Automatic Compensation

Final Report

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1 Executive Summary

In February 2016, Ofcom set out the need for the communications market to deliver significantly better quality of service for consumers.[1] Ofcom identified automatic compensation for consumers for certain service quality issues as one of a number of actions that it would consider to help to deliver this.

To understand the feasibility and likely cost of introducing automatic compensation, Ofcom asked Cartesian to identify and explain, the likely systems and processes needed to introduce automatic compensation, the likely implementation timescales, and cost to industry of introducing and operating automatic compensation.

Cartesian was asked to assess three service issues that could trigger automatic compensation payments, namely delays in service activation, missed appointments and delayed repair following loss of service.

Cartesian conducted this study by first setting out the current approach to consumer compensation. This research was informed by Cartesian's industry knowledge, discussions with CPs and CP responses to information requests issued by Ofcom. Based on our research, we identified the processes and functionality that CPs currently employ to compensate and provide goodwill payments to consumers in the event of service issues.

Based on the current-state assessment we then developed an initial view of the changes that would be required to introduce automatic compensation. We found that the introduction of automatic compensation would be technically feasible and could be achieved by modification to existing systems and processes.

To assess the likely costs of introducing automatic compensation, we estimated per-CP costs and extrapolated these to an industry total. The per-CP costs include the upfront CAPEX costs associated with the process and system development, and the ongoing OPEX costs. Two OPEX components are considered: fixed OPEX relating to the maintenance and upkeep of the processes and systems; and, variable OPEX which relates to the operational costs of handling compensation events. In the model, variable OPEX is largely driven by the time spent by CSAs on the phone with customers.

The cost assessment indicates that each of the three triggers would cost a similar amount to implement individually. Under base case conditions, the estimated upfront CAPEX cost of a single compensation trigger for Large CPs is in the order of £0.75M and the cost to Medium CPs is around £0.28M. Small CPs in the cost assessment rely on the systems of TPIs and therefore the implementation cost for Small CPs is significantly less, estimated at circa £10k to cover CSA training and updates to customer literature. Extrapolating these individual costs to an industry level gives an estimated upfront CAPEX of £8.3M – £8.6M per trigger condition.

The trigger conditions share several common requirements and hence synergies exist which would be realised if the all three triggers were implemented in parallel. The estimated upfront CAPEX of implementing the three trigger conditions in parallel for a Large CP is £1.3M. At an industry level, the estimated upfront CAPEX cost of implementing all three triggers is £14.4M.

Based on discussions with CPs, we modelled a reduction in the amount of time a CSA requires to process a compensation event under automatic compensation versus the current state. We estimate that the time saved would be between 2 and 3 minutes per call depending on the trigger condition. We also

[1] Ofcom: "Making communications work for everyone | Initial conclusions from the Strategic Review of Digital Communications", 25 February 2016

assume that there would be less need for supervisor approval of claims within an industry-standard compensation regime.

The reduction in operational effort leads to a net saving in variable OPEX. The scale of the variable OPEX saving varies with CP size and trigger condition as these factors determine the number of relevant compensation events. We estimate the total annual saving in variable OPEX would be £600k at an industry level if all three trigger conditions were introduced.

When assessed over a 10-year period, on a discounted cash flow basis, the annualised cost to industry of introducing the triggers individually ranges from £2.2M to £2.7M. The Delayed Repair trigger has the lowest annualised cost due to the higher estimated saving in variable OPEX, described above. We estimate that the annualised cost to industry of introducing all three triggers in parallel would be £4.0M under base case conditions.

The outputs of the model are sensitive to the estimated development effort and the estimated saving in variable OPEX (driven by reductions in the amount of time CSAs would spend handling claims). A 20% increase in the estimated development cost increases the annualised cost to industry for all three triggers from £4.0M to £4.8M. Likewise, reducing the estimated saving in variable OPEX by 20% increases the annualised cost to industry to £4.1M.

Both the development effort and operational cost savings are based on Cartesian's own assumptions. Whilst Cartesian has sought to validate our assumptions through discussions with CPs, the extent of this was constrained by the available time, resources and information.

2 Introduction

2.1 Context

In February 2016, Ofcom set out the need for the communications market to deliver significantly better quality of service for consumers.[2] Ofcom identified automatic compensation for consumers for certain service quality issues as one of a number of actions that it would consider to help to deliver this.

Currently, the onus usually falls on the consumer to make a complaint and in some cases 'prove' to their provider that they have experienced poor service quality in order to obtain compensation. Automatic compensation would remove the time, effort and cost that can be required on the part of the consumer in order to receive compensation.

Within this wider context, Ofcom has asked Cartesian to identify at a high level, and explain:

- the likely systems and processes needed to introduce automatic compensation;
- the extent to which such functionality exists already and what, if any, changes would be needed;
- an overall map of the steps that would be needed to make automatic compensation happen;
- likely costs; and,
- likely implementation timings.

2.2 Scope

The scope of this assessment comprises automatic compensation for voice and broadband services on fixed networks. For the purposes of this report, fixed broadband services include those delivered using exchange-based DSL, fibre-to-the-cabinet (FTTC), fibre-to-the-premise (FTTP) and hybrid fibre-coax (HFC) networks.

The study considers three service issues that could trigger automatic compensation payments, namely delays in service activation, missed appointments and delayed repair following loss of service. The study considers residential consumer services only.

In this document, service activation of fixed voice and/or broadband services covers new installations, change of service without a change of CP, migrations from one CP to another, and working line takeover for home moves. Service activation includes cases where an engineer appointment is required ("appointed") and cases where no appointment is necessary ("non-appointed").

Loss of service for fixed voice is where the customer is unable to either make outgoing calls or to receive incoming calls, or both; or where the service only allows for one-way speech (i.e. only one party in the call can hear the other person or be heard), and the loss of service requires repair. This may be a unique loss of service (i.e. affect a single customer) or affect multiple customers.

Loss of service for fixed broadband is where the customer is unable to access the internet and the loss of service requires repair. As with fixed voice, the loss of service may affect one or more customers.

The study also considers four payment mechanisms:

1. Bill credit / balance adjustment

[2] Ofcom: "Making communications work for everyone | Initial conclusions from the Strategic Review of Digital Communications", 25 February 2016

2. Bank transfer
3. Cheque payment by post
4. Pre-payment card by post

The study includes a discussion of existing service level agreements (SLAs) and service level guarantees (SLGs) between CPs for wholesale services.[3] However, detail of how these arrangements may need to change in future is beyond the scope of this study.

2.3 Approach

Cartesian followed a three-step approach in its assessment. First, we mapped out the current approach CPs take in paying customer compensation for service issues. We then identified changes that would be required for the CPs to implement automatic compensation. Finally, we estimated the one-off CAPEX and changes to ongoing OPEX at an industry-wide level.

To map out the current approach we started by developing high-level flows of the end-to-end customer journeys for each of the potential trigger events. These were based on initial hypotheses which we sought to validate through primary research with CPs and the Office of the Telecommunications Adjudicator (OTA).

To account for the fact that CPs of different scale (or different levels of infrastructure ownership) may follow different approaches for service issues, the model presents a stylized representation of industry, with CPs segmented into a number of generic types.

For fixed services, we consider two types of large CPs: vertically integrated CPs that have their own access network ("Vertical CP") and CPs that use Openreach access ("Large CP").

Other CPs are segmented into two tiers, which aligns with the approach taken in the 2013 consumer switching model: Small CPs use the billing and operational support systems of a third party integrator (TPI); Medium CPs develop and support their own systems. The impact to TPIs (in terms of systems development costs) are also modelled and are included in the overall costs to industry.

- Fixed Line Services
    - Vertically Integrated CP (Virgin Media, KCOM)
    - Large CP (BT, Sky, TalkTalk)
    - Medium CP (e.g. a CP with its own systems)
    - Small CP (e.g. a CP which uses the systems of a third party integrator)
    - Third Party Integrator (TPI)[4]

For each of the steps in the high-level process flows we then determined the relevant processes and systems. We used the TM Forum frameworks for business processes (eTOM) and applications (TAM) to structure this analysis.[5] The current state assessment is presented in Section 3 of this report.

[3] SLAs are contractual commitments between operators to provide services to an agreed standard, e.g. to repair a fault within a specified period. SLGs specify the level of compensation that is paid if an SLA commitment is breached.
[4] Third party integrators develop and operate support systems for small CPs on a managed service basis
[5] eTOM (Enhanced Telecom Operations Map) and TAM (Telecom Applications Map) are industry-standard frameworks developed by the TM Forum

In the second step of the assessment, we developed hypotheses of the future state business requirements and the gaps versus the current state operations. From the gap analysis, we identified changes that would be required to the business processes and applications identified at the previous stage. The future state definition and gap analysis are presented in Section 4.

To estimate the costs to industry of automatic compensation we developed an Excel model which is described in Section 5. The model takes assumptions regarding the development effort for each of the process and system changes to estimate one-off CAPEX costs for individual CPs. Assumptions regarding changes to business operations (including, for example, time spent by customer service agents (CSAs) on the phone to customers) are used to estimate changes to individual CP's ongoing OPEX costs. The model then extrapolates from the individual CP costs to the total one-off and ongoing costs for industry using assumptions regarding the number of CPs of each type. Finally, the annualised cost of the options is calculated over a 10-year period.

The scope of the cost model is limited to systems and processes within the Operational domain (i.e. Fulfilment, Assurance and Billing & Revenue Management). Specifically, impacts within the Enterprise Management domain have not been modelled, for example in Financial & Asset Management and Enterprise Risk Management. These enterprise-level impacts are discussed separately in the Impact Assessment section.

Cartesian also estimated the likely implementation timescale. The timescale was informed by the effort estimates in the cost assessment and input from CPs.

3 Current State Approach to Compensation

This section of the report documents the current approach to compensation for UK Communications Providers (CPs). These processes have been identified by industry experts within Cartesian and through meetings with CPs during August and September 2016. A list of the CPs which were interviewed is provided in Appendix 1.

Most CPs interviewed stressed that they do not pay compensation as a standard procedure, instead they award a goodwill payment on a case by case basis. From speaking with CPs, we understand that the value of payments can vary depending on the duration and extent of the inconvenience to the customer.

The CPs which we interviewed all used bill credits for monetary compensation. ✂[6] Postal payments were generally viewed as a costly mechanism. Some CPs indicated that they may offer alternatives to monetary payments, for example an additional service free-of-charge for a period of time.

✂[7] ✂[8]

The amount of compensation is determined by the CSA using either an interactive calculator tool or by reference to a matrix setting out criteria and approval limits. CPs generally have an escalation path to authorize higher compensation amounts or to handle exceptional cases. A manual process is followed to action the payment.

In the following sections, we consider the current state for potential triggers that are in scope for automatic compensation. For each of the potential triggers we provide:

- Description of happy path process – A flow-chart describing the happy path process. For the purposes of this report, the "happy path" is one which results in the impacted customer being awarded a compensatory payment. This is not necessarily the most frequent customer path, but is the one that is most relevant for understanding the processes/systems associated with compensation.
- Deviations from the happy path – A table describing the most common potential deviations from the happy path. This is not meant to be exhaustive and other events may also occur in day-to-day operations.
- Relevant processes – A table that lists the processes which are relevant to the particular compensation scenario. Processes are described according to the industry-standard TM Forum eTOM framework.
- Relevant systems – A table that lists the systems which are relevant to the particular compensation scenario. Systems are described according to the industry-standard TM Forum TAM framework.

For each trigger, we consider the process for a vertically integrated CP and also the process for a CP that is consuming network services on a wholesale basis from an upstream supplier. For fixed services, we focus on the specific case of Openreach as the largest wholesale access provider in the market. Conceptually, the process flows between other wholesale providers and retail CPs will be similar to those of the Openreach case, however the systems and precise processes will be specific to that firm.

[6] ✂
[7] ✂
[8] ✂

For example, BT's wholesale unit provides voice and broadband services to over 1400 CPs with a portfolio that includes voice and broadband services.[9] TalkTalk also provides wholesale services to CPs including the Post Office and Telecom Plus.[10] We have not documented these distinct scenarios in the process descriptions although we have considered these costs in the impact assessment.

3.1 Delayed Service Activation

3.1.1 Summary of Current State

Customers are typically provided with an initial estimate from the CP of when the service will be activated. A firm date will be provided to the customer once the CP has scheduled the job which may include arranging a customer site visit (see Section 3.2 on appointments, below).

In the event that the service is not activated on the specified date, CPs will delay the start of billing for the service. The customer may also be offered some form of compensation as a goodwill gesture if they complain.

In the primary research, we learnt that complaint calls for delayed service activation calls tend to be brief, lasting 5 to 10 minutes. We did not find any examples of CPs proactively compensating customers for delayed service activation in the absence of a customer complaint.

3.1.2 Scenario in which a CP is using Openreach access

CPs that are using Openreach access are dependent upon Openreach for service activation. The lead time for Openreach activities will depend on the product ordered (e.g. WLR, MPF, GEA), the status of the line (e.g. whether there is a working service, a stopped/ceased service, or no existing line at the address.

Depending on the specific circumstances, service activation may require a customer site visit (see Section 0 for information on appointments). Even where no site visit is required, Openreach will be responsible for activation activities which may include cabling at the Metallic Distribution Frame (MDF), cabling in the distribution network (e.g. at the street cabinet at distribution points), and remote activation.

In addition to the Openreach activities, the CP will also need to complete its own activation activities to enable the service. In normal circumstances, the CP's own activities can be conducted remotely.[11] These activities include configuration of the CP's network and systems and, in the case of broadband, sending the Residential Gateway (RG)[12] to the customer which is done in advance of the activation date.

CPs using the Openreach access network will need to consider both the time for the Openreach activities and their own activities to determine the activation date. Under normal circumstances, the Openreach activities will have a longer lead time and will therefore determine the earliest activation date.

It is common practice for CPs to provide an estimated service activation date to the customer at point of sale and confirm the date later in the process once the Openreach activation date is known. The preliminary estimate is based on the indication received from Openreach via its availability check,

[9] http://www.btplc.com/Thegroup/Ourcompany/Groupbusinesses/BTWholesale/index.htm accessed 21/10/2016
[10] TalkTalk Telecom Group plc, Annual Report 2016
[11] In exceptional circumstances, a CP may be unable to fulfil a customer order due to insufficient capacity in its own network (e.g. no free MSAN ports). In this case, the CP would need to send an engineer to add more capacity before the order could be fulfilled. Capacity upgrades are normally performed in advance to avoid this situation.
[12] Residential Gateway (a.k.a. router or modem) is the device which interconnects the broadband access connection to the customer's home network.

adjusted where necessary for the CPs own activities as described above. In the case of Working Line Transfers and Migrate orders, this will be the mandatory 10 working day lead time.

For other orders the CP will offer the customer the first available date (FAD) or accept a later date from the customer if the FAD is not acceptable. The Customer Required Date (CRD) is submitted by the CP in its order to Openreach.

Openreach communicates information regarding the status of orders to CPs using a sequence of KCI (Keep Customer Informed) messages. When Openreach first receives an order, it acknowledges receipt with a KCI1 message. Openreach later confirms the Customer Committed Date (CCD) of the order and any appointment date in a KCI2 message. The KCI2 message usually arrives within 24 hours of order placement for addresses that can be matched to Openreach and/or Post Office databases, but may take up to 48 hours in some cases.

CPs confirm the service activation date to the customer once the KCI2 is received.

For addresses which cannot be matched, a survey may be required before a CCD can be generated. This scenario usually relates to new build properties where it determines further work is required to connect the property to Openreach's network. It may also occur in situations where customers are waiting for a new fibre cabinet to be supplied.

Orders requiring complex planning or provisioning are put into a *planning delay state* by Openreach. In this scenario Openreach indicates an updated preliminary go-live date rather than confirmed date for these orders. CPs must then manage the customer through the (longer) service delivery process. Once Openreach is able to provide a CCD this is sent to the CP in a KCI2 message and the CP can update the customer.

Openreach uses KCI messages to update the CP during the activation process: KCI2 messages are used to provide updates whilst the activation activities are in progress; a KCI3 message indicates that Openreach considers that the order has been successfully completed. Should Openreach encounter a problem which prevents them from completing the work as planned (e.g. they find a fault or discover new planning issues), then Openreach should notify the CP of the issue; however, CPs may be informed of a delay by receipt of a generic delay code. Openreach has an improvement programme to address this issue.[13]

Some KCI messages are dependent on Openreach engineers updating the job records. We understand from the OTA that the engineers have largely moved to using smart phones to update job status, so these are now near real-time.

KCI messages are communicated via the B2B Gateway or Openreach Portal depending on the access product: for MPF and GEA, CPs can use either the gateway or portal (most CPs use the B2B Gateway for MPF); for WLR, there is no portal and CPs must either interface directly with the B2B Gateway or go via a third-party firm (Third Party Integrator, "TPI").

In the event that Openreach misses a committed activation date, Openreach notifies the CP via a KCI2 message. The KCI2 message contains information regarding the reason for the delay. The absence of a KCI3 message also indicates that the job has not been completed.

[13] BT Response to Ofcom Request for Information: Automatic Compensation (Annex 4, Question 1.b)

Depending on the Openreach access product, CPs may have further indications of whether a service has been activated or not:

- For WLR, Openreach provides diagnostic tools that can test if the customer's line is in service.
- For MPF and SMPF, CPs may be able to detect whether or not the DSL connection between their MSAN and the customer's RG has synchronised. Note that this is only possible if the customer has connected and powered-up their RG.
- For GEA, CPs do not have visibility of the connection status at the Openreach MSAN, however they should have visibility of the RG if the connection is successful. Visibility of the customer RG requires an end-to-end IP connection between the CP's own network and the RG.

As indicated above, goodwill payments are currently made by CPs to customers that proactively complain about delays in service activation. These payments are at the discretion of CPs. In assessing whether to compensate a customer, CSAs will check whether the activation date has been missed and, if so, the reason for this.

