



OFFICE OF RAIL AND ROAD



OFFICE OF RAIL AND ROAD: INDEPENDENT INQUIRY INTO THE TIMETABLE DISRUPTION IN MAY 2018

20 SEPTEMBER 2018





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- Annex B Terms of Reference
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FOREWORD

From 20th May 2018 rail passengers in two parts of the country suffered major disruption. People suffered inconvenience, financial and emotional cost over a period of several weeks. They were badly treated on a daily basis by the operators that they had paid in the expectation of a decent service.

The railway had introduced the largest ever revision to the national timetable, involving changes to 46 per cent of train times. The intention was—and remains—to offer more services and more reliability by bringing into use enhanced track, signalling and trains. But in the Northern Trains area (around the North West) and the Govia Thameslink area (some routes into London) things went badly wrong.

Everyone in the industry was surprised, and deeply disappointed, that we failed to deliver the improvements on the date promised. We now have to understand the causes. Unless improvements are made to the way the railway deals with changes like this, something similar may happen again in spite of best endeavours.

The Office of Rail and Road (ORR), which I chair, is an independent body that protects the interests of rail and road users. We are responding to a request from the Secretary of State for Transport for advice on what went wrong and what should be changed to prevent a recurrence. We will publish our recommendations by the end of 2018.

This is an interim report. It sets out an account of the events before and after 20th May. We have taken a forensic approach, with a degree of analysis and depth that has not occurred before. The facts have been checked with the respective parties. We make findings as to the root causes of the failures.

There is an honourable tradition in the rail industry that when things do go wrong employees will be resourceful enough to find a fix—as they do on a daily basis. In planning the May timetable revision over-optimism led to neglect of the risk that repeated slippage past known deadlines would leave

the operators with far too little time to uncover problems in implementation and find those fixes. In the event the operators were overwhelmed. They had made insufficient provision to help people in the event that things went wrong.

The railway is a complex set of inter-dependent activities. Decisions or failures in one activity can have implications for the delivery of service over a large geographical area, the more so as the numbers of trains and passengers have increased. It has become clear that there are inadequate mechanisms to ensure that decisions involving any one activity observe a due regard for implications for the system as a whole.

When a change to a system requires a sequence of stages the implementation plan must include deadlines for each stage designed to allow subsequent processes to complete in good time. A particularly large or complicated set of changes make it all the more important that the plan is respected. On the contrary, for the May timetable changes there were well-intentioned but counter-productive late adjustments to “de-risk” the situation. Network Rail’s timetable planning department, the System Operator, was best placed to notice that a problem was developing and they did recognise this. But they did not take sufficient action to manage the risks or the consequences. The present industry arrangements do not support clarity of decision making: it was unclear who was responsible for what. Nobody took charge.

The ORR started a formal investigation into a possible licence breach back in February when it became apparent that Network Rail would fail to publish a final timetable twelve weeks in advance. But that was on the relatively limited grounds that passengers would not be able to plan ahead. Like everybody else, ORR could have pursued the equally vital question as to whether this failure signalled that the operators would have insufficient time to assemble the necessary resources.

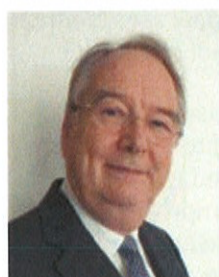
These are some of the issues we will address in the second phase of our work.

Our Inquiry is being advised by a panel of distinguished and highly experienced individuals, for which we are grateful. We recognised from the outset that the ORR itself is part of the industry and that we need to be as exposed to objective scrutiny as every other body. We set up a Prior Role Review under the chairmanship of the Chief Inspector of Railways, operating under protocols used when ORR is dealing with a possible breach of health and safety regulations. The findings from the Prior Role Review have been fully incorporated in this report.

I would like to acknowledge that, through no fault of their own, a number of railway employees were placed in circumstances that asked a very great deal of them: this includes those in passenger-facing positions and those being asked to write and endlessly re-write railway timetables to unreasonable deadlines.

We have enjoyed good cooperation from the rail industry, the Department for Transport and others in preparing this interim report, for which we are grateful: there is a consensus that there is a problem that needs to be understood and resolved.

The staff of ORR have been dedicated and selfless in securing, collating and checking the evidence and drafting this report. I am grateful to them all, but especially to Dan Brown as Inquiry Director and Claire Simpson as Project Director.



