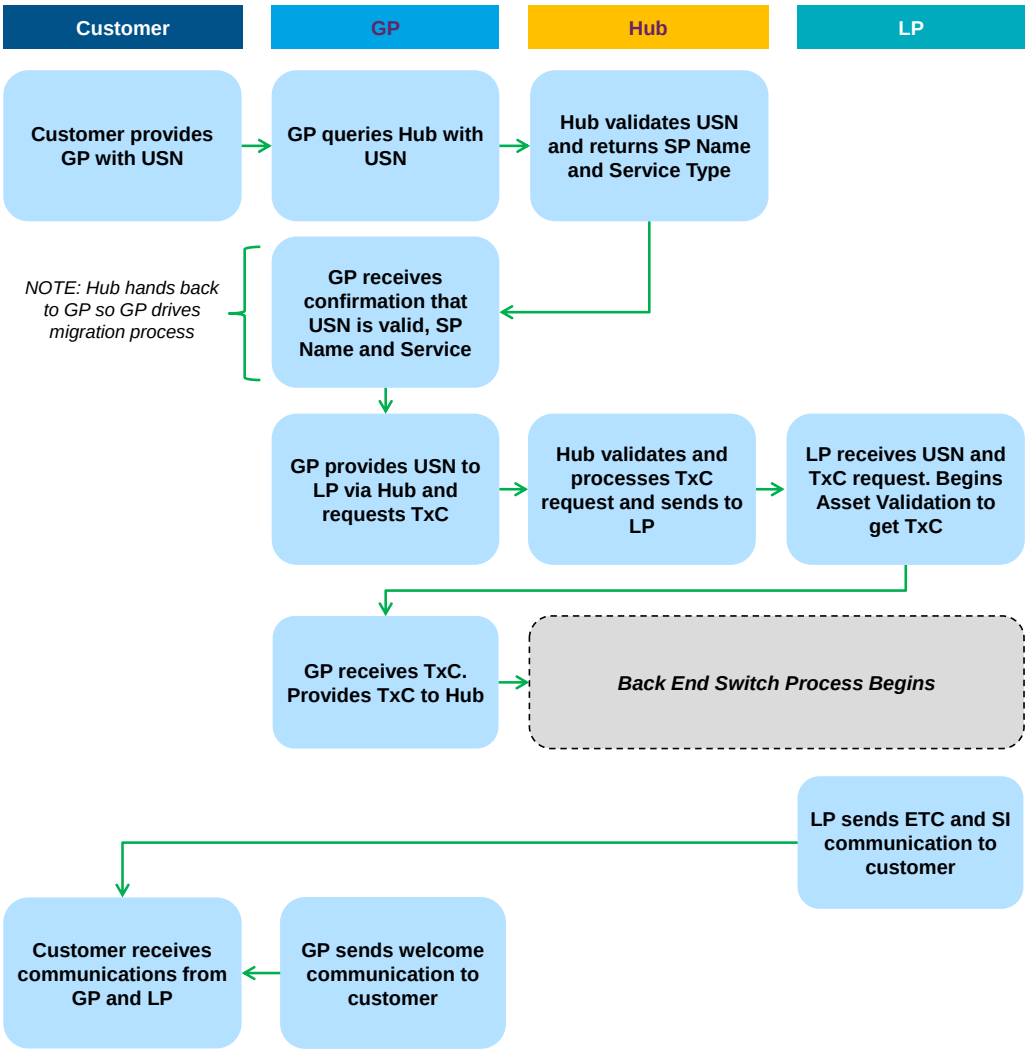
3.6. It is important to note that the USN would be specific to a particular service, e.g. a customer purchasing a bundled product will have different USNs for their broadband and telephony services. The USN could be a non-structured simple code (e.g. 12 alpha-numeric characters).

3.7. The USN concept is a simple version of the Code on Bill system which is used in the UK Energy sector today.

[12] See http://stakeholders.ofcom.org.uk/telecoms/groups/switching-working-group/prcoesses-developed-swg/

3.8. A high level process diagram of the USN-Only model can be seen below.

Figure 7: USN-Only Model – High-Level Process Diagram



TPV

3.9. The TPV switching process utilises the customer's existing Account Reference (provided by their current reseller/provider on their bill) to authenticate the user, and a Third Party Validation (TPV) process to perform consent validation. A summary description of the process follows below.

3.10. A customer wishing to switch a service would tell the GP which services they wish to switch, and their account reference with their current provider (if available). As part of the sign up process, the customer would also supply a set of data such as: their name, address, postcode, Caller Line Identification (CLI) / telephone number, and current provider. If a customer did not have their account reference to hand, the GP sales agent could use this information to query a central database of all CP accounts and services (similar to that used in the USN model) to uniquely identify the customer's account. Once the account has been successfully located on the central database, the GP would transfer the customer to a TPV.

The agent at the TPV would then elicit a statement of consent from the customer, e.g.: "Do you wish to switch service(s) X from CP Y to CP Z?" This statement of consent would be recorded by the TPV and stored, and would be able to be retrieved in the case of a slamming[13] allegation.

3.11. After the conversation with the TPV, the customer would be transferred back to the GP sales agent to allow the sales agent to end the call.

3.12. Meanwhile, once the TPV has validated that consent has been given, the service would be "unlocked" on the Hub, allowing the service to be switched. The TPV would then notify the GP that consent had been validated, and the GP would then request a TxC from the Hub to begin the back-end switching processes (which would work in the same way as the process flow in the USN model). If the service had not been "unlocked" this would suggest that consent had not been given, and the GP would be unable to acquire the TxC from the Hub. In this manner, the TPV acts as a "gatekeeper" to assist in the prevention of slamming abuse by GPs.

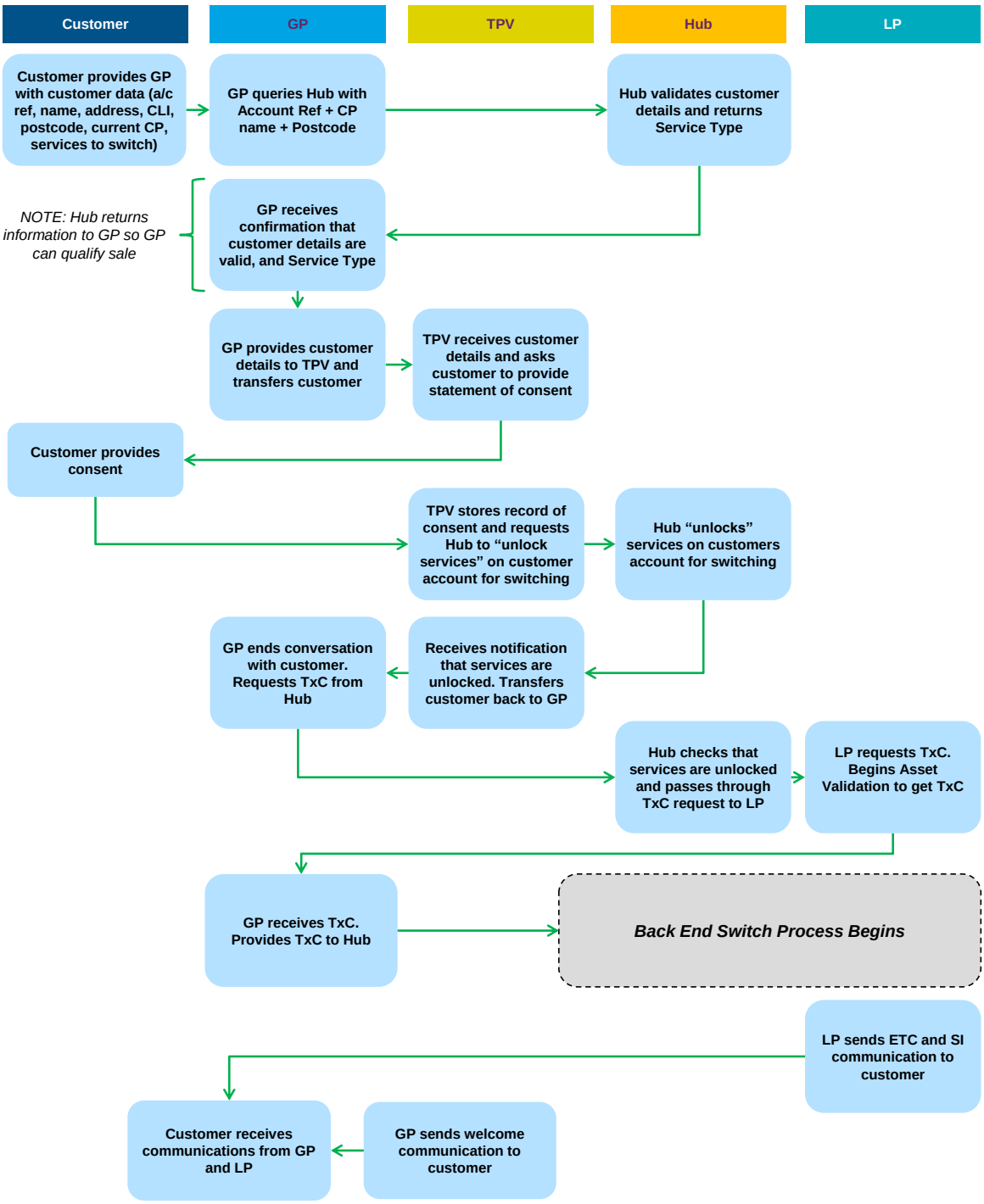
3.13. The TPV process would be handled by phone call for telesales, retail shop and door-to-door sales. Under the original TPV specification the GP agent would be held on the call while the customer spoke to the TPV. Under the alternative TPV the model is costed assuming the GP agent completes the sale before transferring to the TPV and therefore doesn't stay on the TPV call with the customer. In this scenario, if validation is successful, the GP is informed by the TPV that the process has been successful and can begin the TxC process. If the TPV is unable to validate customer consent successfully, the TPV notifies the GP that validation has been unsuccessful and the GP sales agent can then choose to call back the customer to enquire further.

3.14. Customers using an online sales channel would be presented with a TPV web form to collect a record of consent.

3.15. It is envisaged that the Hub in this model would store information for each customer regarding their account reference, current provider, name, address, CLI, postcode, the services supplied, and the access technology for these services. The primary means of identifying the customer on the central database will be through their account reference, CP name, and postcode (postcode is used as a means to prevent erroneous transfers resulting from the mis-keying of account references or where CPs may use non-unique account references). If the customer does not have their account reference to hand, the GP sales agent will be able to query the central database in order to retrieve the account reference (lookup using name, address, CLI). This assumes CLI information for all non-cable customers is stored centrally, which is not currently the case. Below is a high-level process diagram of the TPV model.

[13] "Slamming" is the general term for when a customer has their communications services switched without their knowledge or express consent.

Figure 8: TPV Model – High Level Process Diagram



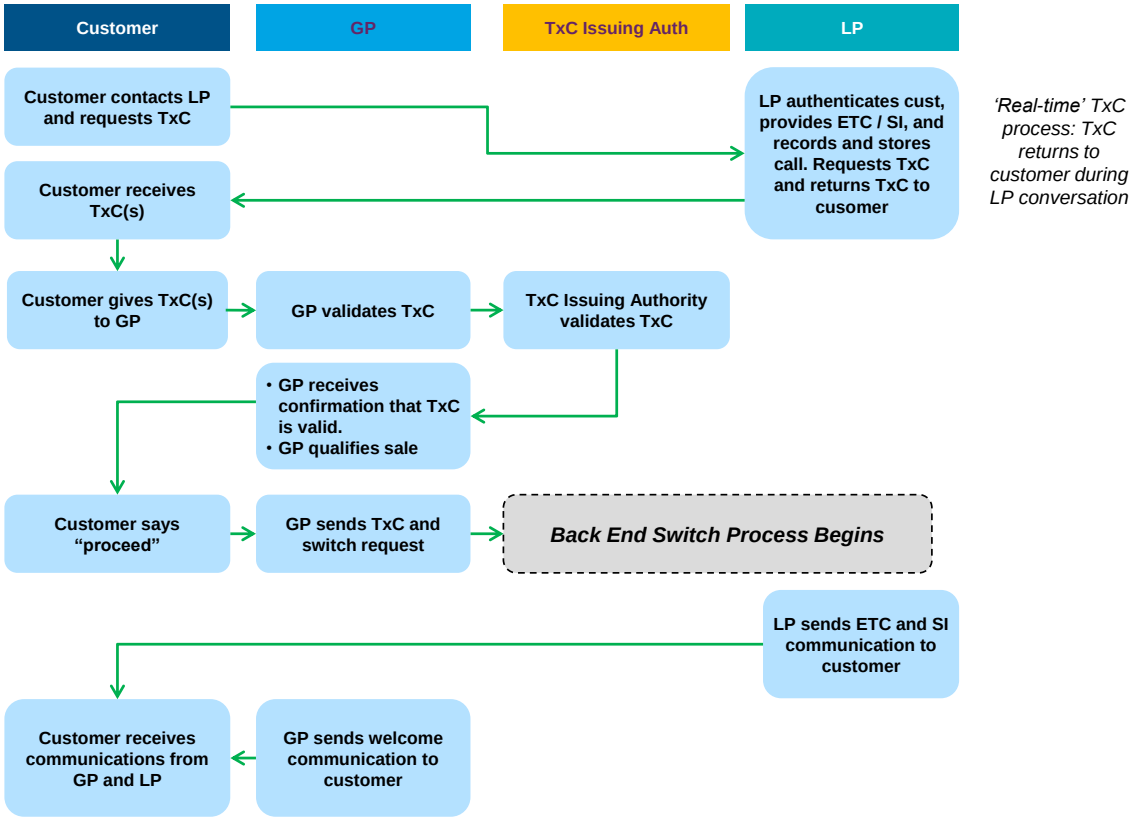
Losing Provider Led

3.16. The LPL switching process performs authentication and consent validation with the customer's existing provider, the LP. In this process the TxC is requested directly by the customer from their current provider. In this way, the TxC in the LPL process has similarities with the MAC process currently used in broadband switching. This is in contrast to the USN and TPV models where the TxC is used solely by LP and GP behind the scenes (for asset

validation) and is therefore unseen by the consumer. A short summary of the LPL front-end process is detailed below.

3.17. A customer wishing to switch services would contact their current provider, the LP, to request a Transfer Code. For telephone communications, this would be via a dedicated facility where LP retention activity would be restricted. The LP would authenticate the customer using existing methods e.g. using account reference numbers, or a password on the account. Once the services to be switched have been identified, the LP may inform the customer of any early termination charges and service implications that would result from the switch. The LP would then perform Asset Validation, which needs to occur while the customer is on-line (either by phone or web) and within a reasonable amount of time. Once asset validation had taken place, the LP would provide the customer with a TxC. The customer would subsequently be able to provide their TxC to the GP, which once validated, could be utilised by the GP to initiate the back-end switching process.

