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ECML Dec 2025 Option Timetable: Timetable Performance Modelling Executive Summary

Timetable Performance & Simulation Team
Capacity Planning, System Operator

Monday, January 27th, 2025

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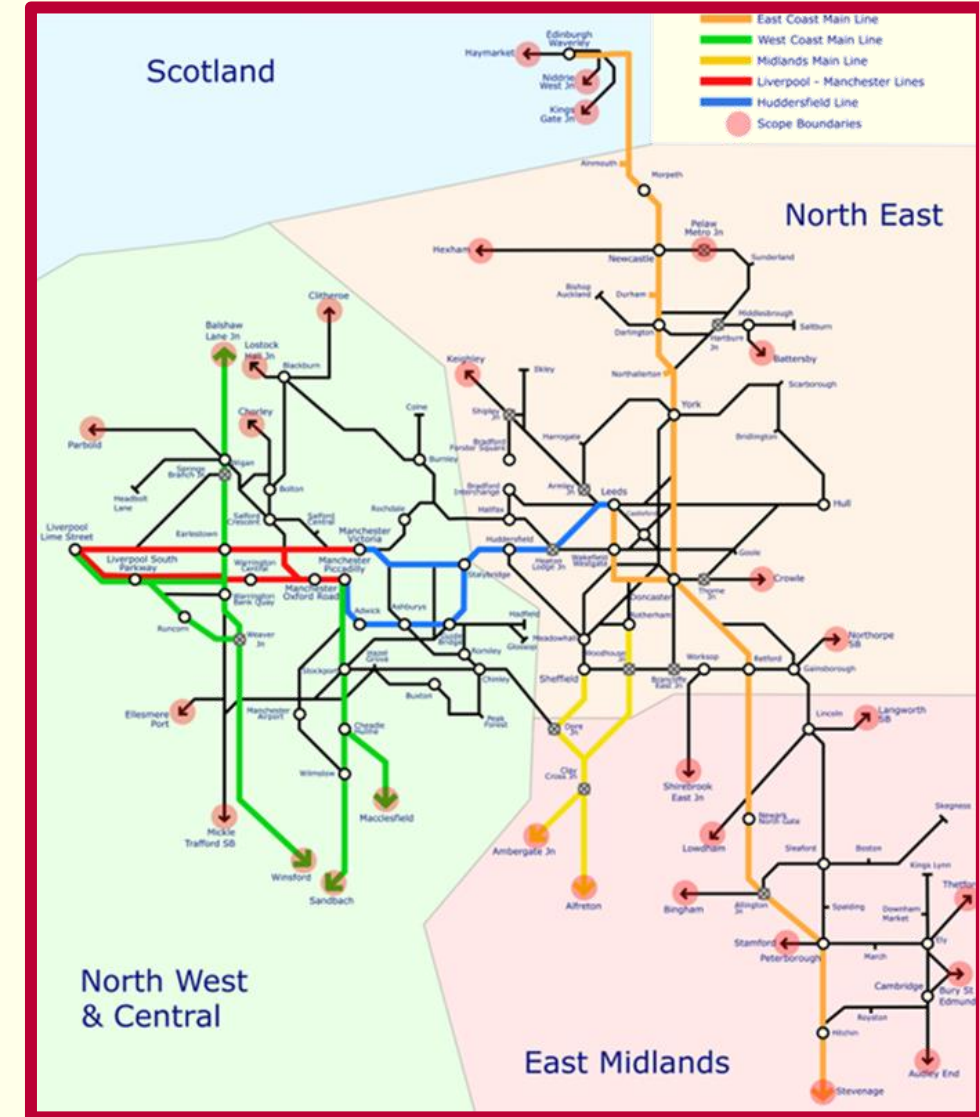
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History

