Optimised train operations

RTS Innovating across Britain's railway

GOALS	WHY?	RECENT POSITION (2020)	STEPPING STONES IN THE NEXT FIVE YEARS	VISION FOR 2025	VISION FOR 2040
Flexible and reliable train planning	There is a need to reduce the lead time and improve quality of future timetables. Easier and more robust ways to add / change paths at short notice allows services to be adjusted to meet passenger and freights needs.	The timetabling process has a long lead time and the working timetable generated doesn't learn from actual running times. The 'short-term' and 'very short-term' planning processes are very manual and not robust.	Single common model of GB rail infrastructure used for all planning. Prioritised improvements of train planning data. Greater integration of crew and stock planning for long and short term planning. Solutions to allow the working timetable to learn from actual train performance. Development and validation of new simulation tools to reflect the complexity of the railway and allow the outcomes of different optimisations to be compared and understood. Solutions available to increase flexibility and robustness of very short-term planning.	Improved working timetable allocates allowances optimally, decreasing the risk of significant disruption if perturbations occur. Train paths are added easily and reliably at short notice. Increased (predictable) quality of service during disturbances and faster recovery.	Demand-based operations: planning and re-planning of trains to meet customer needs can be achieved and communicated in near real-time. Timetable development is informed by real-world operational performance.
Improved real-time operations and decisions	Real-time train performance can be significantly improved by reducing the variability of train operations, and by improving traffic regulation and management during normal working and disruption.	Manual train handling leads to acceleration, braking and coasting lacking consistency. Initial deployments of Traffic Management (TM) and Connected Driver Advisory Systems (C-DAS) are used in a few locations. Shared understanding of where to deploy optimisation solutions and how to get best value out of them is limited. Richer data to better understand disruptions is starting to be explored. Incidences of Signals Passed at Danger remain a problem.	Open-source software infrastructure description Crew and rolling stock resources linked to traffic management (TM). TM integration with signalling systems. Wider roll-out of TM to support, and where appropriate, automate decisions in perturbation. Widespread roll-out of C-DAS in conjunction with TM to improve passenger and freight performance. Elements of ATO-ETCS piloted to remove variability in driving profiles. Agreed strategic deployment plan for driving task support systems to maximise value for money. New data driven tools to prevent and help mitigate disruptions. Define the capability gaps remaining to improved real-time operations and decisions during disruption. Trial and initial fitment of ETCS Limited Supervision on non-ETCS infrastructure.	Strong business case in place for widespread roll-out of TM based on positive results from early implementations. Reduction of variability in acceleration, braking and coasting on key route. Data insight used to inform real-time decisions and to prevent disruption. SPAD risk is virtually eliminated, with positive impact on service reliability.	Real-time optimisation of trains across the network together with effective prevention and recovery from disruptions.
Improved degraded operations	Current degraded working takes time to set up and significantly reduces throughput of trains.	Degraded Mode Working System (DMWS) has been developed in the lab but not yet piloted.	Mainline trials of DMWS. Agreed deployment plan for DMWS which exploits quick wins enabled by some of its elements. Exploration of alternative approaches including hybrid solutions that interface with the signalling system.	Reduced disruption during signalling failures.	All lines have or are migrating to a digital signalling solution.
Signalling and train capabilities support higher route capacity	There is the need to fit more trains on those parts of the network that are full either because of headway lengths or because of bottlenecks at nodes.	Thameslink is successfully ramping up its capacity but traditional signalling and management of nodes continue to limit capacity on most of the network. The migration strategy to digital signalling is unclear. Conventional signalling is based on the worst performing train, which means that the improved performance of modern rolling stock in terms of braking and acceleration are not utilised. Reliable braking in low adhesion remains a challenge.	Agreed migration strategy and roll-out plan for radio based ETCS with no lineside signalling. Lessons identified and implemented from Thameslink mainline ATO deployment over ETCS Level 2. Optimised ETCS braking curves for freight. Validated freight train integrity devices. Enhanced train position systems. Block lengths shortened and optimised by automated design for new schemes. Faster operating, inherently safe, point mechanisms piloted. Rationalisation of train classes and applicable speeds to create homogeneous operations.. Fundamental review of operational principles for mixed-traffic. Double variable rate sanders specified for new trains; prioritised retrofitting for existing trains. Magnetic track brakes for all new, frequent stop trains. Train doors and interior layouts optimised during overhaul and for new build to minimise dwell time.	Schemes deploying radio based ETCS with no lineside signals are in delivery. The overlaying of ATO can be planned and delivered in a more informed way. Capacity in the process of being increased at key bottlenecks thanks to better design and solutions. Use of existing capacity is maximised Predictable and reliable braking unaffected by railhead conditions.	Trains can run closer together safety.