24-016 Updating route knowledge standards for traincrew

Version:	2.0		
Purpose:	Approval to proceed to consultation		
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Sponsor:	Tom Lee, Director of Standards		
Lead industry committee:	Traffic Operation and Management Standards Committee (TOM SC)	**Date:**	27 January 2026
Supporting industry committee:	Control, Command and Signalling Standards Committee (CCS SC)	**Date:**	15 January 2026

Decision

Traffic Operation and Management Standards committee is asked to **APPROVE** to proceed to consultation. In doing so, the committee has **DECIDED** that the document(s):

a) Deliver the intentions of the proposal for change.
b) Are in a suitable state for consultation.

Traffic Operation and Management Standards committee is also asked to:

c) **IDENTIFY** any specific stakeholders to be included in the consultation.
d) **DECIDE** whether the consultation can be carried out within the committee or should be an industry wide consultation.

Control, Command and Signalling Standards Committee is asked to:

e) **SUPPORT** to proceed with the above consultation.
f) **CONSIDER** whether they need any further involvement in the project beyond this stage.

24-016 Updating route knowledge standards for traincrew

This business case for change has been developed to support standards committees in taking decisions related to changes to standards. It includes an assessment of the predicted impacts arising from the change.

Proposed revised document

Number	Title	Issue
RIS-3702-TOM	Management of Route Knowledge	4

Proposed superseded document

Number	Title	Issue
RIS-3702-TOM	Management of Route Knowledge	3

Summary

Background and change

RIS-3702-TOM issue 4 *Management of route knowledge* was revised in March 2020 to incorporate the findings of the research projects T1108 *Achieving a step change in route knowledge management* and T1151 *Making a step change in guards and other on-board operational staff route knowledge.* Research project T1319 *Defining the route knowledge requirements for operating under ETCS* (European Train Control System) was completed in 2024.

RSSB received three Requests for Help (RfHs) through which industry has identified sections of RIS-3702-TOM that could be updated to benefit safety and operational performance. Advances in technology used in training such as driver and guard simulators have taken place in recent years. There have also been developments in the use of online training and electronic devices for the distribution of operational information. Industry has also identified that a common approach to the assessment of route risk may improve safety when drivers transfer between train and freight operating companies (TOCs/FOCs).

RSSB received an additional RfH that highlighted that in degraded situations where trains become stranded, and the risk of an emergency situation occurring is high, there may be an opportunity to permit trains to be moved short distances and under strict conditions, through changes to the route knowledge requirements.

This project sought to align RIS-3702-TOM with lessons learned from industry since the previous update to the standard in 2020 and subsequent research, and to incorporate advances in technology and training. Proposed changes to incorporate route knowledge under ETCS, agreed route risk assessment factors and guidance on how operational staff can identify locations might improve efficiency of route knowledge learning and ongoing management of traincrew competence. This may benefit industry through increasing safety and improving operational performance.

Industry impact due to changes

Impact areas	Scale of impact	Estimated value
A. Legal compliance and assurance	Low	£140,000
B. Health, safety and security	Medium	£689,842
C. Reliability and operational performance	High	£462,000
D. Design and maintenance	N/A	N/A
E. People, process and systems	Medium	£1,765,780
F. Environment and sustainability	N/A	N/A
G. Customer experience and industry reputation	N/A	N/A
Total value of industry opportunity =		**£3,057,622**

The standards change contribution to the total value of industry opportunity

☐ None or low	☐ Minor but useful	☐ Moderate	☑ Important / essential	☐ Urgent / critical

Detail

1. What were the objectives associated with this change?

Objective 1 – Improve the content of RIS-3702-TOM to address industry concerns

Technology

1.1 Since RIS-3702-TOM was previously updated in 2020, elements of technology used for driver and guard training have advanced. Recent investment in technology associated with the introduction of ETCS has driven further advancements in driver simulators. Several TOCs now use simulators for guard training. An RfH (24-REQ-049) identified that the quality of route information provided by simulators and videos has advanced since RIS-3702-TOM issue 3 was published.

1.2 The methods of providing information to staff regarding operations, route information, documentation and training are increasingly delivered using technology.

1.3 It was proposed that this project reviewed the role of technology in the management and undertaking of route learning.

Route learning requirements for drivers and guards

1.4 Research project T1319 *Defining the route knowledge requirements for operating under ETCS* was completed in 2024. The project addressed the needs of the East Coast ETCS deployment by identifying the specific route knowledge required to drive under ETCS following the upgrade. This includes knowledge needed in degraded modes of operation and the knowledge required for transitioning between ETCS and the conventionally signalled railway.

1.5 The project also considered how far route knowledge requirements identified for the East Coast Mainline are applicable to future ETCS deployments. These findings were intended to inform an update to RIS-3702-TOM.

1.6 RIS-3702-TOM 'Appendix D List of route knowledge requirements – Train managers and guards' is based on the findings from research project T1151 *Making a step change in guards and other on board operational staff route knowledge.* This project was published in 2019. An RfH (24-REQ-049) identified that the requirements may not align with current industry practice for all on board operational staff.