Figure 9: LPL Model – High Level Process Diagram



Common Elements across All Three Models

Asset Validation

3.18. All three models utilise a mechanism called the Transfer Code (TxC) process in order to perform asset validation. The TxC process reliably and accurately identifies and tags the correct assets and services to be switched. It provides a unique one-time reference for a migration - a "Transfer Code", which is produced at the time of migration. This Transfer Code is passed up and down the asset chain of both the LP and the GP, so that the correct assets

and services are tagged by all the players in both supply chains. Once the asset has been correctly tagged, the GP is able to use the TxC to initiate the back-end switching process.

3.19. In the USN and TPV models the TxC is used solely for asset validation purposes and is not seen by consumers; in the LPL model, the TxC is provided to consumers to give to their new provider.

3.20. In the USN and TPV models, the TxC is provided by the Hub; in the LPL model, the TxC is provided by a Transfer Code Issuing Authority (TxCIA). The TxCIA would be a body which would be independent of Openreach, and would potentially be able to provide TxCs across multiple infrastructure providers if required.

Back-end Processes

3.21. The back-end inter-CP switching processes are expected to be mostly unchanged from existing processes (other than the need to be able to pass and store the Transfer Code, either in place of an existing identifier such as a MAC, or in addition to other identifiers). During the switching period, post-sales communications from the LP will be used to inform customers of early termination charges and service implications. Under the new processes, customers will receive an actual estimate of their ETCs as well as clear information regarding the service implications. The exact format of this will be determined in future design phases. At the same time, similar to current NoT processes, a welcome correspondence from the GP will be sent to the customer, setting out the details of the new service.

3.22. The specifications also detail changes to the cancellation processes. Under the current system, there are two Cancel processes, "Cancel Own" and "Cancel Other"[14]. In all of the three proposed models, the "Cancel Other" process has been removed. Instead, in the USN and TPV processes, customers will be able to cancel their switches, during the switching period, by calling an automated Customer Cancel Service, or a live TPV agent. In the LPL model, as slamming is less likely, a separate "Customer Cancel" function was not believed to be required and this model relies on the "Cancel Own" process to cancel switches. In the other two models, "Cancel Own" would also remain as an alternative cancellation method.

[14] Currently, GPs can use the "Cancel Own" process to cancel a switch during the switching period. This may occur if a customer calls the GP and requests cancellation. "Cancel Other" can also be used by LPs to cancel a switch during the switching period. This is provided for situations in which it may be more appropriate for a customer to contact their current provider and request cancellation of the switch (e.g. if a customer has been slammed).

4. INDUSTRY COST METHODOLOGY

4.1. For each of the three models under consideration, SWG members were asked to respond with cost estimates for the adoption of the models. This section provides:

- An overview of the responses by CPs
- An analysis of CP responses
- A description of the methodology of extrapolating these submissions into a total industry cost, including how responses were normalised to ensure consistency
- An analysis of the total industry costs, based on CP responses

4.2. This section analyses the costs that were returned by CPs for the USN, TPV and LPL models. Industry was not asked to cost the alternative TPV model and therefore the following analyses in this section only refers to the original three models developed by the SWG.

Overview of Responses

4.3. In total, Ofcom received ✂ responses to its request for cost estimates from SWG members (21 CPs were invited to provide information). These included six responses from retail CPs and ✂ responses from wholesale and access providers. One retail CP's response did not provide sufficient information and it was therefore not possible to include this CP's response in our analysis. All respondents requested that their cost information be kept confidential and anonymous. In total the customer base of CP respondents represented over 16 million fixed voice customers.

4.4. As a group, the sample of retail CP respondents consisted of larger and medium-sized CPs, offering both fixed voice and broadband services. Ofcom did engage with parties outside of the SWG such as smaller providers and Third Party Integrators (TPIs) in order to understand the impacts across the wider industry. However, these parties were unable to provide any cost information.

4.5. We asked CPs to provide the costs of implementing each switching model for individual consumers and businesses with less than 10 employees as this will be the reach of the regulation. CPs would be free to apply a different switching process for larger businesses. However, through discussions with the SWG, it was apparent that CPs tend to apply the same switching model for both individual consumers and all businesses. As a result, in their responses, CPs noted that they would be unable to provide costs for implementing each model just across individual consumers and small businesses because this was not how it worked in practice. Therefore, although any new switching model will be regulated only to apply to switches for individual consumers and small businesses with less than 10 employees, the cost estimates provided include the cost of implementing each model across all switches (including larger business where appropriate).

4.6. In practice, where a large portion of the setup costs are common between small and large businesses, the incremental costs of applying the models to larger business switches may be small. However, inclusion of larger businesses will overstate the number of switches per year

which may increase on-going costs. Therefore including larger businesses means that the costs are overestimated relative to the reach of the regulation[15].

4.7. CPs were asked to provide cost information split into setup costs and on-going costs. In presenting this information, CPs were also asked to separate system change costs from process change costs. In addition, CPs were asked to allocate costs by stage e.g. front end, asset validation, back-end etc. This was to enable analysis of the cost drivers.

4.8. In all cases, CPs were asked to consider and include only the incremental costs of each of the models i.e. the additional costs required over and above current expenditure. CPs were also asked to take into account any cost savings resulting from transitioning to these models i.e. any current costs which would not be incurred under the new models.

4.9. There was a large variety in the level of detail provided within CP responses, with some CPs providing detailed assumptions behind their cost estimate and other providers supplying more limited information.

4.10. In this section, we outline the overall findings while still maintaining the anonymity and confidentiality of responses.

Analysis and Trends of CP Submissions

4.11. Even when the difference in size of respondents was accounted for, there was still a large spread in the costs provided by CPs for the various models under consideration. However, there were a number of key findings from our analysis which are highlighted below.

Retail CP Setup Costs

4.12. Three retail CPs out of five estimated that TPV would be significantly more expensive to setup than the other two models. The reasons for this cost differential included:

- The increased complexity of involving Third Party agents within what have evolved to become highly automated systems and processes.
- The increased cost of setting up systems and processes to encrypt personal data which might be sent to the Hub.
- The cost of notifying consumers that their personal data would be stored by a third party.

4.13. It is worth noting that the specification document does not include any requirement to notify customers of the storage of their personal data.

4.14. However, one CP indicated that the setup cost for TPV would be the same as USN, and one CP stated that the cost for TPV would be significantly less expensive than the other two models. This CP cited the absence of a requirement to change the billing systems as a reason for it being less expensive than USN.

[15] Our estimate based on the number of larger companies switching vs. residential and SME switches suggests that this overstatement is potentially up to 2% for on-going process costs (there were 2.1 million switches in residential and SME, and 50,000 switches in large businesses).

4.15. Three retail CPs out of five indicated that the LPL model would be the least expensive in terms of setup costs. This was the result of these CPs assuming that there would be no requirement to inform customers if the LPL model was adopted, whereas these CPs believed there was a need to send a separate communication to customers if the USN or TPV model was introduced.

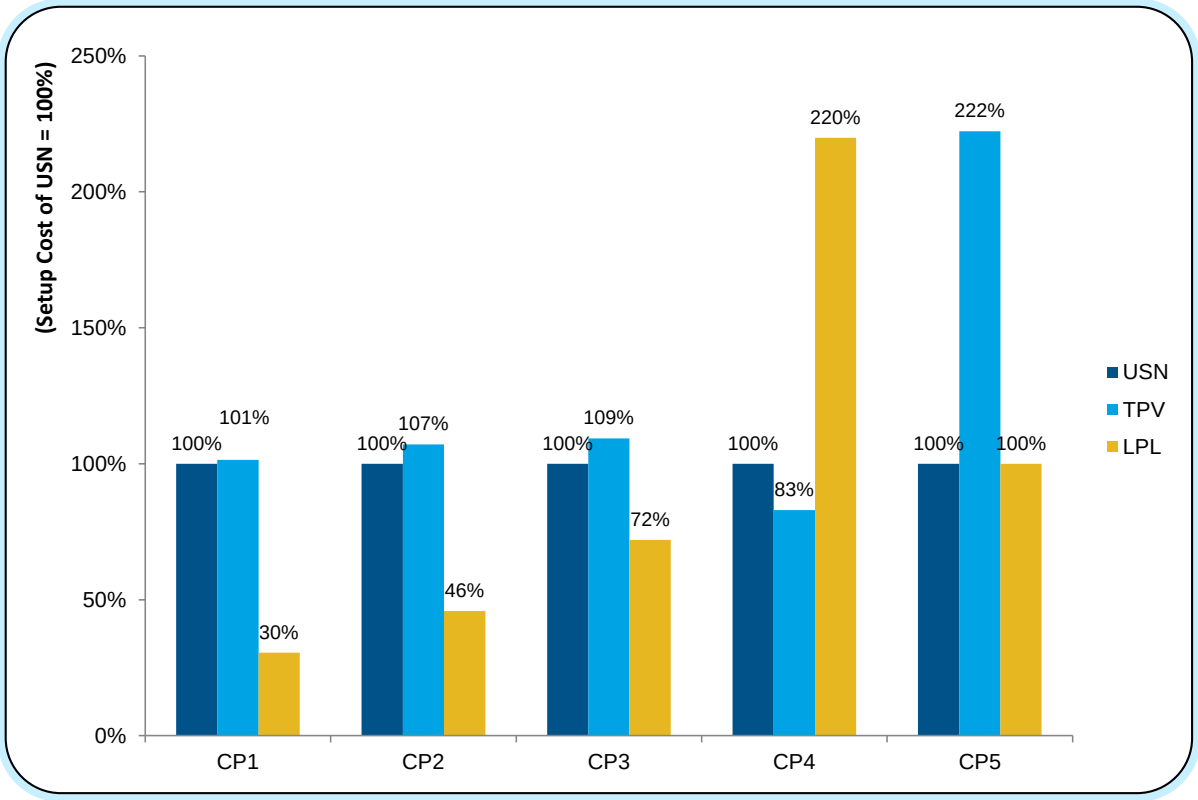
4.16. One CP stated that the setup costs for the LPL model were not significantly different to those required to setup the USN model, and one CP stated that the costs of the LPL model would be significantly higher.

4.17. There were differing opinions as to the drivers of cost across the models. Whereas some CPs stated that there would be an increase in training costs only under the USN and TPV model, other CPs asserted that there would be an increase in training costs only if the LPL model were implemented.

4.18. The cost of connection to the central database/Hub also varied greatly amongst CP responses. For some CPs this formed a significant portion of the overall USN and TPV setup costs, significantly higher than the cost assumed in our independent assessment. Further details of our independent assessment of costs can be found in the Section 9 - Annex 2.

4.19. The chart below shows individual CP responses of setup costs for the TPV and LPL models indexed to their costs for the USN model

Figure 10: Analysis of CP Comparison of Models (Set Up Costs) – Cost Relative to USN



Retail CP On-going Costs

4.20. Three out of five retail CPs stated that the LPL model would be the least expensive in terms of on-going costs (See Figure 11).

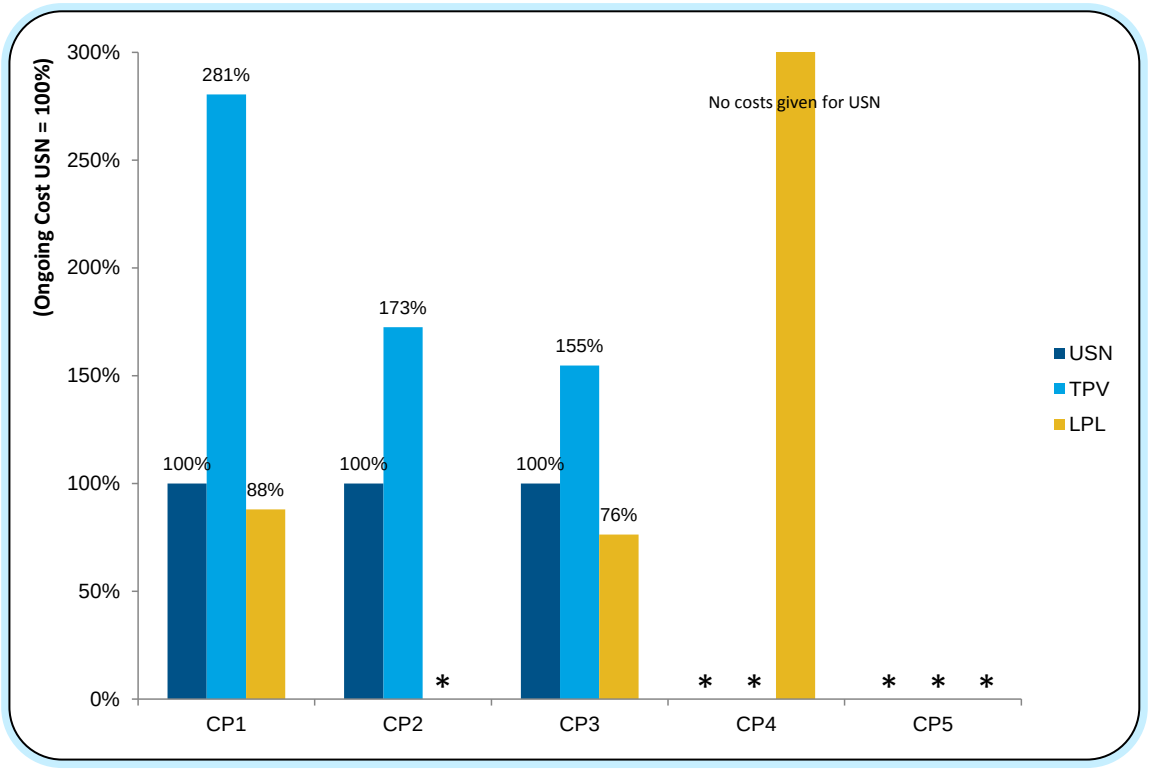
4.21. However, one CP indicated that the LPL model was the only model which would contribute to significant incremental on-going costs vs. the other two models. This CP indicated that the increase in the number of calls from customers wanting a code in order to leave would have a large impact on process costs. Our independent assessment also indicated that the increase in losing calls would drive the majority of on-going costs in the LPL model (See Section 9 –Annex 2).

4.22. Two CPs indicated that the LPL model would have zero incremental on-going costs. In contrast, our independent assessment estimated that there would be increased on-going costs in the LPL model due to the higher number of losing calls received under this model.

4.23. Three out of five retail CPs stated that the TPV model would have the highest on-going costs of all the models. On average these CPs assessed the operating cost of the TPV model to be almost double the cost of supporting the USN model. The main driver of the TPV model's on-going costs is increased call-times, as the GP sales agent waits for the customer to complete the TPV process. If these were removed then our independent assessment estimated that the on-going costs for the TPV model (on a 10 year NPC basis) would fall by 25%.

4.24. The chart below shows individual CP responses of on-going costs for the TPV and LPL models indexed to their costs for the USN model.

