Network Rail's conclusions on variable charges and station charges in Control Period 6 (CP6)

14 May 2018

1. Executive summary

1.1. The purpose of this document is to set out our conclusions on our July 2017 consultation on the methodology for recalibrating the following charges for control period six (CP6):

- Variable Usage Charge (VUC);
- Electrification Asset Usage Charge (EAUC);
- Electric Current for Traction (EC4T);
- Long term charges (LTC) for managed and franchised stations; and
- Qualifying Expenditure (QX) Management Fee for managed stations.

1.2. We have concluded separately on our proposed methodology for allocating fixed costs to train operators[1]. The Rail Delivery Group (RDG) is leading on the recalibration of Schedules 4 and 8 for passenger operators, engaging with the industry throughout the process.

Consultation responses

1.3. We received 22 responses to our consultation from the following stakeholders:

- Arriva Plc;
- Arriva Trains Wales;
- c2c;
- Chiltern Railways;
- Colas Rail;
- DB Cargo;
- Department for Transport;
- East Midlands Trains;
- Freightliner Group;
- GB Railfreight;
- Greater Anglia;
- Heathrow Express;
- London Midland;
- Merseytravel;
- North Yorkshire Moors Railway;
- Rail Freight Group;
- Transport for London;
- Transport for Greater Manchester;
- Transport Scotland;
- Urban Transport Group;
- Virgin Trains East Coast; and
- Virgin Trains West Coast.

[1] Available here: https://cdn.networkrail.co.uk/wp-content/uploads/2018/05/Network-Rails-conclusions-on-its-methodology-for-allocating-fixed-costs-to-train-operators-in-Control-Period-6-May-2018.pdf

1.4. We would like to thank all of the above stakeholders for taking the time to respond to this consultation and/or attending one of the meetings where we discussed this consultation. We appreciate your feedback on our charging proposals. We have published non-confidential versions of the, above, consultation responses on our website[2].

1.5. We summarise, below, our conclusions in relation to each of the charges consulted on in our July 2017 consultation.

Variable Usage Charge (VUC)

1.6. We consulted on some minor changes to VUCs for CP6, reflecting issues that have arisen during CP5. For example, giving passenger operators the option of setting VUC rates based on the maximum line speed over the route on which they operate (instead of the maximum speed of the vehicle), and permitting separate VUC rates for the different variants of the multiple unit motor/trailer vehicles that they operate (instead of the current average rates).

1.7. Following careful consideration of consultation responses, we have concluded that we should introduce the minor changes that we proposed in our consultation. Although the vast majority of operators indicated that they would not take up these new options, we consider that these changes will help to overcome charging issues that have arisen in relation to a minority of vehicles during CP5, and will continue to arise during CP6.

1.8. In light of consultation responses, we have also made some refinements to our proposed approach to setting VUCs in CP6. These include, as requested by freight operators, creating a separate commodity code of passenger testing train movements and working collaboratively with freight colleagues to generate a new 'curving class' for freight wagons with TF25 bogies.

Electrification Asset Usage Charge (EAUC)

1.9. In July 2017 we consulted on updating the assumptions used to calculate EAUC rates regarding the extent to which maintenance and renewal costs vary with traffic. Following careful consideration of consultation responses, we are proposing to retain the variability assumptions used to calculate EAUC rates for CP5.

1.10. In July 2017 we also proposed retaining the methodology used to calculate EAUC rates for CP5. However, following further consideration, we are now proposing an improvement to this methodology. Instead of allocating costs to passenger and freight operators based on their share of electrified vehicle miles in a single year (2017/18), we are now proposing to allocate these costs to passenger and freight operators based on their forecast share of electrified vehicle miles over the next 35 years. We consider that given EAUC is based on a long-run (35-year) cost forecast this change will improve the alignment between the cost and traffic forecasts used to calculate the charge, therefore, improving cost reflectivity.

1.11. We would welcome, in response to this document, any views that stakeholders have on our conclusions to use a long-run forecast of electrified traffic (rather than traffic in a single year) to allocate electrification asset costs between passenger and freight services.

[2] Available here.

Electric Current for Traction (EC4T) Charges

1.12. In July 2017 we consulted on some minor changes to EC4T charges. These proposed changes aimed to address issues raised by the Traction Electricity Steering Group in CP5 and provide a robust contractual basis on which to bill operators for their traction electricity consumption.

1.13. Following careful consideration of consultation responses, we have concluded:

- To recalibrate Distribution System Loss Factors for CP6 using the methodology explained in our July consultation;
- To recalibrate regenerative braking discounts for non-metered electrified services using the methodology explained in our July consultation;
- To remove power factor correction values from Appendix 2 of the Traction Electricity Rules; and
- To introduce default modelled consumption rates for passenger services.

Long Term Charges (LTC) at franchised stations

1.14. In our July 2017 consultation we explained how we proposed allocating forecast route-level franchised station maintenance, repair and renewal (MRR) expenditure to individual franchised stations in CP6.

1.15. Following careful consideration of consultation responses, we have concluded that we should **aim** to calculate franchised station long term charges for CP6 using the methodology (with some minor refinements) proposed in our July 2017 consultation. We provide further information about this methodology in Section 6, below.

1.16. However, we are currently working through some data quality issues relating to the operational property renewals element of the calculation. While we are working to resolve these issues, we are mindful that it may not be possible to do so with sufficient confidence in time for ORR's October 2018 Final Determination.

1.17. Should we not be able to gain sufficient confidence in the accuracy of the data in time for ORR's Final Determination, we may need to adopt a different approach to calculating CP6 franchised station long term charges. We will keep industry colleagues updated as our work progresses in this area and should we conclude that an alternative approach is required, we will discuss this alternative approach further with industry colleagues (e.g. at one the regular Rail Delivery Group PR18 meetings).

Long Term Charges (LTC) at managed stations

1.18. Our July 2017 consultation also explained how we proposed allocating forecast route-level managed station maintenance, repair and renewal expenditure to individual managed stations.

1.19. Following a review of the responses to our consultation, we have made some amendments to the methodology that we are proposing to use to calculate managed station long term charges.

1.20. In July 2017, we proposed allocating route-level forecasts of MRR expenditure to individual managed stations. Based on responses to our consultation, we are concluding that we should **aim** to calculate managed station long term charges on a station-by-station basis.

1.21. We would welcome, in response to this document, any views that stakeholders have on our conclusions to calculate managed station long term charges on a station-by-station basis (rather than allocating route level costs to stations). We will also present our revised methodology at one of the upcoming RDG PR18 working group meetings.

1.22. We are also working through the same data quality issues for the operational property renewals element of the managed station long term charge calculation discussed, above. We will keep industry colleagues updated on our work to resolve these issues. Consistent with our approach for franchised stations, should we conclude that an alternative approach to calculating managed station long term charges is required, we will discuss this alternative approach further with industry colleagues prior to implementation.

Managed Station Qualifying Expenditure (QX) Management Fee

1.23. In July 2017 we consulted on the managed station QX Management Fee, including the range of costs included in the central overheads element and a range for the profit element based on benchmarking analysis of similar operations.

1.24. Following careful consideration of consultation responses, we have concluded to include the cost elements described in our July 2017 consultation in the calculation of central overhead costs.

1.25. In our consultation, we proposed basing the profit element of the QX Management Fee on benchmarking analysis of similar operations. Our initial benchmarking work suggested a range for the profit element of 6-10%. We invited consultees to provide us with further evidence which could inform our analysis.

1.26. Having considered responses to our consultation and having received additional information, we have concluded that a profit element of 6% would be appropriate.

Future engagement and next steps

1.27. The future key milestones for this Periodic Review, relevant to establishing the structure of variable and station charges for CP6, are summarised in the table, below.

Table 1: Future periodic review milestones

Key milestone	Information	Date
ORR's Draft Determination	ORR's minded-to view in relation to setting structure and level of charges for CP6, including its views on our May 2018 conclusions	12 June 2018
Draft CP6 price lists	Publication of draft CP6 price lists by Network Rail, consistent with ORR's Draft Determination	End July 2018

ORR's Final Determination	ORR's final view which will ultimately set the structure of charges for CP6	31 October 2018
Final CP6 price lists	Publication of final CP6 price lists by Network Rail, consistent with ORR's Final Determination	December 2018

1.28. In our July 2017 consultation we stated that we were planning to publish draft CP6 variable and station charges price lists as part of this document consistent with our SBP. However, on 13 April 2018, ORR wrote to industry setting out its decision to cap freight VUCs in CP6. In this letter ORR also asked us to postpone publishing draft CP6 price lists until after it has issued its Draft Determination. Therefore, in this document we have not included draft CP6 price lists. As set out in the table, above, we now propose publishing draft price lists in July 2018 which will be consistent with ORR's Draft Determination.

1.29. **ORR will, ultimately, determine the level and structure of charges for CP6 in its Final Determination, due to be published in October 2018. It will publish a 'minded-to' decision as part of its Draft Determination, due to be published in June 2018. Therefore, it could be that ORR may not ultimately adopt all of our conclusions that are set out in this document.**

1.30. The remainder of this document is structured as follows:

- Safety;
- Proposed VUC methodology;
- Proposed EAUC methodology;
- Proposed EC4T methodology;
- Proposed Station Long term Charge methodology;
- Proposed Managed Station QX Management Fee methodology;
- Appendix 1 - Response to detailed stakeholder comments;
- Appendix 2 – Approach to excluding 'indirect' costs from VUCs;
- Appendix 3 – Approach to calculating franchised station long term charges for CP6;
- Appendix 4 – Approach to calculating managed station long term charges for CP6; and
- Appendix 5 – Approach to forecasting long-term annual equilibrium costs.

2. Safety

Summary of proposal in our consultation

2.1. We did not consider that the proposals set out in our July 2017 consultation were likely to impact the safety of the network. However, we asked stakeholders for their views on this issue.

Summary of consultation responses

2.2. All consultees agreed that the changes suggested in our consultation would not impact the safety of the network. Arriva Trains emphasised that the income from charges should reflect the level of wear and tear on the network. Freightliner stated that safety should be the top priority for Network Rail when operating and renewing the network.

Network Rail conclusion

2.3. We would like to thank stakeholders for considering this issue. We agree with consultees that the proposals set out in our consultation will not impact the safety of the network. Therefore, we are confident that the conclusions that we reach in this document will also not impact network safety.

3. Proposed CP6 Variable Usage Charge (VUC) methodology

Purpose and structure of the chapter

3.1. The purpose of this chapter is to set out our conclusions on the proposals in our July 2017 consultation regarding re-calibrating the Variable Usage Charge (VUC) for CP6.

3.2. The remainder of this chapter is structured as follows:

- Conclusions on vehicle characteristics;
- Conclusions on the assumed maximum speed of passenger vehicles;
- Conclusions on rates for passenger multiple units;
- Conclusions on freight operators running passenger vehicles;
- Conclusions on minor recalibration changes proposed by stakeholders;
- Conclusions on charter operator VUC rates, slot and cancellation charges; and
- Conclusions on North Yorkshire Moors Railway (NYMR) VUC rates.

3.3. In Appendix 1 of this document we respond to the more detailed comments from stakeholders that we received in response to our consultation on VUCs.

Conclusions of vehicle characteristics

Summary of proposal in our consultation

3.4. As part of our July 2017 consultation, we requested that stakeholders review the vehicle characteristics set out in the vehicle characteristics spreadsheet published alongside the consultation. The characteristics of a railway vehicle (e.g. its speed, axle load and unsprung mass) are important factors in calculating the 'wear and tear' that it imposes on the network and, therefore, its VUC rate. For this reason it is really important that stakeholders satisfy themselves that the characteristics of their vehicles are correct. We stated in our consultation that it would not be possible to re-open these characteristics and, therefore, VUC rates in CP6.

Summary of consultation responses

3.5. The majority of stakeholders did not provide any comments on the list of vehicle characteristics that we published alongside the consultation. DB Cargo requested that all new VUC rates agreed in CP5 are transferred onto the new CP6 price list. It also suggest that we confirm a 'drop dead' date by which operators should provide any updates to the list of vehicle characteristics which will underpin CP6 VUC rates. Freightliner expressed concerned that the list of freight vehicles contained wagon/commodity combinations which were not feasible in reality (e.g. coal being transported on intermodal wagons).

Summary of our conclusions

3.6. As requested by DB Cargo, we confirm that we will transfer all new rates agreed during CP5 onto the CP6 price list. However, we also suggest that, in due course, operators review the draft price list carefully to confirm that they contain all of the rates that they are expecting. We also thank Freightliner for highlighting the fact that some wagon/commodity combinations are not plausible (e.g. coal being transported on intermodal wagons). We have sought to remove these combinations from the draft CP6 price list. The wagon/commodity

combinations which have been removed are shown on the updated vehicle characteristics spreadsheet, which has been published alongside this document.

3.7. We welcome DB Cargo's suggestion of setting a 'drop dead' date by which operators should provide any updates to the list of vehicle characteristics. Where possible and appropriate we will always try to accommodate changes suggested by stakeholders to the list of vehicle characteristics. However, in order to ensure that we have sufficient time to do this we request that operators provide us with any updates in this area by no later than **30 June 2018**.

3.8. A full list of the vehicle characteristics currently assumed for each vehicle type has been published alongside this consultation. As set out in our consultation, we cannot re-open these vehicle characteristics in CP6. Therefore, we strongly recommend that operators review these characteristics and provide us and ORR any comments that they have as soon as reasonably possible. We will continue to work collaboratively with stakeholders in order to try and ensure that these assumptions are accurate.

Conclusions on the assumed maximum speed of passenger vehicles

Summary of proposal in our consultation

3.9. As part of our July 2017 consultation we proposed introducing the option of basing the assumed maximum speed of a passenger vehicle on the maximum line speed of the routes over which it operates (ignoring any temporary speed restrictions), rather than the maximum speed that the vehicle is capable of. Where different passenger operators operate the same vehicle class on different routes and are limited to different maximum line speeds, we proposed introducing the option of having two (or more) separate VUC rates. However, we caveated our proposal by saying that, if it emerges that a much more significant level of development work to our billing system is required to implement this change, it may not be proportionate to take it forward for CP6. We also said that in order to make our proposal workable, we would need to establish some additional charging principles.

Summary of consultation responses

3.10. The majority of passenger operators supported our proposal to introduce this additional option when calculating passenger VUC rates. However, in response to the consultation only c2c requested VUC rates based on the maximum line speeds of the relevant routes over which they operate. In particular, c2c requested that rates for their Cl 357 and Cl 387 vehicles be set based on a maximum line speed of 75mph, which is lower than the maximum speed that the vehicles are capable of (100mph and 110mph respectively). Greater Anglia also requested further discussion with us regarding taking up this option for its Cl 379 and Cl 170 vehicles.

3.11. Freight operators expressed concern that our proposal would add complexity to the VUC calculation process, and that any reduction in passenger VUC rates would result in a corresponding increase in freight VUC rates. GBRf also noted that line speed is not considered in the calculation of freight VUC rates.

3.12. Freightliner suggested that our Vehicle Track Interaction Strategic Model (VTISM), which we use to estimate track damage, does not appear to assess the impact of passenger trains running in excess of 100mph.

Summary of our conclusions

3.13. We recognise freight operators' concerns that our proposal will make VUC rates more complex in CP6. However, we consider that the benefits in terms to the improved cost reflectivity of VUC rates to be sufficiently worthwhile. Freight operators are also correct that any reduction in passenger VUC rates as a result of this change could result in a corresponding increase in other VUC rates, including freight rates. However, these changes in rates will make the recovery of VUC costs more accurate, and given only c2c have so far taken up this option any changes in other rates should be negligible.

3.14. We have concluded that we should give passenger operators the option of basing the assumed maximum speed of their vehicles (which informs the assumed operating speed used to calculate VUCs) on the maximum line speed over the routes on which they operate. We will incorporate the new rates requested by c2c into our draft CP6 VUC price list when we publish it in July 2018.