1.7 It was proposed that the current route knowledge requirements for traincrew be reviewed, based upon industry experience since the publication of T1108 *Achieving a step change in route knowledge management*, T1151 *Making a step change in guards and other on board operational staff route knowledge* and T1319 *Defining the route knowledge requirements for operating under ETCS*.

Route risk assessment

1.8 There was no current standardised template used by industry when carrying out a route risk assessment. Guidance is given in RIS-3702-TOM section 2.2 'Route risk assessment', supported by 'Appendix B How to create a route story to complete the route risk assessment'.

The contents of a route story may vary depending on the type of work undertaken by a railway undertaking (RU).

1.9 Developing a route story can assist in completing a route risk assessment. The route risk assessments used by TOCs/FOCs and heritage operators are vital in determining the timescales for factors such as practical route learning and route knowledge retention by staff.

1.10 RIS-3702-TOM identifies that the route risk assessments may differ between TOC and FOCs for identical routes. However, some of the content of the route risk assessment may be common for all types of RU operating over the route.

1.11 When staff transfer to another RU, there is no assurance that any or all the relevant route knowledge training previously undertaken has been completed to the same standard as required by a new employer.

1.12 This project sought to identify if it was feasible to create an industry standard template for route risk assessment based upon those currently used by RUs. This work drew upon on work being completed by the National Freight Safety Group in this area.

Identification of locations on the railway

1.13 There is currently no standardised approach to information used to identify locations that may be studied and remembered as part of route learning by staff. There are various methods used to identify locations across the GB network.

1.14 Technological solutions, such as handheld electronic devices, are frequently provided by TOCs and FOCs to assist drivers and guards in identifying a location in real-time.

1.15 The ability of staff to correctly identify a location during normal, degraded and emergency situations using any available method is an important part of the operational instructions in GERT8000 (the Rule Book).

1.16 The Train Driving Licences and Certificates Regulations 2010 states that in relation to the basic principles of railway infrastructure the driver must have acquired knowledge of, for example, railway structures (like bridges, tunnels and points) and safety installations (like hot-axle box detectors and smoke detectors in tunnels).

1.17 It was proposed that this project sought to identify and record the methods of identification of railway locations when route learning is undertaken by train drivers and guards.

Objective 2 - Investigate the feasibility of stranded trains being moved by drivers with limited route knowledge

1.18 Trains may become stranded behind other trains or obstructions during adverse incidents. Where trains are stationary for extended periods of time, overall system risk increases, including the potential for an uncontrolled evacuation to take place.

1.19 An RfH (24-REQ-039) identified that an adverse incident occurred when a train movement was agreed between the train driver and controlling signaller via a route that the driver did not have route knowledge for. This was due to a degraded situation that meant the train would

have been stranded for an extended period. There is currently no guidance or procedure that gives clarity to this type of situation.

1.20 This type of move is contrary to GERT8000 module TW1 clause 29.1, which states '*When working a train, you must have the necessary knowledge for the entire route over which you are to work or be accompanied by a competent conductor driver'.* Industry believes that in situations where a stranded train cannot be moved under current operational procedures, overall system risk could be reduced by permitting trains to be moved under strict conditions, where the driver does not have route knowledge for the entire movement.

1.21 The project undertook work that determined the feasibility of this change.

2. How has the content in the standard changed to achieve the objectives?

Objective 1 Improve the content of RIS-3702-TOM to address industry concerns

Technology

2.1 The project reviewed the current industry approach to the application of technology in route learning management. It was found that although the fidelity of simulators had improved since RIS-3702-TOM issue 3 was published, the use in the management of route learning had remained broadly the same.

2.2 Additional guidance related to the use of technology was added to RIS-3702-TOM based on industry good practice identified as part of this project.

2.3 References to the forms of technology in the proposed RIS-3702-TOM issue 4 have been updated based on current industry practice.

2.4 The contents of the new Appendix L 'Location information used in communications between traincrew and third parties' include guidance on the use of technology in obtaining route information.

Route learning requirements for train managers and guards

2.5 Appendix C 'List of route knowledge requirements - Drivers, Driver Managers and Route Conductors' has been updated to include the findings from T1319. New guidance has been added identifying a method for tailoring route knowledge requirements to ETCS scheme according to operational criteria.

2.6 During the initial engagement work with TOCs, input was sought on the contents of Appendix D 'List of route knowledge requirements - Guards'. Following this work, no changes to the current contents were found to be necessary.

Route risk assessment

2.7 RSSB undertook a review of current TOC and FOC methodologies for completing a route risk assessment. The project found that the approach taken varied across industry and there was no common approach to identifying the route risk factors on which the assessments were

based. The lack of a common approach to the terminology and descriptions of route risk factors was identified as a barrier to the standardisation of route risk assessments and to the sharing of route information between RUs as set out in the standard.

2.8 RSSB held two workshops to produce a list of route risk factors to be used in route risk assessment based on input from TOCs, FOCs, Network Rail and trade unions. The output from the workshops was circulated to a steering group to facilitate the drafting of the updates to RIS-3702-TOM issue 4.