Figure 11: Analysis of CP Comparison of Models (On-going Costs) – Cost Relative to USN

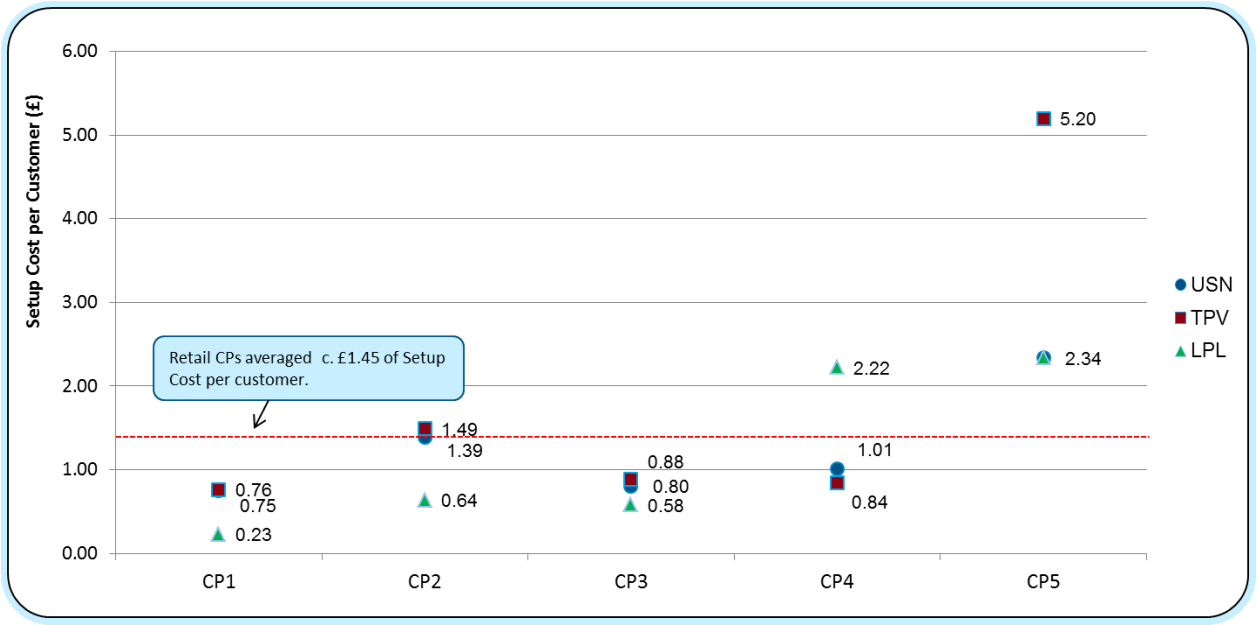


Note: Asterisk(*) denotes CP estimated zero on-going costs for model

On average, retail CPs estimated incremental setup costs of c. £1.45 per customer for each of the models

4.25. To estimate the average setup cost to CPs of any of the models, we averaged the cost per customer (by dividing by their stated customer base, provided along with the cost estimates) for each model for each CP, and then averaged this figure across all CPs. A comparison of the CP's estimated setup costs, revealed that the overall average cost per customer was roughly £1.45. CP5 in particular highlighted higher setup costs for all models. If this outlier is removed, the average setup cost per customer for each was £0.95.

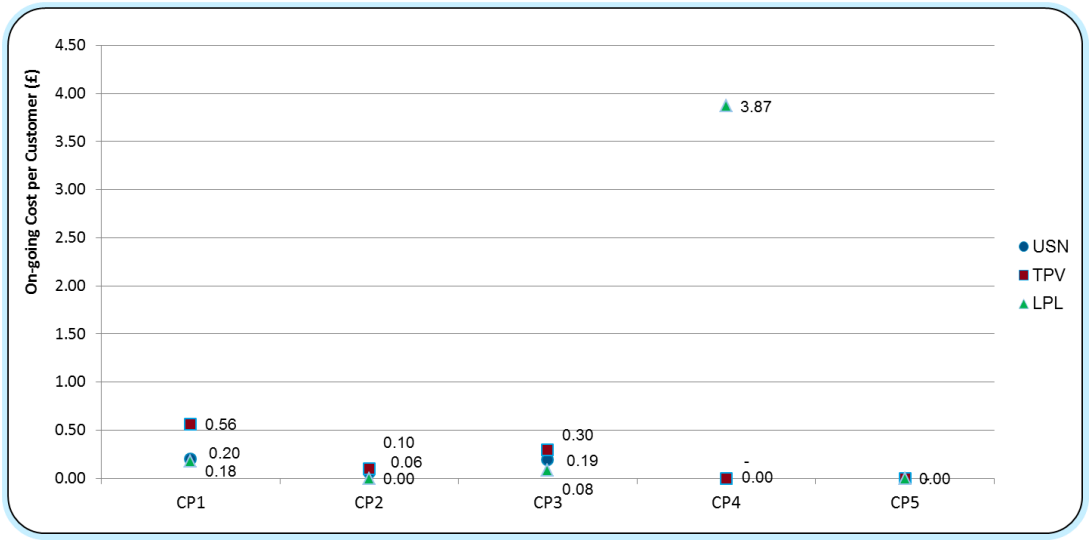
Figure 12: Setup Cost per Customer for Each Switching Model (£)



On average, retail CPs estimated incremental on-going costs of £0.37 per customer for the new processes

4.26. Retail providers indicated that the simple average incremental cost of the USN and TPV models was £0.09 and £0.19 respectively per customer per year. For the LPL model the average increase in on-going costs was £0.83, though this was largely driven by CP4's high on-going costs for the LPL model. If this anomaly is removed, the average on-going cost for the LPL model was £0.07 per customer per year.

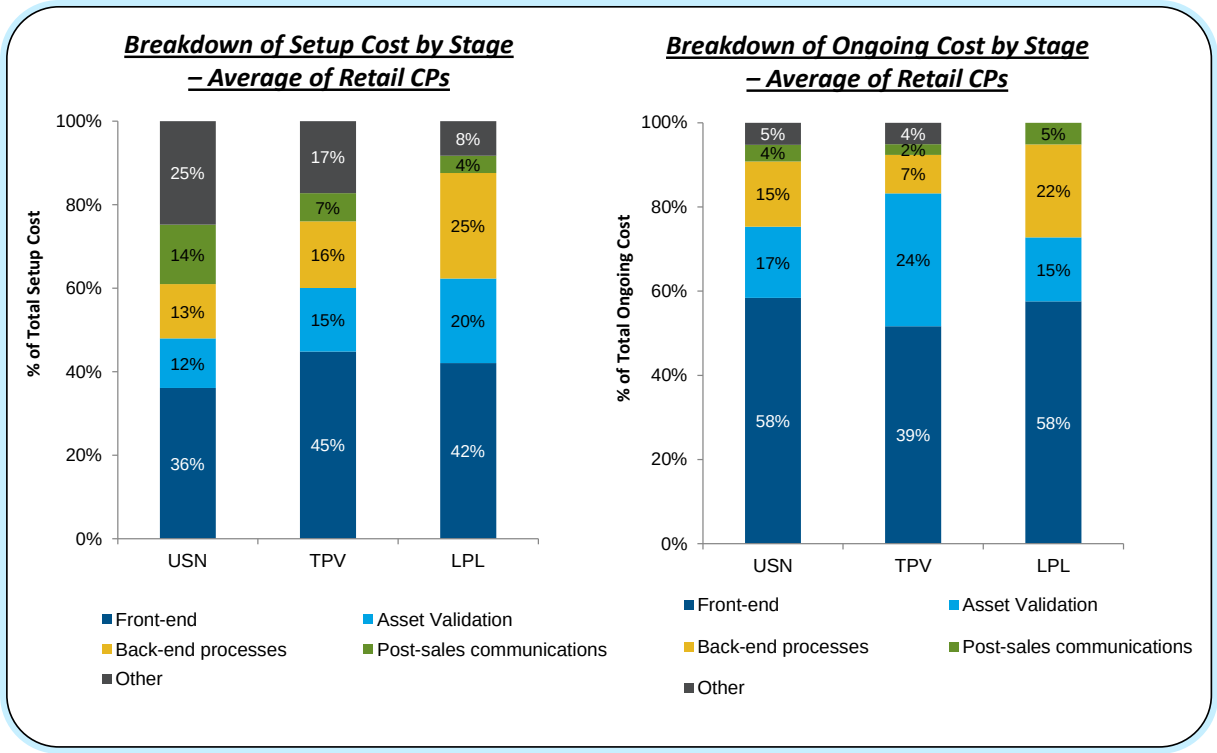
Figure 13: On-going Cost Increase per Customer for Each Switching Model (£)



Changes to the front-end process represented the largest cost in terms of both Set-up Cost and On-going Cost, according to retail CP's breakdown of costs

4.27. Front-end system and process changes were highlighted as being the largest components of set-up costs. Front-end costs included costs involved in the changes to the sales process as well as the required changes to Customer Relationship Management (e.g. the addition of the USN in the CRM system), connection with the Hub systems, and any impacts to the billing systems. Front-end changes were also anticipated to have the highest impact in terms of on-going costs, with asset validation changes forming the second largest cost group.

Figure 14: Breakdown of Setup Costs and On-going Costs by Stage for Retail CPs



For most Access and Wholesale Providers, Set-up Costs and On-going Costs were the same across all three models

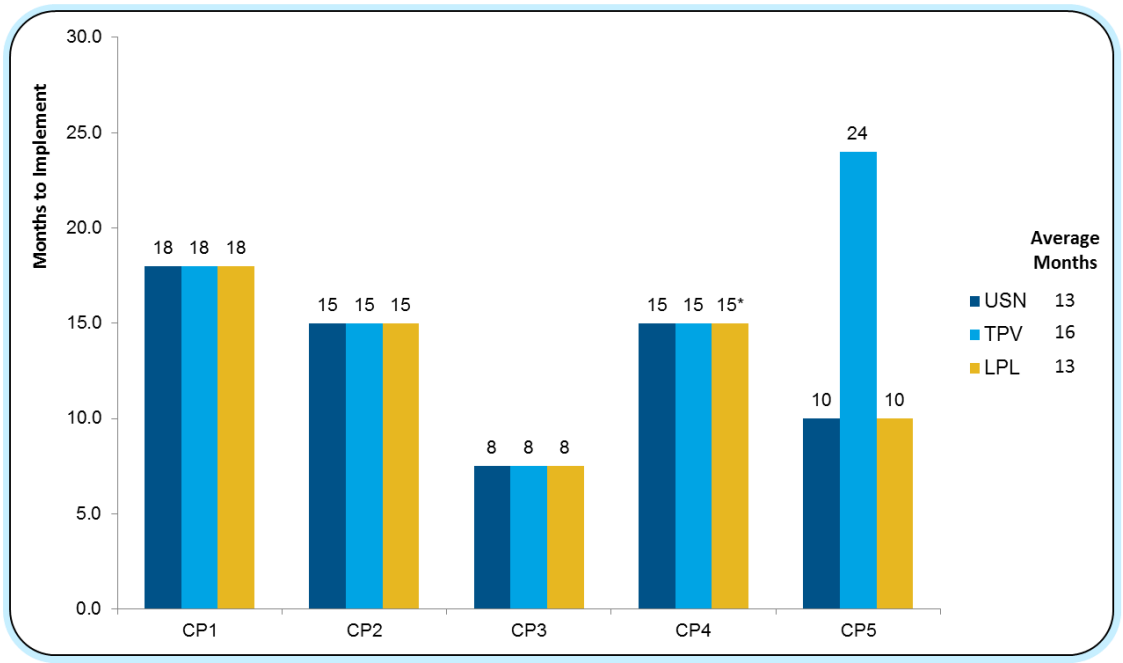
4.28. On the whole, Access and Wholesale Providers stated that the costs for each of the models were the same. One CP noted that the LPL process would cost significantly more to setup, due to the requirements to change its systems in order to return the TxC in a real-time fashion to its customers. In order to maintain the confidentiality of the responses from these providers, we are unable to provide a breakdown of these figures in this report.

The average implementation time stated by retail CPs was between 13 to 16 months for each model

4.29. CPs were asked to estimate the amount of time that it would realistically take to implement each model. Average responses ranged from 13 to 16 months implementation time for each of the three models. The majority of respondents stated that implementation would take the same amount of time, regardless of the chosen option. However, CP5 believed that due to additional complexity of the TPV model, the time required to implement the process would be significantly higher.

4.30. Wholesale and Access Providers also indicated that the implementation time would be the same across all three models, with an average time of 16 months stated.

Figure 15: Comparison of CP Estimates – Time Taken to Implement Model



Consistency of Responses

4.31. There were a number of challenges faced when analysing the initial responses:

- Some responses were submitted incomplete: one CP did not submit costs broken down by Systems and Processes as requested.
- Interpretations of eTOM and TAM were not always consistent. Some CPs had interpreted eTOM and TAM differently, placing costs in different categories to each other. Although

this did not impact the overall cost estimates, it did make it more challenging to compare key cost drivers.

- Finally, it was apparent that several CPs had included costs which were not specified as part of the process descriptions or had left out costs which should have been incurred as a result of the specification.

Normalisation

4.32. CSMG addressed these inconsistencies in CP responses in two ways. Firstly, CSMG contacted CPs and requested clarification of their cost estimates. Following these discussions, some CPs presented revised cost estimates to CSMG.

4.33. However, areas remained where CPs had included costs which were not viewed to be part of the formal switching process, or were not included as part of the specifications for that model. Examples of this included: the cost of sending a separate communication to customers notifying them of the USN and TPV process; the cost of billing changes in the TPV model; additional "non-formal" process costs in the LPL model. In order to address these anomalies, CSMG adjusted CP responses to remove these costs where possible. From this point onwards in the document, the industry methodology cost outputs reflect adjustments made during the "normalisation" process.

4.34. It is important to note that although the normalisation process *removed* costs, CSMG did not *add* any costs to the CP responses(e.g. increasing costs due to a greater number of losing calls in the LPL model). To this extent, the industry assessment of costs may underestimate the cost of implementation.[16]

4.35. In the Annex 1 (Section 8) a full range of the adjustments made to CP responses is included as well as the impact of these adjustments. The outputs of the "non-adjusted" figures are also included for comparison purposes. The normalisation process resulted in changes of 4% to 25% to the overall costs of the various models, based on a 10 Year Net Present Cost perspective.

Methodology – Total Industry Costs for CPs

4.36. Although the retail CP responses returned related to a large percentage of all customers in the UK, it is important to note that as a sample, they formed a small number of all CPs in the market. Therefore, the extrapolation based on these responses must be viewed with some caution and representative of larger CPs rather than smaller ones.

4.37. CSMG utilised the following approach for extrapolating the small sample of industry responses to estimate the cost to the industry overall.

4.38. Firstly, CSMG divided each of the respondents into three segments:

- Tier A CPs –CPs with relatively simple operations, which utilise TPIs to maintain nearly all IT systems. These may include: CRM systems, Billing systems, Order Management and Partner Management systems (such as interface to electronic gateways). In this instance, the TPI is in effect the IT department for the CP, and the CP focuses on the primary selling

[16] Costs were not added to CPs responses to ensure that the industry cost-estimate clearly reflected the costs from industry's perspective and was clearly delineated from the independent cost estimate.

activities. On the whole, these CPs tend to be smaller and would generally have less than 10,000 customers (as it may be inefficient to develop or manage own IT systems at this scale). In general, Tier A CPs are not likely to directly incur significant systems costs, as their TPI supplier will likely action these changes on their behalf. However, we would expect these costs to be incurred by the TPI and ultimately passed through to the CPs, and therefore TPI costs have been included in the overall costs. Tier A CPs will also incur direct costs for any additional process costs under the new models.