- A large volume of analysis and modelling has been conducted across the ECML geography since 2020, which include:
 - 2020: Time Signal at Red analysis that stated to the ESG to restrict the Welwyn viaduct to 18 tph in the Down.
 - 2021: targeted modelling studies using Trenolab software.
 - 2022: ECML-wide simulation model using Trenissimo by Rail Aspects utilising a PRA produced sample timetable
 - 2023/24: ECML ESG Railsys Performance Modelling exercise conducted by Capacity Planning.
- Capacity Planning undertook the 2023/24 Performance Modelling work as scoped by the ESG. As with all modelling exercises it is crucial to understand there is a different level of maturity regarding timetable development between the December 2023 (Base) and the December 2024/2025 Option timetables as assessed. The Base was a D26 standard whilst the Options are at an earlier stage of development.
- The 2023/24 Modelling did not cover the Greater Manchester area or the additional extensions to Bradford Forster Square. There were also missing freight paths in the model because of decisions that were not yet made on how to resolve outstanding conflicts. It was assumed at the time that performance would worsen when these services were added to the Plan and Network Rail set out overlays to results presented at the October 10th 2024 Task Force in the meantime to ensure these risks were communicated clearly.
- To address concerns raised in the PMO deferral letter (April 2024) for a December 2024 introduction, the modelling scope for a December 2025 introduction was adapted and commenced on September 30th, 2024, to coincide with the completion of the timetable sprint work.

2024/25 Modelling

- The model parameters were kept the same as the original ESG remit to ensure some correlation can be made between the previous and current modelling runs (i.e. a Wednesday between 14:00 and 20:00), but due to concerns raised by in the PMO letter of April 2024, the model geography was adapted to ensure areas of concern were addressed.
- The main change was an extension of the geography westwards from the 2023/24 model entry points of Hebden Bridge and Marsden, to now include all of Manchester, Liverpool and parts of the West Coast Mainline.
- The revised geographical scope is shown.
- RailSys is modelling what performance will be like on a good day – effectively what the timetable can achieve when there is lateness in the system, calibrated against the Base, but the system does not require significant regulation to operate. **Emphasis should therefore be placed on delta change between the Base and the Option.**
- There is a point in every modelling study where a snapshot of the timetable needs to be taken, in order to start delivering simulation and onwards analysis. It is key to note that the development of the timetable continued after the final cut was provided and therefore what is ultimately offered will always be different to what has been modelled. Capacity Planning will be undertaking a sweep through our internally developed PIF Analyser which allows us to understand differences in timetable states.



High Level Results – Operator Modelled Punctuality delta changes

Executive Summary

In the previous round of modelling, Long-Distance High-Speed (LDHS) operators saw a worsening of performance on a good day. The ranges of impact set out at the October 2024 Task Force were 7-8% T-1 (Time-to-1%) for LDHS operators and 3-4.5% for T-3 (Time-to-3%) LDHS. These ranges on top of the base results were in recognition of at the time missing freight paths that were still to be resolved and concern around elements of the operation at Peterborough and Leeds including LNER extensions to Bradford that were not in the original ESG plan and models. The new results which include additional freight paths and these extensions confirm it was sensible to provide these overlays. The results are inside or close to the previously reported ranges with in general LDHS operators performing slightly worse than the range at T-1 and most within or slightly better at T-3. As expected TransPennine Trains projections improve following work to re-plan the TransPennine suggested by the PMO and requested by the Task Force.

Operator Summary

As has been the case since the new timetable was conceived and access rights awarded, implementation will see a notable deterioration in punctuality for customers, for example, **LDHS operators degrade by between 8.7 and 10.8 On Time percentage points (pp)**. Lumo is the exception dropping by -4.8pp. T-3 degradation for LDHS (-2.4 to -5.5 pp) is broadly within the forecasted overlay presented at October 2024's Task Force.

This model run includes LNERs preferred 81 min layovers at Leeds. The reinstating of TransPennine Trains paths as per Dec 24 (which are different paths to the previous modelling) sees them improve T-1 by +2.8pp overall and by +1pp at T-3.

A comparative model run was conducted with Leeds turnarounds being planned as 21 minutes. This 21 minute Option showed a slightly improved performance overall.