3.15. As set out in our consultation, for existing operators/vehicles this is a one-off opportunity to reflect line speeds in VUC rates and we will not be able to re-open these vehicle characteristics during CP6 (including where there are changes to line speeds during the control period). Re-opening these characteristics during CP6 would mean that we risk under recovering our 'wear and tear' costs. Therefore, we strongly suggest that if any existing operators would like VUCs for the vehicles that they currently operate to reflect maximum line speed (rather than maximum vehicle speed) to inform us by **30 June 2018**. Basing VUCs on maximum line speed would, however, be an option for existing operators when new vehicle types are introduced during the control period.

3.16. As noted in our consultation, in order to make this proposal workable, we will need to establish some additional charging principles. We consider that these should include:

- Each operator would only be allowed one VUC rate per vehicle class because our billing system is not sophisticated enough to apply different rates when the same vehicle runs on different parts of the network. Enhancing our billing system to allow this would be expensive and not justified in terms of a value for money test. The rate would be based on the maximum speed that the vehicle class is able to reach on any of the parts of the network that it runs on.

- Where vehicles are loaned between train operators the obligation would need to be on operators to inform us, otherwise the 'parent' rate would continue to apply. This is because our billing system attaches rates to vehicles, not operators.

- If vehicles were to be redeployed or cascaded to a different part of the network, with a different maximum line speed, again the onus would need to be on the operator to inform us otherwise the 'parent' rate would continue to apply.

- Where an operator has requested a lower VUC rate which reflects the maximum line speed on the relevant route, and that line speed is subsequently increased, it would be

necessary to calculate an updated VUC rate for that vehicle class. We envisage that this new rate would apply from the date that the line speed was increased.

3.17. We will continue to develop and refine these rules prior to the start of CP6, in collaboration with industry stakeholders and ORR.

3.18. As GBRf's noted line speed is not a relevant consideration in the calculation freight operators' VUC rates. The reason for this is that, unlike passenger operators, freight operating speeds are solely based on analysis of the timetable. This is in contrast to the approach to calculating passenger vehicle operating speeds, which are generally calculated using a formula which converts the maximum speed of the vehicle class (or maximum line speed in CP6) into an assumed typical operating speed[3].

3.19. We respond in detail to the point raised by Freightliner in Appendix 1 of this document. However, in summary, we consider that the track damage assumptions made in relation to passenger vehicles travelling in excess of 100mph to be reasonable, and we will not re-opening these for CP6.

Conclusions on rates for passenger multiple units

Summary of proposal in our consultation

3.20. In our consultation we proposed introducing the option of having more than one VUC rate for multiple unit motor/trailer vehicles within a vehicle class. Historically, although there have always been several variants of motor and trailer vehicles within each vehicle class, the VUC price list has not distinguished between these variants and rates have been calculated on a weighted average basis (separately for motor and trailer vehicles).

3.21. During CP5 we have observed increasing variation between the characteristics of multiple units and that it was becoming increasingly common for multiple units to run in different formations (e.g. as 5-car and 9-car units). This makes calculating a single appropriate weighted average VUC rate for a motor unit, for example, more challenging.

3.22. Our proposed new approach would mean that operators have the option of a calculating separate VUC rates for each variant of motor (and trailer) vehicle. This would mean that these motor (and trailer) vehicles could then be combined in any formation and an appropriate VUC would be levied on the train.

3.23. We caveated the proposal in our consultation by saying that initial analysis indicated that we would be able to accommodate this refined approach to charging passenger operators in our billing system with only a modest level of development work. However, if it emerged that a much more significant level of development work is required to implement this change, it may not be proportionate to take it forward for CP6.

3.24. We did not consider further disaggregation of freight VUCs to be necessary. The main reason for this is that freight VUC rates are already significantly more granular that passenger VUC

[3] Operating speed = 0.021 * maximum speed^1.71

rates. For example, multiple rates already exist for each wagon type reflecting the commodity that it is carrying (including typical laden weight and operating speed).

Summary of consultation responses

3.25. Consultees were generally supportive of having the option of calculating separate VUC rates for the different variants of motor/trailer vehicles. Urban Transport Group suggested that this would better reflect the actual level of wear and tear on the network. DB Cargo was concerned that the proposal would add another level of complexity to the calculation of VUC rates; however, it would have no objections if it only affected passenger vehicles.

Summary of our conclusions

3.26. We agree with DB Cargo's general point about being mindful of introducing too much complexity into our billing system.

3.27. Even though in response to our consultation no passenger operators requested bespoke rates for different variants of the same vehicle class, we have concluded that we should give passenger operators this option for CP6. We consider that it is increasingly likely that separate rates may be necessary, particularly where vehicles do not always run in fixed formations which makes calculating an appropriate single weighted average rate challenging.

3.28. Consistent with our approach to vehicle characteristics more generally, we will not be able to re-open this issue during CP6. Therefore, if any operator would like separate rates for different variants of the same vehicle class, it is vital that they let us know by **30 June 2018**.

3.29. Due to limitations in the functionality of our billing system, this proposal will not apply to freight operators running passenger vehicles (discussed in more detail, below). If a freight operator is running a passenger multiple unit for testing purposes, we would calculate a single rate for the motor vehicle and a single rate for the trailer vehicle based on the average characteristics of the respective vehicles. This approach is consistent with the approach to calculating charges in CP5, which will also continue to be available to operators in CP6

Conclusions on freight operators running passenger vehicles

Summary of proposal in our consultation

3.30. In our consultation we observed an increasing number of passenger vehicles being run by freight operators, mainly for testing purposes. We noted that during CP5 ORR has determined that an operator's VUC rate should be based on the type of vehicle and its intended use when in service, rather than whether it is being operated under a freight or passenger track access contract. For example, if a freight operator operates a passenger train for testing purposes its VUC rate should be based on the passenger charging methodology, not the freight methodology.

3.31. In light of this, we stated that for CP6 if a freight operator operates a vehicle intended for passenger use, its VUC rate will be calculated using the passenger charging methodology. However, we stated that we would continue to express the rate applicable to the freight operator on the price list as a £ per 1,000 gross tonne mile rate, consistent with other freight VUC rates.

Summary of consultation responses

3.32. Freight operators welcomed the clarification in relation to how these train movements would be charged in CP6. Freightliner suggested that we create a new freight commodity type for the running of passenger services so that these train movements are clearly separately identifiable for charging purposes. Freightliner also suggested that VUC rates for the testing of passenger services should be lower than the VUC rate for when these services begin carrying passengers as part of normal operations. They argued that lower rates would be justified on the basis that the testing of passenger services is generally carried out at lower speeds, and the trains would also be lighter because they do not typically carry passengers.

Summary of our conclusions

3.33. As determined by ORR during CP5, if a freight operator runs a train designed for passenger use we will calculate its VUC rate using the passenger charging methodology, rather than the freight charging methodology. However, we will then convert this rate from pence per vehicle mile to pounds per 1,000 gross tonne mile to be consistent with the rest of the freight VUC price list.

3.34. We agree with Freightliner that it could be useful to separately identify these train movements through the creation of new 'passenger movement' freight commodity code. This would make it clear which freight traffic should be subject to the same VUC rates as passenger operators. We will seek to introduce this new freight commodity type for CP6. However, in order for this proposal to work, train operators would have to create specific 'passenger movement' train service codes and assign them to this new freight commodity type.

3.35. We do not support creating two rates for each passenger vehicle class in CP6 (i.e. one for the vehicle testing and then one for the live running). We do not currently have separate VUC rates for empty coaching stock movements and do not propose creating separate rates for test runs. Given the relatively low mileage associated with freight running passenger services, we consider that it would be disproportionate to create separate testing rates for each passenger vehicle class. We also believe that during testing passenger vehicles will reach maximum speed, and be tested in different load conditions.

3.36. Due to limitations in the functionality of our billing system our proposal described above, in relation to giving operators the option of having more than one VUC rate for multiple unit motor/trailer vehicles, would not apply to freight operators running passenger vehicles. If a freight operator is running a passenger multiple unit for testing purposes, we would calculate a single rate for the motor vehicle and a single rate for the trailer vehicle based on the average characteristics of the respective vehicles. This approach is consistent with the approach to calculating charges in CP5, which will also continue to be available to operators in CP6

Conclusions on minor changes proposed by stakeholders

Summary of proposal in our consultation

3.37. In its June 2017 charging conclusions document, ORR stated that it would support Network Rail in making a small number of changes to the VUC for CP6 which are set out, above. As part of the consultation, we also sought stakeholders' views on any other potential minor changes that we could make for CP6.

Summary of consultation responses

3.38. The vast majority of stakeholders did not propose any additional changes in their consultation responses. GBRf questioned whether they were getting a sufficient discount on their VUC rates for their vehicles which run on TF25 bogies. GBRf also stated that, in its opinion, it was unfairly getting charged default rates when it runs a mixture of wagon types as part of the same train (e.g. on route to a maintenance depot) because systems restrictions mean that the same commodity type has to be assigned to all of the wagons in the train. This means that for some of the vehicles the relevant wagon/commodity combination does not exist in the price list.

3.39. Several freight colleagues questioned how our VUC cost estimates comply with the 2012 EU Directive (2012/34/EU) and the Implementing Regulation (EU 2015/909).

3.40. Urban Transport Group stated that research that it has carried out shows that the costs allocated to regional railways are disproportionate.

3.41. GBRf asked how the 'wear and tear' caused by Network Rail engineering traffic is accounted for in our VUC estimates.

Summary of our conclusions

3.42. We welcome train operators' running track-friendly vehicles on the network because this reduces our maintenance and renewal costs. Where operators like GBRf have invested in track-friendly vehicles we consider it important that they get an appropriate reduction in their track access charge rates, reflecting the lower levels of 'wear and tear' that their vehicles impose on the network.

3.43. In response to our consultation GBRf is in the process of providing us with the information that we need in order to create a TF25 'curving class', which we will incorporate into VUC rates for CP6. This information will improve the cost reflectivity of freight VUC rates and ensure that operators receive an appropriate reduction in their charges, reflecting their investment in this track-friendly technology.

3.44. We also recognise GBRf's concern that when they run a train comprising multiple different wagon types (normally to a location to undergo maintenance) they are only able to assign one freight commodity to the train, which can sometimes result in the application of default rates. To address this issue for CP6, we have concluded that a rate for the commodity type 'other' should exist for all wagon types in CP6, which can then be applied to these train movements. This effectively means extending the price list to include these additional wagon/commodity combinations, rather than making a change to the charging methodology.

3.45. We respond, in detail, to the question from freight colleagues in relation to how our VUC cost estimates comply with relevant EU legislation in Appendix 1 and 2 of this document. However, in summary, we have taken the opportunity to review our approach to calculating VUCs for CP6, and we will reflect any changes required by this new implementing regulation in how we propose calculating charges from 1 April 2019 (the start of CP6), prior to the June 2019 implementation deadline. We estimate the impact of excluding indirect costs from the VUC calculation would reduce the average level of our VUC cost estimate by 9%.

3.46. We do not agree with Urban Transport Group that the costs allocated to regional railways are disproportionate. We respond, in detail, to this view in Appendix 1 of this document.

3.47. We also respond in detail to GBRf's query in relation to engineering traffic in Appendix 1 of this document. In summary, engineering traffic is included in our modelling of VUC track 'wear and tear' costs, and we consider this to be an appropriate assumption.

Conclusions on charter operator VUC rates, slot and cancellation charges

Summary of proposal in our consultation

3.48. In our July 2017 consultation, we proposed using the same approach to setting charter VUCs in CP6 as was used in CP5. Unlike other passenger operators, charter operators' VUC rates are levied 'per train' rather than 'per vehicle'. We proposed continuing to assume that a typical charter train is comprised as follows:

- One locomotive plus eleven Mark 1 coaches;
- The steam locomotive rate should reflect a weighted average of the published rates for a Class 98/5 and Class 98/8 steam locomotive, with a 2:1 weighting in favour of the Class 98/8 based on frequency of use; and
- The non-steam locomotive rate should reflect a weighted average of the published rates for a Class 47 and Class 67 locomotive rates, with a 2:1 weighting in favour of the Class 67 based on frequency of use.

3.49. We also stated that we proposed continuing to apply the same slot and cancellation charges in CP6 as we applied in CP5, adjusted annually for changes in inflation (based on RPI), unless determined otherwise by ORR.

Summary of consultation responses

3.50. Most consultees supported retaining the current approach to charging charter operators based on a 'typical' charter train, rather than on a per vehicle basis like other passenger operators. However, Transport for Greater Manchester suggested broadening the definition of a typical charter train to include HSTs, given the potential forthcoming rolling stock cascades which will replace these trains, potentially freeing them up for the charter market.

3.51. GBRf stated that that they consider slot charges to be poor value for money and that we do not carry out work, such as vegetation clearance, with the money received through Slot Charges.

Summary of our conclusions

3.52. We will retain the same approach to charging charter operators in CP6, including assuming calculating VUC rates for the 'typical' charter train.

3.53. We agree with Transport for Greater Manchester that rolling stock cascades could mean that the composition of a 'typical' charter train changes in CP6, particularly given the forthcoming replacement of the current HST trainsets on several lines. However, we consider it premature at this stage to assume that these trains will be operated by charter operators in CP6 and, therefore, too early to revise charter operators' VUCs in this respect. If during CP6 the

composition of a typical charter train changes materially, we will consider this when setting operators' charges for CP7.

3.54. We do not agree with GBRf that Slot Charges are poor value for money. Slot charges cover the cost of additional gauging work and other operational activities, which we must carry out in order to accommodate charter services. These costs are not already funded through our Periodic Review settlement. The Slot Charge is not designed cover the cost of vegetation clearance on routes, which is funded separately as part of our funding settlement.

3.55. We also note that on 13 April 2018 ORR published a letter stating that its Draft Determination (to be published in June 2018) will include a proposal to cap / phase in the VUCs for charter services for a time limited period.

Conclusions on North Yorkshire Moors Railway (NYMR) VUC rates

Summary of proposal in our consultation

3.56. In our July 2017 consultation, we noted that generally NYMR is charged consistent with other passenger operators and pays the VUC rates set out in the passenger section of the Track Usage Price List. However, the CP5 Track Usage Price List also contains two VUC rates specific to NYMR. One of these rates applies to any steam locomotive (and tender) that NYMR run and the other rate applies to any diesel locomotives that NYMR run, which are not already on the Track Usage Price List. These two bespoke rates reflect the following assumptions:

- For steam locomotives the average of the rates on the published price list for Class 98/4 and Class 98/5 vehicle types; and
- For diesel locomotives (not otherwise on the price list) based on the rate for a Class 37/4 vehicle type.

3.57. We proposed retaining these bespoke VUC rates for NYMR in CP6 and calculating them in the same way.

3.58. We note that on 13 April 2018 ORR published a letter stating that it is considering whether it would be appropriate to cap VUCs for open access passenger operators in CP6. For CP5 ORR capped the increase in the level of NYMR's bespoke steam locomotive VUC rate.

Summary of consultation responses

3.59. NYMR stated that it is content with maintaining the current VUC charging mechanism.

Summary of our conclusions

3.60. We have concluded that we should retain the same approach to calculating NYMR VUC rates in CP6.

4. Proposed CP6 Electrification Asset Usage Charge (EAUC) methodology

Purpose and structure of the chapter

4.1. The purpose of this chapter is to set out our conclusions on the proposals in our July 2017 consultation regarding re-calibrating the Electrification Asset Usage Charge (EAUC) for CP6.

4.2. The remainder of this chapter is structured as follows:

- Conclusions on methodology for calculating EAUC rates for CP6; and
- Conclusions on revised variability assumptions.

4.3. In Appendix 1 of this consultation we respond to the more detailed comments from stakeholders that we received in response to our consultation on EAUC.

Conclusions on methodology for calculating EAUC rates for CP6

Summary of proposal in our consultation

4.4. We proposed recalculating the AC and DC EAUC rates for both passenger and freight operators using the latest forecasts of long-run renewal and maintenance costs over 35 years, using the same methodology as used to calculate EAUC rates for CP5.