- Tier B CPs – More complex than Tier A CPs, Tier B CPs may own and maintain some parts of their IT systems, such as the CRM and Billing systems, but may utilise TPIs to perform some back-end functionality such as Service Order Management, and interfaces with the Access Operator or Wholesale Provider's electronic gateways. In contrast to Tier A CPs, Tier B CPs will likely encounter significant system impacts and costs, depending on the extent to which they utilise TPIs. In terms of size, Tier B CPs span a wide range, with between 10,000 and 1 million fixed line customers.
- Tier C CPs – These CPs have the most complex operations of all the three tiers. Tier C CPs tend to own or operate their own IT systems stack (and may have multiple system stacks) and will be heavily involved in changes to any part of their IT systems, including both front-end and back-end changes. For this reason, these CPs tend to have the largest system change impacts. Tier C CPs are also generally large, with an average customer base over 1million fixed line customers. They may offer multiple products, including fixed line, broadband and calls packages, as well as having multiple sales channels to manage. This may increase the number of systems impacted by changes to the switching process.

4.39. Having segmented the respondent CPs into these tiers, CSMG calculated the average set up cost per customer, and average on-going cost per customer for each of these tiers, based on the data provided by respondents.

4.40. However, no responses were received from Tier A CPs. CSMG therefore estimated the costs of a Tier A CP, based on the assumption that these relatively simple CPs would not incur significant systems costs and the majority of costs would be related to process changes. The average process change setup and on-going costs were calculated per customer for all CP respondents, and these were scaled to fit a typical Tier A CP size of 5,000 customers.

4.41. The average setup and on-going costs per customer for each of the tiers can be seen in the table below.

Figure 16: Setup and On-going Costs per Customer for Each Tier and Model

	USN	TPV	LPL
Tier A – Setup	£0.06	£0.07	£0.11
Tier B – Setup	£1.38	£2.29	£1.71
Tier C – Setup	✂	✂	✂
Tier A – On-going	£0.06	£0.16	£0.24
Tier B – On-going	£0.06	£0.10	£0.37
Tier C – On-going	✂	✂	✂

4.42. The high setup and on-going costs for Tier B were driven by an outlier that resulted in the overall average costs for Tier B increasing significantly.

4.43. Using Ofcom industry data, CSMG estimated the number of customers in each of the tiers. In the table below we provide the estimated total number of customers served by CPs in each tier.

Figure 17: Number of Customers for Each Tier[17]

	Tier A	Tier B	Tier C
No. of Customers	4.3m[18]	3.0m	22.0m

4.44. CSMG multiplied the average set-up cost per customer and on-going cost per customer by the number of customers in each tier to estimate the total CP costs. Figure 19 shows the methodology utilised for calculating setup costs; an identical methodology was utilised for estimating on-going costs.

TPIs

4.45. Costs incurred by TPIs as a result of transitioning to each of the switching models were also incorporated into the estimates for the total industry costs. It is assumed that these costs will be passed onto CPs through higher charges and therefore it is appropriate to include any incremental changes to TPI costs resulting from the adoption of these switching models.

4.46. As no responses were received from TPIs, CSMG estimated the expected costs to TPIs by using the average systems costs per customer provided by retail CPs. The total TPI costs for each model are shown below (we have assumed that there are five TPIs).

Figure 18: TPI Costs for Each Model

	USN	TPV	LPL
Setup Costs (£000's)	1,903	2,854	1,098
On-going Costs (£000's)	53	59	29

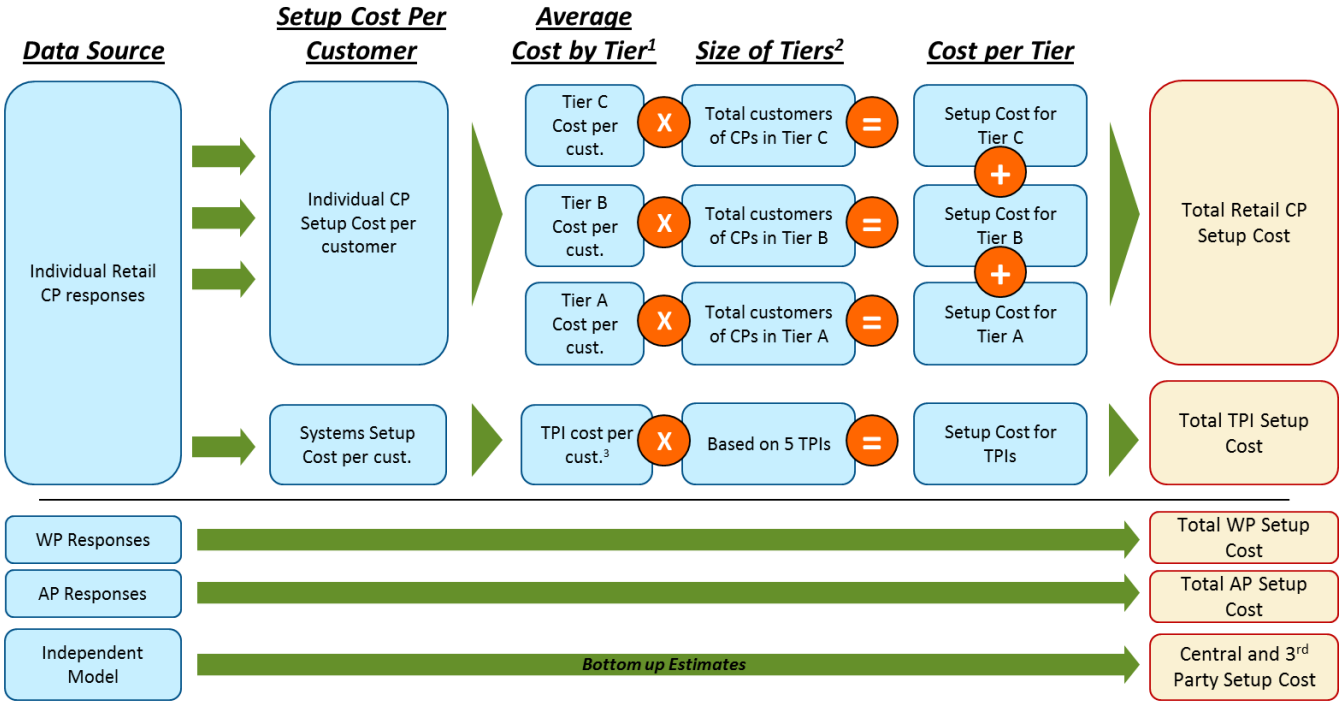
Wholesale /Access CPs

4.47. CSMG also included the responses received from Wholesale (WP) and Access Providers (AP) into the model (the respondents represented the vast majority of the wholesale and access industry on Openreach copper infrastructure).

[17] The number of customers in each Tier relates to the number of unique customers. A consumer who receives line and broadband services from one provider is counted as one customer, however, a consumer may be counted as two customers if they take broadband voice services from different providers. The estimate is based on a combination of Ofcom data regarding residential lines, and data provided by CPs as part of the SWG costings work.

[18] This includes 2.83m CPS customers.

Figure 19: Methodology to Size Total Cost to Industry



Notes: 1. Average cost by Tier is the mean of setup cost per customer figures based on the responses in that Tier. 2. Size of Tiers based on Ofcom data and company figures. 3. TPI costs are based on averaging System costs included in the CP responses. For scaling purposes, a TPI was estimated to have the same scale of system costs as a Tier B (medium) operator

4.48. The results of this methodology can be seen in the table below.

Figure 20: Total CP Costs for Each Model (Setup Cost and Annual On-going Cost for Retail and Wholesale/Access CPs and TPIs, excludes Central Costs)

	USN	TPV	LPL
Setup Cost	£33.3m	£37.3m	£27.1m
On-going Cost per Year	£3.5m	£8.4m	£4.2m

Central Costs

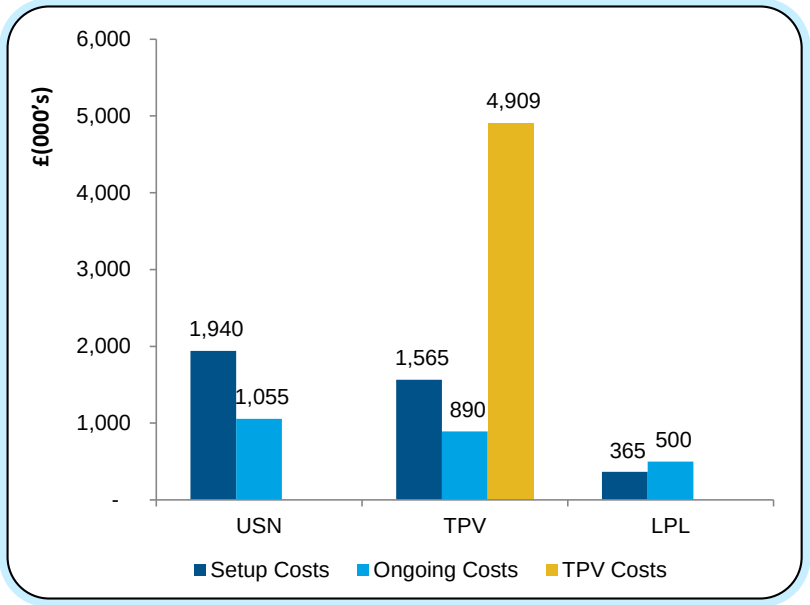
4.49. All three switching models (USN, TPV and LPL) contain an element of central industry costs. In the USN model, this would include costs related to the Hub; in the TPV model, the Hub and TPV fees[19] are central costs; and in the LPL model, there is the requirement to establish and maintain the Transfer Code Issuing Authority ("TxCIA"). In the USN and TPV models, the Hub would fulfil the role of issuing the transfer codes, and therefore a separate TxCIA would not be required.

[19] TPV fees reflect both setup and operating costs of the TPV.

4.50. CSMG estimated the costs of these central elements for each model using a bottom-up methodology, estimating the likely development and infrastructure requirements for system builds, and the process and resource requirements for on-going support and maintenance. For TPV fees, international benchmarks of the amount charged by TPVs per switch in the United States and Ireland were utilised to determine the estimate.[20] Using these benchmarks, we estimate a fee of £2.70 per switch. The total TPV fees were assessed based on an estimate of the total number of switches in industry going forwards.[21] It is worth noting that the cost estimates for the TPV model are sensitive to the TPV fee assumption (see assessment of sensitivity in Section 5 – Independent Cost Methodology).

4.51. These central costs (both setup and on-going) as estimated by CSMG, were added to the extrapolation of CP costs, to form a total industry cost for each model. The central costs for each model are shown below.

Figure 21: Central Costs for Each Model (Setup Cost and Annual On-going Cost)



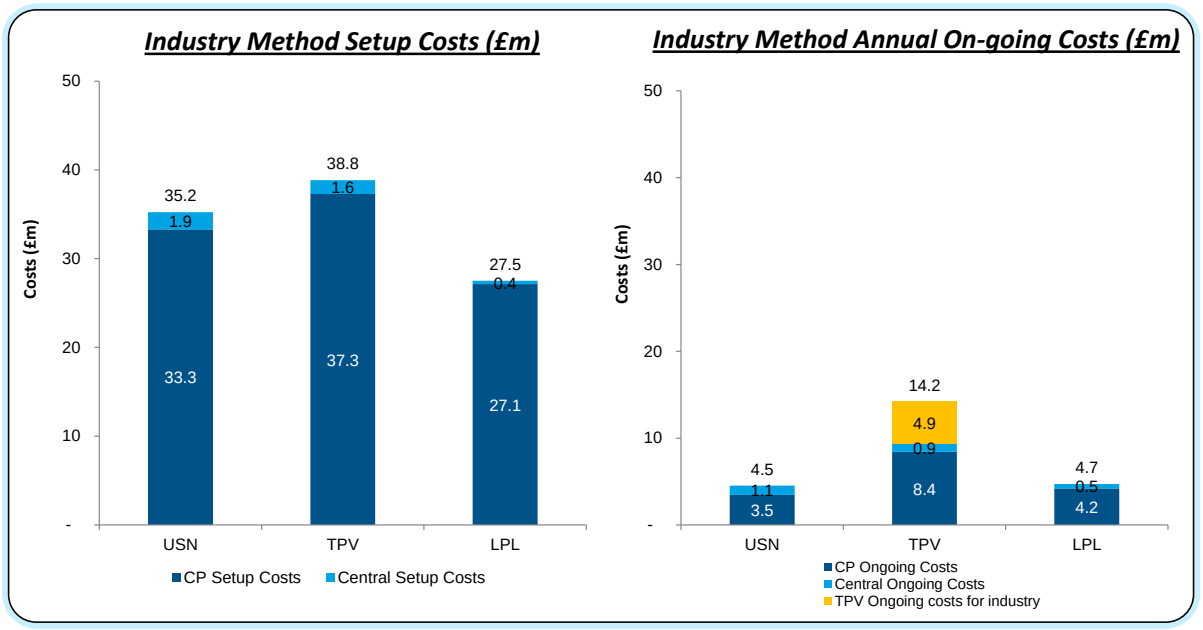
Results

4.52. Our extrapolation of CP responses resulted in total industry set-up costs ranging from £27.5m for the LPL model to £38.8m for the TPV model. In terms of on-going costs per year, the USN model and the LPL model produced roughly similar results (£4.5m for USN, £4.7m for LPL) and the TPV model was shown to have the highest on-going costs (£14.2m). The TPV model included CSMG estimates for TPV fees for the industry. The total industry TPV fees were calculated by multiplying the total number of expected switches in industry by the estimated TPV fee.

[20] See CSMG's previous study – Third Party Validation: Assessment of UK Implementation. This can be found at http://stakeholders.ofcom.org.uk/binaries/telecoms/groups/switching-working-group/papers/csmg.pdf

[21] CSMG estimated there to be 2.1 million switches per year currently. For the purposes of the cost modelling exercise, it is assumed to be the same going forward. This may be a conservative estimate if the number of switches increases under the new switching processes.