Operator	Time to 1%			Time to 3%			Time to 10%		
	Base	Option	Delta	Base	Option	Delta	Base	Option	Delta
Abellio Greater Anglia	79.8 %	80.3 %	0.5 %	94.5 %	93.3 %	-1.2 %	99.3 %	99.5 %	0.2 %
CrossCountry	58.4 %	58.8 %	0.4 %	81.8 %	81.2 %	-0.6 %	96.6 %	96.3 %	-0.3 %
East Midlands Railway	56.6 %	57.4 %	0.8 %	85.3 %	85.5 %	0.2 %	98.2 %	98.2 %	0.0 %
First Hull Trains	74.5 %	63.7 %	-10.8 %	93.9 %	90.4 %	-3.5 %	99.7 %	97.8 %	-1.9 %
Govia Thameslink Railway	60.6 %	56.6 %	-4.0 %	83.0 %	79.9 %	-3.1 %	96.7 %	96.6 %	-0.1 %
Grand Central	76.0 %	67.1 %	-8.9 %	94.5 %	92.1 %	-2.4 %	99.5 %	97.7 %	-1.8 %
London North Eastern Railway	77.1 %	68.4 %	-8.7 %	92.9 %	89.7 %	-3.2 %	98.5 %	97.6 %	-0.9 %
Lumo	84.5 %	79.7 %	-4.8 %	95.1 %	89.6 %	-5.5 %	98.5 %	99.9 %	1.4 %
Northern Trains Ltd	65.0 %	64.9 %	-0.1 %	90.9 %	90.2 %	-0.7 %	99.1 %	99.3 %	0.2 %
ScotRail	75.6 %	73.9 %	-1.7 %	92.6 %	92.6 %	0.0 %	99.5 %	99.3 %	-0.2 %
TransPennine Trains	53.3 %	56.1 %	2.8 %	81.0 %	82.0 %	1.0 %	97.3 %	97.2 %	-0.1 %

Figures refer to passenger operators running as Train Class 1, 2 and 9, based on punctuality at Origin, Termination and Arrivals, within the ESG agreed time scope of 1400-2000

Figures relate to only those trains that are active in the model within the model scope, and do not refer to whole Operator figures.

Project Abraham (EMR) was not in the East Coast ESG base and is not in these modelling results.

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High Level Results – Network Rail Route Modelled Punctuality delta changes



Executive Summary

In the previous round of modelling, Long-Distance High-Speed (LDHS) operators saw a worsening of performance on a good day. The ranges of impact set out at the October 2024 Task Force were 7-8% T-1 (Time-to-1%) for LDHS operators and 3-4.5% for T-3 (Time-to-3%) LDHS. These ranges on top of the base results were in recognition of at the time missing freight paths that were still to be resolved and concern around elements of the operation at Peterborough and Leeds including LNER extensions to Bradford that were not in the original ESG plan and models. The new results which include additional freight paths and these extensions confirm it was sensible to provide these overlays. The results are inside or close to the previously reported ranges with in general LDHS operators performing slightly worse than the range at T-1 and most within or slightly better at T-3. As expected TransPennine Trains projections improve following work to re-plan the TransPennine suggested by the PMO and requested by the Task Force.

Route	Time to 1%			Time to 3%			Time to 10%		
	Base	Option	Delta	Base	Option	Delta	Base	Option	Delta
Anglia	73.6 %	69.0 %	-4.6 %	91.1 %	87.0 %	-4.1 %	98.8 %	98.4 %	-0.4 %
East Coast	64.9 %	62.9 %	-2.0 %	87.5 %	85.8 %	-1.7 %	97.5 %	97.4 %	-0.1 %
East Midlands	59.8 %	56.9 %	-2.9 %	85.6 %	85.1 %	-0.5 %	98.9 %	98.4 %	-0.5 %
North & East	62.2 %	61.2 %	-1.0 %	90.5 %	88.9 %	-1.6 %	98.8 %	98.9 %	0.1 %
North West	63.8 %	65.5 %	1.7 %	88.1 %	88.9 %	0.8 %	98.6 %	98.8 %	0.2 %
Scotland	73.7 %	71.4 %	-2.3 %	91.5 %	91.0 %	-0.5 %	99.2 %	98.9 %	-0.3 %

Figures refer to passenger operators running as Train Class 1, 2 and 9, based on punctuality at Origin, Termination and Arrivals, within the ESG agreed time scope of 1400-2000
Figures relate to only those trains that are active in the model within the model scope, and do not refer to whole Operator figures.
Project Abraham (EMR) was not in the East Coast ESG base and is not in these modelling results.