Stephen Glaister

Stephen Glaister
Chair

EXECUTIVE SUMMARY

"The timetable is our promise to passengers"

Rail Delivery Group, 2015

1. On 20 May 2018, this promise was broken. This interim report into what happened focuses on identifying the factors that contributed to the failure to develop and implement an effective operational timetable in May 2018, and draws conclusions about the management of operational risks created by major timetable changes, based on information received from those involved. Phase 2 of the Inquiry will report before the end of 2018 to make recommendations for change. The Inquiry's Terms of Reference are in Annex B.
2. The Inquiry has reviewed over two thousand documents and conducted wide-ranging interviews with senior executives in the rail industry, other experts and government officials (listed in Annex F). We are grateful for the full and open engagement that the Inquiry has received from every participant. It is as clear as it is surprising that the scale of the disruption to passengers was not foreseen by any party until after it had begun. The full support that the Inquiry has received from participants illustrates the strong consensus among those involved that we must understand what has happened and make any necessary changes to ensure that it does not happen again.
3. This interim report finds that there were systemic weaknesses in the planning and delivery of major network changes, such as those required in preparation for the new timetable in May 2018, and concludes that there is a risk of repeated disruption if the lessons are not learnt and acted upon.
4. Although it is not the focus of this interim report, measures are being taken by the industry and government, in preparation for the planned timetable changes in December 2018 and May 2019, to address these risks.

The recommendations in the final report will consider these actions and whether further measures need to be taken.

Disruption to passengers

5. In the weeks following 20 May 2018, many passengers travelling on the Northern and GTR networks were severely disrupted as a result of the failure of the introduction of a major new timetable, and passengers on many other networks suffered knock-on disruption to their services. This timetable was intended to deliver benefits to passengers as a result of major changes to the network but instead saw passengers experience significant cancellations and delays to their services. On the Northern network up to 310 scheduled trains did not run each weekday during the disruption and 470 scheduled trains per weekday did not run on the GTR network. Where trains did not run, there were significant delays and passengers were unable to rely on the timetable.
6. The impact of this experience has had a significant financial and emotional cost to those passengers affected, directly impacting upon their work and families and in some circumstances their personal safety. This has undermined the trust in the railway and the reliance they place upon it in their lives.

Causes of the timetable disruption

7. The Inquiry has examined the different projects and processes that led up to the May 2018 timetable change, which stretch back many years in their planning and delivery. It finds that there are several critical points in

these processes where, had different decisions been taken, the subsequent disruption could have been avoided or significantly mitigated.

8. These different projects and processes were inter-dependent, which meant that risks and delays arising in one area were quickly passed to others. A bow-wave of risk built up through these interdependent elements over a period of several years.
9. These risks first emerged in delays to the planning and delivery of the North West Electrification Programme, combined with late changes to the scope of the Thameslink Programme, compressing the time available to develop the timetable and then further compressing the time left available for train operating companies to prepare for the implementation of new services. The scale and impact of these interdependent risks crystallised in May 2018, without any of the parties responsible apparently being aware of the scale of the consequences until after the disruption occurred.
10. The extended summary below outlines the Inquiry's findings in full and then examines why the governance structures that coordinate the rail industry failed to adequately identify and manage the systemic risks as they emerged. Among these, the Inquiry has found that there was a critical period during which, had different decisions been made, the disruption from 20 May 2018 onwards could have been avoided or significantly mitigated.
11. The Inquiry finds that in the autumn of 2017, two events combined that created critical risks to the timetabling process. As the North West electrification schemes fell behind schedule, a high-risk decision was taken to catch up the work over Christmas 2017 and, around the same time, a decision was taken to re-plan the introduction of the new Thameslink services. These decisions were taken in good faith, but without due regard for the schedule that needed to be followed to develop the timetable. When unexpected problems then occurred in consequence of both of these decisions (the Christmas works failed to be completed and the re-planning of the Thameslink services proved to be much more complex than expected), the timetable process began to fail because the volume of changes required was too great, at too late a point in the timetable development to be reasonably manageable.
12. These critical events are prior to the decisions made in January and February 2018 to proceed with the May 2018 timetable changes. The Inquiry considers that by this point the likelihood of disruption to passengers from the introduction of the timetable was probably unavoidable under any of the available options that were considered. If there was a final 'go / no-go' decision point that was missed, it was in autumn 2017, although judgements would have been better made earlier in August 2017 to align with the schedule for developing the timetable as set out in Part D of the Network Code.
13. The Inquiry has made findings attributable to Network Rail, the train operators, the Department for Transport (DfT) and the Office of Rail and Road (ORR) about the failures to identify these risks and properly manage them. It finds that:
 - Network Rail's System Operator managed the timetable process and was in the best position to understand and manage the risks, but did not take sufficient action, especially in the critical period in autumn 2017;
 - while the circumstances for Northern and GTR were quite different, neither were properly aware of or prepared for the problems in delivering the timetable and that they did not do enough to provide accurate information to passengers once disruption occurred;
 - DfT and ORR have responsibilities overseeing most aspects of the industry and neither organisation sufficiently tested the assurances that they received from the industry about the risk of disruption, despite having information and powers that would have allowed them to do so; and
 - the rail industry's processes for planning and managing major timetable changes do not adequately manage the risk arising from the engineering and other projects on