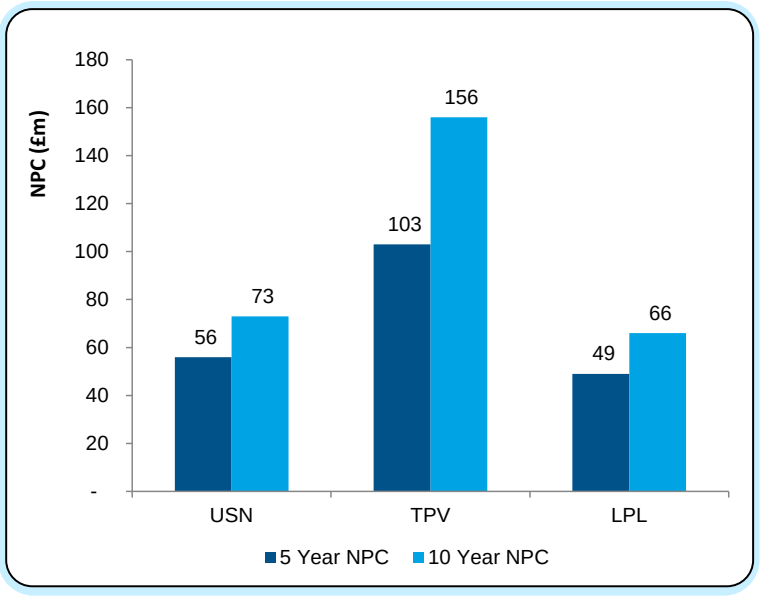
Figure 22: Industry Methodology –Total Industry Costs



4.53. Using these outputs, a Net Present Cost (NPC) for each model was calculated. This was analysed for both a five-year timeframe, and a ten-year timeframe, conservatively assuming that all initial setup costs would have no residual value at the end of each time period.

4.54. The results show that the LPL model is the least expensive of the three models and the TPV model (driven primarily by significantly higher on-going costs) is the most expensive model. The USN model costs were slightly higher than the LPL model, but much lower than the TPV model.

Figure 23: Industry Method Net Present Cost (£m)



5. INDEPENDENT COST METHODOLOGY

Overview

5.1. In addition to the Industry Cost Methodology based on CP inputs described above, CSMG developed an Independent Cost Methodology based on a bottom-up assessment of costs for a set of hypothetical operators.

5.2. CSMG developed cost estimates for the USN, TPV and LPL models. In addition, cost estimates for an alternative TPV model were also developed.

5.3. In the original TPV model, the GP agent hands over the customer to the TPV, but is then required to wait on the line while the customer undergoes the TPV conversation, and following a successful TPV conversation, the GP agent closes the sales conversation with the customer. It is possible that this requirement for the GP agent to hold the line is unnecessary. An alternative process would be where the TPV notifies the GP after the TPV conversation with the customer, if the customer has been successfully validated. The GP could then choose to request the TxC for this customer. By not having the GP agent on the line during the TPV conversation, there is a significant reduction in the order handling time and related on-going costs of the model.

5.4. The costs for this alternative TPV model have been included alongside the original three models developed by the SWG.

Key Cost Modelling Principles

5.5. When constructing the independent cost analysis, CSMG applied a series of key principles. These were:

1) *Costs should be incremental.* CSMG sought to capture only the incremental systems and process costs of transitioning to each of the three processes, compared to the processes and systems in place today for the current switching processes. CPs were asked to follow a similar methodology in providing their cost estimates. This perspective impacts costs in two ways:

   a. Firstly, it is expected that a large proportion of today's cost items (e.g. customer sales staff, CRM systems, fulfilment systems) will be able to be re-utilised under these new switching models. For example, both the industry cost methodology and independent cost methodology does not estimate the total cost of the CRM and fulfilment systems for CPs, but only estimate the cost of the modifications required to these systems under these new switching processes. Similarly, for staff costs, CSMG has not estimated the total staff cost, but would include any increases in staff levels required, or any additional training which staff were required to undertake.

   b. Secondly, from a process perspective, the cost models aim to take into account the difference in processes relative to current switching processes. For example, if under a new process the CSR time taken to handle a switch is 18 minutes, this needs to be measured relative to existing switching times. The cost included in the model would therefore reflect only the difference between the new amount of time taken for a CSR to process the switch, and the current amount of time taken for this.

2) *Only the formal portions of the switching process should be included in cost estimates*. Our Independent Methodology only estimates the cost of the formal portions of the switching process. For example, when analysing the costs of the GPL models, only the customer interaction with the Gaining Provider is included in the costs, and it does not include any conversations the customer may have with their current provider as part of their customer switching journey. Similarly, only one losing provider and gaining provider interaction is assumed when calculating the LPL model costs. The LPL model costs do not reflect situations where a customer may contact their Gaining Provider first before speaking to their current provider[22]. In addition, other deviations from the "happy path" such as problems in the processes are not included in the costs.

3) *Costs are based on a static view of the industry.* We have not taken into account any changes in the market with regards to switching rates, mix of channels to market, number of providers, or other industry trends e.g. increasing prevalence of bundling[23].

Estimating CP Costs

5.6. In order to estimate costs using the Independent Cost Methodology, CSMG assessed the likely material system and process changes for a CP, and estimated the incremental costs compared to today's switching processes. CSMG conducted this analysis by breaking down the systems and processes impacted based on TM Forum's eTOM and TAM frameworks. Having done this, CSMG:

1) Estimated the development time and infrastructure costs required to set-up the various system changes under each model.
2) Estimated on-going maintenance costs for these system changes.
3) Estimated the cost of necessary training and documentation of new processes.
4) Estimated the increased personnel cost resulting from changes in processes.

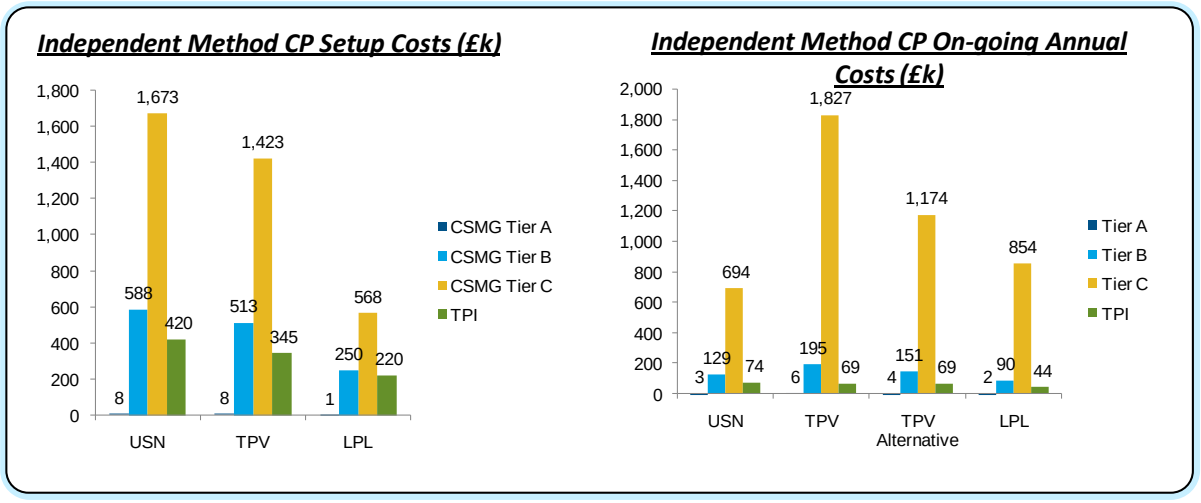
5.7. CSMG used this methodology to estimate the set-up and on-going costs for a set of hypothetical operators. These hypothetical operators corresponded to the same segmentation approach used in the analysis of CP responses (e.g. Tier A, Tier B, Tier C).

5.8. Below we have provided the average per CP costs for each Tier as well as the estimated cost per TPI used in our Independent assessment. Note that the on-going cost of TPV fees has been included in the estimates below.

5.9. Setup costs for the alternative TPV have not been included in the following graphs as these are identical to the original TPV model (only on-going costs are different between the two TPV models).

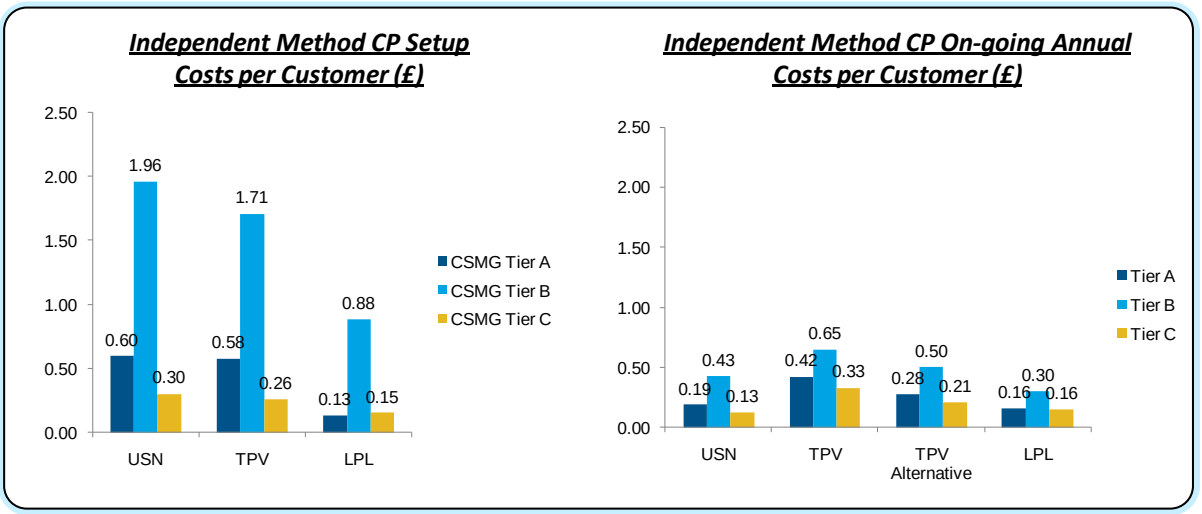
[22] However, the incremental cost of such a scenario is evaluated in the Scenarios section 5.23.
[23] If the trend towards bundling were to be taken into account in the model, this would increase the cost of the LPL model relative to the GPL models. This is because, in the LPL model, a customer needs to call each of their providers in order to assemble a bundle, and therefore a greater amount of customer service representative time would be required to perform the switch.

Figure 24: Independent Methodology per CP Outputs for Tier A to Tier C CPs (Hypothetical Operators) and TPI



5.10. The figure below shows this information on a per customer basis for each Tier and for each model. The costs for Tier C providers on a per customer basis are lowest, as fixed system and process costs are spread amongst a much larger number of customers. The cost to Tier A CPs is lower than for Tier B CPs, as the implementation costs for Tier A CPs' relatively simple systems are borne by TPIs, who are able to leverage economies of scale in systems development. We have apportioned the cost of TPIs to the Tier A segment in the graph below (although in reality some of this cost would be shared with Tier B). TPI costs are shown in the previous graph. It is important to note that no margin assumption was included in the TPI costs; the actual costs borne by CPs for this implementation may therefore be higher.

Figure 25: Independent Methodology per CP Per Customer Outputs (Hypothetical Operators)



5.11. A further breakdown of the individual cost components (using the eTOM/TAM framework) for each of these models can be found in Section 9 - Annex 2.

Calculating the Total Industry Costs Using Independent Estimates

5.12. Using Ofcom industry data, CSMG estimated the number of CPs in each of the Tier groups and multiplied the cost for each of these hypothetical operators by the relevant amount to estimate a total cost for all retail CPs in industry.

5.13. Central Costs were estimated using the same methodology established and described in the Industry Cost Methodology section (Section 4).

5.14. For wholesale and access provider costs, CSMG estimated industry costs and validated these with responses from wholesale and access providers.

5.15. CSMG also conducted a sensitivity analysis of the inputs in the Independent Cost Methodology, making assumptions around low, medium and high cost assumptions for each of the individual cost drivers. CSMG calculated the outputs for a range of sensitivities for key cost input drivers such as developer day-rates, cost per Customer Services Representative minute, the fees charged by TPVs, and the operating cost to capital expenditure ratio assumed for system changes. As a result, the Independent Cost Methodology produces a range of low, medium and high total industry costs dependent on these sensitivities.

Results – Independent Cost Methodology

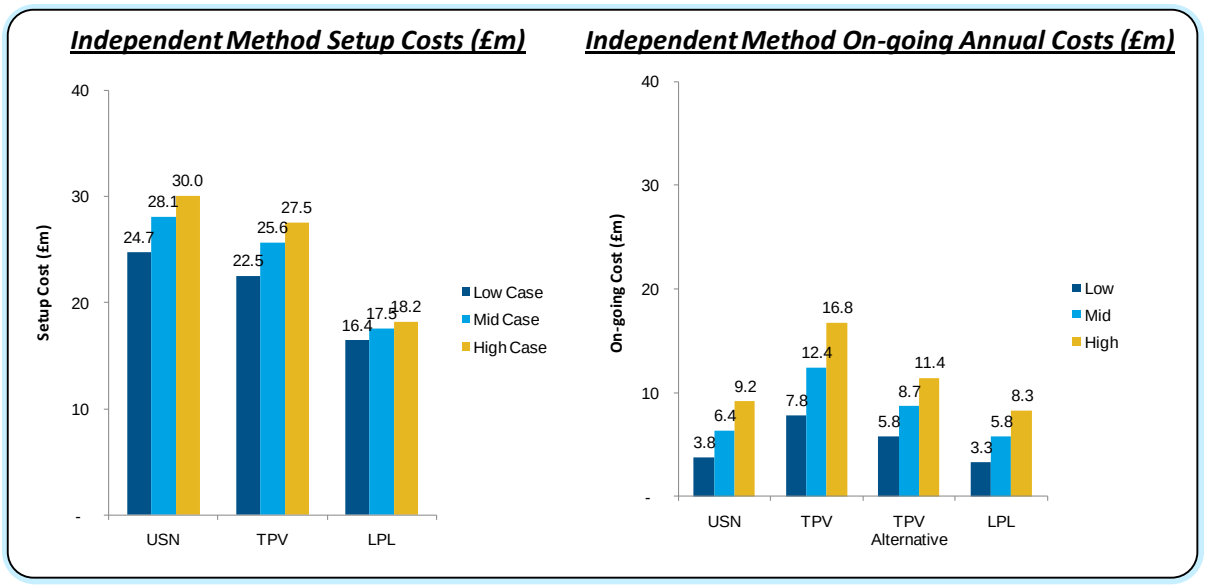
5.16. The Independent Cost Methodology found that, at a total industry cost level, the USN model had the highest setup costs. In the USN model, there is a requirement to construct and maintain a central Hub, as well as develop and support CP interfaces to this Hub on an on-going basis. The USN model also requires significant changes to existing CP systems such as the CRM database and modifications to the billing systems to display the USN on customer bills. These, along with staff training costs for the new process, drive the high setup costs.

5.17. The LPL model had the lowest setup costs due to: lower requirements to change existing systems; lower central costs as there is no Hub in the LPL model, and lower training and process documentation requirements as the process has some parallels with today's MAC process. However, the increased number of losing calls expected leads to an increase in on-going costs for this model (an implied 31% increase in call-centre resources).

5.18. The TPV model setup costs were similar to USN. However, the TPV had significantly higher on-going costs than the other two models. This is primarily the result of three factors. Firstly, we estimate long call-handling times in the original TPV model, as the GP agent needs to stay on the line while the customer has a conversation with the TPV. Secondly, CPs need to pay a fee to a TPV for each in-bound switch. Thirdly, similar to USN, the model requires the construction of Hub interfaces and additional infrastructure which needs to be maintained.