2.9 The output of this work is contained within a new Appendix K 'Route risk factors'. A new requirement to consider these factors when undertaking a route risk assessment, along with guidance, has been added to part 2 'The route risk assessment'.

2.10 Additional discussion took place regarding the feasibility of creating an industry standard methodology for carrying out a route risk assessment. RSSB engaged with the National Freight Safety Group (NFSG) route risk assessment working group to identify a way forward. Based on the complexity and variety of train service factors and routes that are considered by each FOC or TOC when undertaking a route risk assessment, it was decided that it was not feasible to create a more detailed method for this process.

Identification of locations on the railway.

2.11 RIS-3702-TOM issue 4 has been updated to include a new Appendix L 'Location information used in communications between traincrew and third parties'.

2.12 This is supported by guidance on using the appendix when providing information to route learners and developing training materials for traincrew.

Other changes

2.13 To remove gender-specific language, the term 'pilotman' has been replaced by 'pilot'. This change has been published in the Periodical Operating Notice since December 2022.

2.14 The contents of Appendix F 'Integrating non-technical skills (NTS) into the route learning plan' have been updated following publication of RSSB T1207 *Enhancing the integration of non-technical skills into competence management systems,* which updated the NTS framework.

2.15 Document references have been updated to the latest versions where necessary. Minor changes have been made to the document to redraft incorrect punctuation and grammar.

Objective 2 - Investigate the feasibility of stranded trains being moved by drivers with limited route knowledge

2.16 RSSB held workshops which considered the feasibility of a suitable method being devised so drivers, without the correct route knowledge, could move trains over short distances during degraded situations, subject to strict conditions being met. Two workshops were conducted with TOCs, FOCs, Network Rail and trade unions to discuss suitable methods proposed by this project.

2.17 During these workshops, participants demonstrated objections to any RSSB standards change that would permit drivers to move trains over short distances in the absence of route knowledge of the route over which the train is driven.

2.18 After investigation into the possibility of providing additional guidance to the industry regarding drivers' movement of trains in the absence of route knowledge, a regulatory issue regarding the proposed change became evident.

2.19 Regulations 4(2) and 4(3) of the Train Driving Licences and Certificates Regulations 2010 (TDLCR) respectively prohibit RUs and infrastructure managers from deploying a driver to drive a train over a particular route where they do not have a train driving certificate for that route. Similarly, regulation 4(4)(b) prohibits a driver from operating a train over a route for which they do not hold a train driving certificate. TDLCR regulations 9(2)(c) and (4)(a) stipulate that to be issued with a certificate to drive a train over a particular route, the driver must have demonstrated route knowledge for the route by passing professional knowledge examinations. The effect of these provisions is that to operate a train over a particular route, a driver must hold a certificate, thereby requiring route knowledge for that route.

2.20 Regulation 4(7)(a) and (8)(a) permits a train to be operated by a driver who does not have a train driving certificate (requiring route knowledge) for that particular route where they are accompanied in the train cab by another driver who does possess a certificate to operate a train over that route.

2.21 The TDLCR therefore does not permit a driver to operate a train over a route for which they do not hold a train driving certificate unless (and only if) they are accompanied in the train cab by another driver who does hold a certificate to operate a train over that route.

2.22 RSSB held discussions with the Office of Rail and Road (ORR) regarding the TDLCR specifically relating to the provision of a conductor driver and seeking clarity on this subject. The ORR plans to work with the DfT in order to publish an update to the TDLCR in 2027 and the sections of the regulations relevant to objective 2 are part of this work.

2.23 Given the objection registered during the workshops, and the regulatory requirements of TDLCR, a proposed standards change regarding the operation of trains by drivers over routes for which they do not hold route knowledge was deemed inappropriate. Therefore, no changes have been made as a result of this objective.

2.24 Due to this objective not being achieved during this project, the financial benefits identified in section 4 of this document have been removed from the total value to industry table.

3. How urgently did the change need to happen to achieve the objectives?

3.1 Route learning is a key factor in training and recruitment of train drivers and guards, and in enabling safe, efficient and flexible train movements. TOC and FOCs were particularly supportive of this project, which has the potential to deliver benefits across these areas.

3.2 The deployment of ETCS across the GB network has progressed significantly and the updates proposed in this project will support the ongoing work.

3.3 The project found that the NFSG was undertaking simultaneous work to identify a common method of carrying out a route risk assessment for FOCs. This project has engaged with the NFSG working group to share learning and align the project outputs and timescales where applicable.

4. What are the positive and negative impacts of implementing the change?

Justification of impact, scale and quantification for the seven impact areas

A. Legal compliance and assurance

Objective 1

4.1 The *Railways and Other Guided Transport Systems (Safety) Regulations 2006* (ROGS) requires that transport operators establish and maintain a safety management system that provides programmes for the training of persons carrying out work, or voluntary work, directly in relation to the operation and systems to ensure that the competence of such persons is maintained and that they carry out tasks accordingly.