East Coast Route Executive Summary

In the current round of modelling, **East Coast Route T-1 performance degrades by -2pp, and -1.7pp at T-3.** The main driver for this degradation within East Coast Route is **a drop in LNER performance within the confines of East Coast Route by -2.9 T-3 pp along with fellow Long-Distance High-Speed operators** (details in Appendix A).

There are generally positive stories in the south of the Route with EMR (-0.1 T-3pp) and GTR (-0.3 T-3 pp) broadly neutral.

Whilst TransPennine Trains show an overall positive picture at an Operator level (+1pp at T-3), this is driven by positive changes across the North West. These changes are the transfer to electric traction which improves acceleration and deceleration; coupled with changes in the stopping pattern across the Dewsbury Corridor compared to the Base which for longer distance services improves the reliability and lateness transferring into East Coast Route. Within East Coast Route, TransPennine Trains lose -2.8 T-3 pp compared to the Base (see Appendix A).



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Appendix A

High Level Results - Operator within NR Route: Time-to-3 Modelled Punctuality

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High Level Results - Operator within NR Route: Time-to-3 Modelled Punctuality

LNER in East Coast Route

- LDHS services are interacting with more services in the Option than the Base. As forecast and presented at the October 10th 2024 Task Force the inclusion of additional trains on top of the previous modelling, has caused further degradation.
- Kings Cross services extended to Bradford have had recovery removed from dwells at Stevenage, leading to a performance degradation into Peterborough in the Option. Recovery is also lost by reducing dwells from Grantham for these services, which was a source of recovery for Base services. As a result of these factors, Option performance degrades along the route. Robust dwells at Leeds in the Option allow for recovery on departure and performance is then stronger into Bradford.

Northern within East Coast Route

- Ashington <-> Newcastle services perform very poorly on the East Coast Route due to being planned on a minimum margin at Benton East Jn having to wait for the return service to cross the single lead at Benton North Jn into the passing loop. Any delay to the Ashington service will result in the Newcastle service being held here and losing its path on the ECML. These services are also be held for late running Up LDHS.
- Improvements in the Option can be linked to York <-> Leeds (via Harrogate), and York <-> Blackpool North services, where the Harrogate Line for York <-> Leeds services benefit from performance allowance at Knaresborough and an increased margin at Hammerton between the services running in the other direction.

	Anglia					East Coast					East Midlands				
	Base		Option		T-3% Delta	Base		Option		T-3% Delta	Base		Option		T-3% Delta
	T-3%	Trains in scope	T-3%	Trains in scope		T-3%	Trains in scope	T-3%	Trains in scope		T-3%	Trains in scope	T-3%	Trains in scope	
Abellio Greater Anglia	94.4 %	69	93.2 %	70	-1.2 %	98.8 %	6	99.3 %	6	0.5 %					
CrossCountry	90.7 %	15	86.6 %	15	-4.1 %	87.7 %	32	86.4 %	38	-1.3 %	76.5 %	13	77.4 %	13	0.9 %
East Midlands Railway	76.6 %	10	84.3 %	10	7.7 %	90.6 %	37	90.5 %	37	-0.1 %	84.6 %	66	84.0 %	68	-0.6 %
First Hull Trains						92.7 %	5	91.8 %	6	-0.9 %					
Govia Thameslink Railway	88.6 %	73	80.6 %	73	-8.0 %	79.8 %	90	79.5 %	96	-0.3 %					
Grand Central						94.9 %	10	90.6 %	10	-4.3 %					
London North Eastern Railway						92.1 %	75	89.2 %	92	-2.9 %	97.9 %	4	96.3 %	5	-1.6 %
Lumo						95.2 %	4	96.6 %	5	1.4 %					
Northern Trains Ltd						93.3 %	188	89.9 %	232	-3.4 %	96.4 %	24	96.1 %	24	-0.3 %
ScotRail															
TransPennine Trains						84.7 %	60	81.9 %	70	-2.8 %					