Summary of consultation responses

4.5. Consultees did not raise any objections to our proposal to retain the same methodology as was used to calculate EAUC rates in PR13.

Summary of our conclusions

4.6. After further analysis, we have concluded that we should calculate EAUC rates for CP6 using an improved methodology. The CP5 methodology and our new methodology are summarised in the table, overleaf. The reason that we have concluded that we should revise the calculation is that the current approach would have led to perverse increases for certain train operators. These increases could not be justified on cost reflectivity grounds.

4.7. When we explored the reasons for these increases, it highlighted a feature of the current approach that we consider should be revised for CP6.

4.8. Instead of allocating annual average variable AC/DC costs to passenger and freight operators on the basis of their share of AC/DC vehicle miles in a single year, we are now proposing to allocate these costs to passenger and freight operators in proportion to their share of annual average AC/DC vehicle miles in the 35 years starting 2019/20. Given EAUC is based on a long-run (35-year) cost forecast this change will improve the alignment between the cost and traffic forecasts used to calculate the charge, therefore, improving cost reflectivity.

Step number	CP5 Methodology	Proposed methodology for calculating EAUC rates for CP6
1	Take the forecast annual average cost of maintaining and renewing AC and DC electrification assets over 35 years, respectively;	Take the forecast annual average cost of maintaining and renewing AC and DC electrification assets over 35 years, respectively;
2	Network Rail quantified the proportion of maintenance and renewal costs that are variable and used these values to calculate average annual variable costs for AC and DC assets, respectively;	Network Rail quantified the proportion of maintenance and renewal costs that are variable and used these values to calculate average annual variable costs for AC and DC assets, respectively;
3	AC and DC variable costs were allocated to passenger and freight operators according to their share of AC and DC vehicle miles in 2011/12, respectively;	AC and DC variable costs allocated to passenger and freight operators according to their share of annual average AC and DC vehicle miles, respectively, over the 35 years starting in 2019/20;
4	Calculate the forecast annual average electrified vehicle miles for passenger operators and annual average electrified thousand gross tonne miles for freight operators over 35 years, split into AC and DC;	Calculate the forecast annual average electrified vehicle miles for passenger operators and annual average electrified thousand gross tonne miles for freight operators over 35 years, split into AC and DC;
5	AC/DC EAUC rates for passenger operators calculated by dividing the forecast annual average AC/DC variable costs allocated to passenger services by the forecast annual average passenger AC/DC vehicle miles; and	AC/DC EAUC rates for passenger operators calculated by dividing the forecast annual average AC/DC variable costs allocated to passenger services by the forecast annual average passenger AC/DC vehicle miles; and
6	AC/DC EAUC rates for freight operators calculated by dividing the forecast annual average AC/DC variable costs allocated to freight services by the forecast annual average AC/DC electrified thousand gross tonne miles.	AC/DC EAUC rates for freight operators calculated by dividing the forecast annual average AC/DC variable costs allocated to freight services by the forecast annual average AC/DC electrified thousand gross tonne miles.

4.9. As shown, above, the change in approach is only to step 3 of the current approach (shown shaded).

4.10. We recognise that the methodology described in paragraph 4.8 differs from that which we consulted on in July 2017. We would welcome, in response to this document, any views that stakeholders have on our conclusions to use a long-run forecast of electrified traffic (rather than traffic in a single year) to allocate electrification asset costs between passenger and freight services. Should any stakeholders have concerns regarding the methodology described in paragraph 4.8, please send these to RegulatoryEconomics@networkrail.co.uk.

Conclusions on revised variability assumptions

Summary of proposal in our consultation

4.11. In July 2017 we proposed revising the cost variability assumptions that were used to calculate EAUC rates in PR13 and using these revised assumptions to calculate EAUC rates in PR18.

Summary of consultation responses

4.12. The majority of consultees agreed with the revised variability assumptions for EAUC. However, Trenitalia c2c were concerned that the decision to change the variability assumptions appeared to have been based on one particular area of the network and that this may not be representative of the entire network.

Summary of our conclusions

4.13. Following careful consideration of the responses to our consultation, we have concluded that we should retain the cost variability assumptions used to calculate EAUC rates for CP5. These are set out, below. The reason that we have concluded that we should retain the current variability assumptions is that when we investigated the concerns raised by Trenitalia c2c we concluded that they had merit. We are grateful for Trenitalia c2c for pointing this out. We will aim to undertake further work ahead of CP7 in order to provide a more robust source of evidence to support any future changes in variability assumptions.

Category	Traction type	Sub-category	Cost variability assumption
Maintenance	AC	OLE maintenance	8%
	DC	ETE maintenance	20.8%
Renewals	AC	OLE Contact/Catenary Rewire	72%
	AC	OLE Mid-Life Refurbishment	42%
	AC	OLE Full Renewal	10.5%
	AC	OLE Component Change	10%
	DC	Conductor Rail Renewal	54%

5. Proposed CP6 Electric Current for Traction (EC4T) methodology

Purpose and structure of the chapter

5.1. The purpose of this chapter is to set out our conclusions on the proposals in our July 2017 consultation regarding:

- Recalibration of the Distribution System Loss Factors (DSLFs) used to charge metered train operators for their usage of traction electricity;
- Recalibration of the regenerative braking discounts applied to modelled consumption rates where the modelled train operates a regenerative braking system;
- Removing the power factor correction values from Appendix 2 of the Traction Electricity Rules; and
- Introducing default modelled consumption rates for electrified passenger services.

5.2. The remainder of this chapter is structured as follows:

- Conclusions on Distribution System Loss Factor (DSLF) recalibration;
- Conclusions on regenerative braking discount recalibration;
- Conclusions on removing power factor correction values from Appendix 2 of the Traction Electricity Rules; and
- Conclusions on introducing default modelled consumption rates for passenger services.

5.3. In Appendix 1 of this consultation we respond to the more detailed comments from stakeholders that we received in response to our consultation.

Conclusions on Distribution System Loss Factor (DSLF) recalibration

Summary of proposal in our consultation

5.4. Consistent with ORR's June 2017 conclusions document, for CP6, we proposed recalibrating the DSLFs used for billing metered services.

5.5. In July 2017, we consulted on the methodology that we proposed using to recalibrate DSLFs and asked stakeholders for their views on this methodology.

Summary of consultation responses

5.6. The majority of consultees were supportive of the methodology that we proposed using to recalibrate DSLFs. For example Arriva Trains stated that they considered this to represent the best technical advice available. Some consultees raised detailed questions regarding our proposals, which we respond to in Appendix 1 to this document.

Summary of our conclusions

5.7. Consistent with ORR's June 2017 conclusions document, for CP6 we have concluded that we will recalibrate the DSLFs used for billing metered services based on the methodology that we consulted on.

5.8. A finalised report explaining the methodology that we consider should be used to recalibrate DSLFs is shared alongside this conclusions document.

Conclusions on regenerative braking discount recalibration

Summary of proposal in our consultation

5.9. Consistent with ORR's June 2017 conclusions document, for CP6, we proposed recalibrating the regenerative braking discounts that are applied to modelled consumption rates (for non-metered trains that are capable of regenerative braking).

5.10. In July 2017, we consulted on the methodology that we proposed using to recalibrate regenerative braking discounts and asked stakeholders for their thoughts on this methodology.

Summary of consultation responses

5.11. The majority of the consultees agreed with the proposed methodology to recalculate regenerative braking discounts or had no comment. Transport for Scotland said the proposal was sensible. Virgin Trains West Coast agreed that the rationale seemed sensible and confirmed that the proposed discount of sixteen percent for long distance AC concurred with its data from metered trains.

Summary of our conclusions

5.12. We have concluded that we should use the methodology described in our July consultation document to recalibrate the regenerative braking discounts that will apply to modelled vehicles capable of regenerative braking in CP6.

5.13. Based on our latest analysis, the regenerative braking discounts for CP6 based on this methodology would be:

Type of infrastructure / service frequency	Proposed CP6 Discount (%)
AC, long Distance (more than 10 miles between stations)	16%
AC, suburban (less than or equal to 10 miles between stations)	22%
DC	15%

Conclusions on removing power factor correction values from Appendix 2 of the Traction Electricity Rules

Summary of proposal in our consultation

5.14. Appendix 2 of the Traction Electricity Rules includes data on the power factor and power factor correction by metered train, which are used to calculate traction electricity charges for AC metered trains.

5.15. We consulted on removing power factor correction values from Appendix 2 since all of the values are currently either "N/A" (because the metered train in question is a DC train) or equal

to one. Instead, it would be assumed that the power factor correction value for all present and future metered AC trains is equal to one. This would have the advantage of reducing the administrative burden on metered train operators.

Summary of consultation responses

5.16. Consultees were supportive of our proposal to remove the power factor correction values.

Summary of our conclusions

5.17. Given the responses to our July 2017 consultation, we have concluded that the power factor correction values from Appendix 2 of the Traction Electricity Rules should be removed.

Conclusions on introducing default modelled consumption rates for passenger services

Summary of proposal in our consultation

5.18. We proposed introducing default modelled consumption rates for electric passenger train services for CP6 in order to provide Network Rail with a robust contractual basis for billing modelled services whilst waiting for a modelled consumption rate to be consented to or determined by ORR. Consistent with this proposal, metered services would be billed using the default modelled consumption rate whilst waiting for the relevant track access contract to be supplemented to allow for billing on the basis of meter readings, where a generic consumption rate does not exist.

5.19. We proposed that the default rate for electric multiple units in CP6 should be equal to the highest rate for electric multiple units on the modelled consumption rates list (including supplements) at the start of the control period. Similarly, we proposed that the default rate for electrified locomotive-hauled passenger services should be equal to the highest rate for electrified locomotive-hauled passenger services on the modelled consumption rates list (including supplements) at the start of the control period. Setting default modelled consumption rates in this way would provide an incentive for operators to apply for a modelled consumption rate at the earliest available opportunity.

Summary of consultation responses

5.20. The majority of consultees were supportive of our proposal to introduce default modelled consumption rates for passenger services. However, some consultees were concerned at our proposal to set default rates for electric multiple units/electrified locomotive-hauled passenger services at the highest rate for electric multiple units/electrified locomotive-hauled passenger services on the modelled consumption rates list. Transport for London (TfL) were concerned that journeys from a prior financial year could not be recharged once a modelled consumption rate had been consented to/determined by ORR and that this could lead to an operator being overcharged. TfL therefore suggested that the default rate be set at the value for a comparable unit.

Summary of our conclusions

5.21. We understand the concerns raised by TfL. However:

- We consider that the fact journeys in a previous financial year cannot be recharged should incentivise operators to apply for a modelled consumption rate at the earliest available opportunity; and
- For simplicity, we are only proposing to have two passenger default rates (one for electric multiple units and one for locomotive-hauled passenger services). If these rates are not set at a sufficiently high level, then this could incentivise operators of high-consuming services not to apply for a modelled consumption rate (since the modelled rate may be higher than the default rate).

5.22. We have concluded that default modelled consumption rates should be introduced for passenger services for CP6. As suggested in July 2017, we think that the default rate for electric multiple units in CP6 should be equal to the highest rate for electric multiple units on the modelled consumption rates list (including supplements) at the start of the control period. Similarly, we have concluded that the default rate for electrified locomotive-hauled passenger services should be equal to the highest rate for electrified locomotive-hauled passenger services on the modelled consumption rates list (including supplements) at the start of the control period.

5.23. This would mean that default modelled consumption rates for passenger services would be:

Loco/MU	1 Unit	2 x Unit	3 x Unit
Loco	64.112	N/A	N/A
MU	31.346	60.184	89.336

5.24. The default rate for locomotive-hauled services is equal to the rate for a class 92/0 on train service code 23557004. The default rate for electric multiple units is equal to the rate for a class 390 on train service code 22100001.

6. Proposed CP6 stations Long Term Charge (LTC) methodology

Purpose and structure of the Chapter

6.1. The purpose of this chapter is to set out our conclusions on the proposals in our July 2017 consultation regarding re-calibrating the Long Term Charge (LTC) at managed and franchised stations for CP6.

6.2. The rest of this chapter is structured as follows:

- Conclusions on methodology for calculating franchised station long term charges for CP6; and
- Conclusions on methodology for calculating managed station long term charges for CP6.

6.3. In Appendix 1 of this consultation we respond to the more detailed comments from stakeholders that we received in response to our consultation in relation to long term charges.

Conclusions on methodology for calculating franchised station long term charges for CP6

Summary of proposal in our consultation

6.4. In our July 2017 consultation, we proposed calculating franchised station long term charges using the methodology described, below:

(a) Operational property assets
- Forecast route franchised station operational property maintenance, repair and renewal (MRR) expenditure for CP6; and
- Multiply the station's percentage share of the relevant route's average annual franchised station operational property depreciation by that route's forecast annual average franchised station operational property MRR expenditure over CP6.

(b) SISS assets
- Forecast route franchised station SISS MRR expenditure for CP6; and
- Multiply the station's percentage share of the relevant route's average annual franchised station SISS depreciation by that route's forecast annual average franchised station SISS MRR expenditure for CP6.

(c) Total LTC
- Sum the figures calculated in (a) and (b) to calculate the total long term charge for each franchised station.

Summary of consultation responses

6.5. Consultees were generally reasonably supportive of our proposed methodology for calculating franchised station long term charges for CP6. Some consultees requested further information regarding this methodology, which we provide below. In addition, some consultees raised a number of detailed points which we respond to in Appendix 1.

Summary of our conclusions

6.6. Following careful consideration of responses received to our consultation we have concluded that we should **aim** to calculate franchised station long term charges for CP6 using the methodology described in paragraph 6.13, below. This includes some minor refinements to the methodology proposed in our July 2017 consultation.

Data quality

6.7. Currently, however, we are working through some data quality issues for the operational property element of the franchised station long term charge calculation (which forms the most significant part of each station's overall long term charge).

6.8. A key input into our calculation of operational property long-term annual equilibrium costs (the amount that we expect we would have to spend, on average, to preserve asset condition[4] and used to allocate expenditure between individual stations) is data from our Operational Property Asset System (OPAS) system[5]. We have recently been made aware of some data quality issues with the individual station asset data recorded in the OPAS system. We are working to resolve these issues.

6.9. Due to the detailed nature of the asset data held in OPAS and the fact that there are 2,309 franchised stations across the network, however, it may not be possible to resolve these issues with sufficient accuracy in time for ORR's October 2018 Final Determination. We are cognisant of the need to be confident in the data used to allocate route-level expenditure to individual franchised stations, particularly given the potential impact on existing and aspirant open access operators.

6.10. Should we not be able to gain sufficient confidence in the accuracy of the data in time for ORR's Final Determination, we may need to agree a different approach to calculating CP6 franchised station long term charges with operators and ORR. We will keep industry colleagues updated as our work progresses in this area and should we conclude that an alternative approach is required, we will discuss this alternative approach further with industry colleagues (e.g. at one the regular Rail Delivery Group PR18 meetings).

6.11. We have identified a potential alternative methodology that we consider would be a significant improvement on the CP5 methodology and could also help to address the OPAS data quality issues. This approach would be to make use of the fact that each station is classified into one of six categories (A-F), based on station footfall. Category A stations are the biggest and category F the most basic stations. We could use the OPAS data to create a long-run annual average cost estimate (which we call long term annual equilibrium cost) for each of the station categories for each Network Rail route. This cost estimate represents the amount of money that we expect that we would have to spend on average to preserve asset condition (this approach is explained further in Appendix 5 of this document). This approach would mean that the same average long-term annual equilibrium cost would apply to all stations in the same category and on the same route. We consider that one benefit of this approach

[4] Further explanation of how long-term annual equilibrium cost is calculated is explained in Appendix 5.
[5] OPAS is Network Rail's corporate asset register for operational property assets.

would be the 'portfolio effect' that it would have, which would serve to average out any potential data issues with individual franchised stations.