which they depend, or prioritise the impact on passengers when making decisions about these risks.

Remit of the Inquiry

14. On 4 June 2018, the Secretary of State for Transport asked ORR, as the independent rail regulator, to undertake an Inquiry headed by ORR Chair, Professor Stephen Glaister CBE. The Inquiry was asked to review the reasons for the failed introduction of the new 20 May 2018 timetable.¹
15. The Inquiry states in its terms of reference that it has three objectives to:
 - i. *"identify factors that contributed to the failure to develop and implement an effective operational timetable in May 2018;*
 - ii. *draw conclusions about the management of operational risks created by major timetable changes, based on evidence about the causes and consequences of the disruption in May 2018, and its subsequent management; and*
 - iii. *where appropriate, make recommendations to the industry and government in advance of future major network changes for the benefit of passengers, other users and railway staff."*
16. The Inquiry is being held under Section 51 (1) of the Railways Act 2005 and full terms of reference of the Inquiry are set out in Annex B.
17. The Inquiry is being held in addition to and alongside ORR's existing investigation into the compliance of Network Rail and the train operating with the terms of their licences in relation to the timeliness of the provision of timetable information to operators and passengers.
18. Alongside this interim report, ORR is publishing a separate Prior Role Review which examines ORR's relevant actions in preparation for the May 2018 timetable.

Conduct of the Inquiry

19. The Inquiry has recognised the importance of producing and publishing findings quickly, in order that the industry can better take account of them when planning future timetabling changes. This document is therefore an interim publication that addresses points i. and ii. of the stated purpose of the Inquiry. Phase 2 of the Inquiry will set out the proposed way forward on the industry engagement required over the remainder of 2018 and beyond to fully satisfy part iii. of the Inquiry.
20. Within the timescales of this interim publication, we have invited contributions from a wide range of parties. We have received and reviewed over 2,000 pieces of documentation and other representations provided by the parties noted above, freight companies, rail industry representative bodies, trades unions, railway experts and the public.
21. We have commissioned survey data from rail users:
 - Independent quantitative research with over 1000 rail users
 - Over 2,200 responses to a web-based survey on the ORR website
 - 4 independent qualitative focus groups with affected passengers and interviews with front-line rail staff
22. As well as numerous discussions with parties noted above and other experts across the rail industry, the Inquiry has conducted more than twenty formal interviews with key parties, including:
 - Interviews with Transport Focus and London TravelWatch
 - 12 interviews with Train Operating Companies
 - 5 interviews with the DfT
 - Interviews with the Chairs of the Thameslink Independent Readiness Board and Thameslink Independence Assurance Panel
 - 6 interviews with Network Rail

1. <http://orr.gov.uk/news-and-media/press-releases/2018/orr-launches-independent-inquiry-into-may-timetable-disruption>

Accuracy of information received & disclaimer

23. The information on which this interim report is based is that provided by the parties to the Inquiry noted above and not from ORR's own verified sources. This Inquiry has not been undertaken using ORR investigative powers that would legally require participants to provide all information they hold. The information on which the findings are based is only that which the parties have volunteered to share and we are grateful for their cooperation.
24. While facts used in this report have been cross-referenced with the parties and verified wherever possible, ORR cannot independently assure the accuracy of all of the information that it has received during the course of this Inquiry. In several cases, different parties have offered conflicting information or different interpretations of events and this report highlights where that is the case and whether the Inquiry has made judgements about the weight of conflicting information.
25. Because the findings in this report are drawn from the limited information received, they should not be relied upon for commercial, legal or regulatory purposes. Any regulatory action that ORR subsequently takes will be based on source material.
26. ORR will correct the record if we become aware that factual inaccuracies have occurred.