	North & East					North West					Scotland				
	Base		Option		T-3% Delta	Base		Option		T-3% Delta	Base		Option		T-3% Delta
	T-3%	Trains in scope	T-3%	Trains in scope		T-3%	Trains in scope	T-3%	Trains in scope		T-3%	Trains in scope	T-3%	Trains in scope	
Abellio Greater Anglia															
CrossCountry	82.1 %	18	78.1 %	22	-4.0 %	66.1 %	23	69.9 %	24	3.8 %	94.5 %	10	88.4 %	10	-6.1 %
East Midlands Railway	85.4 %	55	84.1 %	55	-1.3 %	85.6 %	15	89.2 %	14	3.6 %					
First Hull Trains	94.6 %	6	89.6 %	6	-5.0 %										
Govia Thameslink Railway															
Grand Central	94.3 %	10	92.9 %	9	-1.4 %										
London North Eastern Railway	95.2 %	27	91.6 %	25	-3.6 %						94.5 %	20	89.5 %	22	-5.0 %
Lumo											94.8 %	5	74.1 %	5	-20.7 %
Northern Trains Ltd	91.7 %	539	89.9 %	597	-1.8 %	89.9 %	463	90.5 %	464	0.6 %					
ScotRail											92.6 %	231	92.6 %	242	0.0 %
TransPennine Trains	79.6 %	86	80.7 %	98	1.1 %	81.7 %	81	84.5 %	96	2.8 %	76.6 %	13	74.3 %	12	-2.3 %

Figures refer to passenger operators running as Train Class 1, 2 and 9, based on punctuality at Origin, Termination and Arrivals, within the ESG agreed time scope of 1400-2000



