



Association of Train Operating Companies

ATOC GN ERTMS 002

Issue one

30 January 2015

ATOC Guidance Note - Level 2 ETCS Principle Considerations for Driver Training

Authorised by

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Submitted by

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Synopsis

This document provides support to Train Operators in evaluating the work streams required for Level 2 ETCS Operation



Guidance Note – L2 Principle considerations for Driver Training

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Part A

Issue record

This Guidance Note will be updated when necessary by distribution of a complete replacement.

Issue	Date	Comments
V1.0	January 2015	Original document

Responsibilities

Copies of this Guidance Note should be distributed by ATOC members to relevant persons within their respective organisations.

Explanatory note

This Guidance Note is for the information of ATOC members.

Supply

Copies of this Guidance Note may also be obtained from the ATOC members' web site.

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Part B

1. Purpose

This document provides guidance to Train Operating Companies (TOCs) on the introduction of European Railway Traffic Management System (ERTMS) fitted infrastructure through the national ERTMS project. It specifically deals with operational changes required for Level 2 (L2) operation and suggests the actions a TOC should consider when implementing change. These include: -

- Identification of the Scheme Plan 'go-live' fitment date;
- The impact of operational changes;
- Updating Competency Management Systems;
- Identification of training requirements;
- Exploring options to best manage competency retention.

2. Scope

This document is designed to assist TOCs in responding with a common approach to the implementation of ERTMS L2 whilst supporting the National Programme. Guidance is given on the workstreams they will encounter and the suggested outputs they will need to achieve.

3. Background

ERTMS is a train control-command system developed in Europe and adopted by the European Union. European Union directives identify ERTMS as the system to be used for interoperability.

ERTMS operation provides Automatic Train Protection functionality, and was independently recommended by the Uff and Cullen reports as the system beyond the Train Protection & Warning System (TPWS). It operates on a speed-based signalling principle and requires the train to accurately report its location, monitor speed and braking, and intervene where necessary.

On-board equipment required for ERTMS includes a European Vital Computer (EVC), an ERTMS data recorder, a Driver Machine Interface (DMI) and Global System for Mobile Communications – Railway (GSM-R) radio fitment.

4. L2 Principle

L2 is the operation of an ERTMS-fitted train over European Train Control System (ETCS) fitted infrastructure. In order to achieve this, onboard ERTMS equipment must be active and the route infrastructure supportive of the correct baseline (software) fitted train. This allows the train to operate in full ETCS supervision.

Full Supervision (FS) provides movement authority from the signalling centre to the driver via GSM-R (data) and the in-cab DMI screen, together with a speed profile over the length of that movement authority and a pre-determined braking model for the traction type.

Should a reduction of speed or 'end of authority' be supervised by the system it will apply a full service brake application until the speed is brought below the braking curve, whereupon it will return brake control back to the driver.

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There are other modes of operation provided within L2 ETCS that are designed for specific operational needs. These include options for onsite operation, shunting mode, or staff-responsible mode. (This list is not exhaustive).

5. Scheme Planning Stage

Prior to a route being converted to L2 it will pass through a similar negotiation and planning process to conventional signalling schemes. However the complexity of the system reference designs, aligned with the limited experience available for operational applications, suggests train operators will need to consider employing an 'ERTMS Scheme Specialist' to ensure they can maximise route flexibility and capacity, together with identifying the best go-live options.

6. Go-live Options

There are several potential options for the 'switch-over' or 'go-live' of a route from conventional signalling to L2 ETCS. These include the following:

- a. **Pseudo overlay.** This occurs where infrastructure is fitted and commissioned prior to go-live. ETCS will be fitted on the train, and the ERTMS related track infrastructure will be in a 'pre-commissioned' state ready for go-live testing whilst conventional signalling remains. This may be as early as 9 months before the go-live date and will provide opportunity for operators to run trains in a 'live' environment during night-time or weekend testing.
- b. **Overlay.** A section of the route is converted to ETCS whilst fixed signals remain in operation. It will enable trains not fitted with ETCS to operate over a L2 route. Therefore, operators can use these routes for driver training. The scheme plan will need to provide this.
- c. **Underlay.** A section of the route is converted to full ETCS operation and provided with temporary fixed signals to allow for driver training. This is ideal where a scheme plan requires complete remodelling.
- d. **Single Line Working.** A section of the route is converted to full ETCS operation whilst the adjacent line remains open to traffic under conventional Single Line Working (SLW) arrangements (Pilotman), allowing for driver training to take place until sufficient traincrew are able to operate the whole service in L2. This is ideal where two-track rural routes have relatively heavy passenger movement and cannot sustain line closure, whilst the Scheme Plan requires a straight switch off of conventional signalling. Although it will cause temporary timetable disruption, it will however enable both training and service trains to operate simultaneously.
- e. **Line Closure.** The route is closed for a period of time to allow for testing and driver training. This is ideal for rural routes with light passenger numbers, especially for single track lines where out-of-season commissioning is taking place.
- f. **Driver cross-cover.** This option allows for operating companies to use existing L2 skilled drivers across different routes whilst driver training takes place.
- g. **Route Migration.** The reverse of the cross-cover option; operating companies can temporarily migrate Drivers to a L2 route for training before their normal route goes live.
- h. **Test Track Driver Training.** Operators may consider formal access to test track infrastructure and provide a trainset to the test track for a period of intensive driver training prior to the go-live date.