Consultation on Phase 2 of the Inquiry

27. ORR welcomes feedback on the findings in this interim report, and the focus that it should take in considering the development of its final report and recommendations in Phase 2 of the Inquiry.

Structure of this report

28. This interim report is arranged in three parts:
 - Part A – Passenger experience and impact
This section of the interim report explains what happened on 20 May 2018 to passenger services and describes the impact that this had on passengers and other rail users, and front-line staff experience;
 - Part B – Our findings into the failure of the May 2018 timetable
This section of the interim report makes findings about the causes of the disruption attributable to the different projects and processes that needed to be delivered by the rail industry in preparation for 20 May 2018, focusing on the infrastructure projects that the timetable change depended upon, the process of developing the timetable itself, and the preparedness of the train operating companies to implement the timetable.
 - Part C – Our broader findings into industry processes and systemic risks
This section on systemic issues makes broader findings about the systems of governance that oversaw the rail industry process of planning and preparation for the timetable change, including the role of ORR, and identifies why these failed to adequately identify and manage the risks.

Summary of findings

29. Below we have summarised our findings which are set out in full in Parts B and C of this report.

Infrastructure Programmes

30. The May 2018 timetable changes in the regions predominantly served by the Northern and GTR networks relied on the delivery of two major infrastructure schemes. The North West Electrification Programme (NWEF) and the Thameslink Programme are intended to create transformational benefits for passengers in the north and the south east, combining new track, signalling, electrification of lines, upgraded stations and new rolling stock to increase the frequency and quality of services across London and the North West.
31. These programmes have been many years in their planning and development, and the structure and terms of the train operating franchises for Northern and GTR reflect the anticipated transformation of those networks over their term.
32. The Inquiry has examined whether any aspect of the development of these infrastructure schemes created risks resulting in the May 2018 disruption.

The Thameslink Programme

33. The Thameslink Programme is intended to establish new cross-London services that will enable up to 24 trains per hour (tph) to operate in both directions from multiple destinations north and south of the Thames using new Class 700 rolling stock. It is intended to deliver new services, shorter journey times, reduced crowding on trains, and better interchange between services.
34. The development of the infrastructure required for the Programme has been delivered in two phases:
- Phase 1: the remodelling of Farringdon and Blackfriars stations which completed on time and on budget in 2011-12; and
 - Phase 2: included remodelling of London Bridge Station (which completed in January 2018) and introducing new track and signalling technology to enable 24tph trains per hour to operate through central London. Phase 2 is not yet complete, but important elements of it were required to be delivered in time to support the May 2018 timetable change.
35. In contrast to the experience in the North West, the Inquiry heard that the development of the Thameslink infrastructure required to be ready for the May 2018 timetable was completed on time. Participants to the Inquiry expressed considerable admiration for the way that Network Rail planned and delivered this extremely complex set of projects, while maintaining an operational railway during construction.
36. The Inquiry has found that the delivery of the necessary Thameslink infrastructure to support the May 2018 timetable was completed successfully and on time. The Inquiry has found no aspect of the delivery of the Thameslink infrastructure that contributed to the causes of the May 2018 timetable disruption.
37. The Inquiry has found that those elements of the Thameslink infrastructure that are still to be completed, including automatic signalling and turnbacks, are not material factors behind the May 2018 disruption because they were not relied upon in the specification of the timetable.
38. The Inquiry heard that one important piece of Thameslink infrastructure, the line through the Canal Tunnels in central London, opened one week later than planned in February 2018.
39. The Inquiry does not judge the one-week delay in the opening of the Thameslink Canal Tunnels in central London to be a material factor behind the disruption because it did not materially impede GTR's ability to prepare to introduce new services in time for May 2018.
40. The introduction into service of the new Thameslink timetable in May 2018, relied on more than the successful completion of the infrastructure projects. The delivery of these other projects and programmes, and their role in the causes of the Thameslink timetable disruption are discussed below.