4.2 The *Operation and Traffic Management National Technical Specification Notice* (OPE NTSN) sets out the minimum requirements for staff accompanying trains, including knowledge of the route.

4.3 The TDLCR sets out the requirement for drivers to have a thorough knowledge of the route for which they sign. Schedule 4 extends to outlining aspects of this knowledge deemed to be important. It may also be appropriate that other traincrew are provided with some or all these aspects listed in the TDLCR

4.4 ORR has published guidance[1] describing the principles and factors that should be considered in any competence management system and explains how to ensure that the competence of individuals and teams satisfies the requirements of existing legislation.

4.5 The proposed updates to RIS-3702-TOM issue 4 will further help RUs comply with their legal obligations under ROGS, the TDLCR, and the OPE NTSN by improving and standardising the process by which route knowledge is learned by traincrew. Any improvement notices or prosecution by the ORR will incur costs and negative outcomes for an RU. Although difficult to quantify due to the individual nature of such occurrences, previous examples of prosecutions

[1] ORR Developing and maintaining staff competence - Railway Safety Publication 1 November 2016

related to a failure to provide adequate training to staff resulted in a fine of £1,400,000[2]. Preventing one incident of this type over five years may save industry £140,000.[3]

B. Health, safety and security

Objective 1

Identification of locations on the railway

4.6 Accurate identification of locations by traincrew when carrying out operational tasks is key to the safe operation of the railway.

4.7 The accurate identification of lineside locations during engineering possessions and degraded working such as single line working by pilot or extended block working, relies on the route knowledge of the traincrew. Where a clear understanding is not reached between the driver and other operational staff about a location of a signal or other identifying location such as a level crossing or bridge, there is a potential for an adverse incident to occur. If we take a conservative estimate that the revisions of the standard could prevent one of these incidents annually, this could save industry £190,110 over five years[4].

4.8 Route knowledge has been identified as an underlying factor in several signal passed at danger (SPAD) events. If we take a conservative estimate that the revisions of the standard could prevent one SPAD per year by improving traincrew route knowledge, industry may save £196,360 over five years.[5]

Route risk assessment

4.9 The assessment and management of route risk was found to be a relevant factor in the train overspeed incidents at Peterborough in 2022 and 2023[6]. Both events resulted in major negative outcomes for passengers travelling on the trains involved and to the RUs involved. The value of preventing this type of incident through improvements to RIS-3702-TOM is difficult to quantify due to the number of variables involved but is likely to be substantial.

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[2] Network Rail fine following serious injury to a member of staff on 19 September 2018 between Crewe and Chester.

[3] Assuming one incident occurs during a five-year period where route knowledge is a contributing factor, resulting in a fine comparable to the 2018 incident (£1,400,000). We estimate that the changes made to this standard could reduce this fine by 10% . Based on these assumptions, the industry may save (0.1*£1,400,000).

[4] Confusion over the location of a worksite markerboard at Grahamston in 2020 led to a SPAD and 168 minutes of train delays. Research project T1171 *Evaluation of Human Performance* listed the cost of investigating a SPAD as £29,622. Cost estimated to be £38,022 (£29,622+(168*£50 per minute delay)).

[5] Route knowledge was cited as an underlying factor for SPADs at Feltham in 2022 and Lewisham in 2023. Train delays of 193 minutes were incurred at Lewisham at a cost of £39,272 (£29,622+(193*£50 per minute delay)).

[6] RAIB reports 06/2023 *Train over-speeding at Spital Junction* and 10/2024: *Overspeed at Spital Junction, Peterborough*

4.10 Between 2020 and 2024, 43 SPADs occurred where the driver identified the wrong signal as applying to their train or was not aware of the location of a signal. A single incident of this type in 2022 led to damage to infrastructure that impacted services over a period of six months. Improvement in the route risk assessment process preventing one occurrence of this type of SPAD during a five-year period may save industry £303,372.[7]

Objective 2

4.11 An uncontrolled evacuation from a stranded train is a potentially serious event, which may lead to significant safety concerns for passengers and staff as well as have negative effects on operational performance for a significant period. An uncontrolled evacuation may occur when a train has not moved for a long period of time because, for example, the train environment has become degraded due to heat or lack of toilet facilities, to the extent that passengers decide to self-evacuate.

4.12 Previous adverse incidents have occurred where trains were stranded for a significant amount of time due the driver of one train not possessing route knowledge for a short distance shunt movement or diversion via a goods or passenger loop. Being able to prevent one uncontrolled evacuation by using a proposed method of moving a train a short distance without driver route knowledge may save industry £315,000 over five years[8].

C. Reliability and operation performance

Objective 1

4.13 Using accurate and effective route risk assessments for the management of route learning and knowledge retention might improve the operational resilience of both an individual TOC/FOC and the wider GB network. This impact is difficult to quantify due to the variables, but we expect the scale of impact to be high, because it has the potential to improve nearly all train operations involving drivers and guards.