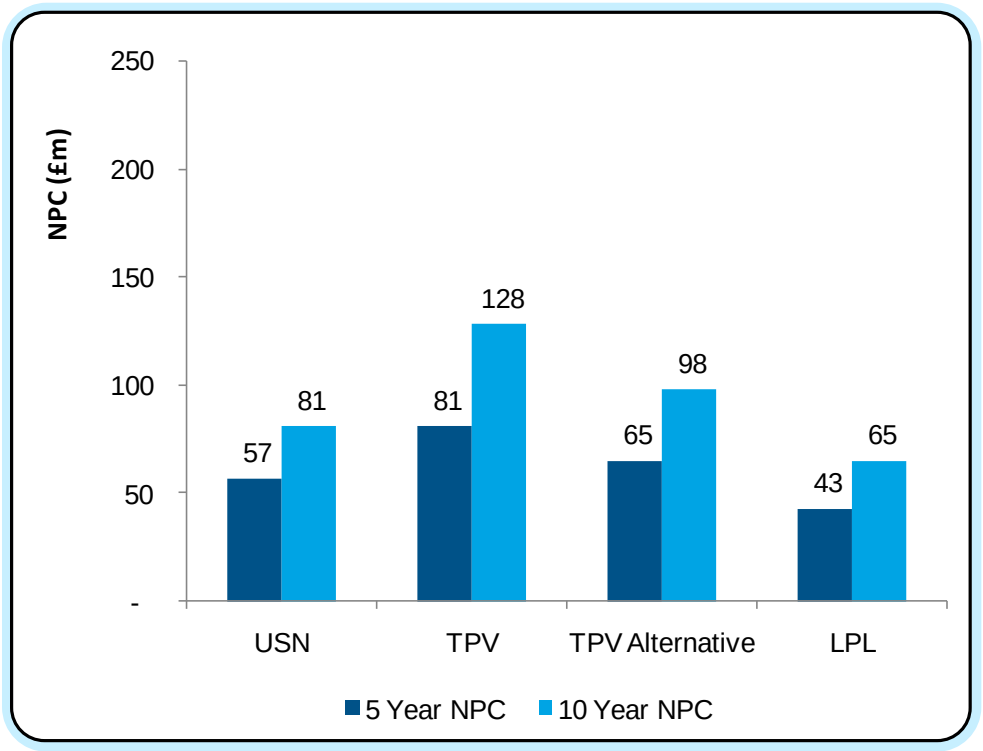
5.19. We also show the alternative TPV model in the graph below. This has lower on-going costs than the original TPV model, as order-handling time is reduced.

Figure 26: Independent Methodology – Total Industry Costs



5.20. Overall, on a Net Present Cost basis over a five year and ten year timeframe, the LPL model's cost was lowest. The original TPV model's cost was highest (more than twice the cost of the LPL model). The alternative TPV model was 23% less expensive than the original, but still had higher costs than the USN and LPL models.

Figure 27: Independent Methodology (Mid Case)–Net Present Cost (£m)



Scenarios

5.21. Using the Independent Cost Methodology, CSMG also analysed two particular scenarios to ascertain the impact on costs. The first scenario analysed the impact on the LPL model costs in the example where a customer journey begins with the customer communicating with the GP, rather than immediately speaking with the LP. The second scenario assessed the extent to which the TPV model is sensitive to the assumptions regarding the fees charged by TPV agencies in the UK.

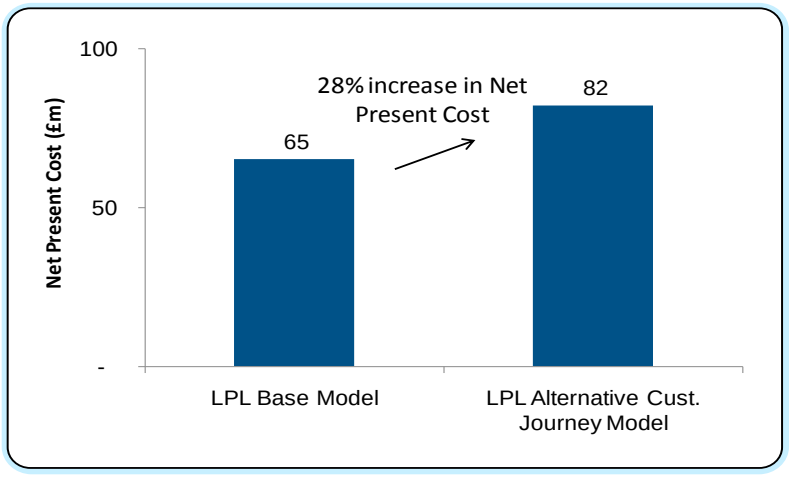
Scenario 1: LPL Alternative Customer Journey

5.22. CSMG evaluated the example of an LPL model where the customer journey begins with the GP rather than the LP. Throughout the costing exercise we have assessed each of the models on the basis of the "happy path". For a LPL model, this is represented by a customer journey where a customer who is looking to switch, contacts their current provider first as they are aware that they require a code from their current provider.

5.23. However, it is possible that consumers using an LPL model contact the GP first e.g. to discuss the service and switching process. Under a scenario where this is the case, it would increase the number of GP calls and call-handling time. This is because a customer would contact the GP first, and then contact the LP to acquire the code, and finally contact the GP again. Ofcom's consumer research[24] found that 28% of consumers who switched their internet service provider claimed to have gone through three stages – contacting the GP, then the LP, then the GP again. CSMG therefore modelled a scenario where 28% of users have an initial contact with the GP before contacting their LP.

5.24. This scenario is modelled below.

Figure 28: LPL Base Model vs. LPL Alternative Customer Journey Model 10-Year Net Present Cost



5.25. The impact of this extra conversation with the GP agent increases the LPL's Net Present Cost significantly. If this scenario is applied to the LPL model, the Net Present Cost of the LPL

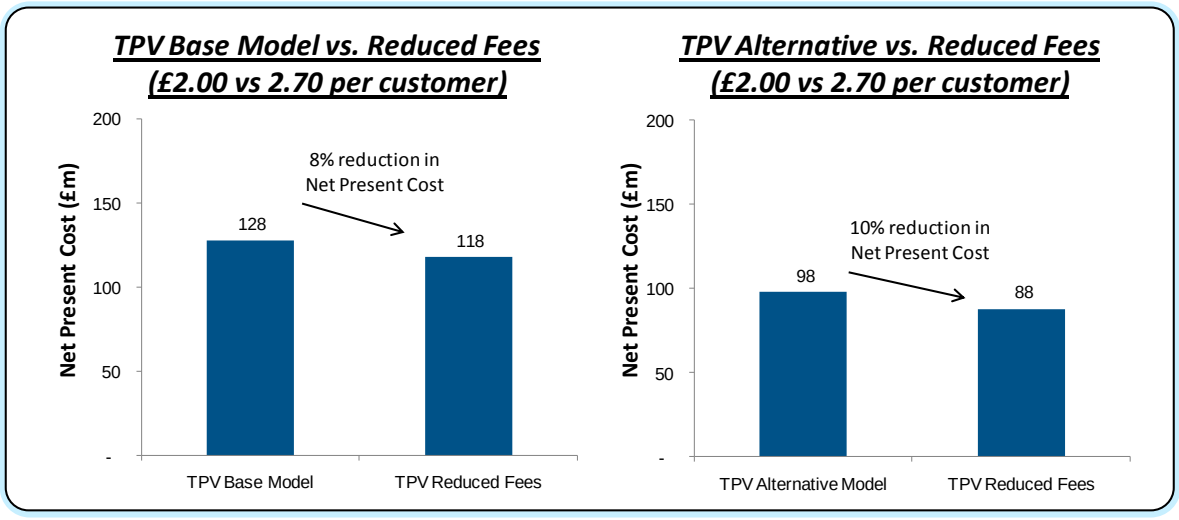
[24] http://stakeholders.ofcom.org.uk/binaries/research/media-literacy/media-lit11/Switching_tables.pdf.

model (over a 10 year time frame) using the independent cost methodology is similar to the USN model (USN: £81m vs. LPL: £82m).

Scenario 2: Sensitivity of TPV fees

5.26. The value of the fees charged by a potential TPV(s) in the UK is a key assumption in the TPV model. For the base case, we have benchmarked the costs to international examples of TPV services. This produced an estimated TPV fee per switch of £2.70. However, estimates provided by CPs regarding in-house TPV costs showed that potential TPV fees could be lower – at around £2.00 per switch. The impact of reducing the TPV fees to £2 has therefore been shown below, resulting in a decrease in the overall TPV costs by 8% on a 10 year Net Present Cost basis. When the same analysis was performed on the Alternative TPV model– the reduction in fees resulted in a 10% reduction in the 10 year NPC.

Figure 29: Reduction in TPV Fees from £2.70 (Base) to £2 – 10-YearNet Present Cost, Original TPV and Alternative TPV Model



6. Overall Results - Comparison of Industry and Independent Cost Methodology

6.1. In this section, we provide a comparison of the outputs of the two different methodologies, across the three original models. As there is no alternative TPV model estimate from industry (CPs were not asked to provide costs for this model), this model has not been included in our comparisons.

Overview

6.2. Before we compare the outputs of the two methods, it is worth noting the relative merits of each. Both approaches have their own strengths and weaknesses in terms of providing a better understanding of actual industry costs and impacts.

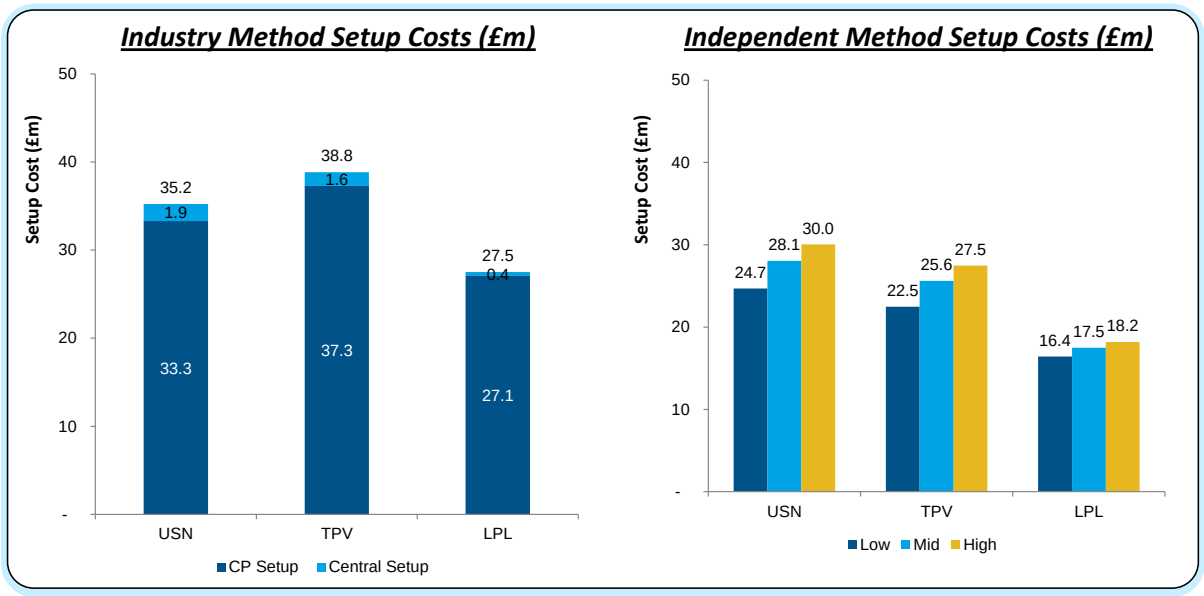
6.3. One of the strengths of the Industry Cost Methodology is that it is based on actual CPs estimates and their understanding of the actual costs to implement the various models. However, the Industry Cost Methodology is weakened by its small sample size, an element of inconsistency in interpretation of costs between CPs, the lack of transparency behind cost drivers, and a lack of comprehensiveness (e.g. no Tier A CPs returned cost-estimates).

6.4. In comparison, the Independent Cost Methodology provides an independent and transparent view of the major system and process changes on CPs, and enables straightforward analysis of the major cost drivers. CSMG's direct experience in supporting the specification of the processes also led to an estimate based on a consistent understanding of the specifications to be costed. However, this method, by its nature, does not capture the individual nuances and impacts for particular CPs.

Comparison of Setup Costs

6.5. In terms of setup costs, the Industry Cost Methodology returned higher costs than the Independent Cost Method across all three switching models. However, under both cost methods, the USN and TPV models were shown to have the highest setup costs, and the LPL model had significantly lower setup costs.

Figure 30: Industry vs. Independent Methodology Setup Cost



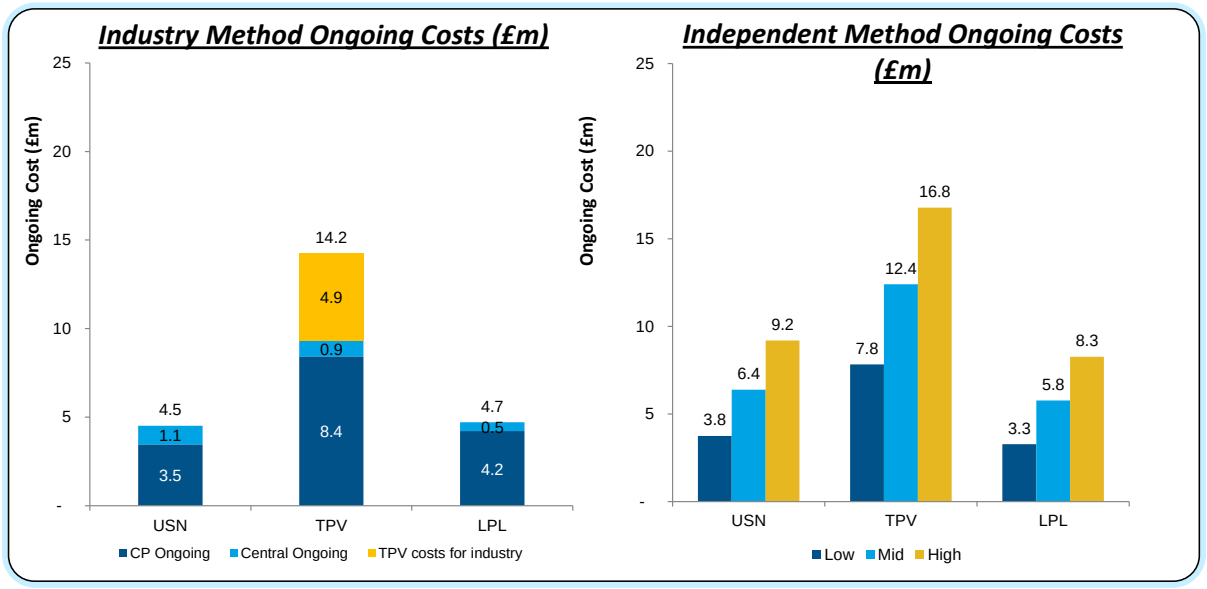
Comparison of On-going Costs

6.6. In terms of on-going costs, the industry method outputs fell within the cost ranges shown by our independent assessment. For TPV, the industry method was higher than the mid-case of the independent method for this model. However, for USN and LPL, the industry method results were lower than the mid-case of the independent cost method.