Openreach makes SLG payments to CPs for delayed service activation where it is at fault. Openreach itemises SLG payments as credits on its invoices to CPs. Openreach invoices monthly, so there will be a lag between the delay occurring and the SLG payment.

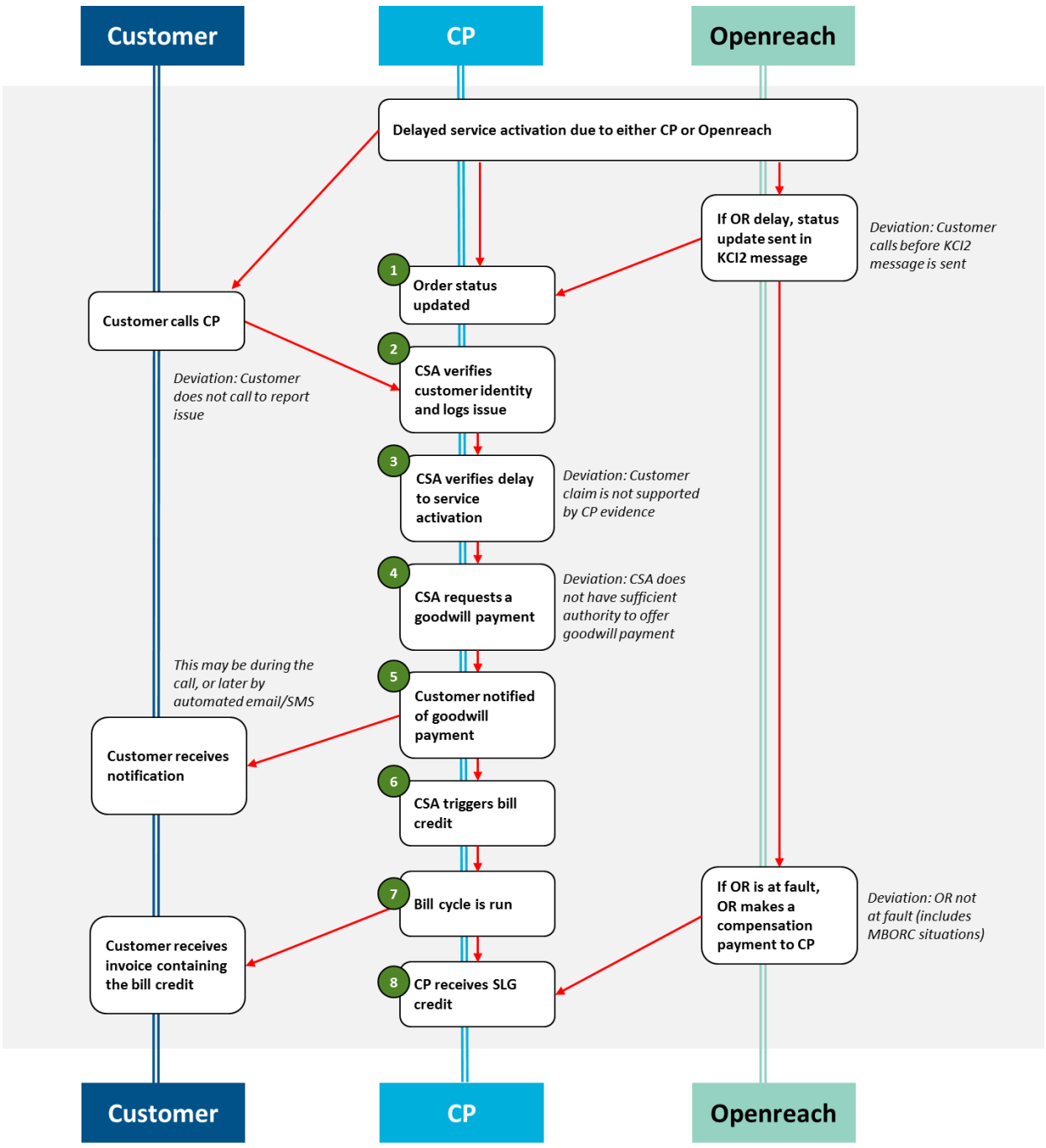
It is typical for a CP to review the SLG items. If the CP believes any owed payments are missing, then it will raise a query with Openreach. Anecdotal evidence indicates that these investigations can be lengthy and it may take two or three billing cycles to reconcile the invoices (i.e. 60 or 90 days).

The Openreach SLGs do not apply in areas where there is a current MBORC declaration.[14] CPs are made aware of MBORC declarations in real-time by email.

[14] MBORC (Matters Beyond Our Reasonable Control) is a contractual provision contained in all Openreach contracts which releases Openreach from liability under the relevant product terms and conditions in circumstances where the cause of the incident is beyond Openreach's reasonable control, and the fix to remedy within contractual timescales is also beyond Openreach's reasonable control.

3.1.2.1 Description of happy path process

Figure 1. Happy Path Process: Delayed Service Activation, Openreach Access (Current State)



Notes

2.	CSA confirms customer identity and logs the issue	Customer may call whilst waiting for the service to be activated, or after late service activation
7.	Bill cycle is run	Customer will receive credit on their next invoice
8.	CP receives an SLG credit from OR	This may be 30 or 60 days after the service activation delay

3.1.2.2 Deviations from Happy Path

Figure 2. Deviations from Happy Path: Delayed Service Activation, Openreach Access (Current State)

Step	Description	Consequences
1A	Customer calls before the KCI2 message is sent from OR to the CP	• CSA would not have visibility of OR delay. CSA may be able to determine service activation had not occurred by absence of KCI3 message. Else CSA would need to follow up on complaint later.
2A	Customer does not report a service activation delay	• Customer complaint is not registered and no compensation is received • Process terminates
3A	Service activation delay is not supported by CP evidence	• Customer does not receive compensation • Customer notified of outcome • Process terminates

4A	CSA does not have sufficient authority to grant goodwill payment	• Goodwill request escalated by CSA to manager
		• If manager approves request:
		  ○ Process continues as normal
		• If manager *does not* approve request:
		  ○ Customer does not receive goodwill payment
		  ○ Customer notified of outcome
		  ○ Process terminates

8A	OR is not at fault (includes MBORC situations)	• OR does not pay SLG credit to CP

3.1.2.3 Relevant Processes

Figure 3. Relevant Processes: Delayed Service Activation, Openreach Access (Current State)

Step	Description	eTOM L0 Process	eTOM L1 Process	eTOM L2 Process
1	Order status updated	Fulfilment	Order Handling	Track & Manage Customer Order Handling
2	CSA confirms customer identity and logs the issue	Fulfilment	Customer Interface Management	Manage Contact
3	CSA verifies delay to service activation	Fulfilment	Order Handling	Track and Manage Customer Order Handling
		Fulfilment	S/P Interface Management	Manage S/P Requests
		Assurance	Customer QoS/SLA Management	Manage QoS/SLA violation
4	CSA requests goodwill payment	Fulfilment	Order Handling	Authorize Credit
4A	Goodwill approved by authorizing manager	Fulfilment	Order Handling	Authorize Credit

5	Customer notified of goodwill payment	Fulfilment	Customer Interface Management	Manage Contact
6	CSA triggers bill credit	Billing & Revenue Management	Bill Invoice Management	Apply Pricing, Discounting, Adjustments and Rebates
7	Run bill cycle	Billing & Revenue Management	Bill Payments and Receivables Management	Manage Customer Billing
		Billing & Revenue Management	Bill Invoice Management	Produce & Distribute Bill
8	CP receives an SLG credit from OR	Billing Revenue & Management	S/P Settlements and Payment Management	Receive & Assess Invoice

3.1.2.4 Relevant Systems

Figure 4. Relevant Systems: Delayed Service Activation, Openreach Access (Current State)

Step	Description	TAM L1 System	TAM L2 System
1	Order status updated	Fulfilment	Customer Order Management
2	CSA confirms customer identity and logs the issue	Fulfilment	Customer Service Representative Toolbox
3	CSA verifies delay to service activation	Fulfilment	Customer Order Management
		Fulfilment	S/P Order Management
		Assurance	Customer SLA Management
4	CSA requests goodwill payment	Fulfilment	Customer Service Representative Toolbox
4A	Goodwill approved by authorizing manager	Fulfilment	Customer Service Representative Toolbox
5	Customer notified of goodwill payment	Fulfilment	Customer Service Representative Toolbox
6	CSA triggers bill credit	Billing & Revenue Management	Billing Inquiry Dispute & Adjustment Management
7	Run bill cycle	Billing & Revenue Management	Bill Calculation
		Billing & Revenue Management	Bill Format & Render
8	CP receives an SLG credit from OR	Billing & Revenue Management	Wholesale Billing

3.1.3 Scenario in which a CP is using its own access network (i.e. non Openreach)

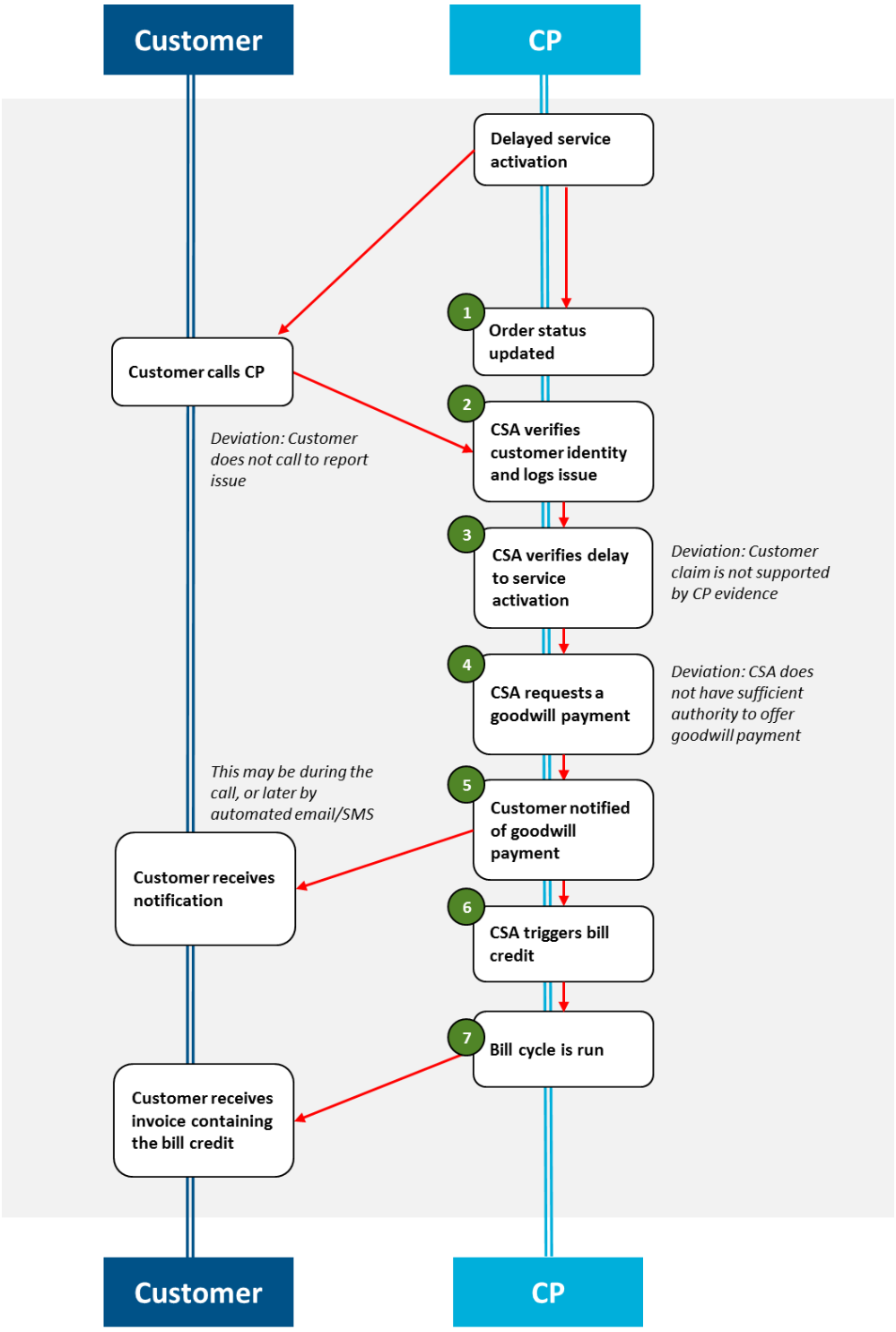
CPs which are using their own access network are able to schedule service activations based on their own lead times with no dependency on Openreach. This case would apply to Virgin Media, KCOM and other alternative access network operators.

In the event that a service activation date was missed, a CP would be able to verify this against its own order handling and network management systems.

For Virgin Media, customers are offered an activation date which depends on the complexity of the activities. ✂[15] ✂[16]

3.1.3.1 Description of happy path process

Figure 5. Happy Path Process: Delayed Service Activation, CP Access Network (Current State)



[15] ✂
[16] ✂

Notes

2.	CSA confirms customer identity and logs the issue	Customer may call whilst waiting for the service to be activated, or after late service activation
7.	Bill cycle is run	Customer will receive credit on their next invoice

3.1.3.2 Deviations from Happy Path

Figure 6. Deviations from Happy Path: Delayed Service Activation, CP Access Network (Current State)

Step	Description	Consequences
A2	Customer does not report a service activation delay	• Complaint is not registered and no compensation is received • Process terminates
A3	Service activation delay is not supported by CP evidence	• Customer does not receive compensation • Customer notified of outcome • Process terminates

A4	CSA does not have sufficient authority to grant goodwill payment	• Goodwill request escalated by CSA to manager
		• If manager approves request:
		  ○ Process continues as normal
		• If manager *does not* approve request:
		  ○ Customer does not receive goodwill payment
		  ○ Customer notified of outcome
		  ○ Process terminates

3.1.3.3 Relevant Processes

Figure 7. Relevant Processes: Delayed Service Activation, CP Access Network (Current State)

Step	Description	eTOM L0 Process	eTOM L1 Process	eTOM L2 Process
1	Order status updated	Fulfilment	Order Handling	Track & Manage Customer Order Handling
2	CSA confirms customer identity and logs the issue	Fulfilment	Customer Interface Management	Manage Contact
3	CSA verifies delay to service activation	Fulfilment	Order Handling	Track and Manage Customer Order Handling
		Assurance	Assurance	Customer QoS/SLA Management
4	CSA requests goodwill payment	Fulfilment	Order Handling	Authorize Credit
4A	Goodwill approved by authorizing manager	Fulfilment	Order Handling	Authorize Credit
5	Customer notified of goodwill payment	Fulfilment	Customer Interface Management	Manage Contact

6	CSA triggers bill credit	Billing & Revenue Management	Bill Invoice Management	Apply Pricing, Discounting, Adjustments and Rebates
7	Run bill cycle	Billing & Revenue Management	Bill Payments and Receivables Management	Manage Customer Billing
		Billing & Revenue Management	Bill Invoice Management	Produce & Distribute Bill

3.1.3.4 Relevant Systems

Figure 8. Relevant Systems: Delayed Service Activation, CP Access Network (Current State)

Step	Description	TAM L1 System	TAM L2 System
1	Order status updated	Fulfilment	Customer Order Management
2	CSA confirms customer identity and logs the issue	Fulfilment	Customer Service Representative Toolbox
3	CSA verifies delay to service activation	Fulfilment	Customer Order Management
		Assurance	Customer SLA Management
4	CSA requests goodwill payment	Fulfilment	Customer Service Representative Toolbox
4A	Goodwill approved by authorizing manager	Fulfilment	Customer Service Representative Toolbox
5	Customer notified of goodwill payment	Fulfilment	Customer Service Representative Toolbox
6	CSA triggers bill credit	Billing & Revenue Management	Billing Inquiry Dispute & Adjustment Management
7	Run bill cycle	Billing & Revenue Management	Bill Calculation
		Billing & Revenue Management	Bill Format & Render

3.2 Missed Appointment

3.2.1 Summary of Current State

CPs supplying fixed voice and broadband services may arrange customer appointments for either installation of new services or troubleshooting and repair of existing services. Compensation for missed appointments can occur in either case and this section is agnostic to the purpose of the appointment.

Compensation for missed appointments is a customer-initiated process for all CPs that we have spoken to. Most of these CPs offer goodwill payments of compensation for customers that phone their call centres and complain about missed appointments where the CP (or its supplier) was at fault. ✂[17]

We understand from discussions with CPs that missed appointments are often due to the field engineer being unable to access the property, i.e. the field engineer arrived on time but was unable to proceed

[17] ✂

due to lack of access. The most common cause of denied access is where the customer is not at home at the time of the appointment. Other, less frequent causes of denied access include areas of a property being locked by the landlord (and the customer does not have a key) or a house found occupied by an unaccompanied minor. In these cases, the CP would not consider itself at fault and therefore would not make a compensatory payment.

Other causes of missed appointment (on the CP side) include the engineer being unavailable due to sickness, new planning activities being discovered on site, encountering a fault, or engineer reaching the end of their working day.

Most CPs use Openreach engineers to resource appointments, with the exception of KCOM and Virgin Media which have their own field staff. This is because only Openreach engineers are permitted to work on the Openreach access network.

Additionally, some CPs which use Openreach engineers also have an independent field services capability. This is typically used for additional services, such as installation of IPTV. In some cases, the independent field resources may be engaged for fault diagnostics at the customer site.

In the event of a missed appointment, CPs will seek to contact the customer to rearrange for another time; however, the customer may call in before the CP has made contact. On TalkTalk's Help Pages they say the customer should contact them if their installations or Openreach engineer misses the appointment, whereas if a TalkTalk engineer misses one the customer should simply reschedule the appointment at the end of the day online.

We assume that, where there is a discussion regarding compensation, that this would normally occur during the same call as the appointment is rearranged. We assume the compensation-specific aspects of the call would take approximately 5 minutes.