6.12. More generally, we think that these data quality issues serve to highlight the difficulties with calculating long term charges for individual franchised stations, which has been raised in previous periodic reviews. We will explore alternative approaches to calculating franchised station long term charges ahead of CP7, working with the industry and ORR.

Calculation methodology (subject to resolving data quality issues)

6.13. If we are able to resolve the data quality issues set out in paragraphs 6.7 to 6.12, above, we conclude that the following methodology should be adopted for calculating franchised station long term charges in CP6:

1. Taking the forecast of post-efficient route-level annual average franchised station operational property MRR expenditure for CP6;

2. Allocating (1) to individual franchised stations in a route based on their share of the relevant route's long-term annual equilibrium cost (the amount that we expect we would have to spend, on average, to preserve asset condition)[6];

3. Taking the forecast of route-level annual average franchised station SISS MRR over CP6 and allocating to relevant individual franchised stations in a route based on their share of the relevant route's annual average SISS renewal cost over 35 years.

4. There are some third party SISS contracts that only apply to certain stations. Where a third party SISS contract covers multiple stations, these costs are allocated to individual stations based on each station's share of those stations' annual average SISS renewal cost over 35 years;

5. Adding (2), (3) and (4) to calculate the total long term charge for each franchised station.

6.14. This is identical to the methodology on which we consulted in July 2017 except that:

- We would allocate route-level annual average franchised station operational property MRR expenditure in CP6 to individual franchised stations based on their share of the relevant route's long-term annual equilibrium cost rather than on the basis of annual depreciation estimates. We are proposing this change because we think that the long-term annual equilibrium cost is more likely to be representative of long-run expenditure.
- Similarly, we would allocate route-level annual average franchised station SISS MRR over CP6 to relevant individual franchised stations according to their share of annual average SISS renewal expenditure over 35 years, rather than on SISS depreciation. We are proposing this change because we think that this approach is more likely to be representative of long-run expenditure.

[6] Further explanation of how long-term annual equilibrium cost is calculated is explained in Appendix 5.

6.15. We describe this methodology in more detail in Appendix 3.

Conclusions on methodology for calculating managed station long term charges for CP6

Summary of proposal in our consultation

6.16. In our July 2017 consultation, we proposed calculating managed station long term charges using the methodology described, below:

(a) Operational property assets
- Forecast route managed station operational property assets MRR expenditure over 100 years;
- Multiply each station's percentage share of the relevant route's average annual managed station operational property depreciation by that route's forecast managed station operational property MRR expenditure over 100 years; and
- Divide this figure by 100 to calculate the expected average annual operational property maintenance, repair and renewal expenditure for that station.

(b) SISS assets
- Calculate route forecasts of SISS MRR expenditure over 35 years;
- Multiply each station's percentage share of the relevant route's average annual managed station SISS depreciation by that route's forecast managed station SISS MRR expenditure over 35 years; and
- Divide this figure by 35 to calculate the expected average annual SISS maintenance, repair and renewal expenditure for that station.

(c) Total LTC calculation
- Sum the figures calculated in (a) and (b) to calculate the long term charge for each managed station.

Summary of consultation responses

6.17. The majority of consultees were supportive of our proposed methodology for calculating managed station long term charges for CP6. However, the Department for Transport (DfT) suggested that calculating station-by-station charges would deliver "greater value for money for taxpayers and funders".

Summary of our conclusions

6.18. Network Rail only has 21 managed stations. These are each quite big undertakings. We have concluded that DfT's feedback about calculating long term charges for managed stations at an individual station level is compelling.

6.19. Therefore, we have concluded that we will **aim** to calculate managed station long term charges using a different methodology (to that set out in our consultation), which is described, below:

(a) Operational property renewal costs: Calculating the long-term annual equilibrium cost for each individual managed station;

(b) Operational property maintenance costs: Taking the operational property maintenance forecasts for individual managed stations which we consider is representative of long-run maintenance expenditure.
(c) SISS renewals: Calculating the long-term annual average renewal cost for SISS for each managed station over 35 years.
(d) SISS maintenance: Calculating the forecast SISS maintenance cost for individual managed stations in CP6 which we consider is representative of long-run maintenance expenditure.
(e) There are a number of third party SISS contracts that only apply to certain stations. Where a third party SISS contract covers multiple stations, these costs are allocated to individual stations based on each station's share of those stations' annual average SISS renewal cost; and
(f) Summing each of the elements, above, to calculate individual managed station long term charges.

6.20. We describe this methodology in more detail in Appendix 4.

6.21. These changes have the potential to make managed station long term charges more cost reflective than the methodology that we consulted on in July 2017. In addition, this change simplifies the managed station LTC calculations as we will no longer need to forecast route-level expenditure and then allocate this to individual managed stations. Instead, we will forecast spend at a station level.

6.22. We would welcome, in response to this document, any views that stakeholders have on our conclusions to calculate managed station long term charges on a station-by-station basis (rather than allocating route level costs to stations). We will also present our revised methodology at one of the upcoming RDG PR18 working group meetings.

6.23. A key input into our calculation of operational property long-term annual equilibrium costs is data from our OPAS system. The same data quality issues described in paragraphs 6.7 – 6.12 apply to the managed station asset information held within the OPAS system. We are working to resolve these issues. We consider resolving the data issues for managed stations to be more achievable than for franchised stations, due to the significantly lower number of stations (21 managed stations compared to 2,309 franchised stations). Should it prove possible to resolve these issues in time for ORR's Final Determination, we consider that we should apply the methodology described in paragraph 6.19, above.

6.24. However, it may not prove possible to resolve these issues in time for ORR's Final Determination. We are cognisant of the need to be confident in the data used to calculate individual managed station long term charges, particularly given the potential impact on existing and aspirant open access operators.

6.25. Should it not prove possible to resolve these issues in time for ORR's Final Determination, it may be appropriate for current CP5 managed station long term charges (or the operational property element of them) to be retained for CP6, with adjustments for inflation. While we are mindful that this would not correct the errors with the current managed station cost forecasting methodology, it would mean that passenger operators (particularly open access operators) are not unduly exposed to volatility in the level of their station charges. We would

be concerned about moving to a different approach if we did not have sufficient confidence in the underlying data.

6.26. We will keep industry colleagues updated on our work to resolve these issues. Consistent with our approach for franchised stations, should we conclude that an alternative approach to calculating managed station long term charges is required, we will discuss this alternative approach further with industry colleagues prior to implementation.

7. Proposed CP6 Managed Station Qualifying Expenditure (QX) Management Fee methodology

Purpose and structure of the chapter

7.1. The purpose of this chapter is to set out our conclusions on the proposals in our July 2017 consultation regarding re-calibrating the Managed Station Qualifying Expenditure (QX) Management Fee for CP6.

7.2. The rest of this chapter is structured as follows:

- Conclusions on central cost categories included in central overheads element of the management fee;
- Conclusions on the profit element of the QX management fee; and
- Aligning the managed station QX Management Fee with the Periodic Review.

7.3. In Appendix 1 of this consultation we respond to the more detailed comments from stakeholders that we received in response to our consultation on managed station QX Management Fee.

Conclusions on central cost categories included in central overheads element of the management fee

Summary of proposal in our consultation

7.4. In July 2017 we proposed including a range of cost categories in the central overheads element of the Managed Station QX Management Fee for CP6. These cost categories were similar to those included in the central overheads element of the Managed Station QX Management Fee for CP5. These cost categories we consulted on were:

- National managed station team;
- Aspects of asset management;
- Architecture;
- Aspects of utilities;
- Fire safety;
- Mapping;
- The Operational Property Help Desk;
- Legal Services and Planning and Regulation;
- Corporate communication;
- Financial shared services;
- Contract and procurement specialists;
- Human Resources;
- Training;
- Competence;
- Services;
- Facilities management; and
- Information systems.

Summary of consultation responses

7.5. Consultees were supportive of our proposed approach to recovering central overhead costs.

Summary of our conclusions

7.6. Given the responses to our consultation we have concluded to include the cost categories on which we consulted in July 2017 in the central overheads element of the Managed Station QX Management Fee for CP6.

7.7. Given these cost categories, our initial, indicative estimate of the central overhead element of the QX Management Fee is £1,105,160 per annum (17/18 prices). This figure is subject to change as we do further work to refine our QX cost estimates ahead of making a formal QX management fee submission to ORR.

7.8. The forecast central overhead element of the QX Management Fee is quoted in pounds, above. However, the central overhead element of the QX management fee is charged as a percentage of the negotiated element of QX. This figure will, therefore, be converted into a percentage once we have finalised our forecast of the negotiated element of QX. This percentage is then added to the profit element (which is also charged as a percentage of the negotiated element of QX) in order to obtain a total percentage management fee.

Conclusions on the profit element of the QX management fee

Summary of proposal in our consultation

7.9. In July 2017, we proposed using benchmarking analysis of other businesses providing similar services in order to determine the level of the profit element of the Managed Station QX Management Fee.

7.10. Based on benchmarking of a similar facility (Victoria Place Shopping Centre) and industry norms (Royal Institution of Chartered Surveyors' guidance and JLL Retail OSCAR), we proposed a range of 6-10% for the profit element.

7.11. We invited train operators to provide us with information regarding the profit element levied at franchised stations, which we would factor in to our benchmarking analysis.

Summary of consultation responses

7.12. Responses to our proposals to levy a profit element of 6-10% were mixed. Some consultees thought that a profit element of 6-10% was too high, whereas others thought that it was reasonable.

7.13. Merseytravel confirms that it does not charge a profit element for Liverpool South Parkway.

7.14. Following the publication of our consultation, we have liaised with three franchised train operators who are station facility owners. All three of the operators confirmed that they levy a profit element of 6%.

Summary of our conclusions

7.15. Given the results of our initial benchmarking and subsequent conversations with train operators, we have concluded that the profit element of the QX Management Fee should be 6% for CP6.

Aligning the managed station QX Management Fee with the Periodic Review

Summary of proposal in our consultation

7.16. In our July 2017 consultation, we proposed better aligning the approval of the managed station QX Management Fee with the Periodic Review process.

Summary of consultation responses

7.17. We did not receive any comments on this proposal.

Summary of our conclusions

7.18. The timings shown below set out how we propose to ensure that the managed station QX Management Fee is better aligned with the Periodic Review process than was the case in CP5:

Date	Action
April 2018	Confirmation of Network Rail's proposed profit element and an indicative pound value for the central overhead costs
September 2018	Network Rail to provide updated forecasts of the negotiated element of QX and our final QX management fee proposal
October 2018	ORR's Final Determination, including its decision on the QX management fee for CP6.

Appendix 1 - Network Rail response to detailed comments from stakeholders

Variable Usage Charge (VUC)

Consistency with EU Law

Summary of consultation responses

Colleagues from the freight community asked how our VUC estimates comply with relevant EU legislation. In particular, how they comply with the new EU implementing regulation (2015/909) issued in June 2015, which provided further clarification on the calculation of the cost that is directly incurred as a result of operating the train service.

Summary of our conclusions

In light of this new regulation, we have taken the opportunity to review our approach to calculating VUCs for CP6, and we will reflect any changes required by this new implementing regulation in how we propose calculating charges from 1 April 2019 (the start of CP6), prior to the June 2019 implementation deadline. In summary, we estimate the impact of excluding indirect costs from the VUC calculation would reduce the average level of our VUC cost estimate by 9%.

We set out our thinking in this area in more detail in Appendix 2 of this document.

Engineering traffic

Summary of consultation responses

GBRf asked how the 'wear and tear' caused by Network Rail engineering traffic is accounted for in our VUC estimates. They expressed concerns that these costs are somehow washed across freight VUCs, and that Network Rail engineering trains are some of the least 'track friendly' on the network.

Summary of our conclusions

As set out in the consultation document, VUC costs are estimated by forecasting how our maintenance and renewal costs would change in response to a small change in traffic levels. For track costs, this cost estimate is developed using the engineering model VTISM, where we increase all traffic (including engineering traffic) by 5%. Therefore, the average £ per 1000 gross tonne mile VUC cost rate reflects the 'wear and tear' caused by engineering trains. However, we consider this to be reasonable because we would need to run more engineering trains as 'wear and tear' on the network increases with traffic levels. We can, however, confirm that the costs associated with this tonnage if reflected in all operators VUC rates and not just freight operators' rates.

We also note that engineering traffic makes up a very small proportion of overall network traffic (c. 3%). Therefore even if we were to exclude this traffic when calculating the average VUC cost rate, which we do not consider to be appropriate, the impact is also likely to be very small. In fact, any impact is likely to be significantly less than 3% because although tack damage costs would fall as a result of excluding engineering traffic, overall tonnage would also fall (i.e. we would end up dividing a slightly lower overall cost number by a slightly lower smaller overall tonnage number), potentially resulting in a very similar VUC cost rate per 1000 gross tonne mile.

VTISM above 100 mph

Summary of consultation responses

Freight colleagues expressed concern that the VTISM model which was used is PR13 establish the track damage formula which allocates VUC costs to vehicle types does not appear to assess the impact of passenger trains running in excess of 100 mph.

Summary of our conclusions

We believe what freight operators are referring to is the fact that when the track damage formula was established by Serco in PR13, the relationship between operating speed and track damage was extrapolated above 75mph. The reason for this was that the original VTISM model runs carried out by Serco in PR13 showed less track damage at 100mph than at 75mph. Serco considered this counter intuitive and, therefore, extrapolated the relation between speed and track damage above 75mph. This approach adopted by Serco means than track damage is actually assumed increase as a vehicle's speed increases beyond 75mph. For example, the current rate for a Class 43/0 locomotive with an assumed maximum speed of 125mph is 41.49 pence per vehicle mile (2017/18 prices), if the assumed maximum speed of this vehicle were to fall to 100mph its VUC rate would reduce to 37.35 pence per vehicle mile (2017/18 prices). We consider this assumption to be reasonable and do not propose re-opening the track damage formula established in PR13.

Costs allocated to regional rail networks

Summary of consultation responses

Urban Transport Group stated that research that it has carried out shows that the costs allocated to regional railways are disproportionate. It stated that this is due to the following questionable assumptions, including the following relevant to VUCs:

- Light weight regional trains are allocated track maintenance and renewal costs as if they caused equivalent impact as Inter-city trains.

- The damage that freight trains cause to infrastructure being largely ignored.

Summary of our conclusions

For the purpose of setting VUCs, we do not agree with UTG that light-weight regional trains are treated in the same way as intercity-trains. VUC rates are designed to be cost reflective and to the extent that intercity trains cause more 'wear and tear' than regional services this will be reflected in their VUC rates. For example, the VUC is levied on a 'per vehicle' basis; therefore, an 11-car inter-city train will pay a higher VUC than a 2-car regional service. Moreover, where intercity-services travel at a higher operating speed, and have a heavier axle load, than regional services this will also be reflected in a higher VUC rate.

We also do not agree with UTG's view that the damage that freight trains cause to rail infrastructure is largely ignored. As noted, above, The VUCs are designed to be cost reflective, and the charges paid by freight wagons carrying steel are significantly higher than that of passenger coaches, for example.

UTG make some additional points in their response in relation to how some of our fixed costs (e.g. overhead costs and financing costs) are allocated to regional train services. These costs do not form part of VUCs.

Electrification Asset Usage Charge (EAUC)

Revised variability assumption

Summary of consultation responses

Many consultees were supportive of our proposal to revise variability assumptions for CP6. However, some consultees were concerned about the impact on the level of EAUC rates. C2C raised concerns regarding the way in which the revised cost variability assumptions were arrived at. In particular, C2C noted that the majority of Network Rail subject matter experts who were consulted on the cost variability assumptions suggested that the variability assumptions should remain unchanged.

Summary of our conclusions

On further reflection, the concerns raised by C2C are valid: the majority of subject matter experts did not propose any changes to the variability assumptions used to calculate EAUC rates for CP5. As a result, we are now proposing to retain the cost variability assumptions used to calculate EAUC rates for CP5. We will undertake further work ahead of CP7 in order to provide a more robust source of evidence to support any future changes in variability assumptions.