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Operators will need to consider changes to their Competency Management System, and plan for its alteration to cover:

1. Initial L2 Operational Railway go-live;
2. The type of go-live and whether overlay will be present on any of their routes;
3. National Programme dates for their routes;
4. The method of training and assessment during L2 deployment;
5. The point in time where L2 operation becomes more extensive than current signaling.

8. The National Programme Driver Training Modular Delivery System

The National Programme will provide a modular delivery approach, which will allow operators flexibility to train the Drivers within their own business model. It is recommended that this material is used and promoted extensively within the depots and during Driver briefings as early as possible.

This programme will include:

1. A communication phase; where information and knowledge is made available through various media, including websites and eLearning packages, together with a part-task computer based trainers for L-NTC. This information will be accessible to the operator and Drivers via a secure log-in.
2. A formal training and assessment phase; where the operational rules of L2 are replicated on part task computer based trainers.

The operator will then need to consider the final stages of satisfying their Competency Management System for the Driver. This will include:

1. Practical handling required in L2 operation;
2. Assessment required in L2 operation;
3. Route knowledge required for successful go-live;
4. Traction knowledge required for successful go-live.

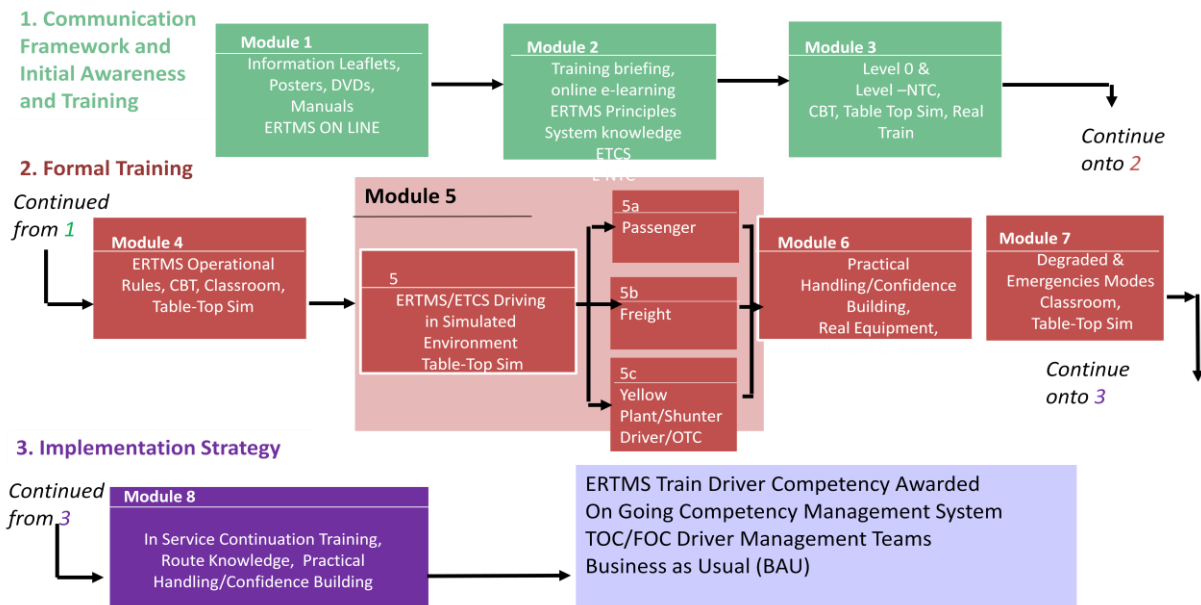
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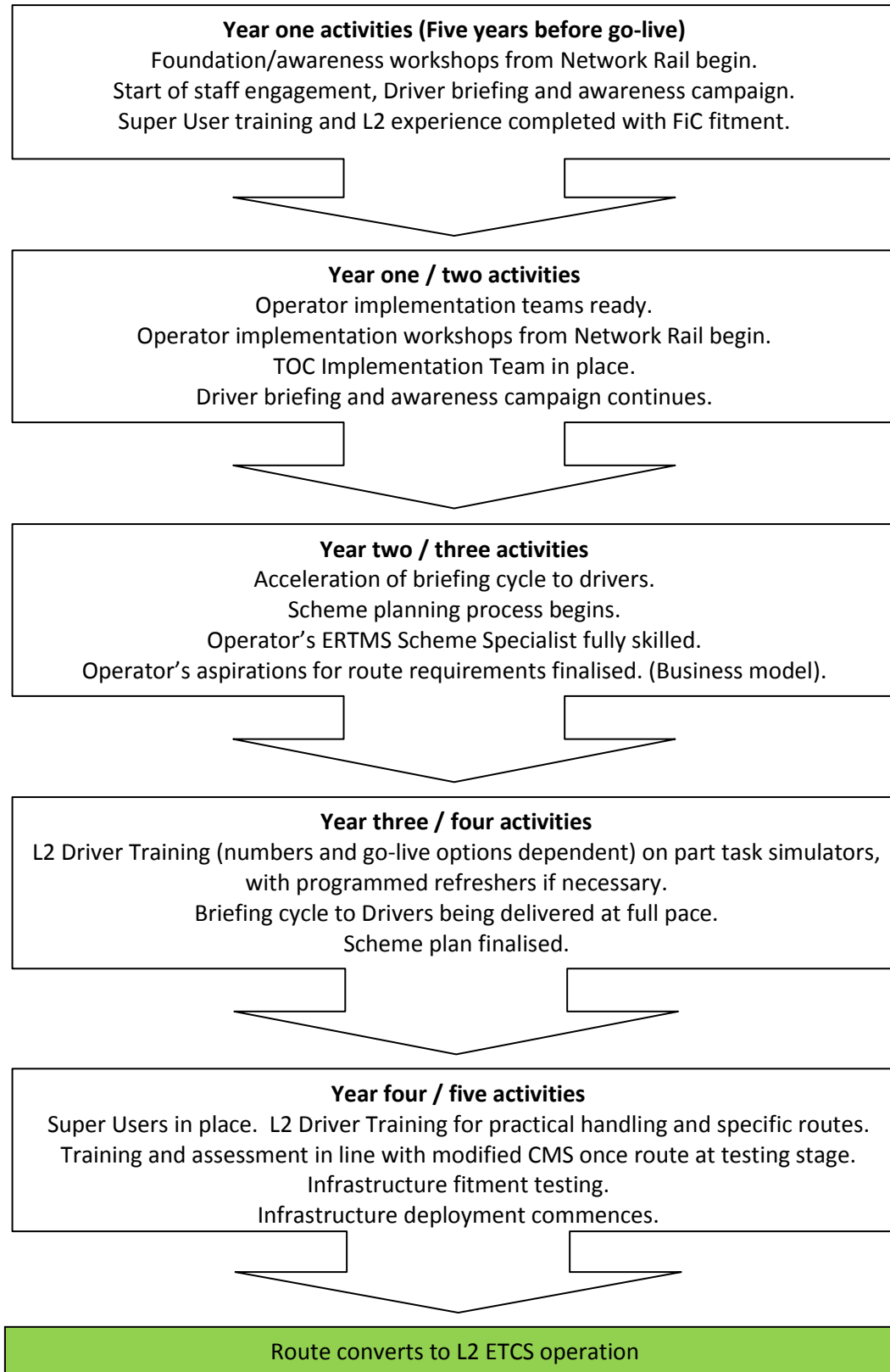
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ETCS/ERTMS Driver Training Modules