3.2.2 Scenario in which a CP is using Openreach field staff

CPs requiring Openreach appointed installation, or repair, book the appointments through Openreach's B2B gateway or portal. In the case of installations, Openreach's systems indicate upfront that a customer site visit is required. For repairs, the results of Openreach diagnostic line tests will flag if a site visit is recommended.

CPs then communicate the confirmed appointment time to the customer. This is usually within 24 hours and may be verbally, via email and/or post. If it subsequently becomes necessary to change the agreed date, CPs will use a variety of channels to reach the customer including telephone, email and SMS.

As described above in Section 3.1 (Delayed Service Activation), Openreach uses KCI messages to update CPs on the status of service activation. The KCI messages are also used for repairs. A successful activation/repair will lead to a KCI3 message which implies that the associated appointment was completed.

In the event that an appointment is missed, a CP will receive a KCI2 message providing a status update identified as either "Openreach missed" or "customer missed". Openreach engineer's also take a time-stamped photograph of the customer's front door in cases where there is no one is at home. The message from Openreach should be sent to the CP immediately following the appointment slot. However, this is not always the case as Openreach may attempt to contact the customer directly on the day to reschedule and arrange a suitable alternative (see below).

✂[18] ✂[19] ✂[20]

To reduce the incidence of failed appointments, CPs are able to provide a customer contact telephone number to Openreach which the field engineer can use to contact the customer on the day. This allows for appointments to be rescheduled within the same day by mutual agreement between the customer and the Openreach engineer. Openreach will attempt to contact the customer three times before referring back to CPs to inform them and contact the customer to rearrange. We understand that almost all CPs have opted into this scheme.

CPs receive weekly reports on missed appointments from Openreach. The reports distinguish between appointments missed by Openreach and those where the Openreach engineer attended the customer's property, but was unable to proceed with the appointment (i.e. unable to gain access).

✂[21] ✂[22, 23]

In cases where Openreach has breached its SLG with regard to a missed appointment, CPs are entitled to compensation. As described in Section 3.1.2, above, Openreach itemises SLG payments as credits on its monthly invoices to CPs. This creates a lag between the delay occurring and the SLG payment. If the CP believes any owed payments are missing, then it may take two or three billing cycles to reconcile the invoices (i.e. 60 or 90 days).

Openreach also provides CPs with an SLG that the first available date offered for installation appointments will be within 12 days. For larger CPs, this SLG is conditional on providing sufficiently accurate forecasts of service activation volume.

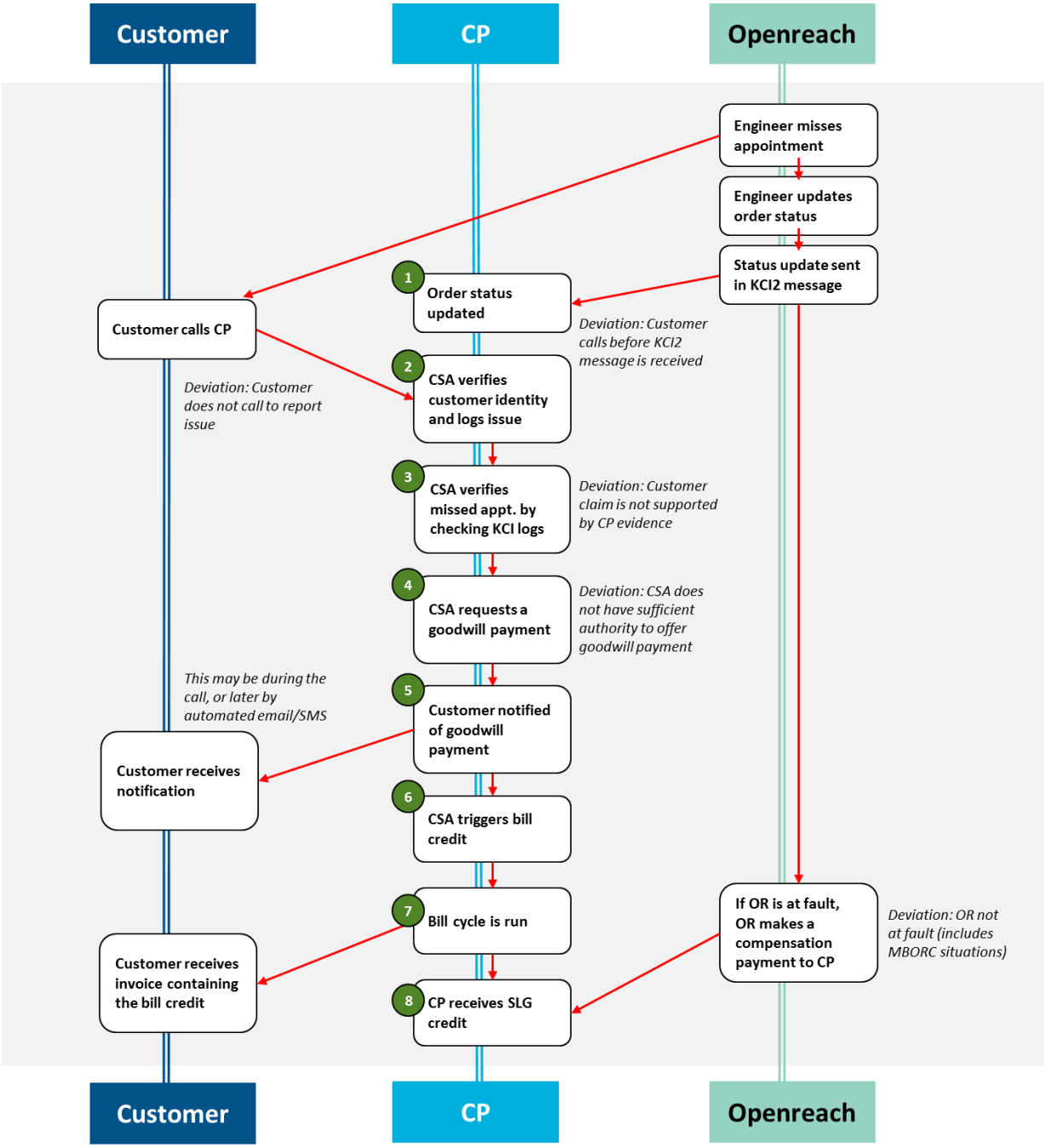
The Openreach SLGs do not apply in areas where there is a current MBORC declaration. CPs are made aware of MBORC declarations in real-time by email.

Some CPs also use independent suppliers for certain field activities such as installation of IPTV and fault diagnostics Conceptually, the process flows for this scenario will be similar to those of the Openreach case, however the systems and precise processes will be specific to that firm. (✂[24]) We have not documented this case as a distinct scenario in the process descriptions although we have considered these costs in the impact assessment.

[18] ✂
[19] ✂
[20] ✂
[21] ✂
[22] ✂
[23] ✂
[24] ✂

3.2.2.1 Description of happy path process

Figure 9. Happy Path Process: Missed Appointment, Openreach Field Staff (Current State)



Notes

1.	Order status updated	This should occur at the time of the appointment; however, records may not be updated until end of the day.
2.	CSA confirms customer identity and logs the issue	Customer may call on the same day or after a missed appointment; CPs generally will proactively contact customer to rearrange.
7.	Bill cycle is run	Customer will receive credit on their next invoice
8.	CP receives an SLG credit from OR	This may be 30 or 60 days after the missed appointment

3.2.2.2 Deviations from Happy Path

Figure 10. Deviations from Happy Path: Missed Appointment, Openreach Field Staff (Current State)

Step	Description	Consequences
1A	Customer calls before the KCI2 message is sent from OR to the CP	• CSA would not have visibility of OR missed appointment. CSA may be able to determine service activation had not occurred by absence of KCI3 message. Else CSA would need to follow up on complaint later.
2A	Customer does not report missed appointment	• Customer complaint is not registered and no compensation is received • Process terminates
3A	Customer claim is not supported by CP evidence	• Customer does not receive compensation • Customer notified of outcome • Process terminates

4A	CSA does not have sufficient authority to grant goodwill payment	• Goodwill request escalated by CSA to manager
		• If manager approves request:
		  ○ Process continues as normal
		• If manager *does not* approve request:
		  ○ Customer does not receive goodwill payment
		  ○ Customer notified of outcome
		  ○ Process terminates

8A	OR is not at fault (includes MBORC situations)	• OR does not pay SLG credit to CP

3.2.2.3 Relevant Processes

Figure 11. Relevant Processes: Missed Appointment, Openreach Access (Current State)

Step	Description	eTOM L0 Process	eTOM L1 Process	eTOM L2 Process
1	Order status updated	Fulfilment	Order Handling	Track & Manage Customer Order Handling
2	CSA confirms customer identity and logs the issue	Fulfilment	Customer Interface Management	Manage Contact
3	CSA verifies missed appointment	Fulfilment	Order Handling	Track and Manage Customer Order Handling
		Fulfilment	S/P Interface Management	Manage S/P Requests
		Assurance	Assurance	Customer QoS/SLA Management
4	CSA requests goodwill payment	Fulfilment	Order Handling	Authorize Credit
4A	Goodwill approved by authorizing manager	Fulfilment	Order Handling	Authorize Credit
5	Customer notified of goodwill payment	Fulfilment	Customer Interface Management	Manage Contact

6	CSA triggers bill credit	Billing & Revenue Management	Bill Invoice Management	Apply Pricing, Discounting, Adjustments and Rebates
7	Run bill cycle	Billing & Revenue Management	Bill Payments and Receivables Management	Manage Customer Billing
		Billing & Revenue Management	Bill Invoice Management	Produce & Distribute Bill
8	CP receives an SLG credit from OR	Billing Revenue & Management	S/P Settlements and Payment Management	Receive & Assess Invoice

3.2.2.4 Relevant Systems

Figure 12. Relevant Systems: Missed Appointment, Openreach Access (Current State)

Step	Description	TAM L1 System	TAM L2 System
1	Order status updated	Fulfilment	Customer Order Management
2	CSA confirms customer identity and logs the issue	Fulfilment	Customer Service Representative Toolbox
3	CSA verifies missed appointment	Fulfilment	Customer Order Management
		Fulfilment	S/P Order Management
		Assurance	Customer SLA Management
4	CSA requests goodwill payment	Fulfilment	Customer Service Representative Toolbox
4A	Goodwill approved by authorizing manager	Fulfilment	Customer Service Representative Toolbox
5	Customer notified of goodwill payment	Fulfilment	Customer Service Representative Toolbox
6	CSA triggers bill credit	Billing & Revenue Management	Billing Inquiry Dispute & Adjustment Management
7	Run bill cycle	Billing & Revenue Management	Bill Calculation
		Billing & Revenue Management	Bill Format & Render
8	CP receives an SLG credit from OR	Billing & Revenue Management	Wholesale Billing

3.2.3 Scenario in which a CP is using in-house field staff

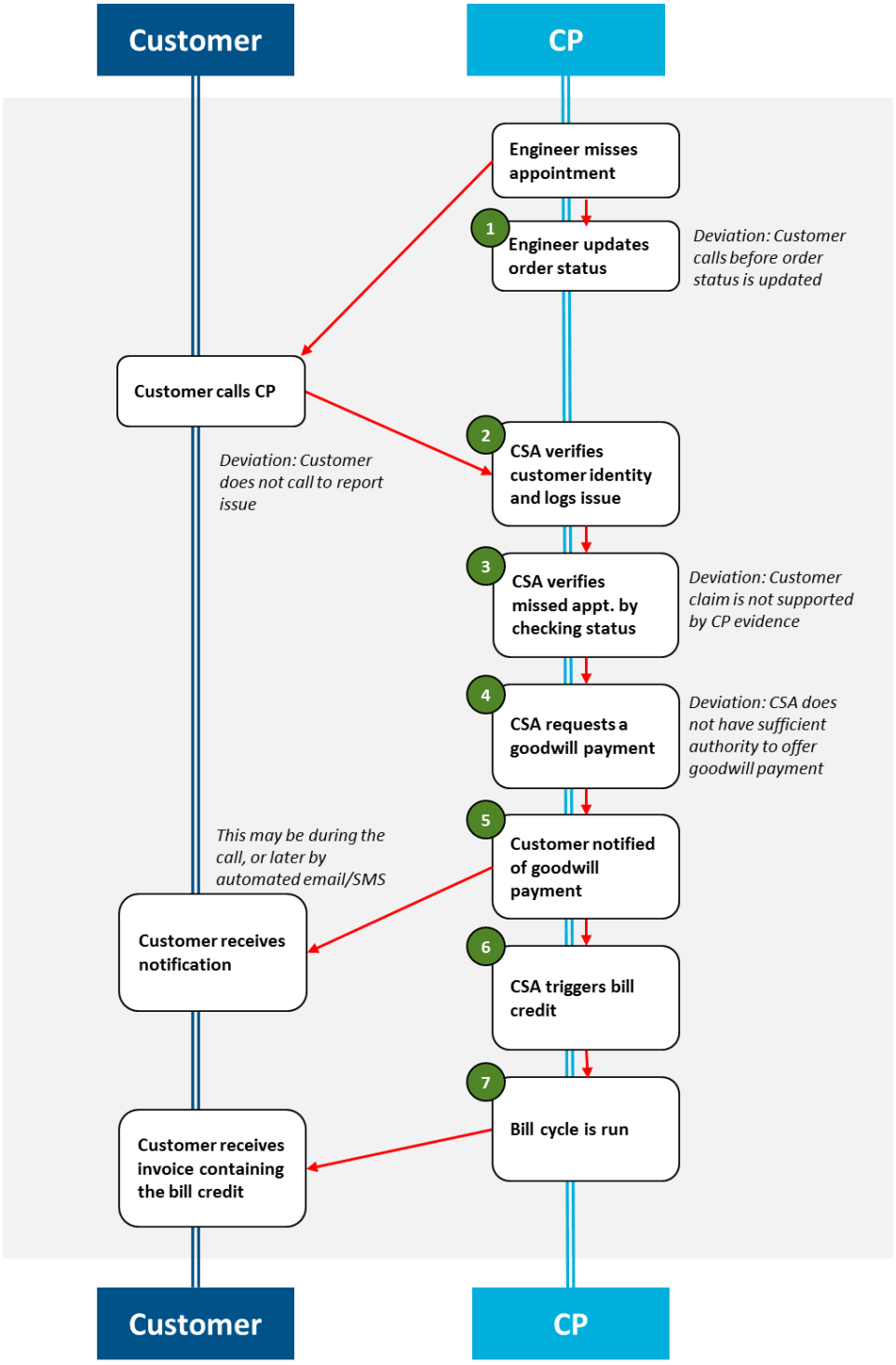
CPs which are using their own field staff are able to schedule appointments based on their own staff availability with no dependency on Openreach. This case would apply to Virgin Media and other CPs with their own field force. In the event that a customer appointment was missed, such a CP would be able to verify this against its own order handling system.

✂[25] ✂[26] ✂[27] ✂[28] ✂[29] ✂[30] ✂[31]

[25] ✂
[26] ✂
[27] ✂
[28] ✂
[29] ✂
[30] ✂
[31] ✂

3.2.3.1 Description of "happy path" process

Figure 13. Happy Path Process: Missed Appointment, In-House Field Staff (Current State)



Notes

1.	Order status updated	This should occur at the time of the appointment; however, records may not be updated until end of the day.
2.	CSA confirms customer identity and logs the issue	Customer may call on the same day or after a missed appointment; CPs generally will proactively contact customer to rearrange.
7.	Bill cycle is run	Customer will receive credit on their next invoice

3.2.3.2 Deviations from Happy Path

Figure 14. Deviations from Happy Path: Missed Appointment, In-House Field Staff (Current State)

Step	Description	Consequences
1A	Customer calls before the order status is updated	• CSA would not have visibility of missed appointment. CSA would need to check internally to proceed with process.
2A	Customer does not report missed appointment	• Complaint is not registered and no compensation is received • Process terminates
3A	Customer claim is not supported by CP evidence	• Customer does not receive compensation • Customer notified of outcome • Process terminates

4A	CSA does not have sufficient authority to grant goodwill payment	• Goodwill request escalated by CSA to manager
		• If manager approves request:
		  ○ Process continues as normal
		• If manager *does not* approve request:
		  ○ Customer does not receive goodwill payment
		  ○ Customer notified of outcome
		  ○ Process terminates

8A	OR is not at fault (includes MBORC situations)	• OR does not pay SLG credit to CP

3.2.3.3 Relevant Processes

Figure 15. Relevant Processes: Missed Appointment, In-House Field Staff (Current State)

Step	Description	eTOM L0 Process	eTOM L1 Process	eTOM L2 Process
1	Order status updated	Fulfilment	Order Handling	Track & Manage Customer Order Handling
2	CSA confirms customer identity and logs the issue	Fulfilment	Customer Interface Management	Manage Contact
3	CSA verifies missed appointment	Fulfilment	Order Handling	Track and Manage Customer Order Handling
		Assurance	Assurance	Customer QoS/SLA Management
4	CSA requests goodwill payment	Fulfilment	Order Handling	Authorize Credit
4A	Goodwill approved by authorizing manager	Fulfilment	Order Handling	Authorize Credit
5	Customer notified of goodwill payment	Fulfilment	Customer Interface Management	Manage Contact
6	CSA triggers bill credit	Billing & Revenue Management	Bill Invoice Management	Apply Pricing, Discounting, Adjustments and Rebates
7	Run bill cycle	Billing & Revenue Management	Bill Payments and Receivables Management	Manage Customer Billing

		Billing & Revenue Management	Bill Invoice Management	Produce & Distribute Bill

3.2.3.4 Relevant Systems

Figure 16. Relevant Systems: Missed Appointment, In-House Field Staff (Current State)

Step	Description	TAM L1 System	TAM L2 System
1	Order status updated	Fulfilment	Customer Order Management
2	CSA confirms customer identity and logs the issue	Fulfilment	Customer Service Representative Toolbox
3	CSA verifies missed appointment	Fulfilment	Customer Order Management
		Assurance	Customer SLA Management
4	CSA requests goodwill payment	Fulfilment	Customer Service Representative Toolbox
4A	Goodwill approved by authorizing manager	Fulfilment	Customer Service Representative Toolbox
5	Customer notified of goodwill payment	Fulfilment	Customer Service Representative Toolbox
6	CSA triggers bill credit	Billing & Revenue Management	Billing Inquiry Dispute & Adjustment Management
7	Run bill cycle	Billing & Revenue Management	Bill Calculation
		Billing & Revenue Management	Bill Format & Render

3.3 Delayed Repair Following Loss of Service

3.3.1 Summary of Current State

Loss of service for fixed voice or broadband services may be caused by a fault that affects only one customer or by a more serious network failure that impacts many customers simultaneously. There are many potential causes of loss of service as illustrated in the table below.