Clarification of cost categories

Summary of consultation responses

Greater Anglia noted that, in our July 2017 consultation, we referred to "OLE component change" but that this cost category was not listed in Appendix 3 as being one of the cost categories included within the EAUC calculation.

Summary of our conclusions

"OLE component change" is sometimes referred to as "Overhead Line Other". This cost category is listed in Appendix 3.

Comments on methodology

Summary of consultation responses

The majority of consultees were content with the methodology that we proposed using in July 2017 to recalibrate EAUC rates for CP6. However, Transport Scotland expected to "see greater emphasis on the potential for environmental incentives – as well as economic signals – on transmission losses".

Summary of our conclusions

The cost of transmission losses are recovered through another charge, the electricity charge for traction (EC4T), and not through the EAUC. The purpose of the EAUC is to is to recover the variable costs (costs that vary with changes in the level of electrified traffic) of maintaining and renewing electrification assets.

Electricity charge for traction (EC4T)

Duration of DSLFs

Summary of consultation responses

C2C asked for confirmation of how frequently distribution system loss factors (DSLFs) will be recalculated, given that renewals and refurbishment work taking place during CP6 could lead to changes in losses.

Summary of our conclusions

Where there is significant electrification work in CP6, we conclude that the methodology described in the document that accompanies these conclusions should be used to calculate DSLFs. Otherwise, we conclude that DSLFs should be fixed for the duration of CP6 and recalculated ahead of CP7.

Loss incentive mechanism

Summary of consultation responses

DB Cargo raised concerns regarding the loss incentive mechanism. In particular:

"In the prevailing situation where the end of year EC4T 'wash-up' corrects an overcharge to operators, the loss incentive mechanism generates a net financial loss for modelled operators, and a net gain to Network Rail. Therefore, operators and Network Rail have opposing incentives to accurately forecast losses: if the DSLF is set too low there is a loss to Network Rail and a gain to modelled operators, and vice versa if the DSLF is set too high. This seems to strongly contradict ORR's intention to share risk, and the industry's general aim to better align incentives."

Summary of our conclusions

In July 2017, we did not consult on the loss incentive mechanism. In June 2017, ORR concluded that the loss incentive mechanism should be retained for CP6. As explained in paragraph 1.4 of our July 2017 consultation, our proposals were designed to be consistent with ORR's conclusions.

We have worked collaboratively with industry, consulting on the methodology that we have concluded should be used to recalibrate DSLFs for CP6 and providing updates to industry meetings such as the Traction Electricity Steering Group and Vehicle/Train Energy System Interface Committee (V/TE SIC).

New ESTAs

Summary of consultation responses

Some consultees asked for further explanation as to why new ESTAs could be needed in CP6.

Summary of our conclusions

New ESTAs could be needed in CP6 because of the potential for additional electrification work.

Including DSLFs in the volume reconciliation

Summary of consultation responses

Greater Anglia argued that:

"…there should be a limit applied whereby the total metered consumption and the total DSLF should not be able to exceed the total net energy imported into an ESTA, thereby protecting TOCs and FOCs from over-estimation of the DSLF. Once an ESTA is fully metered the DSLF should be subject to a volume wash-up in the event total usage is reported to be in excess of actual usage".

Summary of our conclusions

We conclude that the current structure of the volume reconciliation should be retained for CP6. Fixing DSLF values for the duration of the Control Period offers certainty to both metered and modelled operators. Were losses to be included in the volume reconciliation, then this certainty could not be offered to operators.

We will review this area again ahead of CP7.

Obligatory metering

Summary of consultation responses

Greater Anglia suggested that:

"…operators of trains with compliant meters installed could be obligated to opt in and charged based on the metered rate within a set period of time e.g. within 6 financial periods of receipt of the train, unless it is not intended to be leased for more than 13 periods. This would facilitate correct apportionment of EC4T usage."

Summary of our conclusions

On-train metering has the potential to generate significant benefits. Metered operators benefit from more certain bills as their metered consumption is not included in the annual volume reconciliation and the ability to reduce their bills through initiatives such as driver training (which also has the potential to generate environmental benefits).

Network Rail is fully supportive of on-train metering. However, we do not have the power to oblige operators of trains with compliant meters to opt-in to being billed via on-train meter readings.

Station long term charges (LTC)

Netting off

Summary of consultation responses

DB Cargo stated that:

"…there appear to be some imprecision in the explanation of how total costs are calculated. For example, it seems to be no mention of retail/rental income at generated at stations which DB Cargo understands is "netted off" the LTC".

Summary of our conclusions

The gross revenue requirement is the income needed by Network Rail to fund its activities. 'Other Single Till Income' is deducted from the gross revenue requirement to calculate the net revenue requirement, the amount that needs to be recovered from access charges or network grant.

For CP5, retail income, rental income and station long term charges were included in the 'Other Single Till Income' and were, therefore, netted off the gross revenue requirement. However, retail and rental income is not netted off the long term charge i.e. an increase in rental income does not lead to a decrease in station long term charges.

Adjustments for station category and asset risk score

Summary of consultation responses

Virgin Trains East Coast wrote:

"The other areas where queries arise are the basis of the assumptions around the ARS and the Station Category adjustments where there is no evidence provided within the consultation for the values determined. Without this justification a final view on the proposed calculation method cannot be provided."

Summary of our conclusions

Asset risk score (ARS)

The asset risk score is a combination of the risk presented to safety and performance from asset failure, and accounts for the type of asset, the failure types and its location. In our July 2017 consultation we proposed using the following adjustment factors for ARS in order to calculate station long term charges:

ARS	Relative to ARS>5	Adjustment ($R_{i,L}$)
>5	100%	1.18742
4 to 5	92%	1.08649
3 to 4	84%	0.99414
2 to 3	77%	0.90964
1 to 2	70%	0.83232

ARS is a measure used to determine the timing of renewals work; Network Rail's operational property asset policy recommends earlier renewal for assets with higher ARS. The exact adjustment depends on the available budget and the block type (e.g. train shed, canopy, platform etc.), but it is usually approximately 15% earlier renewal for an ARS of 3.5. For the purpose of this assessment, the policy has been extrapolated to a 30% later renewal for the lowest risk assets (ARS<2) compared with very highest risk assets (ARS<5).

Station category adjustment

In our July 2017 consultation we proposed using the following adjustment factors for station category in order to calculate station long term charges:

Station Category	Relative to A	Adjustment (F_L)
A	100%	1.17603
B	93.0%	1.09371
C	86.5%	1.01715
D	80.4%	0.94595
E	74.8%	0.87973
F	69.6%	0.81815

These adjustments are based on expert judgment of the relative cost of undertaking work at stations of different category.

Duration of station long term charges

Summary of consultation responses

Both Virgin East Coast and Virgin Trains West Coast wrote:

"Further clarity is also requested on the proposed calculation as with the revised methodology it may be an expectation that Long Term Charges would then be known for all stations to cover a minimum of the next 35 years for SISS assets and 100 years for property assets. Please confirm if this is the intention of Network Rail as this could provide future assurances for SFOs and Beneficiaries to future levels of charging."

Summary of our conclusions

Managed station long term charge

We understand that Virgin East Coast's and Virgin Train West Coast's comments relate to managed station long term charges.

The purpose of managed station long term charges is to recover expected long-run annual average maintenance, repair and renewal expenditure. We will recalculate managed station long term charges ahead of future Control Periods in order to ensure that these reflect the latest available information and asset base.

As per the Railways Act, ORR carries out an access charges review every five years. We can confirm that our intention is to recalculate managed station long term charges for each Control Period; the managed station long term charges calculated for CP6 will not be fixed for the next 35 years for SISS assets or fixed for the next 100 years for property assets.

Franchised station long term charge

The purpose of franchised station long term charges is to recover expected maintenance, repair and renewal expenditure within the Control Period. Station long term charges for future Control Periods, assuming that the structure of franchised station long term charges is unchanged, will therefore be set so as to recover expected maintenance, repair and renewal expenditure within the relevant Control Period.

Stations in the Greater Manchester area

Summary of consultation responses

Transport for Greater Manchester (TfGM) made a number of comments on the franchised station long term charge, which are summarised below:

1. In TfGM's opinion "the current LTC charging regime has significant flaws, and a greater understanding of asset type and condition is required if a future LTC regime is to reflect the long run funding requirements of stations, and deliver a sustainable passenger experience across the network."
2. TfGM explained its understanding of the LTC methodology as "combines elements of asset depreciation, station asset mix by type, and the 'busyness' of station". Based on the CP5 price list, TfGM concludes that "this does not appear to stand up to scrutiny".
3. In TfGM's opinion the amount of LTC levied is insufficient.

We respond to each of these points, below.

Summary of our conclusions

1. The purpose of franchised station long term charges is to recover expected maintenance, repair and renewal expenditure at franchised stations in the relevant Control Period and not to reflect the long run funding requirement of stations. The level of franchised station long term charges for CP6 will reflect our planned CP6 expenditure which, prior to ORR's October 2018 Final Determination, will have been through a rigorous assurance process.
2. TfGM writes that:
    - A comparison of franchised stations in the top twenty percent of stations by long term charge in CP5 and stations outside of the top twenty percent suggested to TfGM that the methodology described in Appendix 8 of our July 2017 consultation "does not appear to stand up to scrutiny". For example, Bolton Station (with 3.2 million users per annum) is included within the top twenty percent, whilst Stockport (3.6 million users per annum) and Manchester Oxford Road (8.0 million users per annum) are not.
    - Analysis of six stations in the Greater Manchester area suggests "it is clear that there is little correlation between station usage and LTC, and we contend the complexity and/or type if [sic] assets on offer".
    - Analysis of long term charge values at Crewe in CP4 and CP5 suggests that "CP5 actual and CP6 renewals at Crewe do not justify this level of charge when compared to other stations of a similar size, complexity and usage".

TfGM's analysis is based on franchised station long term charges in CP5, which were calculated using a different allocation methodology from our CP6 proposals (set out in Appendix 8 of our July 2017 consultation).

Long term charges for individual franchised stations in CP5 were calculated based on portfolio-level expenditure which was allocated to each station according to the station's forecast share of portfolio-level maintenance, repair and renewal expenditure over thirty-five years. Therefore, station usage was not a factor in the allocation methodology used in CP5, which could explain the differences that TfGM observes. We would urge caution about using a small number of data points to draw conclusions, given the large number of franchised stations (c. 2300 in total).

3. TfGM writes that its analysis of CP5 station long term charges shows that the average long term charge is £34k per annum for 48 out of every 59 stations and that, at approximately £1.2m over 35 years, this is likely to mean "a backlog of renewals".

TfGM's analysis is based on the franchised station long term charge values for CP5. Franchised station long term charges for CP6 will be based on our planned CP6 franchised station maintenance, repair and renewal expenditure, which has been through a rigorous assurance process including being reviewed by ORR.

In addition, our analysis suggests that the average long term charge for CP5 is £54,906 per annum (17/18 prices) across the network. Franchised station long term charges are recalculated ahead of each Control Period, so there is no reason to assume that they will be constant across 35 years.

CP6 Managed Station Qualifying Expenditure (QX)

Netting off

Summary of consultation responses

DB Cargo wrote:

"DB Cargo believes it is incorrect to state that the charges relate to all beneficiaries as it believes that the access charges paid by Freight Operators and Charter Passenger Operators are "netted off" against QX."

Summary of our conclusions

The gross revenue requirement is the income needed by Network Rail to fund its activities. 'Other Single Till Income' is deducted from the gross revenue requirement to calculate the net revenue requirement, the amount that needs to be recovered from access charges or network grant.

For CP5, Qualifying Expenditure (QX) and charges paid by freight and charter operators were included in the 'Other Single Till Income' and were, therefore, netted off the gross revenue requirement. However, charges paid by freight and charter operators are not "netted off" against QX i.e. an increase in freight and charter charges does not lead to a decrease in QX.

The appropriateness of a profit element of six to ten percent

Summary of consultation responses

Nine consultees (East Midland Trains, C2C, Urban Transport Group, Transport for London, Virgin Trains East Coast, Transport for Greater Manchester, Arriva Trains, London Midland and Virgin Trains West Coast) questioned the appropriateness of Network Rail increasing the profit element from the five percent levied in CP5. In particular:

- C2C stated that they believed six to ten percent (the range we proposed in July 2017) was high for a service contract; and
- Transport for Greater Manchester argued that "it would seem inappropriate…to be levying a profit above 3%" given that average train operating company operating margins as a share of revenue are 2.9%.

Summary of our conclusions

We conclude that the profit element for managed station qualifying expenditure for CP6 should be six percent. This is based on:

- Benchmarking of Victoria Place Shopping Centre;
- Royal Institution of Chartered Surveyors' guidance;
- Jones Lang LaSelle (JLL) Retail OSCAR which is regarded as the industry benchmark for shopping centres in the UK; and
- Evidence provided by three train operating companies of the profit element levied as part of franchised station qualifying expenditure charges.

Based on the available evidence, we think that six percent is a reasonable profit for a service contract.

Our benchmarking analysis is based on the profit element levied at facilities similar to managed stations. We understand that the train operating company operating margins referred to by Transport for Greater Manchester are operating margins for train operating companies as a whole, and not the operating margin that they make from franchised station qualifying expenditure charges. Consequently, we think that the benchmarking analysis that we have undertaken is more relevant.

The treatment of risk in CP5

Summary of consultation responses

London Midland raised concerns regarding the way that risk was included in the forecast of utility costs in the QX negotiations for CP5.

Summary of our conclusions

In response to London Midland's comments we provide an explanation, below, of the approach to utility costs that we are currently proposing to use for CP6.

Electricity costs

To generate a fixed rate for electricity, we will look at how each of the components of electricity costs may move between now and the end of CP6. The components of electricity costs are:

- Electricity commodity cost;
- Imbalance/balancing;
- Renewables obligation;
- Contracts for difference;
- Capacity market;
- Hydro;
- Admin;
- Transmission;
- Distribution;
- FiT levelling;
- CCL;
- Metering; and
- CRC.

We will produce two forecasts for each component, a 'high' forecast and a 'low' forecast, for each year and take an average of these values.

Gas and Water

We are currently proposing to take the expected rate for 2019/20 and adjust for inflation in subsequent years.

The duration of the current management fee

Summary of consultation responses

East Midlands Trains commented that:

"Network Rail issued a letter to the ORR dated 30 April 2015 stating that the level of profit that would be added to all Fixed Offers would be 5.00%".

Summary of our conclusions

ORR, in a letter dated 30 April 2015[7], determined that the profit element for CP5 should be 5.0%. This only applied for the duration of CP5. We are now setting out our proposals for CP6.

[7] Available at: http://orr.gov.uk/__data/assets/pdf_file/0008/17792/2015-04-30-management-fee-decision-letter-cp5.pdf

Appendix 2 – Approach to excluding 'indirect' costs from VUCs

The purpose of this note is to set out Network Rail's proposed approach to excluding 'indirect' costs from Variable Usage Charges (VUCs) in Control Period 6 (CP6).

Background

Relevant legislation

Relevant EU legislation transposed into UK law through the 2016 Access & Management Regulations (2016 Regs) means that VUC estimates must be for 'direct costs': "*charges for the minimum access package and track access to service facilities referred to in paragraphs 1 and 2 of Schedule 2 must be set at the cost that is directly incurred as a result of operating the train service*" (para 1(4) of Schedule 3 of the 2016 Regs).

Similar provisions have applied to the calculation of track access charges for some time and industry process reflects this. Track access charges are set through access charge reviews (the periodic review process). As part of that process, stakeholders are consulted on the methodology for calculating track access charges before the level of charges is ultimately set by ORR and Network Rail is required to apply that during the relevant control period.