4.14 The route knowledge of traincrew contributes to train punctuality. Improvement in the route learning process might improve the overall system reliability and punctuality by improving traincrew performance and thus reducing service delays. This could reduce the amount of delay repay compensation paid out. An example of possible quantification of this benefit

[7] SPAD at Crewe in 2022 and subsequent damage to infrastructure led to 5475 minutes delay to 637 trains over a six-month period. Cost to investigate SPAD and cost of train delay is £303,372 (29,622+(5475*£50 per delay minute)).

[8] Service disruption following a hot axle box on a passenger service at Carlton level crossing in 2022 resulted in several stranded trains. Disruption was furthered by several trains not being able to take a short alternative diversion due to lack of route knowledge. A 25% reduction in delays using an alternative method to release trapped trains may save industry £63,000 annually (0.25*1008 minutes delay*£50 per minute*5 events*5 years).

would be a saving of £462,000 over five years for each TOC if an increase of 1% in overall performance was achieved by improving route knowledge standards.[9]

D. Design and maintenance

4.15 This area is not directly applicable to the changes.

E. People, process and systems

Objective 1

4.16 Practical route learning forms an important part of the route learning task. For operational reasons such as train cancellations or weather conditions, it may be difficult to ensure that the planned practical route learning on any given day is completed effectively. Improvements in the availability of technological solutions may increase the effectiveness of practical training through better integration of practical and non-practical route learning. Where planned practical training is not available, effective route learning that is as realistic, timely and appropriate may save industry £340,780 over five years[10].

4.17 The effectiveness of the route learning task may be improved by ensuring the appropriate time and method is employed for each aspect of route learning. Improvements to the consistency and standardisation of route learning may improve predictability through the setting of minimum requirements that align with the output of a route risk assessment and are tailored to the operational context. A quantification of this benefit is difficult; however, this benefit may improve the overall quality of the learning output.

4.18 Route knowledge requirements for traincrew may vary. A FOC driver and TOC driver possessing route knowledge over any given route may learn common route factors as well as those factors unique to their operator driving requirements. Industry does not currently have a standardised approach to recording this information in a route risk assessment.

4.19 When a driver moves to another train operator, the detailed information regarding any existing route competence is not currently transferred to the new operator. Improving this process by providing a more standardised approach to industry may provide greater assurance to the new operator in the route competence of the employed traincrew and allow for a more tailored identification of learning needs. This benefit is difficult to quantify as the amount of additional learning to be undertaken would be determined by the train operator.

4.20 Where drivers or guards have been involved in a SPAD, they may be removed from their role for investigation purposes or to facilitate additional training. Due to the variables involved in

[9] Average Total Delay Repay paid out by each of 15 TOC in 2022/2023 was £9,240,000 (138.6M/15). A 1% reduction in delays due to improved performance by traincrew may save the TOC £92,400 (.01*£9,240,000) annually. Rail passenger compensation paid by train operating companies - GOV.UK

[10] Being unable to complete practical route learning, with no comparable substitute being immediately available may result in an additional day of practical route learning needing to be arranged. Additional salary for one day as trainee driver estimated to be £136 ((£34,551k salary/ (35hrs*52 weeks))*8 hours). Cost to industry annually estimated to be £68,156 (1 day per trainee lost*50 trainees per year*10 TOCs/FOCs).

calculation of any lost productivity or impact to services, the potential cost is difficult to quantify. However, it may be substantial both financially and in terms of a reduction in the provision of services. Improving the quality of route learning may reduce the number of related SPADs and other adverse incidents, benefiting the overall delivery of train services.

4.21 A significant amount of time and resources is dedicated to route learning by both operational and training staff. The exact method and time a member of traincrew requires to be deemed competent over a particular route will vary with each individual, due to the number of factors involved. The quantitative benefit to industry is difficult to determine due to the number of variables but even a small increase in the efficiency of route learning, while maintaining the same quality, may save industry £1,425,000 over five years[11].

F. Environment and social value

4.22 This area is not directly applicable to the changes.

G. Customer experience and industry reputation

Objective 1

4.23 The overspeeding incidents at Spital junction in 2023[12] and 2024 were reported on widely in the national press, including images of the effect of the incident on the passengers travelling on the trains involved. Although difficult to quantify, the qualitative effect of this type of publicity is most likely to be negative for the industry. A reduction in overspeeding incidents due to improved route knowledge may assist in improving the overall industry reputation and customer experience.

Objective 2

4.24 Stranded trains have a large negative impact on the customer experience. The role of social media was examined in the uncontrolled evacuation at Lewisham[13]. This communication and the evacuation were subsequently reported on by national media within a very short period. The financial cost of this negative impact is difficult to quantify due to the difficulty of measuring the effect on the public perception of the industry. Any reduction in the number of uncontrolled evacuations and subsequently the number of stranded trains may benefit industry through a reduction in overall system risk.

[11] Estimated 19,000 GB train drivers, estimated mean annual salary £60000. If 2.5% of drivers are engaged in route learning at any given time and this cost is reduced by 1% through more effective and efficient route learning, this may save industry £285,000 annually (19000*60000*0.025*0.01*5).

