

Crossrail Delay

London's GBP 18.9 Billion Train Line: Three Years Late, Now the UK's Busiest Railway

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Key Facts

Cost: GBP 19B

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Executive Summary

Crossrail's tunnels were built on time. Systems integration, testing, commissioning and programme-management challenges were major contributors to the delay. This investigation reveals why modern megaprojects fail not in construction but in the invisible connections between systems, vendors, and teams.

Executive Lessons

- Software Integration Is the Real Risk

Crossrail's tunnels were built on time and on budget. The delay came from integrating the signalling, communication, and control systems. In modern megaprojects, the physical construction is often the easy part. System integration is where the risk lives.

- Test Early, Test Often, Test Realistically

Crossrail delayed comprehensive system testing until late in the programme. When testing finally began, the number of defects was overwhelming. Integration testing should start as soon as the first two systems can talk to each other.

- Interfaces Must Be Owned and Managed

No single entity owned the interfaces between the physical infrastructure, the trains, the signalling system, and the station systems. When everyone owns the interface, nobody does. Interface management is a full-time discipline, not a meeting agenda item.

Timeline

- 2005-02: The Crossrail Bill is submitted to Parliament to authorise the east-west railway under London.
- 2008-07: The Crossrail Act receives Royal Assent, providing the legal powers to build the railway.
- 2009-05-15: Formal start of Crossrail construction is marked at Canary Wharf; full opening of the central section is later fixed for December 2018.
- 2010-10: The spending review reduces the funding package to GBP 14.8 billion and extends the full-opening timetable as part of cost-saving resequencing.
- 2015: Tunnelling is completed (May 2015); installation and integration of track, power, signalling and station systems begins - the phase where integration problems later emerged.
- 2018-07: An additional GBP 590 million of funding is announced (GBP 300 million for Crossrail Ltd, GBP 290 million for Network Rail) as cost pressures grow.
- 2018-08-31: Crossrail Ltd publicly announces the December 2018 opening of the central section will be missed, citing more time needed to complete infrastructure and testing; autumn 2019 is proposed.
- 2018-12-10: Government, GLA and TfL agree a financing package of over GBP 2 billion; Crossrail's new CEO confirms even an autumn 2019 opening can no longer be committed to.
- 2019-02: NAO publishes a memorandum on the Crossrail programme to support parliamentary scrutiny of the cost and schedule increases.
- 2019-04: Crossrail Ltd announces a revised opening window of October 2020 to March 2021 for the central section (without Bond Street).
- 2019-05-03: NAO publishes 'Completing Crossrail' (HC 2106), finding an unrealistic 'can do' culture, compressed schedules and failures in systems testing and integration drove the cost increases and delay; funding now GBP 17.6 billion.

- 2020-08: Crossrail Ltd announces further delay and up to GBP 1.1 billion more funding; the central section is now expected in the first half of 2022.
- 2021-07-09: NAO publishes 'Crossrail - a progress update' (HC 299), recording the funding package at GBP 18.8 billion and reporting the programme in a more stable position.
- 2022-05-24: The Elizabeth line opens to passengers between Paddington and Abbey Wood, around three and a half years later than the original December 2018 target.

Sources

- Completing Crossrail (HC 2106, 2017-19) (UK National Audit Office, 2019-05-03)
- A memorandum on the Crossrail programme (UK National Audit Office, 2019-02)
- Crossrail - a progress update (HC 299, 2021-22) (UK National Audit Office, 2021-07-09)
- Crossrail: A progress update - Government response to the Committee of Public Accounts (CP 603, Treasury Minutes) (House of Commons Committee of Public Accounts / HM Treasury, 2022-01)
- New financing agreement confirmed for Crossrail project (Transport for London (official press release), 2018-12-10)
- TfL releases Crossrail documents following confirmation of funding (Mayor of London / London City Hall (official press release), 2018-12-10)
- All aboard the transformational Elizabeth line (Transport for London (official press release), 2022-05-24)