In June 2015 the European Commission issued a new implementing regulation (2015/909) (the 2015 Implementing Reg) which sets out further provisions for the calculation of the cost that is directly incurred as a result of operating a train service. The 2016 Regs specifically require an infrastructure manager to calculate that cost in accordance with the 2015 Implementing Reg from 2 August 2019 at the latest (para 1(5) of Schedule 3 of the 2016 Regs). Consistent with this, we have taken the opportunity to review our approach to calculating VUCs for CP6, and we will reflect any changes required by this new implementing regulation in how we propose calculating charges from 1 April 2019 (the start of CP6), prior to the June 2019 implementation deadline.

Definition of direct costs

Article 3 of the new implementing regulation (2015/909) states that direct costs should be calculated as follows:

"*Direct costs on a network-wide basis shall be calculated as the difference between, on the one hand, the costs for providing the services of the minimum access package and for the access to the infrastructure connecting service facilities and, on the other hand, the non-eligible costs referred to in Article 4.* "

Recital 12 of the implementing regulation also states:

"*It is a well-established economic principle that user charges based on marginal costs ensure the optimum effective use of available infrastructure capacity. Hence, the infrastructure manager may decide to use the proxy of marginal costs for calculating its cost directly incurred as a result of operating the train service."*

The relevant extracts from the 2016 Access and Management Regulations (which set out the services to be provided under the minimum access package and access to service facilities) and the new implementing regulation (including the list of non-eligible costs) are provided in Annex 1 of this note.

Approach to excluding indirect costs

Consistent with the new implementing regulation, for CP6 we will continue to assume that marginal costs are a proxy for estimating direct costs.

Furthermore, in order to confirm that only direct costs (as defined in the new implementing regulation) are included in our VUC cost estimates, we have disaggregated the top-level VUC cost categories. Then for each of these more detailed cost categories we have considered whether they are direct or indirect costs based on the definitions in the relevant legislation, and discussions with relevant NR engineering experts. Where we identify a cost category as indirect under the 2015 Implementing Regs we have excluded it from the VUC calculation.

A summary of the impact of this process on the top-level VUC cost categories is shown, below. Overall, it shows that going through this process has reduced the average level of our VUC cost estimate by 9%.

Indirect cost summary

Asset type	Direct cost (%)
Track:	**91%**
Track maintenance	83%
Track renewals	95%
Civils:	**92%**
Embankments renewals	89%
Metallic underbridge renewals	90%
Brick and Masonry underbridge renewals	94%
Culverts renewals	92%
Signalling:	**85%**
Maintenance	82%
Minor works points renewals	95%
Total	**91%**

We have classified a cost category as direct if it is:

1. included in the minimum access package or track access to service facilities (e.g. railway infrastructure including track and points) as defined by the 2016 Access and Management Regulations;

2. not excluded under Article 4 of the implementing regulation (2015/909) (non-eligible costs) (e.g. is not a network-wide overhead cost); and

3. directly incurred as a result of operating the train service. Consistent with marginal costing principles, we consider a cost category to be directly incurred if a sustained small change in traffic levels would result in level of the cost category varying over the long-run.

Generally, we have worked on the basis that design, labour, machinery and materials costs are direct costs, including where these costs are incurred by contractors on our behalf. Where costs relate to HQ staff/management costs we have excluded these on the basis that they are network-wide overheads and are not directly related to traffic level.

By way of example, a breakdown of the more disaggregated track renewal cost categories is shown below, along with our view in relation to whether these are direct or indirect costs. A full breakdown for other VUC cost categories in provided in Appendix 2.

Track renewals

Cost category	Definition	% of cost category	Comments
Contractors	Main Contractors undertaking conventional plain line and S&C track renewals via Framework Agreements. Includes labour, plant, 'small' materials and subcontract costs as well as project management, overheads and profit. Also includes High Output system costs including directly employed management, labour and contractors dedicated to the High Output plain line track renewals systems.	49%	We employ contractors to deliver renewal work: labour, PM, plant, materials, profit. Contractors include their own HQ costs but we only pay this overhead because we are contracting them to do renewals. The effect of traffic on renewals will only be seen in the long-run when asset wears out earlier. More traffic will mean that assets wear out earlier, so we will have to do renewal earlier, and this renewal will include all contractor costs. **Direct cost.**
Design and track bed investigation	Costs for internal designers (Track Design Group, Signalling Design Group etc) and Track Bed design team undertaking surveys and designs to specify the work required as a result of wear and tear to the infrastructure. Typically GRIP stage 3-5 costs.	2%	These are NR employed designers to design renewal projects. These people sit in IP and their time gets charged out to projects. More work means more people; therefore, the cost is direct. **Direct cost.**
High output tier 2 directs	Subcontractor costs for the supply of labour and road rail vehicles to support the High Output systems. Could be combined with 'Contractors' costs, above.	0%	We expect cost category to increase in future years. New category of sub-contractors. We own the High Output machines; this cost category represents labour and road rail vehicles to support those machines. **Direct cost.**
Route services - supply chain	Engineering freight haulage, 'heavy' materials (rail, sleepers, ballast, S&C units) and On Track Machines provided by Route Services / Supply Chain Organisation.	39%	NR Route Services buy rail, sleepers and ballast. We then get FOCs to deliver the materials. Includes tampers and on-track machines. **Direct cost.**
Other directs	Minor works directly related to or supporting the delivery of track renewals. Temporary land access costs, support from local maintenance teams when providing OLE / conductor rail isolations and other miscellaneous support.	4%	Mixture of activities but relates to work being carried out on-site. This is a volume driven cost category so more work means more of these costs. **Direct cost.**

Possession management	Labour (PICOP, SPICOP, barrier men etc) to take and manage the 'possessions' within which Contractors / deliverers are responsible for managing their own 'worksites'. This does not include (and none of the costs provided include) schedule 4 or schedule 8 compensation payments to TOC's and FOC's.	1%	PICOP = Person In Charge Of Possession SPICOP= Senior Person In Charge Of Possession. These are NR people in 'orange jackets'. NR standards mean even when contractors are carrying our work for us we are responsible for taking the possession and handing it back. This is a volume driven cost category so more work means more of these costs. **Direct cost.**
Recharge out direct	Recharges to other projects or funders where works are undertaken on other's behalf, such as additional work in the area that is not directly related to the renewal of the track.	-2%	This cost category represents where we are doing something on site for a part of NR (e.g. a route) not related to the renewal and, therefore, needs to be charged out (e.g. removing some scrap rail that should have been removed previously). **Indirect cost. However, already taken out of the unit rate because it is a negative number.**
NR mgt	IP Track management costs. The cost of people and expenses, accommodation, IP HQ overheads and NR corporate/group overheads.	5%	All NR headcount driven cost. Includes the costs of manging projects through the grip lifecycle. More 'white collar' than 'blue collar'. Making sure access is booked sufficiently in advance, managing designers and contractors. This cost category will include a proportion of IP HQ costs (e.g. IP Finance & HR & Commercial and Development who set policy and standards) **Assumed to be an indirect cost to be conservative. However, this category will include a mixture of direct and indirect costs.**

Annex 1 – Extracts from relevant legislation

Extracts from the 2016 Access & Management Regulations

Part 2 - Access to railway infrastructure and services

"*5.—(1) A railway undertaking must be granted, on equitable, non-discriminatory and transparent conditions, access rights to such railway infrastructure as may be necessary for the purpose of operating all types of rail freight, or international passenger, services.*

(2) The access rights described in paragraph (1) include access to railway infrastructure connecting the service facilities referred to in paragraph 2 of Schedule 2"

Schedule 2 - Services to be supplied to railway undertakings

"*1. The minimum access package referred to in regulation 6(1) must comprise—*

(a) handling of requests for infrastructure capacity; and

(b) the right to utilise such capacity as is granted and, in particular—

(i) such railway infrastructure including track, points and junctions as are necessary to utilise that capacity;

(ii) electrical supply equipment for traction current, where available and as is necessary to utilise that capacity;

(iii) train control, including signalling, train regulation, dispatching and the communication and provision of information on train movements; and

(iv) all other information as is necessary to implement or to operate the service for which capacity has been granted.

2. Access, including track access to services facilities and the supply of services referred to in regulations 5, 6 and 10 must comprise, where they exist—

(a) refuelling facilities, and supply of fuel in these facilities, charges for which must be shown on the invoices separately;

(b) passenger stations, including buildings and other facilities such as travel information display and a suitable location for ticketing services;

(c) freight terminals;

(d) marshalling yards;

(e) train formation facilities including shunting facilities;

(f) storage sidings specifically dedicated to the temporary parking of railway vehicles between two assignments;

(g) maintenance facilities, with the exception of heavy maintenance facilities dedicated to high-speed trains or to other types of rolling stock requiring specific facilities;

(h) other technical facilities, including cleaning and washing facilities;

(i) maritime and inland port facilities which are linked to rail activities; and

(j) relief facilities"

Extracts from commission implementing regulation (EU) 2015/909

Article 2 - Definitions

"*For the purposes of this Regulation, the following definitions shall apply:*

(1) 'direct cost' means the cost which is directly incurred as a result of operating the train service;"

Article 3 – Direct costs on a network-wide basis

"*1. Direct costs on a network-wide basis shall be calculated as the difference between, on the one hand, the costs for providing the services of the minimum access package and for the access to the infrastructure connecting service facilities and, on the other hand, the non-eligible costs referred to in Article 4.*

2. The Member State may decide that the infrastructure manager applies the costs of efficient service provision for the purposes of calculation of direct costs on a network-wide basis referred to in paragraph 1.

3. Asset values used for the purpose of calculating direct costs on a network-wide basis shall be based on historic values or, where such values are not available or where current values are lower, on current values. Historic values of the assets shall be based on the amounts paid and documented by the infrastructure manager at the time of acquisition of these assets. In case of a debt relief, whereby all of part of the infrastructure manager's debts have been assumed by another entity, the infrastructure manager shall attribute a relevant part of the debt relief to reduce its asset values and the corresponding direct costs on a network-wide basis. By derogation from the first sentence, the infrastructure manager may apply values including estimated values or current values or replacement values if they can be transparently, robustly and objectively measured and duly justified to the regulatory body.

4. Without prejudice to Article 4 and if the infrastructure manager can transparently, robustly, and objectively measure and demonstrate on the basis of, inter alia, best international practice that costs are directly incurred by the operation of the train service, the infrastructure manager may include in the calculation of its direct costs on a network- wide basis in particular the following costs:

(a) costs of staff needed for keeping open a particular stretch of line if an applicant requests to run a specific train service scheduled outside the regular opening hours of this line;

(b) the part of the costs of points infrastructure, including switches and crossings, that is exposed to wear and tear by the train service;

(c) the part of the costs of renewing and maintaining the overhead wire or the electrified third rail or both and the supporting overhead line equipment directly incurred as a result of operating the train service;

(d) the costs of staff needed for preparing the allocation of train paths and the timetable to the extent that they are directly incurred as a result of operating the train service.

5. Costs used for calculation under this Article shall be based on payments effected or forecast by the infrastructure manager. Costs calculated under this Article shall be measured or forecast consistently on the basis of data from the same time period."

Article 4 - Non-eligible costs

"*1. The infrastructure manager shall not include in the calculation of direct costs on a network-wide basis in particular the following costs:*

(a) fixed costs relating to the provision of a stretch of line which the infrastructure manager must bear even in the absence of train movements;

(b) costs that do not relate to payments made by the infrastructure manager. Costs or cost centres that are not directly linked to the provision of the minimum access package or to access to infrastructure connecting service facilities;

(c) costs of acquisition, selling, dismantling, decontamination, recultivation or renting of land or other fixed assets;

(d) network-wide overhead costs, including overhead salaries and pensions;

(e) financing costs;

(f) costs related to technological progress or obsolescence;

(g) costs of intangible assets;

(h) costs of track-side sensors, track-side communication equipment and signalling equipment if not directly incurred by operation of the train service;

(i) costs of information, non-track side located communication equipment or telecommunication equipment;

(j) costs related to individual incidences of force majeure, accidents and service disruptions without prejudice to Article 35 of Directive 2012/34/EU;

(k) costs of electric supply equipment for traction current if not directly incurred by operation of the train service. Direct costs of operation of the train services that do not use electric supply equipment shall not include costs of using the electric supply equipment;

(l) costs related to the provision of information mentioned under item 1(f) of Annex II to Directive 2012/34/EU, unless incurred by operation of the train service;

(m) administrative costs incurred by schemes of differentiated charges referred to in Articles 31(5) and 32(4) of Directive 2012/34/EU;

(n) depreciation which is not determined on the basis of real wear and tear of infrastructure due to the train service operation;

(o) the part of the costs of maintenance and renewal of civil infrastructure that is not directly incurred by operation of the train service."

Annex 2 – Cost category breakdown

Track renewals

Cost category	Definition	% of cost category	Comments
Contractors	Main Contractors undertaking conventional plain line and S&C track renewals via Framework Agreements. Includes labour, plant, 'small' materials and subcontract costs as well as project management, overheads and profit. Also includes High Output system costs including directly employed management, labour and contractors dedicated to the High Output plain line track renewals systems.	49%	We employ contractors to deliver renewal work: labour, PM, plant, materials, profit. Contractors include their own HQ costs but we only pay this overhead because we are contracting them to do renewals. The effect of traffic on renewals will only be seen in the long-run when asset wears out earlier. More traffic will mean that assets wear out earlier, so we will have to do renewal earlier, and this renewal will include all contractor costs. **Direct cost.**
Design and track bed investigation	Costs for internal designers (Track Design Group, Signalling Design Group etc) and Track Bed design team undertaking surveys and designs to specify the work required as a result of wear and tear to the infrastructure. Typically GRIP stage 3-5 costs.	2%	These are NR employed designers to design renewal projects. These people sit in IP and their time gets charged out to projects. More work means more people; therefore, the cost is direct. **Direct cost.**
High output tier 2 directs	Subcontractor costs for the supply of labour and road rail vehicles to support the High Output systems. Could be combined with 'Contractors' costs, above.	0%	We expect cost category to increase in future years. New category of sub-contractors. We own the High Output machines; this cost category represents labour and road rail vehicles to support those machines. **Direct cost.**
Route services - supply chain	Engineering freight haulage, 'heavy' materials (rail, sleepers, ballast, S&C units) and On Track Machines provided by Route Services / Supply Chain Organisation.	39%	NR Route Services buy rail, sleepers and ballast. We then get FOCs to deliver the materials. Includes tampers and on-track machines. **Direct cost.**
Other directs	Minor works directly related to or supporting the delivery of track renewals. Temporary land access costs, support from local maintenance teams when providing OLE / conductor rail isolations and other miscellaneous support.	4%	Mixture of activities but relates to work being carried out on-site. This is a volume driven cost category so more work means more of these costs. **Direct cost.**
Possession management	Labour (PICOP, SPICOP, barrier men etc) to take and manage the 'possessions' within which Contractors / deliverers are responsible for managing their own 'worksites'. This does not include (and none of the costs provided include) schedule 4 or schedule 8 compensation payments to TOC's and FOC's.	1%	PICOP = Person In Charge Of Possession SPICOP= Senior Person In Charge Of Possession. These are NR people in 'orange jackets'. NR standards mean even when contractors are carrying our work for us we are responsible for taking the possession and handing it back. This is a volume driven cost category so more work means more of these costs. **Direct cost.**

Recharge out direct	Recharges to other projects or funders where works are undertaken on other's behalf, such as additional work in the area that is not directly related to the renewal of the track.	-2%	This cost category represents where we are doing something on site for a part of NR (e.g. a route) not related to the renewal and, therefore, needs to be charged out (e.g. removing some scrap rail that should have been removed previously). **Indirect cost. However, already taken out of the unit rate because it is a negative number.**
NR mgt	IP Track management costs. The cost of people and expenses, accommodation, IP HQ overheads and NR corporate/group overheads.	5%	All NR headcount driven cost. Includes the costs of manging projects through the grip lifecycle. More 'white collar' than 'blue collar'. Making sure access is booked sufficiently in advance, managing designers and contractors. This cost category will include a proportion of IP HQ costs (e.g. IP Finance & HR & Commercial and Development who set policy and standards) **Assumed to be an indirect cost to be conservative. However, this category will include a mixture of direct and indirect costs.**