[12] RAIB Report 06/2023: Train overspeeding at Spital Junction

[13] RAIB report 02/2019 *Self-detrainment of passengers onto lines that were still open to traffic and electrically live at Lewisham, south-east London, 2 March 2018.*

5. What is the contribution of this standards change in realising the value to industry opportunity?

5.1 Updating the route learning standards to incorporate advances in technology will assist in identifying the most effective methods of providing route information to industry.

5.2 Understanding route knowledge is relevant to many operational tasks, the management of training and competence, and recruitment. Any improvement in the route learning standards provided to industry has the potential to benefit these key areas.

6. What was the effort required by RSSB to make the change?

6.1 RSSB engaged with TOCs, FOCs, the ORR and trade unions and facilitated two workshops and a drafting review group that provided input and commented on the draft documents.

6.2 RSSB engaged with the NFSG route risk assessment work related to the operation of freight trains.

6.3 RSSB identified current industry good practices regarding route risk assessment by engaging with TOC and FOC operational standards staff.

7. Did RSSB deliver against industry's expected timescales?

7.1 This project is currently on schedule for publication of RIS-3702-TOM issue 4 in September 2026.

8. How will the industry implement the change?

8.1 There will be a requirement for industry to update any documents related to the proposed changes to RIS-3702-TOM. There may also be a requirement to align any training methods to the proposed updates.

9. How will RSSB assess whether the change is achieving the objectives?

9.1 RSSB will undertake a 12-month review following publication of the standard to assess whether its content is fit for purpose. During the review, we will seek specific feedback from RUs and anyone else that has adopted and implemented the changes.

9.2 RSSB will support implementation of the standards through stakeholder engagement and will request feedback from users where required.

Appendix A Disposition table

A.1.1 Only sections that have been subject to review have been included in the disposition table. Sections not mentioned below remain unchanged.

Table A1: RIS-3702-TOM issue 3 to RIS-3702-TOM issue 4

From RIS-3702-TOM issue 3	To RIS-3702-TOM issue 4	Way forward	Comments	Objective
1.1.4	1.1.4	Redrafted – no material change	Reference to TSI updated to Operation and Traffic Management National Technical Specification Notice (OPE NTSN).	1
G 2.1.4	G 2.1.4	Redrafted – no material change	Clause updated to remove solidus.	1
G 2.1.6	G 2.1.6	Revised – material change	Reference to train manager removed to align with job roles in GERT8000	1
NA	G 2.1.7	New	New guidance added identifying T1319 *Defining the route knowledge requirements for drivers operating under ETCS.*	1
G 2.1.7	G 2.1.8	Redrafted – no material change	Clause renumbered following addition of new G 2.1.7.	1
G 2.1.8	G 2.1.9	Redrafted – no material change	Clause renumbered following addition of new G 2.1.7.	1
G 2.1.9	G 2.1.10	Revised – material change	Clause updated to include reference to T1319 and renumbered following addition of new G 2.1.7.	1
G 2.1.10	G 2.1.11	Redrafted – no material change	Clause renumbered following addition of new G 2.1.7.	1

From RIS-3702-TOM issue 3	To RIS-3702-TOM issue 4	Way forward	Comments	Objective
G 2.1.11	G 2.1.12	Redrafted – no material change	Clause renumbered following addition of new G 2.1.7.	1
G 2.1.12	G 2.1.13	Redrafted – no material change	Clause renumbered following addition of new G 2.1.7.	1
G 2.1.13	G 2.1.14	Redrafted – no material change	Clause renumbered following addition of new G 2.1.7.	1
G 2.1.14	G 2.1.15	Redrafted – no material change	Clause renumbered following addition of new G 2.1.7.	1
G 2.1.15	G 2.1.16	Revised – material change	Clause renumbered following addition of new G 2.1.7. Reference to Appendix C added.	1
NA	2.2.2	New	Requirement added for RUs to consider the risk factors as listed in Appendix K when carrying out a route risk assessment.	1
G 2.2.2	G 2.2.3	Redrafted – no material change	Clause renumbered following addition of new requirement 2.2.2.	1
G 2.2.3	G 2.2.4	Redrafted – no material change	Clause renumbered following addition of new requirement 2.2.2. Clause updated to remove solidus.	1
G 2.2.4	G 2.2.5	Redrafted – no material change	Clause renumbered following addition of new requirement 2.2.2.	1