North West Electrification Programme

41. NWEF is being developed in four phases between 2014 and 2018, to electrify and upgrade the lines between Blackpool, Wigan, Bolton, Liverpool and Manchester. The completion of Phases 3 and 4 were needed to support the changes to the May 2018 timetable. The project is being delivered by Network Rail, and since 2016 has been overseen by the North of England Programme Board, chaired by the DfT.
42. There was a one-year delay between December 2016 and December 2017 to the delivery of the Phase 4 electrification scheme between Wigan, Bolton and Manchester (the 'Bolton Corridor'), while the infrastructure was risk assessed and then redesigned to legally comply with electrical regulations, or in some places safely deviate from the regulations, which are enforced by ORR. ORR considered that Network Rail should have designed the scheme to the legal standard earlier, or carried out risk assessments for proposed deviations. Network Rail had assumed that it would be permitted to deviate from those standards without a risk assessment.
43. The Inquiry considers that the redesigned delivery of the Bolton Corridor electrification was known about sufficiently early in 2016 to not be a direct contributory factor to the May 2018 disruption, and so has not focused further on the merits of the decision at the time. However, it did compress the remaining timescales available to complete the project, creating a higher level of risk for the remaining project as further delays occurred during 2017.
44. During 2017, unexpected problems occurred with Phase 4, as worse than expected ground conditions caused delays to the construction of the electrification infrastructure. Network Rail relied on a risk-based survey of ground conditions, which did not identify the true extent of sandy ground and uncharted mine works along the route. Many more attempts at driving piles failed than had been expected. Innovative engineering solutions were developed to try to recover the delay and the works were re-planned several times throughout 2017 as each plan proved to be unrealistic.
45. Timescales for project completion were further compressed, costs increased, and there was significant disruption to passengers as the operational railway was periodically closed to allow works to recover at an accelerated pace. Network Rail's confidence in project delivery by December 2017 was put under pressure throughout 2017, such that the P-80 confidence level on which projects are planned (80% probability of completion on time and budget) would only be achievable with considerably more time on site to do works, requiring greater possession of the railway and disruption to passengers.
46. The Inquiry has found that Network Rail's approach to planning the construction of the Phase 4 Bolton Corridor electrification did not accurately estimate the actual construction risks and probable delays to its completion. While these risks were potentially manageable in themselves, the consequential risks to the introduction of the May 2018 timetable were compounded by an excessively optimistic approach to planning and re-planning mitigating actions to catch up construction works as timescales were compressed during 2017.
47. The Inquiry has considered the extent to which the subsequent risks to the timetabling process were taken into account in the timing of decisions to replan the projects. We heard from participants that the focus of the North of England Programme Board was on the delivery of the infrastructure projects. It was not specifically remitted to focus on the management of consequential systemic risks to the timetabling process or introduction of services by train operators, although its members including Network Rail's System Operator (the SO) were aware of these issues. The risks were noted to the Board in October 2017 by the SO, but no sufficient actions were taken by the SO to mitigate these risks. The Inquiry has heard that the Programme faced substantial pressure from senior levels of Network Rail to not defer the milestone while there remained a chance of success, despite the increasing risks.

48. The Inquiry has found that the DfT's North of England Programme Board was aware of the consequential risks to the May 2018 timetable of a failure to deliver the Phase 4 infrastructure projects on time. While it was not remitted to manage systemic risks, it did not sufficiently consider aligning the timing of its decisions with the timetabling process, and Network Rail's System Operator did not press for this despite being aware of these risks.
49. The final attempt to catch up construction work in time for the introduction of the May 2018 timetable occurred over Christmas 2017, when a blockade of the Bolton Corridor (closing the railway so that intensive construction works could take place) failed to complete all of the work needed.
50. While 3 of 4 key projects were successfully achieved during this blockade in an enormous effort by Network Rail, further problems were encountered relating to wet ground conditions, causing a failure to complete all of the necessary foundation works. This meant that there were no acceptable options remaining to complete the works in time for the May 2018 timetable change without causing substantial disruption to passengers by closing the operational railway in early 2018. In January 2018 a decision was made by the North of England Programme Board to delay the completion of the project until after the point needed for the May 2018 timetable change.
51. The Inquiry has found that the decision to rely on the successful delivery of the Christmas 2017 works to recover Phase 4 of the North West Electrification Programme created substantial risks for the introduction of the May 2018 timetable, leaving no margin for error or unexpected problems during the Christmas blockade. The subsequent failure to deliver these works directly delayed the development of the timetable which caused disruption to passengers in May 2018.
52. During early 2018, works continued on Phase 3 of the North West Electrification Programme, including a blockade of the line between Blackpool and Preston, which caused substantial disruption to passengers during this period. A series of problems which were not reasonably foreseeable by Network Rail caused the line to be reopened three weeks later than planned. A significant consequence of this delay was that train drivers operating on that route needed to be retrained due to the terms and conditions in their contracts, although this is not a regulatory requirement. This led to fewer suitably trained drivers being available than necessary when the new timetable was introduced in May 2018, which contributed to the disruption.
53. The Inquiry has found that delays to the NWEF Phase 3 works in early 2018 were not reasonably foreseeable by Network Rail and that Northern Rail had no reasonable expectation that it would face a consequential shortage of drivers. This worsened the disruption in May 2018, in the Northern region, but was not a factor behind the need to rewrite the Northern timetable.