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Appendix B

Next Steps – building in performance throughout timetable production

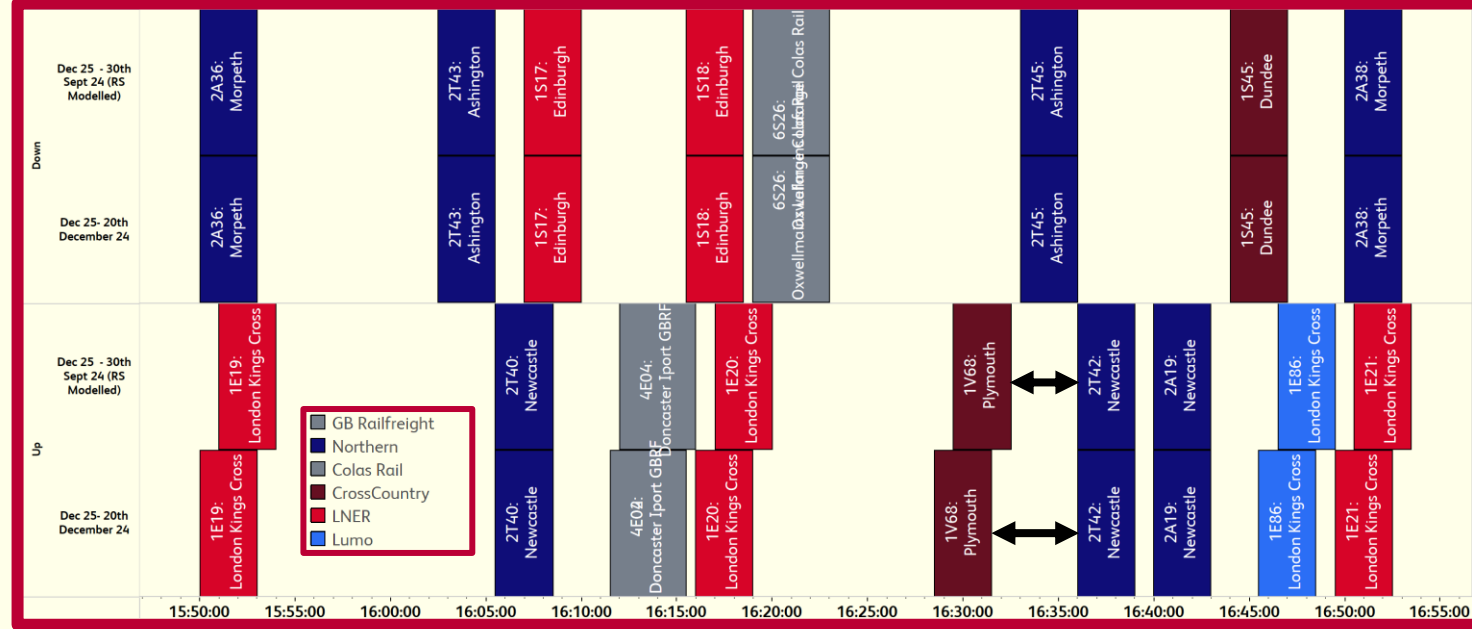
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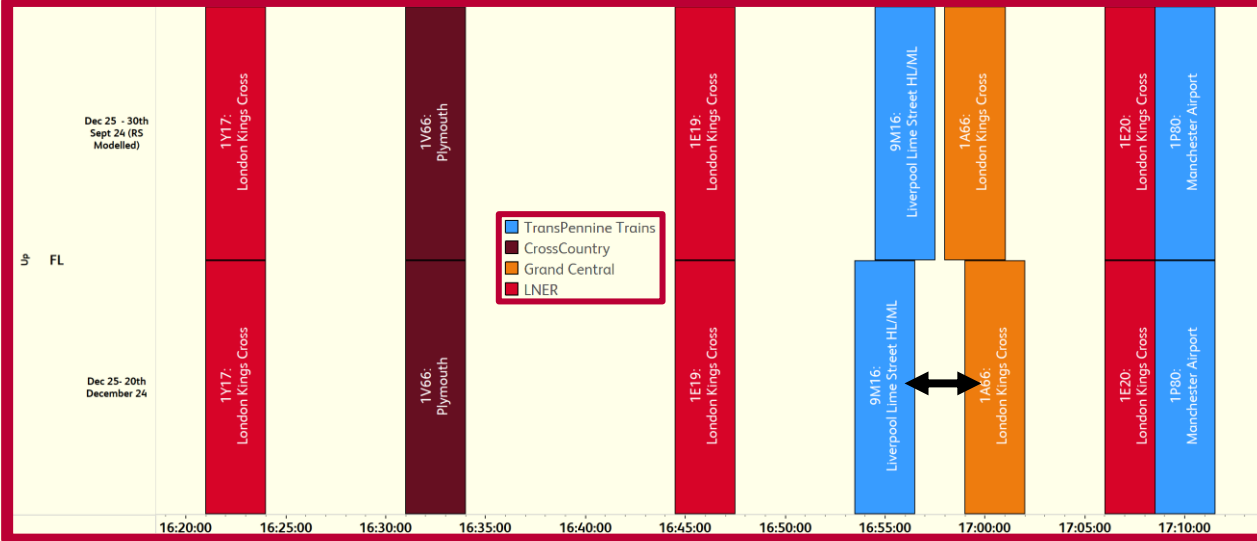
Next Steps – building in performance throughout timetable production

- Unless instructed by Task Force, no more modelling runs are planned, focus is now on utilising the insight from the latest round of modelling to improve the timetable and/or maintain performance improvements that have been structured. I.e.:
 - To incorporate the new 1Y20 (NCL > KGX) and 1M72 (NCL > BHM) – highlighted bottom right - the following 1V71 (EDI > Bristol) has had its dwell time at Newcastle extended from 4 to 7.5 minutes, which allows for T-3 recovery. This change is crucial in stabilising punctuality before entering the now more congested path south of Newcastle, ensuring this service arrives to York with T-3 improvements in comparison with the Base.
 - Changes made to the gap between the TransPennine Trains and Grand Central through Tollerton Junction (below) and the increased gap between the Up CrossCountry 1V's at Benton North Junction (right).
- Capacity Planning, the Region and Operators need to focus now on performance improvement ideas. Capacity Planning will be taking timetable cuts at strategic points to monitor developments i.e. PWTT, PDNS.

Benton North Junction (Modelled Option vs 'Current' state)



Tollerton Junction (Modelled Option vs 'Current' state)



Birtley Junction (Base vs Modelled Option vs 'Current' state – highlighting introduced services)