Figure 17. Illustrative Causes of Loss of Service for Fixed Voice and Broadband Services

Cause	Potential Impact			Responsibility
	Voice	Broadband	No. customers	
Hardware or software fault in RG		✓	Single	CP
Misconfiguration of RG		✓	Single	CP / Customer
Fault in home wiring on customer side of NTE	✓	✓	Single	Customer
Missing micro-filter(s)		✓	Single	Customer
Fault in access network cabling	✓	✓	Single/Multiple	CP
Incorrect jumpering at PCP or MDF site	✓	✓	Single	CP
Hardware or software fault in access network equipment	✓	✓	Single/Multiple	CP
Misconfiguration of access network equipment	✓	✓	Single/Multiple	CP
Hardware or software fault in CP aggregation/core network	✓	✓	Multiple	CP
Misconfiguration of CP aggregation/core network	✓	✓	Multiple	CP
Fault in an interconnecting network	✓	✓	Multiple	CP

As shown in the table, loss of service may be caused at various points in the network, including within the customer's home environment beyond the CP's demarcation point. Some causes are the responsibility of the CP (or its upstream supplier), whereas others are the responsibility of the customer. Finally, depending on the cause of the fault, the customer may experience loss of service to only broadband, only voice, or both simultaneously.

In the case of an individual customer fault, the CP's fault management process is triggered by a customer reporting the fault. CPs do not proactively react to individual lines going down due to the large volume of these events, many of which would not be actual faults (e.g. a customer may have disconnected their RG). Any actions for individual line fault would therefore be customer-initiated.

Loss of service faults on individual lines that are reported by customers will be investigated by the CP to determine the cause of the problem. CPs have a range of diagnostic tools available depending on the service (voice or broadband) and the network on which it is delivered. Fixed voice services are more simple test and diagnose versus broadband. For analogue voice services, line tests can provide a high degree of confidence in whether there is an access network fault.[32] Fixed broadband is more complex: lines which conform to the MPF specification can still experience broadband faults; broadband is also more likely to suffer from intermittent faults (e.g. due to electrical interference). In some cases, it may be necessary to send an engineer to the customer's property to further investigate the problem. In the event that the fault is found to be caused by a problem in the customer's home environment, the CP is likely to charge for the home visit.

If the CP determines that the fault lies within its area of responsibility, then the CPs may compensate the customer depending on the duration of the outage. This would typically require the customer to complain. A complaint may be received during a customer outage or after the fault has been resolved. As such, it is likely to require two calls from the customer: the first to report the fault, and a second to claim compensation. ✂[33]

We assume that the compensation-specific aspects of the customer's interaction with the CP would take slightly longer than the other trigger conditions as there are more variables to consider (e.g. start and stop times of the fault, cause of the fault). We estimate this would take approximately 6 minutes.

✂[34, 35, 36] ✂[37, 38]

A more serious network failure could include a fault in the CP's aggregation or core network, for example, a fault on a connection between two locations in the CP's network or a fault relating to an Internet service such as DNS (Domain Name Service). CPs detect network failures through their network management systems and independently initiate their fault management process. (✂[39]) In such cases, the CP may decide to proactively compensate affected customers for the service issue, although we have no evidence that this has actually occurred.

Proactive compensation is most likely for high-profile incidents involving a significant proportion of the customer base. Alternatively, CPs may rely on customers contacting their call centre to claim compensation. The latter situation would include, but not be limited to, cases where it was unclear which customers were affected. Compensation payments for network failures may therefore be either CP-initiated or customer-initiated.

✂[40] Other CPs may also use IVR as a means of communicating service status to their customers.

✂[41] ✂[42]

[32] For example, on BT's network, testing against SIN 349, "BT Metallic Path Facility Interface Description"
[33] ✂
[34] ✂
[35] ✂
[36] ✂
[37] ✂
[38] ✂
[39] ✂
[40] ✂
[41] ✂
[42] ✂

3.3.2 Scenario in which a CP is using Openreach access

CPs that are using Openreach access are dependent upon Openreach for certain diagnostic tools, investigations and repairs. The extent to which a CP can diagnose and/or repair a fault independently of Openreach depends upon the location of the fault in the network, the access product that the CP is using to serve the customer and the nature of the fault.

Faults in the CPs own network (i.e. affecting the CP's own network element or inter-site connection) will be diagnosed by the CP independently. Faults in the Openreach access network may require support from Openreach to resolve.

For investigating suspected faults on the Openreach network, CPs vary in their diagnostic capabilities. Some have their own sophisticated diagnostics, while smaller CPs can be totally dependent on Openreach for all diagnostics. CSAs are typically able to run remote diagnostics to help identify the most common CP network equipment issues.

Openreach provides a Line Test and Diagnostic service that allows CPs to confirm the state of individual WLR and LLU lines.[43] The line test only tests the narrowband characteristics of the line, i.e. the state of the line with respect to carrying voice services. The test is available via the Portal and B2B Gateway.

CPs which use this test are provided with a high-level summary of the test results. When applicable, the test results indicate whether a fault should be raised and when an appointment is required. The line test also generates a unique Test Reference that can be used by CPs in support of a subsequent fault report.

Figure 18. Output of Openreach Line Test and Diagnostics[44]

Output Field	Description
Service ID	The identity of the service for which the test was run
Line Test Reference	Unique identified for the line test
Friendly Result Message	Test results converted from the underlying technical output into something that is more meaningful for CP
Friendly Result Code	Result code converted from the underlying technical output into something that is more meaningful for CP
Appointment Required Flag	Advice to CP on whether to request an engineer appointment: • Y - Appointment advised • N - Appointment not advised
Fault Report Advice Flag	Advice to CP on whether to create a fault report • Y - Fault on Openreach network, fault report advised. • N - Openreach network tests OK, fault report is NOT advised. • C - Test Inconclusive/ Not Completed.
Service Maintenance Level	The SML associated with the line that was tested
Line and Network stability information	-
BRAG (Blue, Red, Amber, Green) Outcome	An indication of the speed performance of a broadband service (ADSL) on the line based on the line length from the exchange

[43] Openreach: Dialogue Services Product Guide, June 2016
[44] Ibid.

For next-generation access products (GEA, FVA and Ethernet), Openreach provides an equivalent Service Test dialogue service. This service conducts a real-time test of the physical characteristics of the access circuit and – as with the Line Test and Diagnostics service – returns a high-level summary of the test results, a unique test reference and an explicit indication of the need to request an appointment or raise a fault report.

When a line fails the relevant Openreach line test, the CP will raise a fault report with Openreach which will trigger Openreach's fault restoration activities. Repair times are subject to SLGs as described below.

Lines which pass the line test, but are not delivering a working service to the customer, require further investigation. CPs may conduct additional tests themselves and/or engage Openreach to investigate (and possibly repair) on their behalf.

Openreach offers six Special Fault Investigation (SFI) modules to investigate broadband issues where the line is working to SIN 349. Each module targets a different issue, for example, the End User Wiring module for work on customer home wiring, beyond the NTE. The SFI modules cost between £29 and £125 each and CPs may order more than one SFI module in the course of diagnosing a fault.

In addition to SFIs, Openreach levies Time Related Charges (TRCs) for investigations and repairs where the work is not covered under the terms of service, and where standard charges are not available. For lines that pass the SIN 349 test, TRCs can be raised for engineer visits to customer's premises, e.g. to charge for repairs to end-user wiring that the end user has accidentally cut through. TRCs are charged per-visit and per-hour.

To reduce the need to engage Openreach (and hence reduce SFI and TRC payments) some CPs have invested in their own diagnostic systems. ✂[45] ✂[46] ✂[47]

✂[48]

✂[49] CPs choose from a range of service levels (Service Maintenance Levels, "SMLs") for the access products that they buy from Openreach. As shown in the table below Openreach offers a range of five SMLs. Each product has a default SML, the cost of which is bundled with the product rental charge. CPs can choose to pay a premium to obtain a higher SML which will offer improved repair times. For MPF it is also possible to downgrade from the default SML 2 to SML 1.

Figure 19. Available Service Maintenance Levels by Openreach Product[50]

Product	SML 1	SML 2	SML 2 Business Plus	SML 3	SML 4
WLR (basic)	**Default**	Premium	Premium	Premium	Premium
LLU MPF	Discount	**Default**	Premium	Premium	Premium

[45] ✂
[46] ✂
[47] ✂
[48] ✂
[49] ✂
[50] Openreach: Service Product Pricing Common Products Repair Service Levels, 8 April 2016

LLU Shared MPF	-	**Default**	Premium	Premium	Premium
GEA FTTC	-	**Default**	-	Premium	Premium

CPs typically use either SML 2 or SML 1 for consumer products which have target fix times of next-working-day and day-after-next respectively. CPs use SML 3 for customers with special needs in which faults reported by 13.00 should be cleared by 23.59 the same day; faults reported after 13:00 should be cleared by 12.59 the next day. ✂[51, 52] ✂[53]

In calculating the duration of a fault, Openreach's clock starts when the CP opens a trouble ticket with Openreach. If Openreach requires an appointment to proceed with the investigation/repair, then the clock is stopped until the appointment starts.

It is currently the CP's discretion whether they await the outcome of Openreach diagnostics before releasing a compensatory payment to complaining customers.

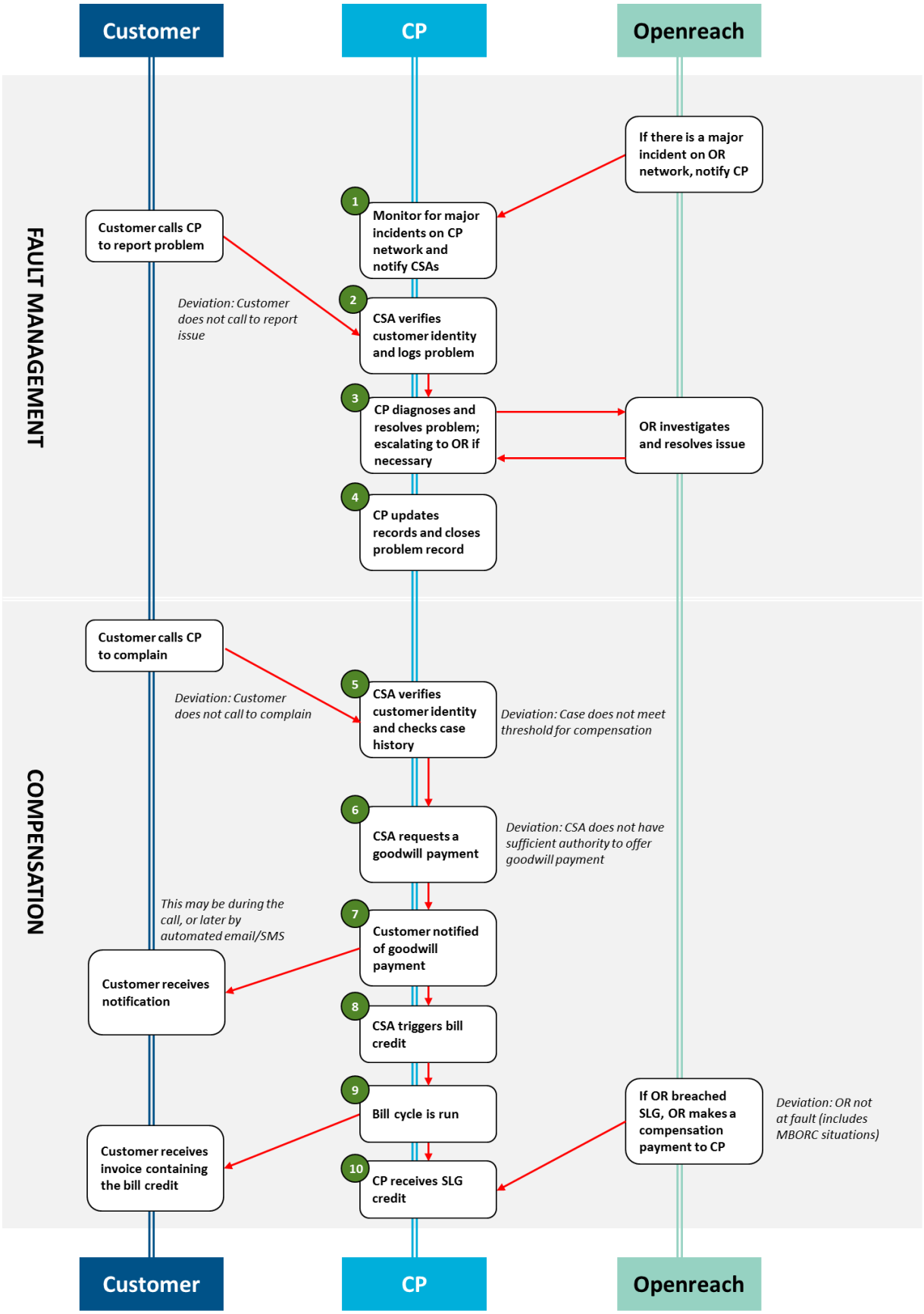
Openreach proactively notifies CPs of large-scale outages on its network via the B2B Portal and Incident Room alerts. ✂[54]

We understand that Openreach does not proactively notify CPs of which customer lines are impacted by a given fault. For example, if an MSAN in a street cabinet failed, then our understanding is that Openreach would not proactively notify each CP which of its respective lines were no longer receiving service.

[51] ✂
[52] ✂
[53] ✂
[54] ✂

3.3.2.1 Description of happy path

Figure 20. Happy Path Process: Delayed Repair Following Fixed Loss of Service, Openreach Access (Current State)



Notes

2.	CP diagnoses and resolves problem; escalating to OR if necessary	The time required to investigate, diagnose and resolve a loss of service problem can be anything from a few minutes to several days.
5.	CSA verifies customer identity and checks case history	The customer may call to complain during an ongoing loss of service event or after it has cleared.
7.	Bill cycle is run	Customer will receive credit on their next invoice
10.	CP receives an SLG credit from OR	This may be 30 or 60 days after the fault was resolved

3.3.2.2 Deviations from Happy Path

Figure 21. Deviations from Happy Path: Delayed Repair Following Fixed Loss of Service, Openreach Access (Current State)

Step	Description	Consequences
2A	Customer does not report loss of service	• Customer complaint is not registered and no compensation is received • Process terminates
5.1A	Customer does not follow up to request compensation	• Customer does not receive compensation • Process terminates
5.2A	Case history does not meet criteria for compensation (e.g. no fault found, insufficient duration, customer responsible)	• Customer does not receive compensation • Customer notified of outcome • Process terminates

6A	CSA does not have sufficient authority to grant goodwill payment	• Goodwill request escalated by CSA to manager
		• If manager approves request:
		  ○ Process continues as normal
		• If manager *does not* approve request:
		  ○ Customer does not receive goodwill payment
		  ○ Customer notified of outcome
		  ○ Process terminates

10A	OR is not at fault (includes MBORC situations)	• OR does not pay SLG credit to CP

3.3.2.3 Relevant Processes

Figure 22. Relevant Processes: Delayed Repair Following Fixed Loss of Service, Openreach Access (Current State)

Step	Description	eTOM L0 Process	eTOM L1 Process	eTOM L2 Process
1	Monitor for major incidents on CP or OR network and notify CSAs	Assurance	Service Problem Management	Report Service Problem
2		Assurance	Customer Interface Management	Manage Contact

	CSA confirms customer identity and logs the problem	Assurance	Problem Handling	Create Customer Problem Report
3	CP diagnoses and resolves problem; escalating to OR if necessary	Assurance	Problem Handling	Track and Manage Customer Problem
		Assurance	Service Problem Management	Diagnose Service Problem
		Assurance	S/P Problem Reporting & Management	Initiate S/P Problem Report
		Assurance	S/P Problem Reporting & Management	Track & Manage S/P Problem Resolution
		Assurance	S/P Problem Reporting & Management	Close S/P Problem Report
4	CP updates records and closes problem record	Assurance	Problem Handling	Close Customer Problem Report
5	CSA verifies customer identity and checks case history	Assurance	Customer Interface Management	Manage Contact
		Assurance	Customer QoS/SLA Management	Manage QoS/SLA Violation
6	CSA requests a goodwill payment	Assurance	Customer QoS/SLA Management	Manage QoS/SLA Violation
7	Customer notified of goodwill payment	Assurance	Customer Interface Management	Manage Contact
8	CSA triggers bill credit	Billing & Revenue Management	Bill Invoice Management	Apply Pricing, Discounting, Adjustments and Rebates
9	Run bill cycle	Billing & Revenue Management	Bill Payments and Receivables Management	Manage Customer Billing
		Billing & Revenue Management	Bill Invoice Management	Produce & Distribute Bill
10	CP receives an SLG credit from OR	Billing Revenue & Management	S/P Settlements and Payment Management	Receive and Assess Invoice

3.3.2.4 Relevant Systems

Figure 23. Relevant Systems: Delayed Repair Following Fixed Loss of Service, Openreach Access (Current State)

Step	Description	TAM L1 System	TAM L2 System
1	Monitor for major incidents on CP or OR network and notify CSAs	Assurance	Service Performance Management
2	CSA confirms customer identity and logs the issue	Assurance	Customer Service Representative Toolbox
3	CP diagnoses and resolves problem; escalating to OR if necessary	Assurance	Customer Problem Management
		Assurance	S/P Assurance Management

4	CP updates records and closes problem record	Assurance	Customer Problem Management
5	CSA verifies customer identity and checks case history	Assurance	Customer Service Representative Toolbox
6	CSA requests goodwill payment	Assurance	Customer SLA Management
7	Customer notified of goodwill payment	Assurance	Customer Service Representative Toolbox
8	CSA triggers bill credit	Billing & Revenue Management	Billing Inquiry Dispute & Adjustment Management
9	Run bill cycle	Billing & Revenue Management	Bill Calculation
		Billing & Revenue Management	Bill Format & Render
10	CP receives an SLG credit from OR	Billing & Revenue Management	Wholesale / Interconnect Billing

3.3.3 Scenario in which a CP is using its own Access Network (i.e. non Openreach)

CPs which are using their own access network are able to diagnose and repair faults with no dependency on Openreach. This case applies to Virgin Media and other alternative access network operators.