From RIS-3702-TOM issue 3	To RIS-3702-TOM issue 4	Way forward	Comments	Objective
G 2.2.5	G 2.2.6	Redrafted – no material change	Clause renumbered following addition of new requirement 2.2.2.	1
G 2.2.6	G 2.2.7	Redrafted – no material change	Clause renumbered following addition of new requirement 2.2.2.	1
G 2.2.7	G 2.2.8	Revised – material change	Clause clarified to add reference to new requirement and renumbered following addition of new requirement 2.2.2.	1
NA	G 2.2.9	New	Guidance has been included on how the route-related risks presented in this document have been completed for generic traincrew roles.	1
NA	G 2.2.10	New	Guidance added explaining how the route risks in Appendix K are not exhaustive.	1
NA	G 2.1.11	New	Guidance added regarding risk factors in Appendix K.	1
NA	G 2.1.12	New	Guidance added on using the information in Appendix C and D to complete a route story.	1
NA	G 2.1.13	New	Guidance added identifying how the risk factors have been grouped in the document.	1
NA	G 2.1.14	New	Guidance added regarding the example considerations in Appendix K.	1
G 2.2.9	G 2.2.15	Redrafted – no material change	Clause renumbered following addition of new requirement 2.2.2.	1
G 2.2.10	G 2.2.16	Redrafted – no material change	Clause renumbered following addition of new requirement 2.2.2.	1
G 2.2.11	G2.2.17	Redrafted – no material change	Clause renumbered following addition of new requirement 2.2.2.	

From RIS-3702-TOM issue 3	To RIS-3702-TOM issue 4	Way forward	Comments	Objective
G 2.3.7	G 2.3.7	Revised – material change	To remove gender-specific language, the term 'pilotman' has been replaced by 'pilot'. This change has been published in the Periodical Operating Notice since December 2022.	1
NA	G 2.4.11	New	Guidance has been included on how railway undertakings might consider the types of information available to staff when carrying out operational tasks that may be used to identify a given location. This information might be included when providing route learning information to staff.	1
NA	G 2.4.12	New	Additional guidance on the purpose of Appendix L added. A signpost to Appendix L *Location information used in communications between traincrew and third parties* has also been included.	1
B	B	Redrafted – no material change	Reference to 'spreadsheet' throughout Appendix B changed to 'table'. Reference to Microsoft Excel removed.	1
B.6	B.6	Revised – material change	Guidance updated to include reference to Appendix K *Route risk factors.*	1
Table 2	Table 2	Redrafted – no material change	Reference to 'spreadsheet' in title changed to 'table'.	1
Table 3	Table 3	Redrafted – no material change	Reference to 'spreadsheet' in title changed to 'table'.	1
NA	Note	New	Note added explaining purpose of Appendix C.	1
C.1	C.1	Revised – material change	Clause updated to explain T1319 *Defining the route knowledge requirements for drivers operating under ETCS* is now included in Appendix C.	1
C2	C.6	Redrafted – no material change	Clause renumbered following addition of new guidance in C.2, C.3, C.4 and C.5.	1

From RIS-3702-TOM issue 3	To RIS-3702-TOM issue 4	Way forward	Comments	Objective
NA	C.2	New	Explanation added of European Train Control System (ETCS) and European Rail Traffic Management System (ERTMS).	1
NA	C.3	New	Background to T1108 *Achieving a step change in route knowledge management* added.	1
NA	C.4	New	Background to T1319 *Defining the route knowledge requirements for drivers operating under ETCS* added.	1
NA	C.5	New	Explanation of the contents of table 4.	
Table 4	Table 4	Revised – material change	Table revised to add the driver route knowledge requirements for ETCS without lineside signals and ETCS with lineside signals.	1
NA	C.7	New	Section added titled 'Operational criteria for tailoring route knowledge requirements to ETCS scheme'.	1
NA	C.7	New	Clause added to explain purpose of the section.	1
NA	C.8	New	Background to T1319 *Defining the route knowledge requirements for drivers operating under ETCS* added.	1
NA	C.9	New	Guidance on ETCS schemes and relevant route knowledge requirements added.	1
NA	C.10	New	Information on how railway undertakings may use this guidance added.	1
NA	C.11	New	Signpost to table 5 added.	1
NA	C.12	New	Signpost to figure 2 added along with purpose and intended use of the operational criteria worksheet.	1
NA	C.13	New	Explanation of purpose of assessing criteria added.	1
NA	C.14	New	Guidance added on good practice should any criteria not be met.	1
NA	C.15	New	Good practice where routes encompass different ETCS schemes added.	1

From RIS-3702-TOM issue 3	To RIS-3702-TOM issue 4	Way forward	Comments	Objective
NA	Table 5	New	Table 5 *Operational criteria for tailoring route knowledge requirements to an ETCS scheme* added that sets out the operational criterion, reasoning and examples related to the review of route knowledge requirements for ETCS schemes.	1
NA	Figure 2	New	An example worksheet for tailoring route knowledge requirements to an ETCS scheme has been added.	1
Figure 2	Figure 3	Redrafted – no material change	Figure number renumbered following addition of figure 2 *Example worksheet for tailoring route knowledge requirements to an ETCS scheme.*	1
NA	F.5	New	Guidance related to the updated non-technical skills framework and research document T1207 *Enhancing the integration of non-technical skills into competence management systems* has been added.	1
Figure 3	Figure 3	Revised – material change	The non-technical skills category 'conscientiousness' has been changed to 'diligence' in line with the updated NTS framework published in T1207 *Enhancing the integration of non-technical skills into competence management systems.*	1
Appendix D	Appendix D	Revised – material change	Reference to train manager removed to align with job roles in GERT8000. No change to meaning or content of appendix.	1
H.1	H.1	Redrafted – no material change	Clauses H.1b and H.1f have been revised to remove references to Digital Versatile Discs (DVDs). These have been replaced with the more relevant term 'videos'.	1
H.2	H.2	New	Guidance added on the accessibility of route knowledge material provided in electronic format.	1
H.2	H.3	Redrafted – no material change	Clause renumbered following addition of revised H2.	1
H.3	H.4	Redrafted – no material change	Clause renumbered following addition of revised H.2.	1