Track maintenance

Cost category	Definition	% of cost category	Comments
Section 1: Direct Costs Attributable to ABP Standard Jobs	Direct Labour costs and time on tools associated with NR staff. These costs are broken down into 140 activities in BRT's Activity Based Planning Model (e.g. tamping, stone blowing, grinding etc).	16%	An increase in traffic would mean that assets wear out more quickly and therefore we have to spend more 'time on tools' carrying out maintenance work. **Direct cost.**
Section 2: Direct Costs Attributable to non-ABP Jobs & NTOT	Covers the costs which fall outside the 140 standard activities in the Activity Based Planning Model and non-time on tools and capex hours (e.g. manual correction of track geometry).	30%	An increase in traffic would mean that assets wear out more quickly and therefore we have to spend more 'time on tools' carrying out maintenance work. If an increase in traffic results in more 'time on tools' it will also result in more 'non-time on tools'. If the additonal trains reduce access windows this will also drive an increase in the 'non-time on tools'. **Direct cost.**
Total direct labour	**Comprised of categories, above**	**46%**	**See comments, above**
Direct costs attributable to plant	**Includes costs associated with tamping, stoneblowing and rail grinding machines.**	**19%**	**An increase in traffic would mean that track assets wear out more quickly and therefore we have to spend more on maintenance work using on-track machines. Direct cost.**

Other Operating Income - PWAY	NR high speed income, telecoms income, utilities recoveries	-1%	This income would not increase if we accommodated more trains. **Indirect income.**
Indirect Staff Costs - PWAY	Salaries, NI, pension costs, Allowances etc of management/supervisor roles rather than the front line staff who carry out the Maintenance activities.	16%	We would not have more management/supervisor roles as a result of a small change in traffic levels. **Indirect cost.**
Labour Related Off-charges / Recoveries - PWAY	Capex recoveries (other possessions), cross maintenance, labour off-charges etc	-1%	This category represents the costs of where we have used maintenance staff to deliver capex. May not be directly related to 'wear and tear' from train services. Already excluded from unit rates (i.e. is a minus number). **Indirect cost.**
Net Contractor Costs - PWAY	Specialist contractors, labour contractors etc	5%	An increase in traffic would mean that assets wear out more quickly and therefore we have to spend more on contractors carrying out maintenance work. **Direct cost.**
Net Materials - PWAY	Ballast, rail, sleepers, freight haulage etc	10%	An increase in traffic would mean that assets wear out more quickly and therefore we have to spend more on materials carrying out maintenance work. **Direct cost.**
Net Plant Total - PWAY	Wheeled plant, small plant, vehicle costs etc	8%	An increase in traffic would mean that assets wear out more quickly and therefore we use plant/vehicles more to carry out maintenance work. **Direct cost.**
Other Operating Costs - PWAY	Accommodation and property costs, other overheads (e.g. legal, IT, HR), other employee related costs (e.g. training and PPE)	2%	Will contain a mixture of indirect and direct costs. Property costs and corporate overhead costs will not vary with small changes in traffic levels. However, employee related costs would vary if the increased train movements resulted in increased labour costs. **Assumed to be an indirect cost to be conservative.**
Direct Staff: Labour Recoveries - PWAY	Capex recoveries (other possessions), cross maintenance labour off-charge etc	-3%	This category represents where we have used maintenance people to deliver capex. May not be directly related to 'wear and tear' from train services. Already excluded (i.e. is a minus number). **Indirect cost.**
Total other costs	**Comprised of categories, above**	**35%**	**See comments, above**

Signalling maintenance

Cost category	Definition	% of cost category	Direct or indirect and why?
Direct Cost Attributable to ABP Signalling Standard Jobs	Direct Labour costs and time on tools associated with NR staff. These costs are broken down in BRT's Activity Based Planning Model (e.g. train protection, level crossings etc)	26%	An increase in traffic would mean that assets wear out more quickly and therefore we have to spend more 'time on tools' carrying out maintenance work. **Direct cost.**
Cost of non ABP Signalling Standard Jobs	Very similar to the category above but covers the costs which fall outside the standard activities in the Activity Based Planning Model	3%	An increase in traffic would mean that assets wear out more quickly and therefore we have to spend more 'time on tools' carrying out maintenance work. **Direct cost**
Cost of non OPEX Hours for Signalling Teams	Non-time on tools and capex hours	43%	If an increase in traffic results in more 'time on tools' it will also result in more 'non-time on tools'. If the additonal trains reduce access windows this will also drive an increase in the 'non-time on tools'. **Direct cost.**
Total Direct Labour	**Comprised of categories, above**	**72%**	**See comments, above**
Labour Related Off-charges / Recoveries	Capex recoveries (other possessions), cross maintenance labour off-charge etc	-5%	This category represents where we have used maintenance people to deliver capex. May not be directly related to 'wear and tear' from train services. Already excluded from unit rates (i.e. is a minus number). **Indirect cost.**
Net Contractor Costs	Specialist contractors and labour contractors etc	2%	An increase in traffic would mean that assets wear out more quickly and therefore we have to spend more on contractors carrying out maintenance work. **Direct cost**.
Net Materials	Freight haulage and switches and crossing costs etc	10%	An increase in traffic would mean that assets wear out more quickly and therefore we have to spend more on materials carrying out maintenance work. **Direct cost**.
Net Plant	Wheeled plant, small plant, vehicle costs etc	3%	An increase in traffic would mean that assets wear out more quickly and therefore we use plant more to carry out maintenance work. **Direct cost**.
Direct Other Costs	**Comprised of categories, above**	**9%**	**See comments, above**
Other Operating Income	NR high speed income, telecoms income, utilities recoveries	0%	This income would not increase if we accommodated more trains. **Indirect income**

Other Operating Costs	Accommodation and property costs, other overheads (e.g. legal, IT, HR), other employee related costs (e.g. training and PPE)	3%	Will contain a mixture of indirect and direct costs. Property costs and corporate overhead costs will not vary with small changes in traffic levels. However, employee related costs would vary if the increased train movements resulted in increased labour costs. **Assumed to be an indirect cost to be conservative.**
Indirect Staff Costs	Salaries, NI, pension costs, Allowances, bonus etc of management/supervisor roles rather than the front line staff who carry out the Maintenance activities.	16%	We would not have more management/supervisor roles as a result of a small change in traffic levels. **Indirect cost.**
Indirect Other Costs	**Comprised of categories, above**	**18%**	**See comments, above**

Civils renewals (embankments, metallic underbridges, masonry underbridges and culverts)

Cost category	Definition	% of cost category	Comments
Contractors' direct costs	Costs that the contractor expends on site (i.e. its labour, plant, materials) and sub-contractor costs to carry out the construction works.	54%	The cost of replacing a bridge deck, for example, includes contractor costs, labour, materials and plant etc. More traffic means that we would replace bridge earlier than anticipated; therefore, you would expend labour plant materials earlier than expected. **Direct cost.**
Design	Includes architects, engineers and technology specialists responsible for the conceptual design aspects and their development into drawings, specifications and instructions required for construction of the rail infrastructure works or facility and associated processes.	9%	Every time we do a renewal the design team need to do a drawing based on the type structure and traffic that runs over it etc. Directly linked to contractor direct costs. If there are more renewals we will need more designers to develop the renewals. May not be a like-for-like renewal. We may be a different specification bridge, which may be a better whole-life cost solution, particularly if we are expecting different traffic flows in the future. **Direct cost.**
Project Management	Means employer, project manager, quantity surveyor / cost manager, and all other consultants responsible for the delivery of the rail infrastructure project on time, on cost and to the required performance criteria (design and quality).	3%	Project management costs allocated to the project. Will include HQ costs and some non-specific project costs (e.g. buildings and services). A proportion of these costs will be directly related to managing the renewal project. However, this cost category will also include some national overhead costs. **Assumed to be an indirect cost to be conservative.**

Main Contractor's Preliminaries	Means items which cannot be allocated to a specific element, sub-element or component. Main contractor's preliminaries include the main contractor's costs associated with management and staff, site establishment, temporary services, security, safety and environmental protection, control and protection, common user mechanical plant, common user temporary works, the maintenance of site records, completion and post-completion requirements, cleaning, fees and charges, sites services and insurances, bonds, guarantees and warranties. Main contractor's preliminaries exclude costs associated with subcontractor's preliminaries, which are to be included in the unit rates applied to rail infrastructure works.	28%	These costs are specific to the project, so if there are more renewals there would be more of these costs. These costs cannot be allocated to a specific element, sub-element or component of the project. Therefore, they are spread over the whole project. You would expect prelim costs to increase in proportion to direct costs. These costs are very specific to the location and the project. They are not generic network-wide costs. **Direct cost.**
Other Project Costs	Means costs that are not necessarily directly associated with the cost of constructing the rail infrastructure works, but form part of the total cost of the rail infrastructure project to the employer (e.g. land acquisition costs and marketing costs).	7%	Land acquisition is explicitly excluded under EU law.. Includes marketing and insurance costs which are more network wide than project specific. Would also include rental of land access which would be excluded under land acquisition. **Indirect cost.**

Appendix 3 – Approach to calculating franchised station long term charges for CP6

Purpose

The purpose of this appendix is to provide further explanation of the methodology for calculating franchised station long term charges for CP6 that is described in paragraph 6.13 of the main conclusions document.

As noted in paragraphs 6.7 to 6.12 of the main conclusions document, we are currently working to resolve some data quality issues with the Operational Property Asset System (OPAS) which is used in the methodology described in paragraph 6.13. Should we not be able to gain sufficient confidence in the accuracy of the data held in OPAS in time for ORR's Final Determination, and following discussion with ORR, we may conclude that a different approach is appropriate.

Context

In July 2017, we published a consultation regarding our proposed methodology for calculating track and station access charges for CP6. For franchised station long term charges we proposed the following methodology:

(a) Operational property assets
- Forecast route franchised station operational property MRR expenditure for CP6; and
- Multiply the station's percentage share of the relevant route's average annual franchised station operational property depreciation by that route's forecast annual average franchised station operational property MRR expenditure over CP6.

(b) SISS assets
- Forecast route franchised station SISS MRR expenditure for CP6; and
- Multiply the station's percentage share of the relevant route's average annual franchised station SISS depreciation by that route's forecast annual average franchised station SISS MRR expenditure for CP6.

(c) Total LTC
- We will then sum the figures calculated in (a) and (b) to calculate the total long term charge for each franchised station.

May 2018 methodology update

We have concluded that a minor amendment to the methodology proposed in July 2017 should be made for allocating forecast franchised station MRR expenditure to individual franchised stations.

We have concluded that there should be a change to the methodology for allocating forecast route-level operational property maintenance, repair and renewal expenditure to individual franchised stations. Rather than using depreciation estimates to allocate route-level operational property maintenance, repair and renewal, as proposed in July 2017, we have concluded to allocate these costs on the basis of each station's share of the relevant route's long-term annual equilibrium renewal expenditure.

In July 2017, we did not have long-term annual equilibrium renewals forecasts. Now that this information is available, we have concluded to use this for allocating costs because we think that the concept is easier to understand than depreciation estimates. Depreciation estimates were intended to act as a proxy for each station's operational property long-run renewal expenditure; now that data on each station's long-term annual equilibrium expenditure is available, use of depreciation estimates is no longer required.

We explained in our July 2017 consultation document, our view that annual depreciation estimates are a good proxy for long-term annual equilibrium expenditure. Following our consultation, we have calculated franchised stations percentage shares of MRR costs under both methodologies (long-term annual equilibrium and annual depreciation) and can confirm that overall the results are not materially different.

For the avoidance of doubt, the methodology that we have concluded should be used to calculate franchised station long term charges for CP6 (assuming that the data quality issues referred to above can be resolved) is described, below:

1. Taking the forecast of post-efficient route-level annual average franchised station operational property MRR expenditure for CP6;

2. Allocating (1) to individual franchised stations in a route based on their share of the relevant route's long-term annual equilibrium cost;

3. Taking the forecast of post-efficient route-level annual average SISS MRR over CP6 and allocating to relevant individual franchised stations in a route based on their share of the relevant route's annual average SISS renewal cost over 35 years.

4. There are some third party SISS contracts that only apply to certain stations. Where a third party SISS contract covers multiple stations, these costs are allocated to individual stations based on each station's share of those stations' annual average SISS renewal cost over 35 years;

5. Adding (2), (3) and (4) to calculate the total long term charge for each franchised station.

Further information is provided, below.

Step 1: Taking the forecast of post-efficient route-level annual average operational property MRR expenditure for CP6

As part of our Strategic Business Plan, each of Network Rail's eight geographic routes has forecast what it expects to spend on maintaining, repairing and renewing (MRR) franchised station operational property assets over CP6. We will take each route's forecast of pre-efficient operational property MRR expenditure in CP6 and divide by five in order to calculate the annual average MRR expenditure. We will then apply an efficiency overlay, reflecting Network Rail's view of the potential for efficiency improvement over CP6.

Step 2: Allocating (1) to individual franchised stations in a route based on their share of the relevant route's long-term annual equilibrium cost

We will allocate each route's forecast of post-efficient annual average franchised station operational property MRR expenditure to individual franchised stations in the route according to their share of the relevant route's long-term annual equilibrium cost. Further information on long-term annual equilibrium costs is provided in Appendix 5.

Step 3: Taking the forecast of post-efficient route-level annual average SISS MRR over CP6 and allocating to relevant individual franchised stations in a route based on their share of the relevant route's annual average SISS renewal cost over 35 years

As part of our Strategic Business Plan, each of Network Rail's eight geographic routes has forecast what it expects to spend on maintaining, repairing and renewing (MRR) franchised station information and security system (SISS) assets over CP6. We will take each route's forecast of pre-efficient SISS MRR expenditure in CP6 and divide by five in order to calculate the annual average MRR expenditure. We will then apply an efficiency overlay, reflecting Network Rail's view of the potential for efficiency improvement over CP6.

This total will then be allocated to relevant franchised stations (those where Network Rail is responsible for SISS MRR) in the route in proportion to their share of annual average SISS renewal cost over 35 years.

A forecast of each franchised station's SISS renewal expenditure over 35 years is calculated using the telecoms Decision Support Tool (DST). The model effectively takes each assets' installation year and then repeatedly adds on the given service life to produce subsequent renewal dates. The renewal volumes are then collated by year and asset type, and then multiplied by their respective unit costs. An average of SISS renewal expenditure over the 35 years is then calculated by summing expenditure over the 35 years and dividing by 35.

Step 4: Third party SISS contracts

There are a number of contracts that Network Rail has with third parties to provide SISS maintenance and repair services. Where these contracts cover multiple stations, these costs are allocated to individual stations based on each station's share of those stations' annual average SISS renewal cost over 35 years.

Step 5: Calculating total long term charges for each individual station

The total long term charge for a franchised station consists of:

- The operational property MRR expenditure allocated to it; and
- The SISS MRR expenditure allocated to it.

To calculate the total long term charge for an individual franchised station we will, therefore, sum the amounts allocated to that station in steps 2, 3 and 4.

A worked example

In this example, there are two stations in the same route (stations A and B). Their respective long-term annual equilibrium costs and 35 year annual average SISS renewal figures are shown, below:

Station	Long-term annual equilibrium operational property cost	35 year annual average SISS renewal
A	100	20
B	50	5
Total	**150**	**25**

Step 1: Taking the forecast of post-efficient route-level annual average operational property MRR expenditure for CP6

We assume that this route is forecasting a pre-efficient annual average operational property MRR expenditure for CP6 of 500 units, giving an annual average expenditure of 100 units (500/5). If we assume an efficiency overlay of 5%, then the post-efficient route-level annual average operational property MRR expenditure for CP6 is 95 units.