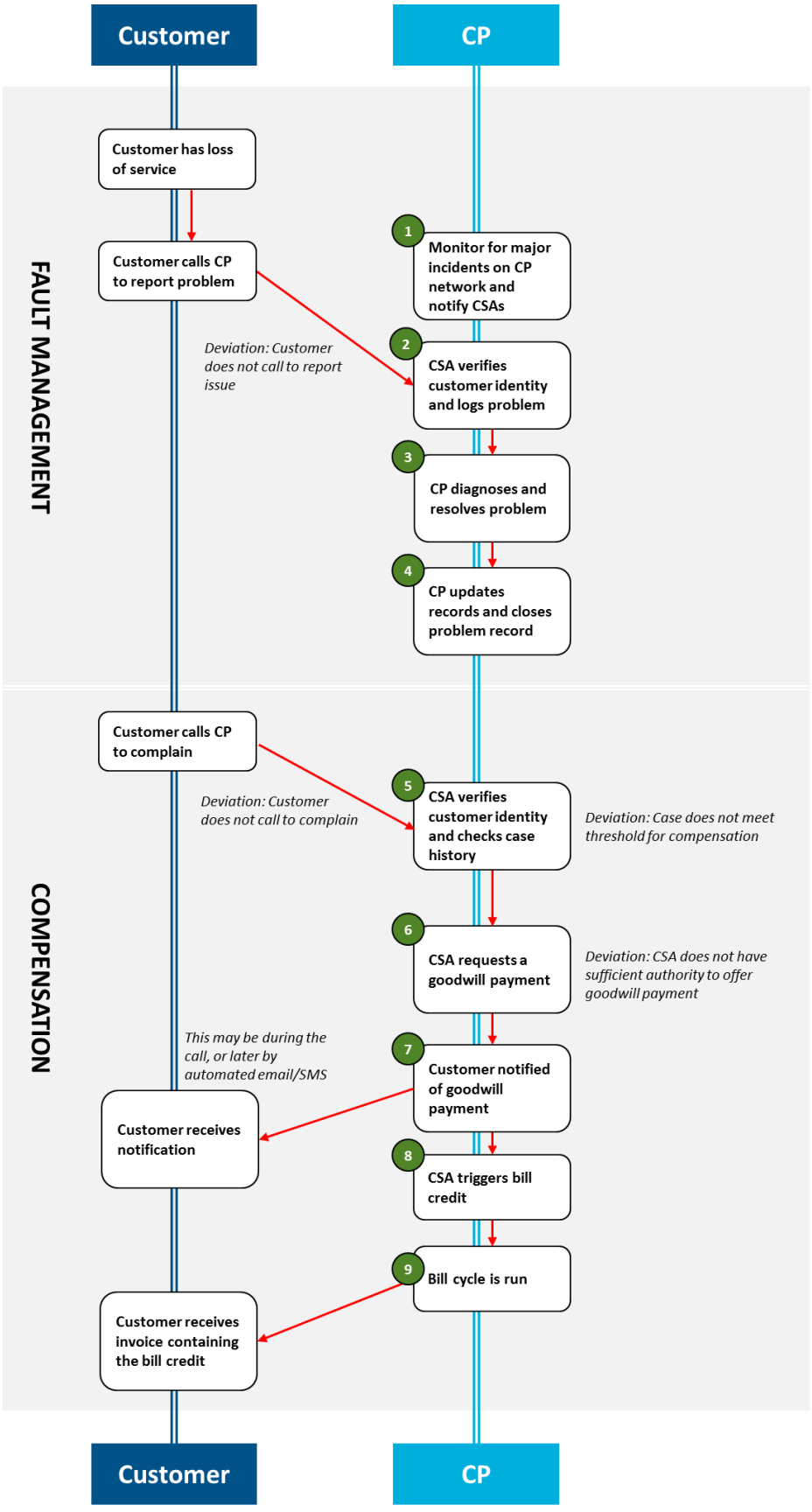
In general, one would expect that a vertically-integrated CP would be in a better position to identify, diagnose and react to network faults versus one that used the access network of a wholesale supplier. As such, a large, vertically-integrated CP could be expected to automate a significant amount of the overall fault-to-repair journey.

✂[55] ✂[56] ✂[57] ✂[58] ✂[59] ✂[60]

[55] ✂
[56] ✂
[57] ✂
[58] ✂
[59] ✂
[60] ✂

3.3.3.1 Description of happy path

Figure 24. Happy Path Process: Delayed Repair Following Fixed Loss of Service, CP Access Network (Current State)



Notes

2.	CP diagnoses and resolves problem	The time required to investigate, diagnose and resolve a loss of service problem can be anything from a few minutes to several days.
5.	CSA verifies customer identity and checks case history	The customer may call to complain during an ongoing loss of service event or after it has cleared.
7.	Bill cycle is run	Customer will receive credit on their next invoice

3.3.3.2 Deviations from Happy Path

Figure 25. Deviations from Happy Path: Delayed Repair Following Fixed Loss of Service, CP Access Network (Current State)

Step	Description	Consequences
2A	Customer does not report loss of service	• Customer complaint is not registered and no compensation is received • Process terminates
5.1A	Customer does not follow up to request compensation	• Customer does not receive compensation • Process terminates
5.2A	Case history does not meet criteria for compensation (e.g. no fault found, insufficient duration, customer responsible)	• Customer does not receive compensation • Customer notified of outcome • Process terminates

6A	CSA does not have sufficient authority to grant goodwill payment	• Goodwill request escalated by CSA to manager
		• If manager approves request:
		  ○ Process continues as normal
		• If manager *does not* approve request:
		  ○ Customer does not receive goodwill payment
		  ○ Customer notified of outcome
		  ○ Process terminates

3.3.3.3 Relevant Processes

Figure 26. Relevant Processes: Delayed Repair Following Fixed Loss of Service, CP Access Network (Current State)

Step	Description	eTOM L0 Process	eTOM L1 Process	eTOM L2 Process
1	Monitor for major incidents on CP network and notify CSAs	Assurance	Service Problem Management	Report Service Problem
2	CSA confirms customer identity and logs the issue	Assurance	Customer Interface Management	Manage Contact

		Assurance	Problem Handling	Create Customer Problem Report
3	CP diagnoses and resolves problem	Assurance	Problem Handling	Track and Manage Customer Problem
		Assurance	Service Problem Management	Diagnose Service Problem
4	CP updates records and closes problem record	Assurance	Problem Handling	Close Customer Problem Report
5	CSA verifies customer identity and checks case history	Assurance	Customer Interface Management	Manage Contact
		Assurance	Customer QoS/SLA Management	Manage QoS/SLA Violation
6	CSA requests a goodwill payment	Assurance	Customer QoS/SLA Management	Manage QoS/SLA Violation
7	Customer notified of goodwill payment	Assurance	Customer Interface Management	Manage Contact
8	CSA triggers bill credit	Billing & Revenue Management	Bill Invoice Management	Apply Pricing, Discounting, Adjustments and Rebates
9	Run bill cycle	Billing & Revenue Management	Bill Payments and Receivables Management	Manage Customer Billing
		Billing & Revenue Management	Bill Invoice Management	Produce & Distribute Bill

3.3.3.4 Relevant Systems

Figure 27. Relevant Systems: Delayed Repair Following Fixed Loss of Service, CP Access Network (Current State)

Step	Description	TAM L1 System	TAM L2 System
1	Monitor for major incidents on CP network and notify CSAs	Assurance	Service Performance Management
2	CSA confirms customer identity and logs the issue	Assurance	Customer Service Representative Toolbox
3	CP diagnoses and resolves problem	Assurance	Customer Problem Management
4	CP updates records and closes problem record	Assurance	Customer Problem Management
5	CSA verifies customer identity and checks case history	Assurance	Customer Service Representative Toolbox
6	CSA requests goodwill payment	Assurance	Customer SLA Management
7	Customer notified of goodwill payment	Assurance	Customer Service Representative Toolbox
8	CSA triggers bill credit	Billing & Revenue Management	Billing Inquiry Dispute & Adjustment Management

9	Run bill cycle	Billing & Revenue Management	Bill Calculation
		Billing & Revenue Management	Bill Format & Render
10	CP receives an SLG credit from OR	Billing & Revenue Management	Wholesale / Interconnect Billing

4 Future State and Gap Analysis

This section outlines the likely future state requirements of an auto-compensation scheme, for each potential trigger in turn. The required changes to the current-state systems and processes are described in detail. Assumptions are then made on the number of development days required to implement the changes for different types of CP.

4.1 Delayed Service Activation

4.1.1 Summary of Future State

Our working hypothesis for the future state is that customers would be compensated if their service was not activated by a committed activation date. The amount of compensation payable to the customer would vary depending on the duration of delay (in days), subject to a maximum amount. Compensation would not apply where delays were caused by the customer (e.g. it was not possible to access the property for an appointed installation).

We assume that the CP would initiate the compensation itself without requiring the customer to make a claim. Customers may call to complain about the delay, but this would not be necessary for a compensation payment to be made.

CPs currently already offer compensation for customer-initiated claims on a case-by-case basis so the processes and systems are already largely in place to handle these claims. The introduction of automatic compensation would formalize some of the existing practices and require CPs to adopt an industry-standard approach to assessing the claims. To achieve this, CPs will need to implement changes to their case management procedures. This would include formalizing the criteria under which compensation is paid and standardizing the calculation for the payment amount.

CPs already have access to the dates required to determine if a service activation was delayed: committed activation date and the actual activation date, the latter being used to initiate customer billing. This would identify a customer as potentially eligible for compensation. The CP would then need to check whether or not the delay was due to the customer by extracting data from the order management system.

For the payment amount, CPs will only be able to calculate the compensation amount once the service has been activated. At this point, the CP will also know the cause of the delay and hence will be able to determine if the customer is eligible for compensation.

With the process potentially now handled in the absence of a customer phone-call, the CP would need to automate a communication (letter, email or SMS) out to impacted customers notifying them of the compensation payment.

4.1.2 Scenario in which a CP is using Openreach access

4.1.2.1 Gaps versus Current State

The following table outlines for each step in the current state process the changes that would need to be made to facilitate automatic compensation for this potential trigger.

Figure 28. Gaps versus Current State: Delayed Service Activation, Openreach Access Network

Step	Description of Current State	Changes required for Auto-Compensation
1	Order status updated	No change.
2	CSA confirms customer identity and logs the issue	Some customers will still call to complain. IVR to be updated to efficiently route calls. CSA scripts will need to be updated to align with new compensation process. CSAs will need to be able to access the compensation eligibility, reason and amount when speaking with customers.
3	CSA verifies delay to service activation	This step will now be initiated without a call from the customer. The CP will need to run a daily report to identify customers that are potentially eligible for compensation for delayed service activation. Relevant data will include: - Customer details (account number, address, etc.) - Product - Date ordered - Committed activation date (*) - Actual activation date (*) Items marked with an asterisk will be informed by Openreach data which can be gathered during the course of normal business operations and recorded against the customer order. The list of potentially eligible customers will then need to be filtered to remove those customers where the CP is not at fault. Relevant data will include: - Identifying delays due to “customer missed” appointments (*) Items marked with an asterisk will be informed by Openreach data. Appointment data is supplied in KCI2 messages. Larger CPs may automate the analysis of the data to determine which customers are eligible. This will require new parsing and analysis of Openreach data. For small CPs, manual inspection of a system generated report may be more cost effective given the relatively small volumes they are dealing with.
3A	CSA requests goodwill payment	The calculation of the compensation amount would follow an industry-standard formula. Relevant data is included in the list above. Larger CPs could fully automate this step in their BSS systems. A small CP may use a spreadsheet. It is likely that all CPs would have some human oversight of the compensation amounts, even if this is just

		monitoring the aggregate daily amount or sampling the automated outputs for QA purposes.
4	Goodwill approved by authorizing manager	There would be no need for management approval.
5	Customer notified of goodwill payment	Customer communications (letter, email or SMS) will need to be configured so that the customer is notified that they are receiving compensation. Relevant data is included in the list above, plus derived information such as the payment amount.
6	CSA triggers bill credit	Bulk billing process to credit customers who have been verified to have been impacted by the trigger event. May require upgrading batch billing systems.
7	Run bill cycle	The bill cycle will run "as is", but additional item codes will be needed to identify/describe the compensation process Invoice generation will run as is, but the invoice will need to display new item codes associated with the compensation. Additional information/explanation may be required in associated documentation to clarify the items to the customer
8	CP receives an SLG credit from OR	No change

4.1.2.2 Impacts to Relevant Processes

Figure 29. Process Impacts: Delayed Service Activation, Openreach Access Network

Ref	Impact	eTOM Level 0	eTOM Level 1
1	Update CSA scripts and case management procedures	Fulfilment	Customer Interface Management
2	Add IVR option to channel customers to the most appropriate CSAs (not to actually process a claim)	Fulfilment	Customer Interface Management
3	Ability to process Openreach logs to determine if delay was due to customer	Fulfilment	S/P Interface Management
4	Business logic to determine whether criteria for compensation payment has been met	Assurance	Customer QoS/SLA Management
5	Ability to calculate compensation amount based on duration of delay	Assurance	Customer QoS/SLA Management
6	Add capability to automatically trigger a billing credit once a delayed installation has been registered to a customer	Billing & Revenue Management	Bill Invoice Management
7	Automate comms to customer to notify of successful compensation payment	Fulfilment	Customer Interface Management

4.1.2.3 Impacts to Relevant Systems

Figure 30. System Impacts: Delayed Service Activation, Openreach Access Network

Ref	Impact	eTOM Level 1	eTOM Level 2
1	Update CSA scripts and case management procedures	Fulfilment	Customer Service Representative Toolbox
2	Add IVR option to channel customers to the most appropriate CSAs (not to actually process a claim)	Operations Support and Readiness	Customer & Network Care
3	Ability to process Openreach logs to determine if delay was due to customer	Fulfilment	Suppler Partner Management
4	Business logic to determine whether criteria for compensation payment has been met	Assurance	Customer SLA Management
5	Ability to calculate compensation amount based on duration of delay	Assurance	Customer SLA Management
6	Add capability to automatically trigger a billing credit once a delayed installation has been registered to a customer	Billing & Revenue Management	Receivables Management
			Bill Calculation
7	Automate comms to customer (email) to notify of successful compensation payment	Fulfilment	Customer Interface Management

4.1.3 Scenario in which a CP is using its own network

4.1.3.1 Gaps versus current state

Virgin Media handles its own installation provisions and scheduling as it does not use the OR network. ✂[61]

The following table outlines for each step in the current state process the changes that would need to be made to facilitate automatic compensation for this potential trigger.

Figure 31. Gaps versus Current State: Delayed Service Activation, Own Access Network

Step	Description of Current State	Changes required for Auto-Compensation
1	Order status updated	No change.
2	CSA confirms customer identity and logs the issue	Some customers will still call to complain. IVR to be updated to efficiently route calls. CSA scripts will need to be updated to align with new compensation process. CSAs will need to be able to access the compensation eligibility, reason and amount when speaking with customers.