Timetable development & the System Operator

54. Network Rail's System Operator business unit (the SO) is responsible for the production and publication of the national timetables, including the timetable for May 2018. It works with train operators and with Network Rail routes (who may want to access the network for engineering works, for example) to decide the best allocation of network capacity. In doing this, it translates train operators' access rights and the train paths that they bid for into the timetable according to the processes set out in Part D of the Network Code. It coordinates the process for establishing a base timetable twice a year and for making nearer-term changes to it (e.g. to accommodate engineering works, special events and ad-hoc requests from passenger, freight or charter services).
55. The Inquiry has heard that the SO had good visibility across Network Rail's business of the risks arising from the infrastructure programmes as a member of the relevant programme boards, and its managing director's position as co-chair of the national Portfolio Board, alongside a DfT director. It

noted these risks to the North of England Programme Board and to the rail industry's National Task Force at meetings in the autumn of 2017.

56. The Inquiry has found that the SO had sufficient information to understand the risks and potential for disruption arising from the infrastructure programmes, and that it was in a unique position in the industry to understand these dependent risks to the timetable process for which it was responsible.
57. The Inquiry has considered whether the SO managed the process of planning and developing the timetable with appropriate regard to the risk of disruption, and managed these risks so far that it was able within its own process of developing the timetable.
58. The very large number of timetable changes required for May 2018 fully consumed the resources of the SO's timetabling function as it prepared to deliver its timetable offer to the industry. Neither the SO or train operators had the reasonable ability to prepare alternative versions of the timetable to reflect different potential outcomes from the infrastructure programmes. The option to 'roll forward' existing timetables was also limited because of the nature of the infrastructure and rolling stock changes and the inter-dependence of these changes.
59. The assumptions that the SO made in autumn 2017 about the likely availability of the NWE Phase 4 infrastructure in May 2018 were therefore critical to the successful execution of its timetabling function.
60. The Inquiry heard a circular argument between IP and the SO about whose responsibility it was to make these judgements. The project team explained that its focus was exclusively on infrastructure delivery. DfT chaired the Programme Board and said that it relied on the advice of these professionals about what was deliverable. All parties were aware of the risks, but the Inquiry judges that, on balance, the SO was in the best position to understand the risk to the timetable and that it was the only body able to make decisions about the assumptions that were used to create that timetable. This is because of its position as member of the Programme and Portfolio boards
61. The SO said that it was not remitted in autumn 2017 to advocate different decisions by the Programme Boards and DfT. It explained its belief that, had it decided in autumn 2017 not to assume that the NWE infrastructure would be ready, it would have been 'overruled' in favour of the advice from the project team because it would have delayed benefits to passengers. This may or may not have been the case, but while it highlighted the risks to the project team and DfT, it was also the body best placed to consider and advocate alternative options, which it did not do. Following the disruption in May 2018, these are exactly the sorts of mitigating options that are being actively developed and considered by Network Rail in preparation for the December 2018 and May 2019 timetables, providing a counterfactual illustration of the missed opportunities in autumn 2017.
62. The Inquiry has found that the SO was the body best placed to address the risks associated with the delivery of NWE Phase 4 upon its timetable process in autumn 2017, but has seen limited evidence that it considered or pro-actively advocated alternative options. This significantly increased the risk that it would not be able to meet the industry schedule for producing a timetable in time for May 2018.
63. In correspondence relating to ORR's investigation into whether Network Rail has complied with the terms of its licence (a regulatory process initiated in February 2018 and conducted separately from this Inquiry, which has found Network Rail in breach of its licence), Network Rail has described the measures that it is now taking to introduce additional oversight and assurance review processes across its business, which were not in place prior to May 2018. The Inquiry considers, as explained above, that the SO was uniquely positioned to have performed these roles in preparation for May 2018.