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Operators will need to consider the lead-in time needed before achieving a functioning L2 operation. The timeline below is merely an 'assumed' example and individual scheme plans may differ. This list is not exhaustive.



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Operators will need to consider how knowledge transfer into their business will occur and who will deliver the CMS assurance process. This is most likely to be through the Driver Manager or Driver Trainer/Instructor teams, and will require a small group of people to be able to extract the maximum amount of knowledge possible from the First in Class (FiC) process, the scheme planning stage and the infrastructure testing stage. These positions will need to be identified and given sufficient time prior to the operators' first FiC process (lead or affected) to become familiar with L2 operation.

11. Principle considerations

Each operator will need to consider the ERTMS programme, the critical dates, timeframes and likely impacts of the changes brought about by ERTMS to their operation. It is recommended each operator nominates a 'point of contact' for ERTMS, who can focus on the project and provide guidance to their operations and engineering teams.

Consideration should also be given to the operators existing structure in readiness for the ERTMS National Programme, with a review of route knowledge and link structures against L2 (and LNTC) planned infrastructure go-live dates together with driver numbers and likely exposure to ERTMS fitted infrastructure.

Additionally, where an operator has not undertaken FiC or has chosen cab reversion for FiC, consideration should be made in the time required to train managers, assessors and trainers prior to fleet fit and L2 commissioning.

12. Demand forecasting

Each operator will need to identify at the earliest opportunity the likely route programme and go-live profile for ERTMS to assist in accurate demand forecasting for Driver manager, Driver instructor, Driver training and Driver numbers. Operators will need to consider:

1. Current and potential churn rate of drivers;
2. Age profile;
3. Pension profile;
4. Existing technology (skills) being worked;
5. Additional infrastructure schemes;
6. Fleet cascades/Traction training requirements;
7. Service/timetable expansion;
8. FiC and Fleet fit patterns against L2 infrastructure.

This list is not exhaustive.