

# Completing the Elizabeth line

5 April 2023



# Testing and Commissioning

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# Test Strategy

- Identifying the optimal point to commence testing
- Minimise on-site testing
- Validated off-site test rigs including interfacing systems
- Some elements can only be comprehensively tested on-site
- Allow sufficient time & specialist resources at the final integration testing stages



# Test Planning & Execution

- Multi-discipline TT&C project team
- Multi-location test team (office, Control Centre, sites and onboard test trains)
- Close working relationship with Operators & Maintainers
- Governance and Assurance
- 24/7 Management of Data & Reporting
- Crossrail Observation Logs (COL) & Triage



# The Evolution of Testing

Dynamic Testing actually commenced prior to the end of construction

Integration testing (Routeway & Stations) specified and executed

System Testing with a Train (STT) introduced to enable testing in the ROGS environment

Apportioning time & space to all the parties needing to complete works was a significant programme challenge.

Construction

Dynamic Testing

ROGS Trial Running

Trial Operations

ELIZABETH LINE

Reliability Running introduced under test script in Dynamic Testing

System Integration Dynamic Testing (SIDT) introduced prior to Trial Running

Degraded Mode scenario testing undertaken through the Trial phases

Timetable Demonstrations undertaken through the Trial phases and into Passenger Service

## System Integration Testing

- Traditionally Contractor-led, focused on technical performance
- System Integration tests must envelop all the sub-systems
- Needs to be scenario-based, with all sub systems interacting & performing together
- Spans Infrastructure, Systems, People and Process
- Client often best positioned and incentivised to specify and/or undertake this testing
- Key evidence to inform the Crossrail Engineering Safety Assurance Case (CESAC)
- Crossrail client-led testing stressed the system in new ways considering: Safety, Operability, Reliability, Maintainability.