64. The Inquiry has found that the SO did not have in place sufficient co-ordinated processes, co-operation and system-wide oversight to manage the effective delivery of the scale of change required for May 2018, although Network Rail is now taking measures to correct this.
 65. The Inquiry has considered whether the SO and train operators took all reasonable steps to run a robust and efficient process in preparing the timetable once the scale of the challenge emerged in late 2017 and early 2018, with the resources and processes that were available to them at the time.
 66. The Inquiry has found that the System Operator's timetabling team, and those of passenger and freight operators, were placed under extreme pressure in early 2018 as the unprecedented extent and complexity of the need to rewrite the timetable became clear. The teams involved made extraordinary efforts to complete the work then required, without any reasonable options to reduce or mitigate the scale of the task at that late stage.
 67. The Inquiry has considered whether issues arising from the compliance with Part D of the Network Code contributed to the failure to introduce an operable timetable in May 2018. It has also considered whether Part D remains fit for purpose where major timetable changes are required, in contrast to the more incremental changes that are usually undertaken.
 68. The Inquiry has found that the schedule prescribed by Part D of the Network Code for the timetabling process was applied flexibly by the SO and by train operators in preparing the May 2018 timetable, but does not judge that flexibility is inappropriate in certain circumstances. As found earlier, it is critical that decisions about infrastructure projects avoid compressing the time available to develop the timetable, by being made in alignment with the Part D process, even if this schedule varies in different circumstances.
 69. The issue of whether compliance with Part D of the Network Code needs to be reviewed will be considered further in Phase 2 of the Inquiry.
- In particular, we propose to consider whether the management of risks to future timetable changes arising from major infrastructure or rolling stock programmes on which timetables are dependent can be accommodated through greater compliance with the Network Code.
70. The Inquiry has considered whether the overall capability and resources available to the SO are sufficient to deliver large timetable changes. This is also a focus of ORR's separate investigation into Network Rail's compliance with its licence requirements, and a feature of ORR's current Periodic Review of Network Rail.
 71. The Inquiry has found that the resources available to the SO could not reasonably have been increased at short notice to mitigate problems as they emerged in the timetabling process for May 2018. However, the SO could have done more to estimate the resource demands at a much earlier stage and consider other mitigations, as is now being done in anticipation of future timetable changes. ORR stated in its PR18 draft determination the need for additional SO resources in the next control period.
 72. We will consider the issue of the SO's long-term resources and capability further in Phase 2 of the Inquiry. We will also consider an issue that has been raised with the Inquiry regarding the use of technology to support the accuracy and efficiency of the timetabling process by the SO and train operators. However, we have found no evidence that this was a primary cause of the disruption in May 2018.
- ### Northern's preparedness to operate the 20 May 2018 timetable
73. The Inquiry has examined the role of the Northern train operating franchise in the timetabling process, and whether it did everything reasonably practicable in its preparations to introduce an operable timetable on 20 May 2018.
 74. On 5 January 2018, the Extraordinary North of England Programme Board decided that implementing a further closure of the railway to deliver NWEF Phase 4 for May 2018

would be too disruptive for passengers. As a consequence, Northern was required to fundamentally re-cast its timetable, with 16 weeks available to complete work that would normally take 40 weeks under the schedule in Part D of the Network Code.

75. At the end of January 2018, Northern sent Network Rail a wholly revised series of bids for the May 2018 timetable. These were resource-led as the absence of the expected electrical infrastructure on the line meant that availability of diesel rolling stock became the fundamental determinant in working services back into the 'Bolton corridor'. This affected almost the whole of Northern's network, completely changing the plan that Northern had anticipated introducing in May 2018.
76. At the beginning of February 2018, Northern formally requested that the SO consider rolling forward the national December 2017 timetable to May 2018, in order to simplify the changes required and mitigate risks from the already compressed timescales. However, Northern had no reasonable way of knowing how severe the eventual disruption would turn out to be. The SO considered that this was not practicable as the decision was being made in the context of contractual offers to other operators and other irreversible infrastructure and rolling stock changes.
77. The Inquiry has found that Northern engaged properly with Network Rail's timetabling process and the factors that caused the timetable to be re-planned at a late stage were outside its control. The Inquiry has reviewed evidence that Northern was immediately aware of the risks that this late replan could create and that it explored options with Network Rail to mitigate these by requesting a national roll-over of the December timetable. The Inquiry has been unable to undertake independent technical analysis about whether this was a viable option.
78. The Inquiry has considered Northern's preparations to introduce the revised timetable into service, including the measures taken to ensure the availability and planning of rolling stock and train crew, which the Inquiry heard were material factors in the May 2018 service disruption.
79. The failure to electrify the Bolton Corridor created challenges for Northern's planning of available rolling stock, creating a need for Northern to reallocate 47 diesel vehicles. This led to reduced capacity and resilience on Northern's services as diesel units were taken from planned capacity enhancements and contingency stock at depots. The compressed timescales resulted in less time for optimising the unit diagrams than originally planned and Northern has stated it is probable the attempt to expedite the process "did impact on the quality of the train crew diagrams".
80. The Inquiry has found that Northern took reasonable measures to ensure that services were covered by corresponding train units. Based on the evidence received, the Inquiry finds that the ability of train crew to operate the rolling stock was a greater factor in the May 2018 timetable delivery than the availability of the rolling stock itself.
81. Like GTR, the compression of timescales meant that Northern had insufficient time to complete fully developed, optimised and quality assured train crew diagrams prior to consultation with staff. Emergency rostering was adopted but a major displacement of staff and trains developed, resulting in the new timetable quickly falling over and the subsequent introduction of an interim timetable on 4 June.
82. The Inquiry found that in the lead up to the timetable change, Northern did not have train crew rosters that had been fully optimised or agreed with the unions. The Inquiry finds that Northern could not have reasonably accelerated the train crew diagramming process, which followed a rolling stock plan that had not been fully optimised.
83. Northern explained that there were factors which limited its level of resilience at this late stage, and the Inquiry considers that Northern had less potential to stress test and plan contingency into its approach to train crew planning than GTR had in early 2018. These included having finite training resource to deliver an increased number of required training days and removal of potential training