Step 2: Allocating (1) to individual franchised stations in a route based on their share of the relevant route's long-term annual equilibrium cost

In our example, the total long-term annual equilibrium operational property cost for this route is 150 units. Two thirds (100/150) of this comes from station A and one third (50/150) comes from station B. Consequently, two thirds of the 95 units from the previous step should be allocated to station A and one third of the 95 units from the previous step should be allocated to station B.

The resulting allocation is shown, below:

Station	Post-efficient route-level annual expenditure	Share of long-term annual equilibrium expenditure	Allocation of post-efficient route-level annual expenditure
A	95	2/3	63.33 (2 decimal places)
B	95	1/3	31.67 (2 decimal places)

Step 3: Taking the forecast of post-efficient route-level annual average SISS MRR over CP6 and allocating to relevant individual franchised stations in a route based on their share of the relevant route's annual average SISS renewal cost over 35 years

We assume that this route is forecasting a pre-efficient annual average SISS MRR expenditure for CP6 of 100 units, giving an annual average expenditure of 20 units (100/5). If we assume an efficiency overlay of 5%, then the post-efficient route-level annual average operational property MRR expenditure for CP6 is 19 units.

In our example, the total 35 year annual average SISS renewal for this route is 25 units. Four fifths (20/25) of this comes from station A and one fifth (5/25) comes from station B. Consequently, four fifths of the 19 units referred to in the previous paragraph should be allocated to station A and one fifth of the 19 units from the previous step should be allocated to station B.

The resulting allocation is shown, below:

Station	Post-efficient route-level annual average SISS MRR over CP6	Share of 35 year annual average SISS renewal	Allocation of post-efficient route-level annual expenditure
A	19	4/5	15.2
B	19	1/5	3.8

Step 4: Third party SISS contracts

In our example, Network Rail has a contract with a third party which provides SISS maintenance and repair costs as station A only. This contract will cost 10 units over the course of CP6, an annual average cost of 2 units. These 2 units are allocated to station A.

Step 5: Calculating total long term charges for each individual station

To calculate the total long term charge for stations A and B, we will sum the costs allocated to each station in steps 2-4. This is shown, below.

Station	Allocation of operational property MRR	Allocation of SISS MRR	Allocation of 3rd party SISS MRR	Total
A	63.33	15.2	2	80.53
B	31.67	3.8	0	35.47

Appendix 4 – Approach to calculating managed station long term charges for CP6

Purpose

The purpose of this appendix is to provide further explanation of the methodology for calculating managed station long term charges for CP6 that is described in paragraph 6.19 of the main conclusions document.

As noted in paragraphs 6.23 to 6.26 of the main conclusions document, we are currently working to resolve some data quality issues with the Operational Property Asset System (OPAS) which is used in the methodology described in paragraph 6.19. Should we not be able to gain sufficient confidence in the accuracy of the data held in OPAS in time for ORR's Final Determination, and following discussion with ORR, we may conclude that a different approach is appropriate.

Context

In July 2017, we published a consultation regarding our proposed methodology for calculating track and station access charges for CP6. For managed station long term charges we proposed the following methodology:

(a) Operational property assets

- Forecast route managed station operational property assets MRR expenditure over 100 years;
- Multiply each station's percentage share of the relevant route's average annual managed station operational property depreciation by that route's forecast managed station operational property MRR expenditure over 100 years; and
- Divide this figure by 100 to calculate the expected average annual operational property maintenance, repair and renewal expenditure for that station.

(b) SISS assets

- Calculate route forecasts of SISS MRR expenditure over 35 years;
- Multiply each station's percentage share of the relevant route's average annual managed station SISS depreciation by that route's forecast managed station SISS MRR expenditure over 35 years; and
- Divide this figure by 35 to calculate the expected average annual SISS maintenance, repair and renewal expenditure for that station.

(c) Total LTC calculation

- We will sum the figures calculated in (a) and (b) to calculate the long term charge for each managed station.

May 2018 methodology update

We received feedback from some stakeholders who thought that, rather than allocating route-level expenditure to individual managed stations, Network Rail should calculate station-by-station charges for managed stations. Reflecting this feedback, we have concluded that the methodology described, below, should be used to calculate managed station long term charges for CP6 (assuming that the data quality issues referred to above can be resolved) :

1. Operational property renewal costs: Calculating the long-term annual equilibrium cost for each individual managed station;
2. Operational property maintenance and repair costs: Taking the operational property maintenance and repair forecasts for individual managed stations and assuming that this is representative of long-run maintenance expenditure.
3. SISS renewals: Calculating the long-term annual average renewal cost for SISS for each managed station over 35 years.
4. SISS maintenance and repair: Calculating the forecast SISS maintenance and repair cost for individual managed stations in CP6 and assuming that this is representative of long-run maintenance expenditure.
5. There are a number of third party SISS contracts that only apply to certain stations. Where a third party SISS contract covers multiple stations, these costs are allocated to individual stations based on each station's share of those stations' annual average SISS renewal cost; and
6. Summing each of the elements, above, to calculate individual managed station long term charges.

Further information is provided, below.

Step 1: Calculating the long-term annual equilibrium operational property cost for each individual managed station

The methodology for calculating long-term annual equilibrium operational property costs is described in detail in Appendix 5. In summary, the long-term annual equilibrium cost of an asset is calculated in the following way:

1. First, the annualised cost of replacing a standard asset of that type is calculated (the standard annual average cost). To do this the standard replacement cost for that asset is divided by the standard expected life for that asset.
2. Next, the standard annual average cost is adjusted to reflect the following factors:
    a. Asset risk: Network Rail's asset policy is to renew higher risk assets earlier, all else being equal.
    b. Station busyness: The cost of doing work at busier stations is greater than at quieter stations, all else being equal.

These adjustments are based on Network Rail expert engineering judgment.

Finally, the modelled cost estimates described in steps one and two above are then scaled based on recent historical expenditure and asset condition surveys. This final step is required in order to ensure that our modelled cost estimates include all MRR costs, and reflect the expenditure required in practice to maintain steady-state station asset condition.

We consider that this provides a good forecast of the annual average cost of renewing an asset since we have taken the estimated cost of renewing the asset, divided it by the expected life and then made adjustments for factors which we know affect the cost of work.

This calculation is done for each asset at a station and then summed to get a station total.

In CP5, the operational property element of a managed station's long term charge was set based on an annual average of expected maintenance, repair and renewal expenditure over 100 years. 100 years was chosen, rather than a shorter period of time, in order to even out the extremes of expenditure found at these very large stations.

We consider that the approach described above will, similarly, have the effect of smoothing out the extremes of expenditure found at managed stations. The reason for this is that we are estimating the annual average expenditure required over the long-run to maintain steady-state station asset condition. This long-run average approach has the effect of 'smoothing out' any significant one-off station costs, for example, the cost of a new train shed roof.

Step 2: Operational property maintenance forecasts

As part of our Strategic Business Plan, each of Network Rail's eight geographic routes has forecast what it expects to spend on maintaining and repairing managed station operational property assets over CP6. We will take each route's forecast of pre-efficient operational property MRR expenditure in CP6 and divide by five in order to calculate the annual average MRR expenditure. We will then apply an efficiency overlay, reflecting Network Rail's view of the potential for efficiency improvement over CP6.

Step 3: SISS renewals

A forecast of each managed station's SISS renewal expenditure over 35 years is calculated using the telecoms Decision Support Tool (DST). The model effectively takes each assets' installation year and then repeatedly adds on the given service life to produce subsequent renewal dates. The renewal volumes are then collated by year and asset type, and then multiplied by their respective unit costs. An average of SISS renewal expenditure over the 35 years is then calculated by summing expenditure over the 35 years and dividing by 35.

Step 4: SISS maintenance and repair

We will take a forecast of pre-efficient SISS maintenance and repair expenditure in CP6 and divide by five in order to calculate the annual average SISS maintenance and repair expenditure. We will then apply an efficiency overlay, reflecting Network Rail's view of the potential for efficiency improvement over CP6.

Step 5: Third party SISS contracts

There are a number of contracts that Network Rail has with third parties to provide SISS maintenance and repair services. Where these contracts cover multiple stations, these costs are allocated to individual stations based on each station's share of those stations' annual average SISS renewal cost over 35 years.

Step 5: Calculating total long term charges for each individual station

The total long term charge for a managed station consists of operational property MRR and SISS MRR.

To calculate the total long term charge for an individual managed stations we will, therefore, sum the amounts calculated for that station in each of the previous steps.

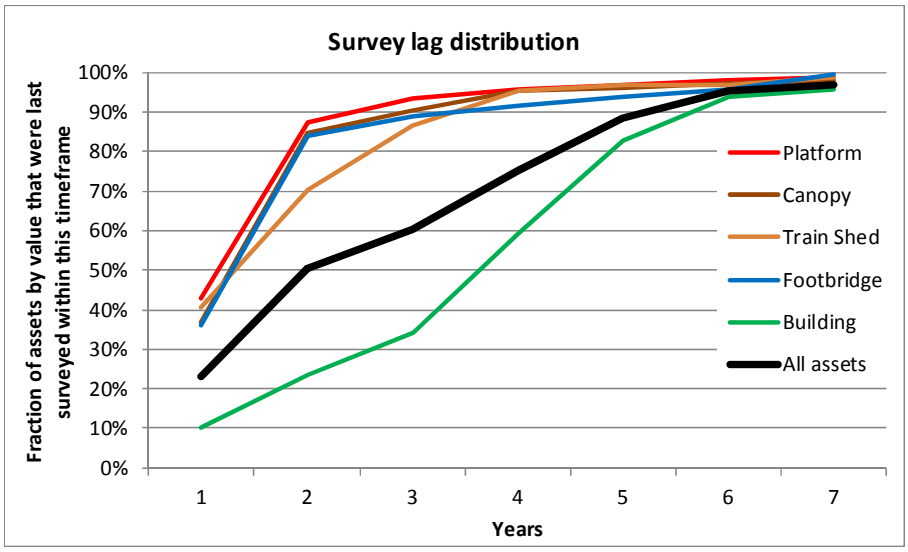
Appendix 5 – Approach to forecasting long-term annual equilibrium costs

Long-term annual equilibrium cost

An equilibrium renewal rate is one that preserves the average condition of the assets. The condition of an individual asset is represented by the percentage of asset remaining life (PARL), which is the asset remaining life (ARL) divided by the asset life expectancy (ALE). The average condition of all assets is weighted by asset replacement value.

$$PARL_{Weighted} = \frac{\sum_i PARL_i \times Vol_{i,A} \times UnitCost_A}{\sum_i Vol_{i,A} \times UnitCost_A}$$

The station and LMD PARL are reported each year. They are based on a subset of critical blocks and features. The station PARL history since the end of CP4 has been used to calibrate the equilibrium expenditure. In that time, reported PARL increased from 54.68% at the end of CP4 (end March 2014) to 55.18% at the end of March 2017. However, the 0.49% improvement in PARL is not solely due to the expenditure over the first year. Survey intervals of over a year (as shown below) mean that the impact of many of the works in preceding years would only have been recorded later.



For example, even if the survey interval was one year, the impact of half of all works in the latest year would be unrecorded.

In order to account for this, a weighted average of the expenditure over the previous five years has been used, with weights calculated according to the probability that a renewal in the year will have impacted on the change in PARL. Note that the weights have to account for renewals in 12/13 and 13/14 that would have already been surveyed by the end of 13/14, as well as those in all years that have yet to be resurveyed.

The basic calculation is shown below:

1. The asset base in CP5 and CP6 is different from CP4, because most franchised stations in Anglia and a few on the East Coast Mainline in LNE were transferred to the franchisees on long-lease in CP5, so their renewals in CP5 and CP6 are not NR's responsibility, but they were in CP4. Therefore, the expenditure on NR stations in CP4 has been reduced to account for the smaller asset base (i.e. if NR had no responsibility for these stations in CP4, it would have spent less on renewals). The adjusted renewal expenditure on stations in each year is shown below:

Financial year	**12/13**	**13/14**	**14/15**	**15/16**	**16/17**
Adjusted station expenditure (£M)	157	264	135	178	100

2. The fraction of assets (by value) surveyed at the end of each year is:

End year	**5**	**4**	**3**	**2**	**1**
Surveyed assets (see chart above)	89%	75%	60%	51%	23%

3. The fraction of works (by asset value) surveyed after the work was completed, but within the period from the end 13/14 to end 16/17 is derived using the work is distributed evenly across the year:

Work year	**12/13**	**13/14**	**14/15**	**15/16**	**16/17**
Surveyed after work completed but before end 13/14	37%	12%	0%	0%	0%
Surveyed after work completed and before end 16/17	82%	68%	55%	37%	12%
Net	**45%**	**56%**	**55%**	**37%**	**12%**

4. The net surveyed fractions are the relative weights given to each year's expenditure. So the average weighted annual expenditure is:

$$\bar{R} = \frac{\sum_{Y=12/13}^{16/17} R_Y . W_Y}{\sum_{Y=12/13}^{16/17} W_Y} = £180.4M$$

5. An annual expenditure of £180.4M gives a 3-year equivalent expenditure of £541M to give a 0.5% increase in PARL over the same period. This is in addition to the loss of remaining life of the assets expected over the same period, assuming no renewals. This is the annual depreciation divided by the total replacement value:

$$PARL_{Dep} = \frac{\sum_i Vol_{i,A} . UnitCost_A / ALE_A}{\sum_i Vol_{i,A} . UnitCost_A} = 2.07\% pa$$

6. Thus, £541M over three years offsets three years annual depreciation plus the change in PARL over the same period. The equilibrium renewals expenditure would only need to offset annual depreciation over the same period (i.e. no change in PARL) so the final equilibrium annual expenditure is:

$$R_{eq} = \bar{R}.\frac{3.PARL_{Dep}}{3.PARL_{Dep} + PARL_{Change}} = £167.1M\ pa$$

7. This is equivalent to a renewal expenditure on stations per control period of:
5 x 167M = £835M.

There are implicit assumptions in the model that the policy and external conditions over the 5 years of the calibration period will continue into the future. For example:

- The distribution of works will be similar in the future as it was over the previous 5 years, so that it will have the same impact on asset condition.
- Unit activity costs have not changed significantly over the last five years.
- Other non-NR renewal work, such as TOC minor works (interior decoration etc.) at sites where NR is mostly responsible for renewals, and major enhancements (e.g. new platforms, new train shed roof), will also have the same overall impact on asset condition as they have had in the last few years.

Long-term renewal expenditure forecasts

The long-term forecasts are calculated on the following basis:

1. The average annual renewals spend on an asset in the long-term is proportional to its full replacement cost spread over its effective time in service. Note that this is not the same as saying that the renewal expenditure is the same as the replacement cost, because the calibration procedure adjusts the total average replacement costs to a target expenditure over the whole asset base. Thus, it is recognised that the costs of actual works (including mid-life refurbishments) do not exactly match the cost of end-of-life replacement for individual assets; the model assumption is that the relative contribution of each asset towards the total renewal costs will be similar, so the final forecast cost distribution between stations and routes will be representative of the actual cost distribution.
2. The Ops Property asset policy states that higher risk assets should be renewed earlier, in order to minimise the total risk. The Tier 1 model adjusts the Asset Life Expectancy (ALE) according to the Asset Risk Score (ARS), such that high risk assets (ARS>5) are renewed 30% earlier than low risk assets (ARS<2).
3. The F&G unit costs do not account for the restrictions that come with working on busy, complex stations to NR's high safety standards. The unit replacement costs have been adjusted so that work on the busiest stations (Category A) are 30% higher than work on the smallest stations (Category F) and all non-station sites.

From the above, the annual long-term cost of an asset is:

$$C_{i,A,S,R} = \frac{V_i U_A . W_S}{ALE_A / W_R}$$

where

$C_{i,A,S,R}$	Asset *i*, asset feature/attribute *A*, site type *S*, ARS group *R*
V_i	Asset quantity
U_A	Standard replacement cost of asset type *A*
ALE_A	Standard asset life expectancy
W_S	Site category weight for costs
W_R	ALE adjustment for ARS group *R*