6.7. One of the major drivers of on-going cost in the independent assessment for USN and LPL model is the cost of incremental call-time. In the USN model, this additional call-time was the result of the customer needing to find their bill to quote their USN. Consumer research by Ofcom suggested that this could increase call-times by up to 5 minutes.[25] In the LPL model, an increase in the number of losing calls, would also drive additional call costs.

6.8. In developing the Industry Method estimates, only one CP specifically referred to these additional costs. If other CPs have not included these incremental call-time costs, this could explain the difference between the industry and independent methods for the USN and LPL models.

Figure 31: Industry vs. Independent Method On-going Costs

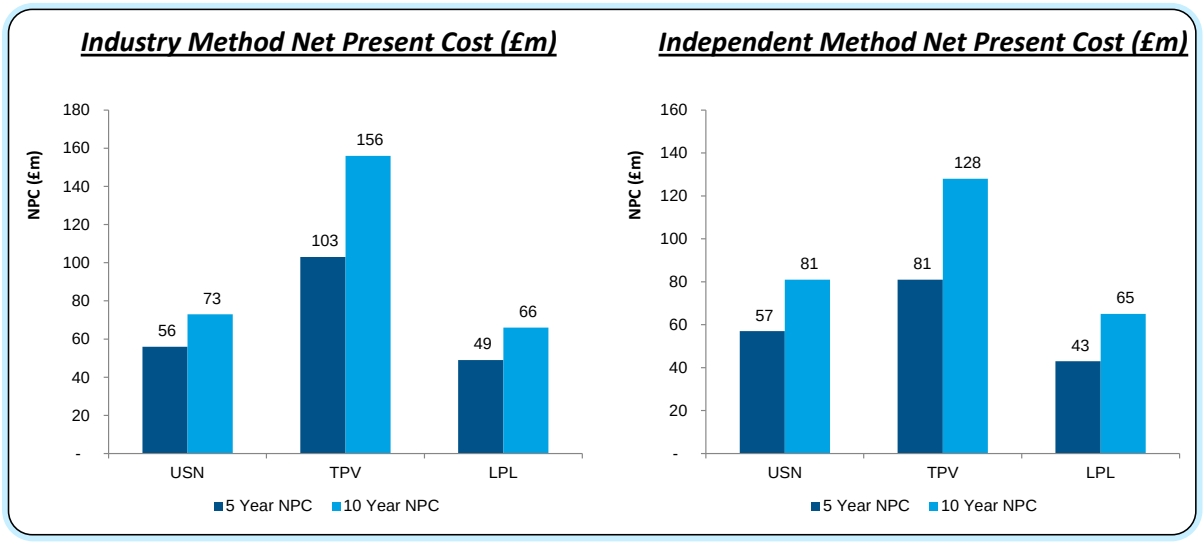


Comparison of Net Present Cost

6.9. When compared on the basis of Net Present Cost, the Independent Cost Methodology produced similar but not identical costs to the Industry Methodology. This is to be expected given the different results for set-up and on-going costs reached by each cost methodology. However, the two are consistent in the relative cost ranking of each model – using both methods, LPL is the least expensive model, with TPV being significantly more expensive than the other two models.

[25] **[OFCOM TO ADD REFERENCE].**

Figure 32: Industry vs. Independent Methodology –Net Present Costs



7. CONCLUSIONS

7.1. It is inherently difficult to estimate the potential costs in transitioning to a new switching process. Despite the level of engagement from industry during the SWG process, there remains insufficient data to accurately represent the costs of every retail provider, wholesale and access provider, and third party integrator within the industry.

7.2. Having said this, the SWG members, Ofcom and CSMG have invested a significant amount of time and effort via the SWG process to collect information and estimate costs. The two cost methodologies (Independent and Industry-based) expressed in this report therefore provide a reasonably robust range of estimates of the potential costs of the proposed switching models based on the information available.

7.3. Comparing the mid-case in the independent method, and the industry method costs, showed that the costs of transitioning over a ten year time-frame may range from £65m to £66m for LPL, between £73m and £81m for USN and £128m to £156m for TPV. The alternative TPV model analysed resulted in an estimated cost of £98m.

Figure 33: 10 Year Net Present Cost

	USN	TPV	Alternative TPV	LPL
Industry	£73m	£156m	N/A	£66m
Independent	£81m	£128m	£98m	£65m

8. ANNEX 1: ADJUSTMENTS MADE TO CP RESPONSES

8.1. In working towards a representative total cost model for industry, CSMG made certain adjustments to the responses submitted by individual CPs in order to normalise the range of costs included. A full list of these adjustments is presented below.

Figure 34: List of Adjustments Made to CP Responses

Adjustment	Reason for Adjustment	Model(s) Impacted	No. of CPs Impacted
Removed process setup costs of notifications to customers under USN and TPV models	A separate communications to customers is not viewed as essential to the model	USN,TPV	2 CPs
Removed LPL on-going process costs which were viewed to not be part of the formal switching process (e.g. initial conversation with GP, costs to follow-up with customers who did not return TxCs)	Only the formal parts of the switching process have been accounted for in the costings analysis	LPL	1 CP
Removed cost of changes in billing for TPV model	The TPV model does not require billing changes	TPV	1 CP

8.2. All adjustments made removed costs; no adjustments were made to add costs to responses. This was to maintain a fair representation of CP estimates of costs as much as possible, however it may result in costs being understated for particular models. For example, in the case of the LPL model, some CPs did not include increased order handling costs from the increase in the number of losing calls. This may result in an underestimate of costs for this model.

Impact of Adjustments

8.3. CSMG analysed the impacts of these adjustments on the Net Present Cost of the three models.

USN Model

8.4. Removing the setup cost of notifications decreased the Net Present Cost of the USN model over a ten year time frame by £6m or 8.5% of the unadjusted Net Present Cost.

Figure 35: Impact of Adjustments Made to USN Responses

	10 year Net Present Cost	% Impact
USN Unadjusted	£78m	
Removed notifications	(£5m)	
USN Adjusted	**£73m**	**6%**

TPV Model

8.5. Removing notifications decreased the Net Present Cost of the TPV model over a ten year time frame by £6m or 4% of the unadjusted Net Present Cost.

Figure 36: Impact of Adjustments Made to TPV Responses

	10 year Net Present Cost	% Impact
TPV Unadjusted	£163m	
Removed notifications	(£6m)	
Removed bill change costs	(£0.4m)	
TPV Adjusted	**£156m**	**4%**

LPL Model

8.6. Removing non-formal switching process costs from the LPL model decreased the Net Present Cost of the LPL model over a ten year time frame by £22m or 25% of the unadjusted Net Present Cost. As this is a reduction in the on-going costs, the impact is made more pronounced when viewed over a ten year time frame.

Figure 37: Impact of Adjustments Made to LPL Responses

	10 year Net Present Cost	% Impact
LPL Unadjusted	£88m	
Removed non-formal processes	(£22m)	
LPL Adjusted	**£66m**	**25%**

Comparison of Unadjusted and Adjusted Industry Costs

8.7. For comparison purposes we have illustrated the unadjusted 10 Year Net Present Cost outputs below. As can be seen, adjustments to the USN and TPV model responses made a marginal impact on the overall Net Present Costs produced for the total industry. However, the adjustment made to the LPL model response made a significant impact, reducing the overall Net Present Cost of the model by 25% (from £88m to £66m).

Figure 38: Comparison of Unadjusted vs. Adjusted Net Present Costs over 10-Year Timeframe

	USN	TPV	LPL
Unadjusted	£78m	£163m	£88m
Adjusted	£73m	£156m	£66m
Impact of Adjustment	6%	4%	25%

9. ANNEX 2: INDEPENDENT COST BREAKDOWN

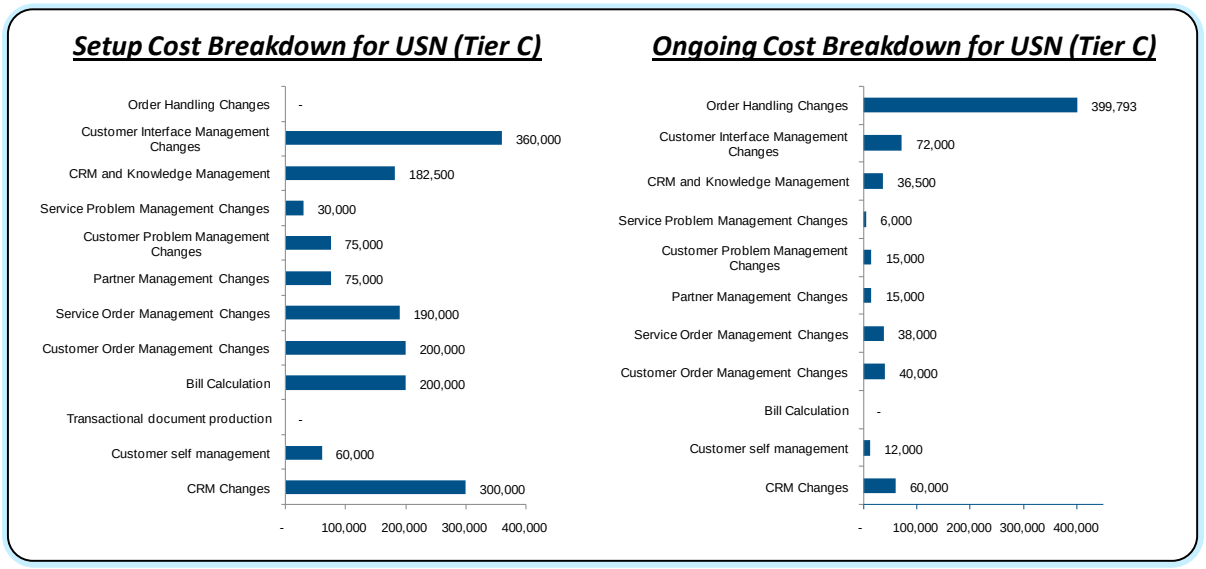
9.1. In this section, a breakdown of CSMG's independent cost estimates for a Tier C CP is provided. Each component of the CP's systems and processes was broken down according to the eTOM and TAM framework. For setup costs, an estimate based on development time, infrastructure costs, and CSR training time was used for each of the switching models. An operating to capital expenditure ratio of 20% was used to estimate the on-going costs to support and maintain new systems and processes. For order handling costs the difference in total order handling time was used to derive the on-going costs.

USN Model

9.2. For the USN model, the scale of Tier C Customer Service operations results in the largest costs appearing in training of CSRs in the new processes (CIM setup costs). Changes to the CRM systems form the second largest setup cost, which includes the requirements to include the USN in the CRM system, followed by customer order management and billing changes.

9.3. In terms of on-going costs, the Order Handling represents the largest cost driver. Ofcom research indicated that consumers are likely to take 5 minutes to find their bill in order to quote their USN. This drives an increase in the order handling changes vs. today's order handling times for telesales.

Figure 39:USN (Tier C) Setup and On-going Cost Breakdown



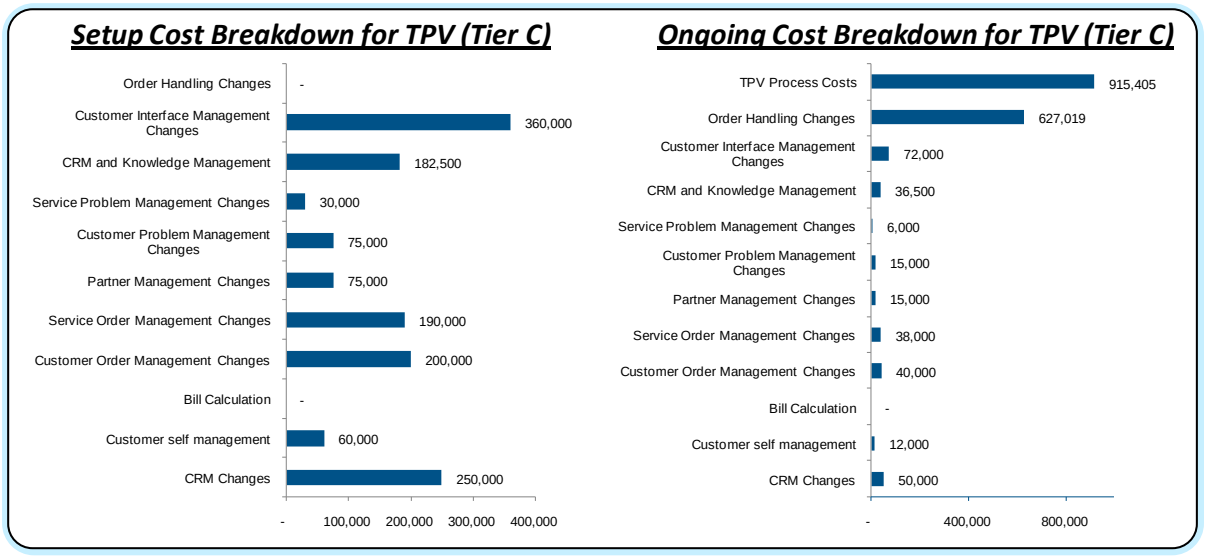
TPV Model

9.4. Capital expenditure costs are similar to the USN model. However, in the TPV model, there are no bill calculation costs, as there are no billing changes required in this model. Also, CRM impacts are lower as there is no requirement to hold the USN in the CRM database.

9.5. Fees payable to the TPV agent are the largest driver of on-going costs. Order-handling time is increased compared to the USN model, as the original TPV process model assumes that the

GP agent will hold while the customer is connected to the TPV and during the TPV conversation with the customer. All other on-going costs are similar to the USN model.