[61] ✂

3	CSA verifies delay to service activation	This step will now be initiated without a call from the customer. The CP will need to run a daily report to identify customers that are potentially eligible for compensation for delayed service activation. Relevant data will include: - Customer details (account number, address, etc.) - Product - Date ordered - Committed activation date - Actual activation date The list of potentially eligible customers will then need to be filtered to remove those customers where the CP is not at fault. Relevant data will include: - Identifying delays due to "customer missed" appointments CPs may automate the analysis of the data to determine which customers are eligible. This will require new parsing and analysis of internal data.
3A	CSA requests goodwill payment	The calculation of the compensation amount would follow an industry-standard formula. Relevant data is included in the list above. CPs could fully automate this step in their BSS systems. It is likely that all CPs would have some human oversight of the compensation amounts, even if this is just monitoring the aggregate daily amount or sampling the automated outputs for QA purposes.
4	Goodwill approved by authorizing manager	There would be no need for management approval.
5	Customer notified of goodwill payment	Customer communications (letter, email or SMS) will need to be configured so that the customer is notified that they are receiving compensation. Relevant data is included in the list above, plus derived information such as the payment amount.
6	CSA triggers bill credit	Bulk billing process to credit customers who have been verified to have been impacted by the trigger event. May require upgrading batch billing systems.
7	Run bill cycle	The bill cycle will run "as is", but additional item codes will be needed to identify/describe the compensation process Invoice generation will run as is, but the invoice will need to display new item codes associated with the compensation. Additional information/explanation may be required in associated documentation to clarify the items to the customer

4.1.3.2 Impacts to Relevant Processes

Figure 32. Process Impacts: Delayed Service Activation, Own Access Network

Ref	Impact	eTOM Level 1	eTOM Level 2
1	Update CSA scripts and case management procedures	Fulfilment	Customer Interface Management
2	Add IVR option to channel customers to the most appropriate CSAs (not to actually process a claim)	Fulfilment	Customer Interface Management
3	Ability to process CP order logs to determine if delay was due to customer	Assurance	Customer QoS/SLA Management
4	Business logic to determine whether criteria for compensation payment has been met	Assurance	Customer QoS/SLA Management
5	Ability to calculate compensation amount based on duration of delay	Assurance	Customer QoS/SLA Management
6	Add capability to automatically trigger a billing credit once a delayed installation has been registered to a customer	Billing & Revenue Management	Bill Invoice Management
7	Automate comms to customer (email) to notify of successful compensation payment	Assurance	Customer Interface Management

4.1.3.3 Impacts to Relevant Systems

Figure 33. System Impacts: Delayed Service Activation, Own Access Network

Ref	Impact	eTOM Level 1	eTOM Level 2
1	Update CSA scripts and case management procedures	Fulfilment	Customer Service Representative Toolbox
2	Add IVR option to channel customers to the most appropriate CSAs (not to actually process a claim)	Operations Support and Readiness	Customer & Network Care
3	Ability to process CP order logs to determine if delay was due to customer	Assurance	Customer SLA Management
4	Business logic to determine whether criteria for compensation payment has been met	Assurance	Customer SLA Management
5	Ability to calculate compensation amount based on duration of delay	Assurance	Customer SLA Management
6	Add capability to automatically trigger a billing credit once a delayed installation has been registered to a customer	Billing & Revenue Management	Receivables Management Bill Calculation
7	Automate comms to customer (email) to notify of successful compensation payment	Fulfilment	Customer Interface Management

4.2 Missed Appointment

4.2.1 Summary of Future State

Our working hypothesis for the future state is that customers would be compensated if an appointment was missed, i.e. the engineer failed to arrive during a specified time period. The amount of compensation payable to the customer would be a fixed amount. Compensation would apply to appointments for the installation or repair of fixed voice and broadband services irrespective of whether the engineer was an employed by the CP, Openreach or another firm contracted by the CP.

Compensation would not apply where the missed appointment was caused by the customer (e.g. the customer was not at the property). Compensation would not apply if the appointment is rearranged by the CP with greater than 24 hours' notice. Compensation would also not be paid if the customer and the engineer mutually rearranged the appointment for another time on the same day (see Section 3.2.2).

For this trigger, we assume that the CP would initiate the compensation itself without requiring the customer to make a claim. Customers may call to complain about the missed appointment, but this would not be necessary for a compensation payment to be made.

As service activation and fault repair may be dependent upon an appointment, a missed appointment may cause one of these other trigger conditions to be met. We assume that where multiple trigger events occurred, these would be processed separately.

CPs currently already offer compensation for customer-initiated claims regarding missed appointments on a case-by-case basis, so the processes and systems are already largely in place to handle these claims. The introduction of automatic compensation would formalize some of the existing practices and require CPs to adopt an industry-standard approach to assessing the claims. To achieve this, CPs will need to implement changes to their case management procedures. This would include formalizing the criteria under which compensation is paid and standardizing the calculation for the payment amount.

CPs already have access to the information to determine if an appointment was missed. This would identify a customer as potentially eligible for compensation. The CP would then need to check whether or not the delay was due to the customer by extracting data from the order management system.

With the process potentially now handled in the absence of a customer phone-call, the CP would need to automate a communication (letter, email or SMS) out to impacted customers notifying them of the compensation payment.

4.2.2 Scenario in which a CP is using Openreach field staff

As described in Section 3.2.2, Openreach currently notifies CPs of missed appointments using KCI messages. This information is used to assess customer complaints for compensation in the current state. We assume that this information feed would continue to be used in the future state.

Automating the process for identifying that a customer should be compensated would require new business logic to parse the KCI messages and identify whether the delay was due to the customer. As indicated above, the business logic would also need to have the flexibility to recognize when appointments had been rearranged by mutual consent between the Openreach engineer and the customer.

If the CP is using any other suppliers for field services, then the appointment records for these firms would also need to be captured and processed.

4.2.2.1 Gaps versus Current State

The following table outlines for each step in the current state process the changes that would need to be made to facilitate automatic compensation for this potential trigger.

Figure 34. Gaps versus Current State: Missed Appointment, Openreach Field Staff

Step	Description of Current State	Changes required for Auto-Compensation
1	Order status updated	No change.
2	CSA confirms customer identity and logs the issue	Some customers will still call to complain and customer contact will be necessary to reschedule appointment. IVR to be updated to efficiently route calls. CSA scripts will need to be updated to align with new compensation process. CSAs will need to be able to access the compensation eligibility, reason and amount when speaking with customers.
3	CSA verifies missed appointment	This step will now be initiated without a call from the customer. The CP will need to identify customers that are potentially eligible for compensation for missed appointments. Relevant data will include: - Customer details (account number, address, etc.) - Product - Appointment date (*) - Appointment status (*) Items marked with an asterisk will be informed by Openreach data which can be gathered during the course of normal business operations and recorded against the customer order. Appointment data is supplied in KCI2 messages. The list of potentially eligible customers will then need to be filtered to remove those customers where the CP is not at fault. Relevant data will include: - Identifying “customer missed” appointments (*) Items marked with an asterisk will be informed by Openreach data. Larger CPs may automate the analysis of the data to determine which customers are eligible. This will require new parsing and analysis of Openreach data. For small CPs, manual inspection of a system generated report may be more cost effective given the relatively small volumes they are dealing with.
4	CSA requests goodwill payment	The calculation of the compensation amount would follow an industry-standard formula. Relevant data is included in the list above. Larger CPs could fully automate this step in their BSS systems. A small CP may use a spreadsheet. It is likely that all CPs would have some human oversight of the compensation amounts, even if this is just monitoring the aggregate daily amount or sampling the automated outputs for QA purposes.

4A	Goodwill approved by authorizing manager	There would be no need for management approval.
5	Customer notified of goodwill payment	Customer communications (letter, email or SMS) will need to be configured so that the customer is notified that they are receiving compensation. Relevant data is included in the list above, plus derived information such as the payment amount.
6	CSA triggers bill credit	Bulk billing process to credit customers who have been verified to have been impacted by the trigger event. May require upgrading batch billing systems.
7	Run bill cycle	The bill cycle will run "as is", but additional item codes will be needed to identify/describe the compensation process Invoice generation will run as is, but the invoice will need to display new item codes associated with the compensation. Additional information/explanation may be required in associated documentation to clarify the items to the customer
8	CP receives an SLG credit from OR	No change

4.2.2.2 Impacts to Relevant Processes

Figure 35. Process Impacts: Missed Appointment, Openreach Field Staff

Ref	Impact	eTOM Level 1	eTOM Level 2
1	Update CSA scripts and case management procedures	Assurance	Customer Interface Management
2	Add IVR option to channel customers to the most appropriate CSAs (not to actually process a claim)	Assurance	Customer Interface Management
3	Ability to parse Openreach KCI messages to identify missed appointments and link them back to customer IDs	Assurance	S/P Interface Management
4	Ability to automatically identify whether in-house engineers (if any) have missed appointments	Workforce Management	Manage Work Order Lifecycle
5	Ability to automatically identify whether engineers from other suppliers (if any) have missed appointments	Assurance	S/P Interface Management
6	Business logic to determine whether criteria for compensation payment has been met	Assurance	Customer QoS/SLA Management
7	Add capability to automatically trigger a billing credit once a missed appointment has been registered to a customer	Billing & Revenue Management	Bill Invoice Management
8	Automate comms to customer (email) to notify of successful compensation payment	Assurance	Customer Interface Management

4.2.2.3 Impacts to Relevant Systems

Figure 36. System Impacts: Missed Appointment, Openreach Field Staff

Ref	Impact	eTOM Level 1	eTOM Level 2
1	Update CSA scripts and case management procedures	Assurance	Customer Service Representative Toolbox
2	Add IVR option to channel customers to the most appropriate CSAs (not to actually process a claim)	Operations Support and Readiness	Customer & Network Care
3	Ability to parse Openreach KCI messages to identify missed appointments and link them back to customer IDs	Assurance	Suppler Partner Management
4	Ability to automatically identify whether in-house engineers (if any) have missed appointments	Workforce Management	Work Order Tracking and Management
5	Ability to automatically identify whether engineers from other suppliers (if any) have missed appointments	Assurance	S/P Interface Management
6	Business logic to determine whether criteria for compensation payment has been met	Assurance	Customer SLA Management
7	Add capability to automatically trigger a billing credit once a missed appointment has been registered to a customer	Billing & Revenue Management	Receivables Management
		Billing & Revenue Management	Bill Calculation
8	Automate comms to customer (email) to notify of successful compensation payment	Assurance	Customer Interface Management

4.2.3 Scenario in which a CP is using in-house field staff

Virgin Media, which is not reliant on OR engineers, has its own systems to track appointments. ✂[62] ✂[63]

4.2.3.1 Gaps versus Current State

The following table outlines for each step in the current state process the changes that would need to be made to facilitate automatic compensation for this potential trigger.

Figure 37. Gaps versus Current State: Missed Appointment, In-House Field Staff

Step	Description of Current State	Changes required for Auto-Compensation
1	Order status updated	No change.
2	CSA confirms customer identity and logs the issue	Some customers will still call to complain and customer contact will be necessary to reschedule appointment. IVR to be updated to efficiently route calls.

[62] ✂
[63] ✂

		CSA scripts will need to be updated to align with new compensation process. CSAs will need to be able to access the compensation eligibility, reason and amount when speaking with customers.
3	CSA verifies missed appointment	This step will now be initiated without a call from the customer. The CP will need to identify customers that are potentially eligible for compensation for missed appointments. Relevant data will include: - Customer details (account number, address, etc.) - Product - Appointment date - Appointment status The list of potentially eligible customers will then need to be filtered to remove those customers where the CP is not at fault. Relevant data will include: - Identifying “customer missed” appointments CPs may automate the analysis of the data to determine which customers are eligible. This will require new parsing and analysis of internal data.
4	CSA requests goodwill payment	The calculation of the compensation amount would follow an industry-standard formula. Relevant data is included in the list above. CPs could fully automate this step in their BSS systems. It is likely that all CPs would have some human oversight of the compensation amounts, even if this is just monitoring the aggregate daily amount or sampling the automated outputs for QA purposes.
4A	Goodwill approved by authorizing manager	There would be no need for management approval.
5	Customer notified of goodwill payment	Customer communications (letter, email or SMS) will need to be configured so that the customer is notified that they are receiving compensation. Relevant data is included in the list above, plus derived information such as the payment amount.
6	CSA triggers bill credit	Bulk billing process to credit customers who have been verified to have been impacted by the trigger event. May require upgrading batch billing systems.
7	Run bill cycle	The bill cycle will run “as is”, but additional item codes will be needed to identify/describe the compensation process Invoice generation will run as is, but the invoice will need to display new item codes associated with the compensation. Additional information/explanation may be required in associated documentation to clarify the items to the customer

4.2.3.2 Impacts to Relevant Processes

Figure 38. Process Impacts: Missed Appointment, In-House Field Staff

Ref	Impact	eTOM Level 1	eTOM Level 2
1	Identify breach of SLAs e.g. appointment is missed	Assurance	Customer QoS/SLA Management
2	Update CSA scripts and case management procedures	Assurance	Customer Interface Management
3	Add IVR option to channel customers to the most appropriate CSAs (not to actually process a claim)	Assurance	Customer Interface Management
4	Ability to automatically identify whether in-house engineers have missed appointments	Workforce Management	Manage Work Order Lifecycle
5	Ability to automatically identify whether engineers from other suppliers (if any) have missed appointments	Assurance	S/P Interface Management
6	Business logic to determine whether criteria for compensation payment has been met	Assurance	Customer QoS/SLA Management
7	Add capability to automatically trigger a billing credit once a missed appointment has been registered to a customer	Billing & Revenue Management	Bill Invoice Management
8	Automate comms to customer (email) to notify of successful compensation payment	Assurance	Customer Interface Management

4.2.3.3 Impacts to Relevant Systems

Figure 39. System Impacts: Missed Appointment, In-House Field Staff

Ref	Impact	eTOM Level 1	eTOM Level 2
1	Identify breach of SLAs e.g. appointment is missed	Assurance	Customer SLA Management
2	Update CSA scripts and case management procedures	Assurance	Customer Service Representative Toolbox
3	Add IVR option to channel customers to the most appropriate CSAs (not to actually process a claim)	Operations Support and Readiness	Customer & Network Care
4	Ability to automatically identify whether in-house engineers have missed appointments	Workforce Management	Work Order Tracking and Management
5	Ability to automatically identify whether engineers from other suppliers (if any) have missed appointments	Assurance	S/P Interface Management
6	Business logic to determine whether criteria for compensation payment has been met	Assurance	Customer SLA Management
7	Add capability to automatically trigger a billing credit once a missed appointment has been registered to a customer	Billing & Revenue Management	Receivables Management
8		Billing & Revenue Management	Bill Calculation

	Add capability to automatically trigger a billing credit once a missed appointment has been registered to a customer Automate comms to customer (email) to notify of successful compensation payment	Assurance	Customer Interface Management

4.3 Delayed Repair Following Loss of Service

4.3.1 Summary of Future State

Our working hypothesis for the future state is that customers would be compensated if they suffer a complete loss of service which is not restored by the second full working day (not including the day the provider is notified of the loss). The amount of compensation payable to the customer would vary depending on the duration of delay (in calendar days), subject to a maximum amount. Compensation would apply to loss of fixed voice and/or broadband services. Compensation would not apply where the fault was caused by the customer.

In the context of delayed repair, automatic compensation can refer to (i) a case in which CPs automatically detected a customer fault, repaired the fault and followed up with compensation where applicable without the customer needing to proactively contact the CP at all. Alternatively, the CP-initiated aspect could refer to (ii) the compensation element only, i.e. a customer would still be required to report the fault, however the compensation payment would follow automatically if the relevant criteria were met. In both cases, there would be no need for the customer to make a specific call to request compensation.

The primary challenge for the first of these two cases is the identification of service affecting faults in the access network. This is because there is a limited amount of proactive monitoring at an individual line level. According to BT, its analogue PSTN lines are routinely tested "to a level approaching once every 24 hours".[64] BT's testing regime would apply to WLR lines but not to MPF lines. It is unclear whether CPs using MPF have a proactive testing regime and, if so, whether it is of similar frequency.

For broadband services, proactive monitoring of individual lines is more challenging due to the greater likelihood that a service outage is caused by the customer (for example, temporarily switching off the RG). For this reason, CPs have adopted a reactive approach to dealing with individual line faults, i.e. they wait for the customer to notify them that there is a fault.

Therefore, given the technical complexity, our working hypothesis for individual line faults is that CP-initiated compensation would operate as described in the second case, i.e. customers would still be required to report service affecting faults. Such an approach would enable CPs to reuse much of their existing customer fault management systems and processes.

CPs currently already offer compensation for customer-initiated claims on a case-by-case basis so the processes and systems are already largely in place to handle these claims. The introduction of automatic compensation would formalize some of the existing practices and require CPs to adopt an industry-standard approach to assessing the claims. To achieve this, CPs will need to implement changes to their case management procedures. This would include formalizing the criteria under which compensation is paid and standardizing the calculation for the payment amount.

[64] BT SIN 351, "BT Public Switched Telephone Network (PSTN): Technical Characteristics of the Single Analogue Line Interface", Issue 4.6.

To determine whether compensation is applicable for a delayed repair following loss of service, the CP will need to check whether the time limit for the repair had been exceeded. Functionality to measure restoration time is standard in commercial off-the-shelf (COTS) trouble ticket systems. The CP would also need to check whether the cause was due to the customer.

With the process potentially now handled in the absence of a customer phone-call, the CP would need to automate a communication (letter, email or SMS) out to impacted customers notifying them of the compensation payment.

Distinct from individual line faults, there is also the case of major network outages that affect multiple customers. Such events are rare and would be caused, for example, by the failure of a network element within the CP's network. In such cases, it would be technically feasible for CPs to proactively identify affected customers and proactively compensate them if the service was not restored within a given number of days. This could be done without requiring the customer to report the fault as the CP will be aware – via its network monitoring systems – that the failure has occurred.

We assume that CPs are currently already tracking and remedying multi-customer affecting faults, and so development of additional fault detection systems for auto-compensation is not required. What would be new subsequently identifying which customers where affected and then triggering the compensation payments. As for the individual line faults, the CP would also need to put in place communications to notifying customers of the compensation.

As we are only considering loss of service (not degradation) and the time to restore is one or more days, there are a limited number of relevant failure modes to consider. The most likely (within these criteria) would be a failure in a network element at the edge of the network (e.g. an MSAN), or in the backhaul from an access node (e.g. a BT Exchange) to the CP's aggregation network.[65] For these cases, identification of the affected customers can be achieved using the CP's network inventory records which will map customer lines to affected network element or access node.

✂[66] ✂[67]

4.3.2 Scenario in which a CP is using Openreach access

4.3.2.1 Gaps versus Current State

The following table outlines for each step in the current state process the changes that would need to be made to facilitate automatic compensation for this potential trigger.