opportunities through extended engineering activity; for example in the Bolton Corridor over weekends. There were also some operational difficulties in managing drivers under different terms and conditions and the end of the rest-day working agreement on 21 February 2018, although these were known quantities that could have been managed.

84. The Inquiry has found that the compressed driver training timescales from the failure of NWEF Phase 4 to electrify the Bolton corridor and the additional retraining burden of the NWEF Phase 3 overrun were the primary causes of Northern's inability to arrange for a sufficient level of driver competency to operate an effective service from 20 May 2018, and that Northern was constrained in its ability to manage these in the limited time available.
85. The Inquiry has considered Northern's understanding of risks related to the successful delivery of the May 2018 timetable.
86. Northern was able to identify risks to the delivery of the May 2018 timetable at various stages in its development, and a number of these are listed in Northern's timetable readiness dashboards. Nevertheless, by 9 May 2018 Northern expressed its view to Transport for the North that it still expected to be able to run a full service from 20 May. The Inquiry has not been able to fully establish the basis on which Northern provided this assurance.
87. The Inquiry has found that in the lead up to the timetable change, Northern failed to adequately understand or communicate the risks arising from failing to have a sufficient number of trained drivers to operate the 20 May 2018 timetable. As a result, passengers faced severe disruption and were not provided with information that would have allowed them to manage the impact.
88. In parallel with the disruption caused by the failure of the May 2018 timetable, Northern services experienced additional disruption caused by an ongoing industrial relations dispute. This further exacerbated the impact on staff and passengers, and complicated the short-term planning of rolling stock and crews. However this was planned industrial

action and while it aggravated the impact of the timetable disruption, the Inquiry has seen no evidence to suggest that these on-the-day industrial relations issues were a primary causal factor behind the failure of the timetable itself.

Northern's actions to mitigate the impact of disruption on passengers

89. The Inquiry heard that it became clear at a very early stage after 20 May, that Northern Rail had problems with the delivery of the timetable, so for the first two weeks there was a combination of planned changes and significant levels of unplanned cancellations based on available resources on the day. There were occasions when the train driver or conductor was delayed and services had to be cancelled without prior notice, even on services which were already full of passengers.
90. The company had a hotspot map of where disruption was greatest and deployed extra staff at those locations to provide additional customer service assistance and to also feed back into their gold command structure. Short-term planning measures were put in place based on this feedback and customer demand, resulting in additional shuttles and 'sweeper' trains for example on the Bolton corridor. Ticket acceptance arrangements were put in place on Metrolink and restrictions on advance purchase tickets lifted.
91. No additional arrangements were put in place for passengers who are disabled as many of the affected stations were staffed and they had the autonomy to make decisions. There are some examples that where trains were full, staff authorised use of taxis for vulnerable passengers. Nonetheless, the number of complaints received about accessibility issues increased and the impact on passengers who are disabled arising from inadequate information was severe.
92. There is some evidence to conclude that there was a failure to provide services to passengers requiring assistance, as well as examples of good practice in other places. The Inquiry has found that Northern acted quickly to