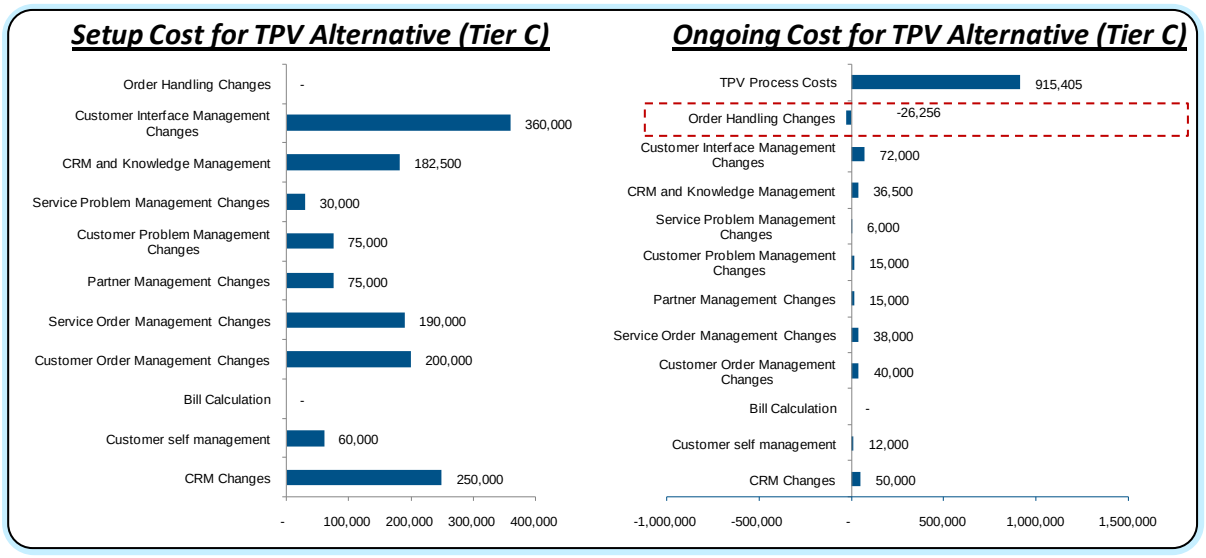
Figure 40:TPV (Tier C) Setup Cost and On-going Cost Breakdown



Alternative TPV Model

9.6. In the Alternative TPV Model, the setup costs are identical to the original TPV model. However, the fact that the CSR does not need to stay on the line during the TPV conversation results in reduced Order Handling costs which now represent a small cost saving in the alternative TPV model. In summary, for the alternative TPV model, there is a large reduction in order handling costs between the original TPV model and this alternative version.

Figure 41:Alternative TPV Model (Tier C) Setup Cost and On-going Cost Breakdown

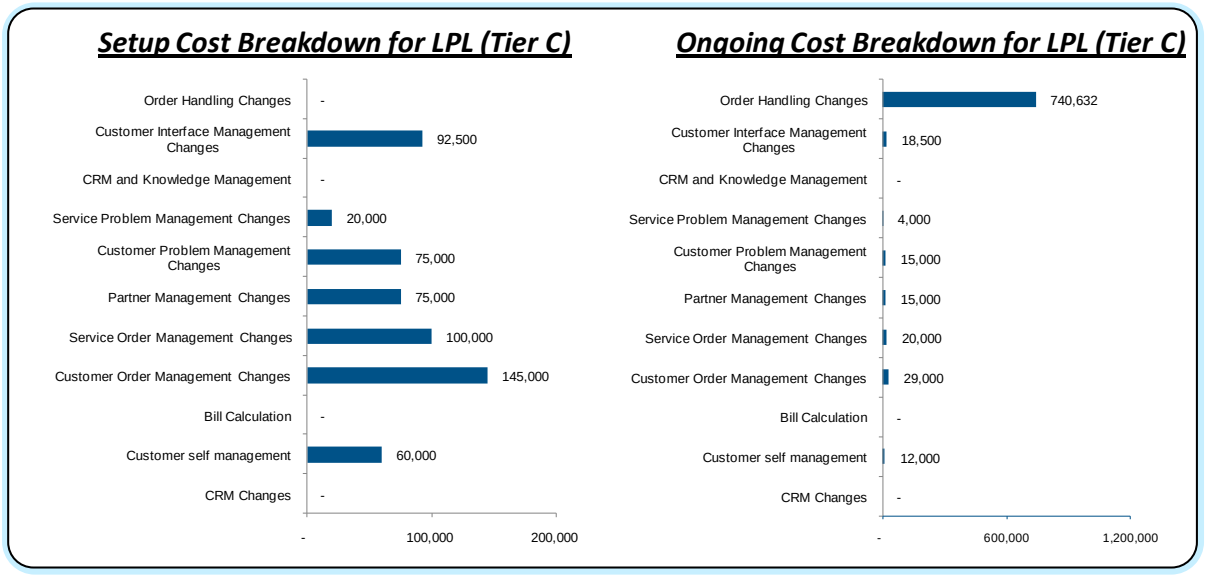


LPL Model

9.7. Customer and Service Order Management are the largest setup costs. These changes enable the setting up of the CP with the TxCIA (for validation and inputting of TxCs) and also the retrieval of TxC's. Training costs for Customer Interface Management is the second largest setup cost for the LPL model, however, the training costs are expected to be substantially less for LPL than for USN and TPV. It is expected that CSRs will already be familiar with the current MAC process which is similar to the proposed LPL model, and therefore training requirements will be lessened. However there will still be requirements to train staff regarding new features of the model such as restrictions on save activity, call recording and real-time provision of the TxC.

9.8. Order Handling costs are the largest incremental on-going cost as under an LPL model CPs would need to field an increased number of losing calls. When considering the LPL process, we have assumed that the customer calls the LP first. The costs would be significantly higher if the customer contacted the GP first (See Section 5 -Scenarios).

Figure 42: LPL (Tier C) Setup Cost and On-going Cost Breakdown



10. ANNEX 3: ASSUMPTIONS TABLES

Market Size Assumptions

	Assumption	Source
Fixed Line OR residential customers	19.4m[26]	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	✂	*CSMG estimate*
# of Access Providers	✂	*CSMG estimate*

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

General CP Sensitivities (For Independent Method and Central Costs)[27]

Sensitivities	Low	Mid	High
Day-rate for developer	£400	£500	£550
Training per CSA day	£400	£500	£550
FTE Cost per year	£40,000	£60,000	£70,000
Opex to Capex ratio	15%	20%	25%
Cost per CSA minute	£0.20	£0.36	£0.52
TPV fee per call	£2.00	£2.70	£3.30
TPV fee for online	£0.25	£0.50	£0.75
TPV fee for customer cancel	£0.54	£1.08	£1.62
% of switches through customer cancel	5%	7%	10%

Market Channel Assumptions (For Independent Method Costs)[28]

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

[27] Based on CSMG estimates. High cases and low cases represent reasonable assumptions given range of industry benchmarks.
[28] Based on weighted average of sample of CP responses.

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[29]	7.2%	7.2%	7.2%

Process Assumptions[30]

	USN			TPV			LPL		
	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C
# of CSAs to be trained*	5	100	350	5	100	350	5	100	350
# of training days for CRM	1	1	1	1	1	1	0	0	0
# of training days for CIM	2	2	2	2	2	2	1	1	1
# of process documentation days for CRM	0	15	15	0	15	15	0	0	0
# of process documentation days for CIM	0	20	20	0	20	20	0	10	10
Gaining call handling time (mins)	18	18	18	20	20	20	12	12	12
Losing call handling time (mins)	0	0	0	0	0	0	9	9	9

*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. % 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).
[30] CSMG estimates

System Assumptions[31]

	USN			TPV			LPL		
	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C
# of days for delivery of CRM system changes	0	200	500	0	150	400	0	0	0
Additional hardware required for CRM changes (£)	0	20k	50k	0	20k	50k	0	0	0
Additional hardware required for Billing changes (£)	0	50k	200k	0	0	0	0	0	0
Days for delivery of COM system changes	0	160	300	0	160	300	0	100	150
Additional hardware required for COM (£)	0	20k	50k	0	20k	50k	0	40k	70k
Days for delivery of SOM system changes	0	60	300	0	60	300	0	30	120
Additional hardware required for SOM (£)	0	10k	40k	0	10k	40k	0	10k	40k
Days for delivery of Partner Management system changes	0	70	150	0	70	150	0	70	150
Additional hardware required for Partner Management (£)	0	0	0	0	0	0	0	0	0
Days for delivery of CPM system changes	0	70	150	0	70	150	0	70	150
Additional hardware required for CPM (£)	0	0	0	0	0	0	11	11	11
Days for delivery of SPM system changes	0	20	60	0	20	60	0	10	40
Additional hardware required for SPM (£)	0	0	0	0	0	0	0	0	0
Days for delivery of Customer Self Mgt system changes	0	60	120	0	60	120	0	60	120
Additional hardware required for Customer Self Mgt (£)	0	0	0	0	0	0	0	0	0

[31] 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.

Central Cost Assumptions and Sensitivities[32]

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

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

11. ANNEX 4: COST TEMPLATE

USN - Technology Costs (impact on system development, new software, platforms etc)

Below are the technology areas (according to Level 1 TAM framework) which we expect to be impacted. Respondents are asked to provide a description of systems and technology cost impacts (both initial setup and on-going costs) and give details of any areas where costs might be avoided. A description of the cost impact and assumptions used to arrive at the estimated cost impact is also required

TAM LEVEL 0	TAM Level 1	Initial Capex (£)	Incremental Opex / Year (£)	Avoided Capex (£)	Avoided Opex / Year (£)	Description of cost impact and assumptions
Market / Sales Domain	Channel Sales Management					Insert detailed description of impact and assumptions here
Customer Management Domain	Customer information management					Insert detailed description of impact and assumptions here
Customer Management Domain	Transactional document production					Insert detailed description of impact and assumptions here
Customer Management Domain	Customer order management					Insert detailed description of impact and assumptions here
Customer Management Domain	Customer self management					Insert detailed description of impact and assumptions here
Customer Management Domain	Customer contact management, retention and loyalty					Insert detailed description of impact and assumptions here
Customer Management Domain	CSR toolbox					Insert detailed description of impact and assumptions here
Customer Management Domain	Bill Calculation					Insert detailed description of impact and assumptions here
Service Management Domain	Service Inventory Management					Insert detailed description of impact and assumptions here
Service Management Domain	Service Order Management					Insert detailed description of impact and assumptions here
Supplier / Partner Domain	Partner Management					Insert detailed description of impact and assumptions here
	Total	0	0	0	0	

USN - Process Costs (Impact on personnel costs etc)

Below are the processes (according to eTOM Level 1 framework) which we expect to be impacted. Respondents are asked to provide a description of impacts on operational/staff resources (both initial and on-going costs) and give details of any areas where costs associated with current processes might be avoided. A description of the cost impact and assumptions used to arrive at the estimated cost impact is also required

eTOM Level 0	eTOM Level 1	Initial Capex (£)	Incremental Opex / Year (£)	Avoided Capex (£)	Avoided Opex / Year (£)	Description of cost impact and assumptions
Strategy Infrastructure and Product	Strategy & Commit					Insert detailed description of impact and assumptions here
Strategy Infrastructure and Product	Infrastructure Lifecycle Management					Insert detailed description of impact and assumptions here
Strategy Infrastructure and Product	Product Lifecycle Management					Insert detailed description of impact and assumptions here
Operations	Operations Support and Readiness					Insert detailed description of impact and assumptions here
Operations	Fulfilment					Insert detailed description of impact and assumptions here
Operations	Assurance					Insert detailed description of impact and assumptions here
Operations	Billing and Revenue Management					Insert detailed description of impact and assumptions here
Enterprise Management	Strategic and Enterprise Planning					Insert detailed description of impact and assumptions here
Enterprise Management	Enterprise Risk Management					Insert detailed description of impact and assumptions here
Enterprise Management	Enterprise Effectiveness Management					Insert detailed description of impact and assumptions here
Enterprise Management	Knowledge & Research Management					Insert detailed description of impact and assumptions here
Enterprise Management	Stakeholder & External Relations Management					Insert detailed description of impact and assumptions here
Enterprise Management	Human Resources Management					Insert detailed description of impact and assumptions here
	Total	0	0	0	0	

USN High Level Assumptions

The following section will be utilised to understand the underlying business assumptions used by operators to arrive at the scale of cost impacts

Please provide the assumptions you used to arrive at your cost estimates:	**Assumption**	**Input Example**	**Comments**
Timescales			
Total time taken to implement changes		in months	
Operator Size			
# of gaining switches / month		*7,000*	
% which are consumer and SME <10 employees		*80%*	
# of new provides / month		*7,000*	
% which are consumer and SME <10 employees		*80%*	
# of losing switches / month		*3,000*	
% which are consumer and SME <10 employees		*80%*	
# of ceases / month		*3,000*	
% which are consumer and SME <10 employees		*80%*	
Size of customer base		*1,000,000*	
% which are consumer and SME <10 employees		*80%*	
Products impacted			
Voice - MPF		*Yes / No*	
Voice - WLR		*Yes / No*	
Voice - CPS		*Yes / No*	
Broadband - MPF		*Yes / No*	
Broadband - SMPF		*Yes / No*	
Broadband - Bitstream		*Yes / No*	
Channel Mix			
% of gaining switches through telesales		*40%*	
% of gaining switches through online		*30%*	
% of gaining switches through door to door		*15%*	
% of gaining switches through retail shop		*15%*	

Additional business information

Please provide any additional relevant information regarding your business that has impacted cost estimates	Insert additional information here

Additional existing systems and processes information

Please provide any additional relevant information regarding your existing processes and systems that has impacted cost estimates (e.g. existing MAC process)	Insert additional information here

Additional supply chain information

Please provide any additional relevant information regarding your supply chain that has impacted cost estimates (e.g. use of Third Party Integrators)	Insert additional information here

USN Breakdown of Costs

In the section below, stakeholders are requested to provide the breakdown of Technology costs, allocating costs depending on where the cost is incurred in the switch process. Stakeholders should refer to the use-case documentation process diagrams where necessary

Breakdown of Technology Cost Impacts	Initial Capex (£)	Incremental Opex / Year (£)	Avoided Capex (£)	Avoided Opex / Year (£)	Description of breakdown assumptions
Front-end					Insert description of breakdown assumptions here
Asset Validation					Insert description of breakdown assumptions here
Back-end processes					Insert description of breakdown assumptions here
Post-sales communications (e.g. letters / ETCs)					Insert description of breakdown assumptions here
Other (e.g. Initial setup on system, new provide, cease)					Insert description of breakdown assumptions here
Total	0	0	0	0	
Checksum	TRUE	TRUE	TRUE	TRUE	

In the section below, stakeholders are requested to provide the breakdown of Process costs, allocating costs depending on where the cost is incurred in the switch process. Stakeholders should refer to the use-case documentation process diagrams where necessary

Breakdown of Process Cost Impacts	Initial Capex (£)	Incremental Opex / Year	Avoided Capex (£)	Avoided Opex / Year	Description of breakdown assumptions
Front-end					Insert description of breakdown assumptions here
Asset Validation					Insert description of breakdown assumptions here
Back-end processes					Insert description of breakdown assumptions here
Post-sales communications (e.g. letters / ETCs)					Insert description of breakdown assumptions here
Other (e.g. Initial setup on system, new provide, cease)					Insert description of breakdown assumptions here
Total	0	0	0	0	

12. ANNEX 5: GLOSSARY OF ABBREVIATIONS

Term or Abbreviation	Description
AP	Access Provider
CIM	Customer Interface Management
CLI	Customer Line Identification
COM	Customer Order Management
CP	Communications Provider
CPM	Customer Problem Management
CRM	Customer Relationship Management
CSR	Customer Service Representative
CCS	Customer Cancel Service
ETC	Early Termination Charges
eTOM	Enhanced Telecoms Operations Map
GP	Gaining Provider
GPL	Gaining Provider Led
LLU	Local Loop Unbundling
LP	Losing Provider
LPL	Losing Provider Led
MAC	Migration Authorisation Code
NoT	Notice of Transfer
SI	Service Implications
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
USN	Unique Service Number
WP	Wholesale Provider

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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