



# Implementation of Tilt Activation Speed Supervision on West Coast Mainline

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Agenda

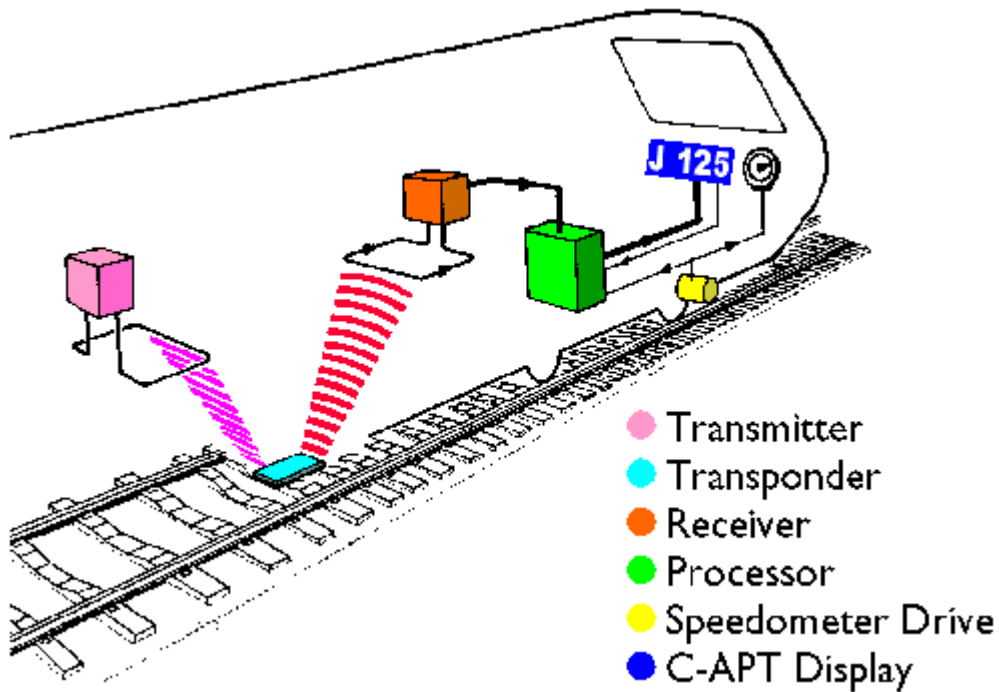
# We've come a long way...



**SCREW AVERAGE**  
*Create amazing.*

**Virgin**  
**trains**

# ...but speed supervision isn't new



# TASS on WCML

- Ten years from conception to full realisation of benefits
- Ten or more organisations & hundreds of people involved – from Railtrack teams to Independent Safety Assessors
- Helped move WCML from a 110mph railway to an ‘enhanced permissible speed’ railway up to 125mph
- TASS was only a ‘stopgap’ arrangement between traditional signalling and speed supervision to ‘moving block’ signalling
- It was expected to only be in place for 5 years (to implementation of ‘PUG2’ – the 140mph railway from 2005)
- You can run without TASS in a HQ degraded mode
- Tilt / TASS ultimately enabled the VHF timetable from December 2008 (‘Red Revolution’ timetable in September 2004 exploited tilt but wasn’t wholly dependent on it)

# Today

- How does TASS work?
- Fleet & Engineering change
- Operational change
- Lessons Learned
- Key messages for Digital Railway

# What is TASS and How Does It Work?

- Static balise-based system
- Fixed Data
- Authorises Tilt
- Supervises speed
- The train reads a “barcode” through two antennae
- TASS does not sense or transmit signal aspects

# Fleet & Engineering change

- Introduction of Super Voyagers (from 2001) and Pendolino (from 2002) fleets
- Trains were initially limited to 'permissible speed' with tilt/TASS isolated
- Initial testing at 'Test Site A' (Carnforth – Carlisle) with tilt/TASS operational at 125mph, from late 2002
- Initial train maintenance undertaken by Alstom at Longsight (techs on train did maintenance at depot)
- 'High Speed' (125mph+) test sites (Rugby – Nuneaton) followed successful testing on Test Site A
- First 140mph run on the Trent Valley – May 2003
- Public operation of TASS enabled trains on West Coast in late 2003 – but not dependent on it

# Fleet & Engineering lessons learned

- Test sites on the route were essential
- Techs on trains worked well
- Maintenance and reliability of new and old fleets together was difficult
- Only knew if something wrong if the train intervened – no incremental warnings
- TASS does not handle divergent routes (e.g. Colwich)
- Balise reliability poor to start with (not helped by limited NR local knowledge)
- Expertise (in NR) on TASS implementation has ebbed away 'in steady state' over time
- TASS odometry and balise installation problems continue

# Operational change

- Driver training was delivered in two stages, but not initially planned this way
- Trained drivers on Class 390 'conversion' from loco-hauled / HST without tilt/TASS in 2002/3
- Follow-on training was just tilt/TASS in 2003/4
- Beneficial for drivers, who had time to 'learn' the train before tilt/TASS was included in the training plan
- Briefing / Training for operational support staff at depot and in Control – development of the 'Fiche PC' fault guide

# Operational lessons learned

- Leap in technology proved difficult for some drivers to adjust
- Moving from reliance on a driver's route knowledge to a system that was basically telling them how to drive the train
- Helped to detach fleet training with tilt / TASS training
- TASS 'overlays' on the route, no impact on train service if it didn't work
- Initially there was a negative reaction to the TASS element of tilt until adjustments were made (e.g. 16-car vs. 5-car issue with Class 221, Wolverhampton)
- Don't overlook support team competence – Control instructions, Operating Standards
- A number of enhancements and adjustments found and resolved post-implementation

# Key messages for Digital Railway

- Run test sites in parallel (ETCS 'overlay') for both testing and training
- Provision of support during testing and training (during service expansion - more so when traditional signalling is switched off)
- Don't underestimate culture change (leap in technology impact on manpower planning & performance)
- Splitting out traction and TASS / Tilt training worked for us
- Very close working between teams was essential – joint project approach
- Key sessions (i.e. TASS Working Group) sat separate from the 'normal' contractual environment – hands on people focusing on problem solving, not who will pay for it
- Don't expect it to work perfectly first time – support and capability required post-implementation
- Don't let implementation experience ebb away in steady state – keep people competent
- Focus required on contingency plans – what if it doesn't work first time, or equipment fails, or trains aren't fitted? What is the fallback?