Figure 40. Gaps versus Current State: Delayed Repair Following Fixed Loss of Service, Openreach Access

Step	Description of Current State	Changes required for Auto-Compensation
1	Monitor for major incidents on CP or OR network and notify CSAs	No change

[65] Failures elsewhere in a CP's network would cause traffic to be automatically rerouted.
[66] ✂
[67] ✂

2	CSA confirms customer identity and logs the issue	No change
3	CP diagnoses and resolves problem; escalating to OR if necessary	No change
4	CP updates records and closes problem record	No change
5	CSA verifies customer identity and checks case history	Some customers will still call to complain and customer contact will be necessary to reschedule appointment. IVR to be updated to efficiently route calls. CSA scripts will need to be updated to align with new compensation process. CSAs will need to be able to access the compensation eligibility, reason and amount when speaking with customers. Case history processing will now be initiated without a call from the customer. The CP will need to identify customers that are potentially eligible for compensation for delayed repair. Relevant data will include: - Customer details (account number, address, etc.) - Product - Date problem reported - Problem type (i.e. Loss of Service) - Date problem resolved (*) Items marked with an asterisk may be informed by Openreach data which can be gathered during the course of normal business operations and recorded against the problem report. The list of potentially eligible customers will then need to be filtered to remove those customers where the CP is not at fault. Relevant data will include: - Cause of fault (*) Items marked with an asterisk will be informed by Openreach data. Larger CPs may automate the analysis of the data to determine which customers are eligible. This will require new parsing and analysis of Openreach data. For small CPs, manual inspection of a system generated report may be more cost effective given the relatively small volumes they are dealing with.
6	CSA requests goodwill payment	There would be no need for management approval.
7	Customer notified of goodwill payment	Customer communications (letter, email or SMS) will need to be configured so that the customer is notified that they are receiving compensation. Relevant data is included in the list above, plus derived information such as the payment amount.

8	CSA triggers bill credit	Bulk billing process to credit customers who have been verified to have been impacted by the trigger event. May require upgrading batch billing systems.
9	Run bill cycle	The bill cycle will run "as is", but additional item codes will be needed to identify/describe the compensation process Invoice generation will run as is, but the invoice will need to display new item codes associated with the compensation. Additional information/explanation may be required in associated documentation to clarify the items to the customer
10	CP receives an SLG credit from OR	No change

4.3.2.2 Impacts to Relevant Processes

Figure 41. Process Impacts: Delayed Repair Following Fixed Loss of Service, Openreach Access

Ref	Impact	eTOM Level 1	eTOM Level 2
1	Identify breach of SLAs e.g. calculate length of outage	Assurance	Customer QoS/SLA Management
2	Update CSA scripts and case management procedures	Assurance	Customer Interface Management
3	Add IVR option to channel customers to the most appropriate CSAs (not to actually process a claim)	Assurance	Customer Interface Management
4	Add verification capability to approve/reject customer reports at a more granular level of fault diagnosis	Assurance	Service Problem Management
5	Improve fault verification processes so that outages can be linked to specific customer	Assurance	Service Problem Management
		Fulfilment	Service Configuration & Activation
6	Business logic to determine whether criteria for compensation payment has been met	Assurance	Customer QoS/SLA Management
7	Add capability to automatically trigger a billing credit once a missed appointment has been registered to a customer	Billing & Revenue Management	Bill Invoice Management
8	Automate comms to customer (email) to notify of successful compensation payment	Assurance	Customer Interface Management

4.3.2.3 Impacts to Relevant Systems

Figure 42. System Impacts: Delayed Repair Following Fixed Loss of Service, Openreach Access

Ref	Impact	TAM Level 1	TAM Level 2
1	Identify breach of SLAs e.g. calculate length of outage	Assurance	Customer SLA Management

2	Update CSA scripts and case management procedures	Assurance	Customer Service Representative Toolbox
3	Add IVR option to channel customers to the most appropriate CSAs (not to actually process a claim)	Operations Support and Readiness	Customer & Network Care
4	Add verification capability to approve/reject customer reports at a more granular level of fault diagnosis	Assurance	Customer Service Representative Toolbox
5	Improve fault verification processes so that outages can be linked to specific customer	Assurance	Service Problem Management
		Assurance	Customer Problem Management
6	Business logic to determine whether criteria for compensation payment has been met	Assurance	Customer SLA Management
7	Add capability to automatically trigger a billing credit once a missed appointment has been registered to a customer	Billing & Revenue Management	Receivables Management
			Bill Calculation
8	Automate comms to customer (email) to notify of successful compensation payment	Assurance	Customer Interface Management

4.3.3 Scenario in which a CP is using its own network

4.3.3.1 Gaps versus Current State

The following table outlines for each step in the current state process the changes that would need to be made to facilitate automatic compensation for this potential trigger.

Figure 43. Gaps versus Current State: Delayed Repair Following Fixed Loss of Service, Own Access Network

Step	Description of Current State	Changes required for Auto-Compensation
1	Monitor for major incidents on CP network and notify CSAs	No change
2	CSA confirms customer identity and logs the issue	No change
3	CP diagnoses and resolves problem; escalating to OR if necessary	No change
4	CP updates records and closes problem record	No change
5	CSA verifies customer identity and checks case history	Some customers will still call to complain and customer contact will be necessary to reschedule appointment. IVR to be updated to efficiently route calls.

		CSA scripts will need to be updated to align with new compensation process. CSAs will need to be able to access the compensation eligibility, reason and amount when speaking with customers. Case history processing will now be initiated without a call from the customer. The CP will need to identify customers that are potentially eligible for compensation for delayed repair. Relevant data will include: - Customer details (account number, address, etc.) - Product - Date problem reported - Problem type (i.e. Loss of Service) - Date problem resolved The list of potentially eligible customers will then need to be filtered to remove those customers where the CP is not at fault. Relevant data will include: - Cause of fault CPs may automate the analysis of the data to determine which customers are eligible. This will require new parsing and analysis of internal data.
6	CSA requests goodwill payment	There would be no need for management approval.
7	Customer notified of goodwill payment	Customer communications (letter, email or SMS) will need to be configured so that the customer is notified that they are receiving compensation. Relevant data is included in the list above, plus derived information such as the payment amount.
8	CSA triggers bill credit	Bulk billing process to credit customers who have been verified to have been impacted by the trigger event. May require upgrading batch billing systems.
9	Run bill cycle	The bill cycle will run “as is”, but additional item codes will be needed to identify/describe the compensation process Invoice generation will run as is, but the invoice will need to display new item codes associated with the compensation. Additional information/explanation may be required in associated documentation to clarify the items to the customer

4.3.3.2 Impacts to Relevant Processes

Figure 44. Process Impacts: Delayed Repair Following Fixed Loss of Service, Own Access Network

Ref	Impact	eTOM Level 1	eTOM Level 2
1	Identify breach of SLAs e.g. calculate length of outage	Assurance	Customer QoS/SLA Management

2	Update CSA scripts and case management procedures	Assurance	Customer Interface Management
3	Add IVR option to channel customers to the most appropriate CSAs (not to actually process a claim)	Assurance	Customer Interface Management
4	Add verification capability to approve/reject customer reports at a more granular level of fault diagnosis	Assurance	Service Problem Management
5	Improve fault verification processes so that outages can be linked to specific customer	Assurance	Service Problem Management
		Fulfilment	Service Configuration & Activation
6	Business logic to determine whether criteria for compensation payment has been met	Assurance	Customer QoS/SLA Management
7	Add capability to automatically trigger a billing credit once a missed appointment has been registered to a customer	Billing & Revenue Management	Bill Invoice Management
8	Automate comms to customer (email) to notify of successful compensation payment	Assurance	Customer Interface Management

4.3.3.3 Impacts to Relevant Systems

Figure 45. System Impacts: Delayed Repair Following Fixed Loss of Service, Own Access Network

Ref	Impact	TAM Level 1	TAM Level 2
1	Identify breach of SLAs e.g. calculate length of outage	Assurance	Customer SLA Management
2	Update CSA scripts and case management procedures	Assurance	Customer Service Representative Toolbox
3	Add IVR option to channel customers to the most appropriate CSAs (not to actually process a claim)	Operations Support and Readiness	Customer & Network Care
4	Add verification capability to approve/reject customer reports at a more granular level of fault diagnosis	Assurance	Customer Service Representative Toolbox
5	Improve fault verification processes so that outages can be linked to specific customer	Assurance	Service Problem Management
		Assurance	Customer Problem Management
6	Business logic to determine whether criteria for compensation payment has been met	Assurance	Customer SLA Management
7	Add capability to automatically trigger a billing credit once a missed appointment has been registered to a customer	Billing & Revenue Management	Receivables Management
			Bill Calculation
8	Automate comms to customer (email) to notify of successful compensation payment	Assurance	Customer Interface Management

5 Impact Assessment

5.1 Methodology

5.1.1 Overview

In this section, we set out our methodology for assessing the potential costs to industry that would arise from adopting automatic compensation for the potential triggers described in Section 2. This section includes a description of the cost model and the key input assumptions.

The model estimates the incremental costs of the CPs adopting automatic compensation relative to the status quo, and thus shows the net impact of change to the industry. It covers both one-off CAPEX and ongoing OPEX. The OPEX includes both fixed costs (for systems support) and variable operating costs driven by the volume of events that warrant compensation.

The model was designed with the following principles in mind:

- to have sufficient granularity of costs to allow input assumptions to be validated;
- to allow for variation in the level of cost impact between different types of CP;
- to allow sensitivity analysis, for example testing upper and lower estimates of costs, or changes in the volume of compensation events.

Ofcom and Cartesian sought input from representative providers in the industry covering large, medium and small CPs to validate the working assumptions around the potential triggers. The CPs were asked to provide an overview of the current state of the processes/systems involved in compensation. Model assumptions regarding the one-off costs of implementing the potential changes are largely based on Cartesian's own estimates. These are informed by our collective expertise in OSS/BSS and experience in supporting companies implement change to their business operations.

5.1.2 Model Structure

From a high-level perspective the model is divided into three main sections:

An **input section** containing the assumptions used to drive the model. It includes:

- General assumptions like the number of CPs, agent handling time, and salary costs for agents and other full-time employees (FTEs).
- CP-related assumptions, where we define the number of agents and other full-time employees to be trained and the related training costs.
- Assumptions related to estimating the volume of events e.g. fault rates, subscriber numbers
- Estimates of compensation event volumes per CP.
- Estimates for the delivery effort required to implement the process and system changes, according to their complexity and the different factors to capture for delivery synergies.
- Total delivery effort for each one of the major changes

A **calculation section** that determines the OPEX and CAPEX costs for each potential trigger scenario:

- This comprises several worksheets that calculate the OPEX and CAPEX costs of each option at a process and system level as per the TAM and eTOM frameworks.
- An **output section** consisting of a summarised view of each potential trigger scenario, with costs over a 10-year period.

The cost model considers the costs to CPs in each of the scenarios and sums these to determine the overall cost to industry.

- Retail CPs are segmented as follows:
  - Vertically Integrated CP (Virgin Media, KCOM)
  - Large CP (BT, Sky, TalkTalk)
  - Medium CP (e.g. a CP with its own systems)
  - Small CP (e.g. a CP which uses the systems of a third party integrator)
- The impact to TPIs (in terms of systems development costs) are also modelled and are included in the overall costs to industry

5.2 Key Assumptions

Input assumptions used in the cost model include information gathered by Ofcom from formal information requests, recent consumer research, and estimates where required. Below, we list the assumptions used in the model and their respective sources.

A number of simplifying assumptions were made in the cost modelling:

- Costs are based on a static view of the industry. We have not taken into account any changes in the market with regards to the total number of compensation events by each potential trigger;
- The model uses real costs rather than nominal values; unit costs are held constant over the period of analysis;
- The back-end Operation and Business Support Systems (OSS/BSS) of the four largest fixed CPs are assumed to be similar in terms of size and complexity, and hence development effort;
- For Virgin Media and KCOM, specific differences relating to their access network ownership and non-reliance on OR have been accounted for;
- The model assumes that customer support agent costs are fully variable – specifically, the model assumes customer support costs can be flexed down in response to lower demand;
- We have assumed that the volume and nature of interactions between CPs and Openreach relating to compensation events will not materially change;
- For 'delayed repair following loss of service' we have assumed that CPs/OR currently log and remedy all significant faults;
- The cost model excludes the compensation amount paid by CPs to consumers.

5.2.1 Communications Provider Assumptions

CP assumptions include the number of CPs by segment in the model, the share of fixed lines and the number of CSAs that would require training for the introduction of automatic compensation.

Figure 46. Communications Provider Assumptions

Input	Value	Source / Notes
CPs by Segment		
Vertical	2	KCOM, Virgin Media
Large	3	BT, Sky, TalkTalk
Medium	11	Ofcom estimate based on Openreach and Simplifydigital
Small	50	Ofcom estimate
TPIs	5	Cartesian estimate
Share of Fixed Lines by CP Segment		
Vertical	✂	Derived from CP data provided in response to Ofcom information request for 2016Q1
Large	✂	Derived from CP data provided in response to Ofcom information request for 2016Q1
Medium	8%	Cartesian estimate
Small	8%	Cartesian estimate
Number of CSAs by CP Type		
Vertical	2500	Cartesian estimate
Large	2500	Cartesian estimate
Medium	100	Cartesian estimate
Small	20	Cartesian estimate
Staff Costs		
IT Developer	£500/day	Based on market rates
IT Project Manager (per day)	£500/day	Cartesian assumption: Similar rate to IT developer

5.2.2 Compensation Events Assumptions to estimate opex savings resulting from lower number of customer calls in future as set against current compensation event volumes

The current average annual number of compensation events for the proposed triggers have been estimated by Ofcom from S135 data supplied by CPs.

For the Delayed Service Activation and Missed Appointment triggers, the model uses Ofcom's estimate of the current annual number of events that result in monetary compensation.

For the Delayed Repair trigger, we take Ofcom's estimate of the current annual number of events that result in monetary compensation and adjust this to account for the trigger threshold of 2 working days (i.e. we exclude the compensated events for repairs that occurred in less than 2 working days). We have done this by pro-rating the compensated events across the loss of service incidents that took one or more day to repair.

This approximation is reasonable if the following two conditions are broadly satisfied: (1) monetary compensation is not (or at least rarely) paid to incidents where the repair is completed in one working

day; (2) the probability of receiving monetary compensation for a fault repaired in 1 to 2 working days is the same as for a fault repaired in more than 2 days.

Figure 47. Compensation Event Assumptions

Input	Value	Source
Annual number of events that result in monetary compensation for Delayed Service Activation	166,663	Ofcom analysis based on CP data
Annual number of events that result in monetary compensation for Missed Appointments	34,151	Ofcom analysis based on CP data
Annual number of events that result in monetary compensation for Delayed Repair Following Loss of Service	605,569	Ofcom analysis based on CP data

5.2.3 Cost Assumptions

Cost assumptions include staff costs for IT development and business operations, and event-based costs for customer communications and compensation payments.

Figure 48. Cost Assumptions

Input	Value	Source / Notes
Development Costs		
IT Developer	£500/day	Based on market rates
IT Project Manager (per day)	£500/day	Cartesian assumption: Similar rate to IT developer
Project Management Overhead	15%	Cartesian estimate: 10% - 20% overhead for combined project management
Ongoing Support Costs	20%	Cartesian estimate: As a percentage of upfront costs
Operational Staff Costs		
CSA	£27,684/year	Based on formal information request by Ofcom from 4 largest CPs
CSA Supervisor	£54,400/year	Based on market rates from reed.co.uk with an estimated 60% employer overhead
Second Line Operations Staff	£80,000/year	Based on market rates from reed.co.uk with an estimated 60% employer overhead
Customer Communication Costs		
Email	£0.02	Cartesian estimate; assumes that CP uses a bulk email platform
Letter	£0.80	Cartesian estimate; assumes 2nd class post

Compensation Transaction Costs		
Bill credit	nil	Processed in existing billing cycle
BACS transfer	£0.23	HSBC Business Banking Pricelist - Small Business Tariff (large CPs may get bulk discounts)
Cheque by post	£0.80	Cartesian estimate; assumes 2nd class post
Pre-paid credit card by post	£1.00	MasterCard/Visa + 2nd class post

5.2.4 Delivery Effort Estimates

The potential costs of changes to CP systems (software applications) and processes (operational activities) are analysed on a bottom-up basis using estimates of the required effort in systems development, process modification and staff training. These estimates are set out using the same list of requirements that are used in the impact assessments, and can thus be cross-referenced to the process specifications.

The effort estimates for the main CP types for each of the major cost categories are shown in the table below. These estimates consider the time required for an end-to-end IT delivery project, including requirement gathering, solution design, documentation, software development, implementation and testing. They are based on Cartesian's industry experience gathered from internal experts who have first-hand experience in relevant divisions of CPs.

Some of the compensation triggers share common requirements, for example:

- All triggers require changes to customer literature, e.g. terms & conditions;
- All triggers require the ability to send outbound communications to the customer to notify them of the compensation payment;
- The Delayed Service Activation and Missed Appointment triggers both need to identify if a missed appointment occurred and, if so, was it due to the customer; and,
- All triggers require the ability to process the compensation payment.

In the case that multiple triggers were implemented, it is likely that CPs would seek to develop functions like this once and reuse them where applicable.

To account for this reuse within the model we estimate how much development effort is common for each of the requirements. The model then applies these reuse percentages when summing the effort for scenarios that include multiple triggers.

For small fixed CPs, the development estimates cover only customer-facing process changes and subsequent training; system changes are implemented via the TPIs. The TPI estimates are roughly in line with fixed medium sized CPs as tend to have similar OSS/BSS infrastructure in terms of size and complexity.

The following table summarizes the estimated number of days of effort required to implement the changes to the processes and systems for each of the potential triggers in each of the CP tiers. The effort estimates include developer and project management time. In practice the work would be undertaken by a number of people working in parallel. The elapsed time to implement these changes may therefore be less than the number of days of effort. Training is not included in this table.

Figure 49. Total Delivery Effort per CP and Compensation Trigger (man-days)

Trigger	Small CP	Medium CP	Large CP	Vertical CP	TPI
Delayed Service Activation	30	552	1,152	1,075	483
Missed Appointment	30	535	1,117	1,041	466
Delayed Repair following LoS	30	535	1,087	1,087	466
All Triggers	35	926	1,899	1,823	811

The scope of the cost model is limited to systems and processes within the Operational domain (i.e. Fulfilment, Assurance and Billing & Revenue Management). Specifically, impacts within the Enterprise Management domain have not been modelled, for example in Financial & Asset Management and Enterprise Risk Management.