From RIS-3702-TOM issue 3	To RIS-3702-TOM issue 4	Way forward	Comments	Objective
H.4	H.5	Redrafted – no material change	Clause renumbered following addition of revised H.2.	1
H.5	H.6	Redrafted – no material change	Clause renumbered following addition of revised H.2.	1
H.6	H.7	Redrafted – no material change	Clause renumbered following addition of revised H.2.	1
H.7	H.8	Redrafted – no material change	Clause renumbered following addition of revised H.2.	1
H.8	H.9	Redrafted – no material change	Clause renumbered following addition of revised H.2.	1
H.9	H.10	Redrafted – no material change	Clause renumbered following addition of revised H.2.	1
H.10	H.11	Redrafted – no material change	Clause renumbered following addition of revised H.2.	1
H.12	H.12	New	Good practice related to the use of electronic route map information added.	1
H.11	H.13	Redrafted – no material change	Clause renumbered following addition of revised H.12.	1

From RIS-3702-TOM issue 3	To RIS-3702-TOM issue 4	Way forward	Comments	Objective
H.12	H.14	Redrafted – no material change	Clause renumbered following addition of revised H.12.	1
H.13	H.15	Redrafted – no material change	Clause renumbered following addition of revised H.12.	1
H.14	H.16	Redrafted – no material change	Clause renumbered following addition of revised H.12.	1
H.15	H.17	Redrafted – no material change	Clause renumbered following addition of revised H.12.	1
H.16	H.18	Redrafted – no material change	Clause renumbered following addition of revised H.12.	1
H.17	H.19	Redrafted – no material change	Clause renumbered following addition of revised H.12.	1
H.18	H.20	Redrafted – no material change	Clause renumbered following addition of revised H.12.	1
H.19	H.21	Redrafted – no material change	Clause renumbered following addition of revised H.12. Figure 4 has been updated to correct the 4-aspect signal image colour light positions and remove the reference to SPAD indicator.	1
Figure 3	Figure 4	Redrafted – no material change	Figure renumbered following addition of figure 2 *Example worksheet for tailoring route knowledge requirements to an ETCS scheme.*	1

From RIS-3702-TOM issue 3	To RIS-3702-TOM issue 4	Way forward	Comments	Objective
NA	Appendix K	New	Appendix K *Route risk factors* added.	1
NA	Note	New	Note added explaining purpose of Appendix K.	1
NA	K.1	New	Explanation of the appendix added	1
NA	K.2	New	Explanation of the structure of the appendix added.	1
NA	K.3	New	Explanation of the terminology table added.	1
NA	Table 10	New	Table titled *Risk factors – signals* added.	1
NA	Table 11	New	Table titled *Risk factors - stations and non-running line locations* added.	1
NA	Table 12	New	Table titled *Risk factors – route* added.	1
NA	Table 13	New	Table titled *Risk factors - personal safety, equipment and signs* added.	1
NA	Table 10	New	Table titled *Terminology used within this appendix* added to explain terminology used in Appendix K.	1
NA	Appendix L	New	New Appendix L added titled *Location information used in communications between traincrew and third parties*	1
NA	Note	New	Note added explaining purpose of Appendix L	1
NA	L.1	New	Guidance added indicating that railway undertakings might consider sources of location information when providing route learning information to traincrew.	1
NA	L.2	New	Guidance added giving examples of the third parties referenced in the appendix	1
NA	L.3	New	Guidance added explaining the contents of table 15.	1
NA	L.4	New	Guidance added explaining how identifying a location might assist operational staff.	1
NA	L.5	New	Guidance added explaining the purpose of table 15.	1
NA	L.6	New	Signpost to relevant section of Train Driver Licence Regulations added.	1

From RIS-3702-TOM issue 3	To RIS-3702-TOM issue 4	Way forward	Comments	Objective
NA	L.7	New	Guidance added indicating how the information in the appendix might be considered when undertaking training of traincrew.	1
NA	L.8	New	Guidance added explaining the column identifiers used in table 15.	1
NA	Table 15	New	New table added setting out types of location information that can be used by traincrew when communicating with third parties, methods of providing that information to traincrew, examples of its use by third parties and examples of considerations and limitations of the information.	1
Definitions	Definitions	Revised – material change	Definitions for ETCS DMI, ETCS and geocoding added.	1
References	References	Revised – material change	RS521, RS523 and T1319 *Defining the route knowledge requirements for drivers operating under ETCS* added.	1