In practice, CPs will have existing controls and processes to manage fraud and risk. We assume that these processes could be adapted to accommodate the needs of automatic compensation. The cost model includes development costs for management information systems (MIS) and reporting which would feed into the fraud and risk processes and controls.

5.2.5 Operational Effort Estimates

For the base-case, we have assumed that the volume of customer calls to report trigger events will not change from current levels if auto-compensation was introduced.

However, we model a small decrease in call duration for all trigger events. This is to reflect the fact that CSA processes will become streamlined as a result of system/process changes to implement auto-compensation. As the compensation amounts will be standardised, there will be a time saving in calculating the payment amount. We assume there will also be less requirement for escalation to the CSA Manager for approval of compensation payments.

The following table summarises the estimated time saved by CSAs for each of the trigger events.

Figure 50. Operational Effort Estimates

Input	Value	Source
CSA time saved per event for Delayed Service Activation	2 minutes	Cartesian estimate
CSA time saved per event for Missed Appointment	2 minutes	Cartesian estimate
CSA time saved per event for Delayed Repair following Loss of Service	3 minutes	Cartesian estimate

5.2.6 Finance Cost Parameters

Note that the model uses real costs, based on 2016/17 values; nominal WACC is converted to real WACC in the model using the Fisher equation.

Figure 51. Finance Cost Parameters

Input	Value	Source
Inflation Rate	2.0%	Bank of England target rate
Nominal WACC	9.8%	Ofcom estimate for retail CPs from 2016 BCMR

5.3 Base Case Cost Estimates

This section presents the outputs of the model under base case input assumptions. All figures are shown in real terms, based on 2016/17 values.

The base case cost input assumptions are presented in Section 5.2, above. Sensitivity adjusted outputs are presented in Section 5.4, below.

5.3.1 Estimated upfront CAPEX

Figure 52 shows the estimated upfront CAPEX that would be incurred per CP for each CP type. The final column of the table extrapolates these per-CP costs by the assumed number of each CP type to estimate the total cost to industry.

The CAPEX costs include the cost of changes to CP processes and systems, updating consumer literature and the cost of training CSAs. The CAPEX for Small CPs is much lower than the other CP types as these CPs use the systems of TPIs, as explained in Section 2.3.

The three trigger conditions have fairly similar implementation costs and share a number of common elements. The commonality between the three individual triggers can be seen in the estimated CAPEX for the All Triggers case, in which synergies between the individual triggers produces a total that is less than the sum of the individual cases.

Figure 52. Upfront CAPEX by Compensation Trigger

Trigger	Cost per CP (£M)					Industry Total (£M)
	Small	Medium	Large	Vertical	TPI	
Delayed Service Activation	0.01	0.28	0.75	0.72	0.24	8.6
Missed Appointment	0.01	0.27	0.74	0.70	0.23	8.3
Delayed Repair	0.01	0.27	0.72	0.72	0.23	8.3
All Triggers	0.01	0.48	1.31	1.27	0.41	14.4

5.3.2 Net Change in Ongoing Variable OPEX

Figure 53 shows the estimated net change in variable OPEX that would result from implementing automatic compensation. Negative figures in the table indicate a cost saving versus the current state. The figures are recurring, annual amounts.

The cost savings are a result of the assumed reduction in CSA time in handling customer compensation requests. This time saving is largely driven by the simple, standard rules for determining compensation entitlement and calculating the compensation amount. In the base case scenario, the number of customer compensation calls is assumed to be the same in the current state and future state.

Of the three triggers, the Missed Appointment trigger has the lowest net saving in OPEX due to the relatively small number of compensation events versus the other two trigger conditions. Delayed Repair Following Loss of Service has the highest net saving in OPEX, due to both the large number of trigger events and the assumption that automatic compensation would lead to a greater saving in CSA time for this trigger, due to the greater complexity in determining compensation eligibility and value for delayed repair under the current state.

Figure 53. Net Change in Variable OPEX by Compensation Trigger

Trigger	Net Change in Variable OPEX per CP (£M)					Industry Total (£M)
	Small	Medium	Large	Vertical	TPI	
Delayed Service Activation	0.00	0.00	-0.02	-0.01	0.00	-0.1
Missed Appointment	0.00	0.00	0.00	0.00	0.00	0.0
Delayed Repair	0.00	0.00	-0.12	-0.04	0.00	-0.5
All Triggers	0.00	0.00	-0.14	-0.05	0.00	-0.6

5.3.3 Annualised Cost

Figure 54 shows the estimated costs on annualised basis over 10 years.

The tables shows the costs for each of the compensation triggers individually, for the scenario in which all three triggers are implemented in parallel, and also the incremental cost of each trigger to the other two.

The annualised cost calculation includes the upfront CAPEX, the net change in variable OPEX, and an assumed fixed OPEX amount for maintenance and upkeep of the systems. The fixed OPEX amount is calculated as a percentage of CAPEX as explained in Section 5.2.

Of the three triggers, Delayed Repair Following Loss of Service has the lowest annualised cost as this trigger has the largest number of compensation events which produces a higher net reduction in variable OPEX.

Figure 54. Annualised Cost over 10 Years by Compensation Trigger

Trigger	Annualised Cost per CP (£M)					Industry Total (£M)
	Small	Medium	Large	Vertical	TPI	
Cost of Individual Triggers						
Delayed Service Activation	0.00	0.10	0.21	0.21	0.08	2.7
Missed Appointment	0.00	0.09	0.22	0.21	0.08	2.7
Delayed Repair	0.00	0.09	0.10	0.17	0.08	2.2
Cost of each trigger, Incremental to the other two triggers (when implemented at the same time)						
Delayed Service Activation	0.00	0.03	0.05	0.06	0.03	0.7
Missed Appointment	0.00	0.03	0.05	0.06	0.03	0.7
Delayed Repair	0.00	0.03	-0.05	0.03	0.03	0.4
Cost of all three triggers (when implemented at the same time)						
All Triggers	0.00	0.16	0.24	0.31	0.14	4.0

5.4 Sensitivity Analysis

To understand the sensitivity of the model outputs to changes in the input assumptions, we modelled six scenarios with adjustments to the input assumption. All of these scenarios take a more conservative view with respect to the base case in Sections 6.2.1 to 6.2.3, above.

- Increase estimated development effort by 20%
- Increase estimated training costs by 20%
- Reduce the net change in variable net OPEX by 20%
- Increase the volume of customer calls in the future state by 20%
- Increase the estimated number of Small CPs by 20%

5.4.1 Sensitivity to the estimated development effort

In this scenario, we increase the estimated development effort for each of the trigger cases by 20%. This increases the upfront CAPEX and, as a consequence, also increases the fixed OPEX. The combination of these two effects causes an increase the Annualised Cost as shown in the following table.

In absolute terms, the impact on each of the three triggers is similar, increasing the annualised cost to industry by approximately £0.5M. In percentage terms, this equates to an increase of between 19% and 23%, with Delayed Repair having the greatest percentage increase.

For the scenario with all three triggers, the annualised cost to industry increases from £4.0M to £4.8M (22%).

Figure 55. Model Outputs with 20% increase in estimated development effort (£M)

Trigger	CAPEX	Fixed OPEX	Var OPEX	Annualised Cost	Annualised Cost (Base Case)
Delayed Service Activation	10.1	2.0	-0.1	3.2	2.7
Missed Appointment	9.8	2.0	0.0	3.2	2.7
Delayed Repair	9.8	2.0	-0.5	2.7	2.2
All Triggers	16.9	3.4	-0.6	4.8	4.0

5.4.2 Sensitivity to the estimated training costs

In this scenario, we increase the estimated training costs for each of the trigger cases by 20%. This increases the upfront CAPEX and, as a consequence, also increases the fixed OPEX. These changes cause a small increase (1%) in the Annualised Cost as shown in the following table.

Figure 56. Model Outputs with 20% increase in estimated training costs (£M)

Trigger	CAPEX	Fixed OPEX	Var OPEX	Annualised Cost	Annualised Cost (Base Case)
Delayed Service Activation	8.8	1.8	-0.1	2.7	2.7
Missed Appointment	8.5	1.7	0.0	2.7	2.7
Delayed Repair	8.5	1.7	-0.5	2.2	2.2
All Triggers	14.8	3.0	-0.6	4.0	4.0

5.4.3 Sensitivity to the estimated net change in variable OPEX

In this scenario, we decrease the estimated net change in variable OPEX for each of the trigger cases by 20%. As the forecasted change is a reduction in OPEX, the sensitivity adjustment reduces the estimated operational cost savings. As a result, this change increases the Annualised Cost as shown in the following table.

Of the three triggers, the impact is greatest on the annualised cost of the Delayed Repair trigger (5%). This is due to this trigger having a larger estimated net saving in variable OPEX versus the other triggers.

Figure 57. Model Outputs with 20% decrease in the magnitude of net change in OPEX (£M)

Trigger	CAPEX	Fixed OPEX	Var OPEX	Annualised Cost	Annualised Cost (Base Case)
Delayed Service Activation	8.6	1.7	-0.1	2.7	2.7
Missed Appointment	8.3	1.7	0.0	2.7	2.7
Delayed Repair	8.3	1.7	-0.4	2.3	2.2
All Triggers	14.4	2.9	-0.5	4.1	4.0

5.4.4 Sensitivity to the volume of customer compensation calls in the future state

In this scenario, we increase the volume of customer compensation calls for each of the trigger conditions by 20%.

Increasing the volume of future-state customer compensation calls drives an increase in the future-state variable OPEX cost. This leads to a small (0.3% - 6.4%) increase in annualised cost as shown in the following table.

Figure 58. Model Outputs with 20% increase in customer compensation calls (£M)

Trigger	CAPEX	Fixed OPEX	Var OPEX	Annualised Cost	Annualised Cost (Base Case)
Delayed Service Activation	8.6	1.7	-0.1	2.7	2.7
Missed Appointment	8.3	1.7	0.0	2.7	2.7
Delayed Repair	8.3	1.7	-0.4	2.3	2.2
All Triggers	14.4	2.9	-0.4	4.1	4.0

5.4.5 Sensitivity to the estimated number of Small CPs

In this scenario, we increase the estimated number of Small CPs in the model from by 20% (from 50 to 60). This increases the contribution of upfront CAPEX, fixed OPEX and net variable OPEX from the Small CP segment to the total industry costs. These changes cause a small (1% - 2%) increase the Annualised Cost as shown in the following table.

Figure 59. Model Outputs with 20% increase in the estimated number of Small CPs (£M)

Trigger	CAPEX	Fixed OPEX	Var OPEX	Annualised Cost	Annualised Cost (Base Case)
Delayed Service Activation	8.7	1.7	-0.1	2.7	2.7
Missed Appointment	8.4	1.7	0.0	2.7	2.7
Delayed Repair	8.4	1.7	-0.5	2.2	2.2
All Triggers	14.5	2.9	-0.6	4.0	4.0

5.5 Implementation Time Estimate

We estimate that implementation of automatic compensation for the three triggers could be achieved in 12 to 18 months for Large CPs. We would expect Small and Medium CPs (including TPIs) would be able to implement the changes in six to nine months.

The estimated implementation timescales are based on our development effort estimates and discussions with CPs. The timescales assume that a CP is able to allocate the necessary resources to the implementation programme and that it is not unduly delayed by other IT and business change initiatives.

6 Conclusions

As described in the introduction to this report, the objectives of the study were to identify at a high level, and explain:

- the likely systems and processes needed to introduce automatic compensation;
- the extent to which such functionality exists already and what, if any, changes would be needed;
- an overall map of the steps that would be needed to make automatic compensation happen;
- likely costs; and,
- likely implementation timings.

Section 4 of this report sets out an initial view of the changes that would be to introduce automatic compensation. In our assessment, the introduction of automatic compensation for the three compensation triggers that Ofcom has proposed would be technically feasible and could be achieved by modification to existing systems and processes.

Section 3 of the report describes the current state approach to consumer compensation and identifies the processes and functionality that CPs currently employ to compensate consumers and provide goodwill payments in the event of service issues.

An assessment of the likely costs of introducing automatic compensation is presented in Section 5. The cost assessment indicates that each of the three triggers would cost a similar amount to implement individually. Under base case conditions, the estimated upfront CAPEX cost of a single compensation trigger for Large CPs is in the order of £0.75 million and the cost to Medium CPs is around £0.28M. Small CPs in the cost assessment rely on the systems of TPIs and therefore the implementation cost for Small

CPs is significantly less, estimated at circa £10k to cover CSA training and updates to customer literature. Extrapolating these individual costs to an industry level gives an estimated upfront CAPEX of £8.3M – £8.6M per trigger condition.

The trigger conditions share several common requirements, for example identifying the cause of a missed appointment is required for both the missed appointment trigger and the delayed service activation trigger.

Consequently, the cost of implementing all three compensation triggers in parallel is less than the sum of the costs of implementing the triggers individually. The estimated upfront CAPEX of implementing the three trigger conditions in parallel is £1.3M for a Large CP. At an industry level, the estimated upfront CAPEX cost of implementing all three triggers is £14.4M.

The cost assessment also estimates the impact that automatic compensation on CPs' ongoing OPEX costs. Two OPEX components are considered: fixed OPEX relating to the maintenance and upkeep of the processes and systems; and, variable OPEX which relates to the operational costs of handling compensation events. In the model, variable OPEX is largely driven by the time spent by CSAs on the phone with customers.

Based on discussions with CPs, we modelled a reduction in the amount of time a CSA requires to process a compensation event under automatic compensation versus the current state. We estimate that the time saved would be between 2 and 3 minutes per call depending on the trigger condition. We also assume that there would be less need for supervisor approval of claims within an industry-standard compensation regime.

The reduction in operational effort leads to a net saving in variable OPEX. The scale of the variable OPEX saving varies with CP size and trigger condition as these factors determine the number of relevant compensation events. For Large CPs, the estimated net reduction in variable OPEX ranges from £4k for Missed Appointments to £12k for Delayed Repair Following Loss of Service. The Delayed Repair trigger has the highest net saving in OPEX, due to both the large number of trigger events and the assumption that automatic compensation would lead to a greater saving in CSA time for this trigger, due to the greater complexity in determining compensation eligibility and value for delayed repair under the current state.

At an aggregate level, we estimate the total saving in variable OPEX would be £600k at an industry level if all three trigger conditions were introduced.

When assessed over a 10-year period, on a discounted cash flow basis, the annualised cost to industry of introducing the triggers individually ranged from £2.2M to £2.7M. The Delayed Repair trigger has the lowest annualised cost due to the higher estimated saving in variable OPEX, described above. We estimate that the annualised cost to industry of introducing all three triggers in parallel would be £4.0M under base case conditions.

The outputs of the model are sensitive to the estimated development effort and the estimated saving in variable OPEX (driven by reductions in the amount of time CSAs would spend handling claims). A 20% increase in the estimated development cost increases the annualised cost to industry for all three triggers from £4.0M to £4.8M. Likewise, reducing the estimated saving in variable OPEX by 20% increases the annualised cost to £4.1M.

Both the development effort and operational cost savings are based on Cartesian's own assumptions. Whilst Cartesian has sought to validate our assumptions through discussions with CPs, the extent of this was constrained by the available time, resources and information.

7 Glossary

Abbreviation / Term	Definition
B2B	Business to Business
CCD	Customer Committed Date (also known as Committed Delivery Date). The Openreach agreed date when an access order will be activated or installed.
CP	Communications Provider
CRD	Customer Required Date. The date on the customer requirement form when a customer needs the service to be activated or installed.
CSA	Customer Service Agent
CSR	Customer Services Representative
eTOM	Enhanced Telecoms Operating Model, a TM Forum framework for mapping CP processes
FAD	First Available Date
FTTC	Fibre to the Cabinet
GEA	Generic Ethernet Access
KCI	Keep Customer Informed
MBORC	Matters Beyond Our Reasonable Control. A contractual provision contained in all Openreach contracts which releases Openreach from liability under the relevant product terms and conditions in circumstances where the following criteria apply to our failure to perform the contract: • The cause of the incident is beyond Openreach's reasonable control and • The fix to remedy within contractual timescales is also beyond Openreach's reasonable control. Examples of MBORC situations include damage caused by exceptionally severe weather, criminal damage to network apparatus, damage to a PCP or pole caused by a traffic accident.
MDF	Metallic Distribution Frame
MIS	Management Information System
MPF	Metallic Path Facility
OR	Openreach
Openreach Portal	The portal provides an online interface for CSAs to interact with Openreach's dialogue services. CP staff can use the workflows to help them while they are on the phone to customers.
OTA	Office of the Telecommunications Adjudicator
PCP	Primary Connection Point, a.k.a. Openreach street cabinet
TM Forum	An industry association for CPs and their suppliers. Formerly "TeleManagement Forum".
TPI	Third party integrators develop and operate support systems for small CPs on a managed service basis
TRC	Time Related Charges. Openreach charges for engineer time spent repairing faults, where this work is not covered under the terms of service, and for providing or rearranging services or equipment where standard charges are not available.
OTA	Office of the Telecommunications Adjudicator

Abbreviation / Term	Definition
RG	Residential Gateway (a.k.a. router or modem) is the device which interconnects the broadband access connection to the customer's home network.
SLA	Service Level Agreement. A contractual commitment between operators to provide services to an agreed standard, e.g. to repair a fault within a specified period.
SLG	Service Level Guarantee. SLGs specify the level of compensation that is paid if an SLA commitment is breached.

Appendix 1: List of CPs interviewed

Cartesian interviewed a range of CPs to obtain insights on current state systems and operations and perspectives on the changes that would be required to implement automatic compensation.

- Asda Mobile
- BT
- O2
- Post Office
- SSE
- TalkTalk
- Virgin Media
- Vodafone
- Zen

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