CROSSRAIL INFORMATION PAPER

A6 – SELECTION OF WESTERN TERMINI

This paper explains how and why the decision was taken to operate Crossrail services from Maidenhead and Heathrow.

It will be of particular relevance to those interested in the route development process.

This is not intended to replace or alter the text of the paper itself and it is important that you read the paper in order to have a full understanding of the subject. If you have any queries about this paper, please contact either your regular Petition Negotiator at CLRL or the Crossrail helpdesk, who will be able to direct your query to the relevant person at CLRL. The helpdesk can be reached at:

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Information Paper

A6 – SELECTION OF WESTERN TERMINI

1. Introduction

1.1 During the development of Crossrail, a range of options were considered for serving the Great Western Main Line (GWML) corridor. This paper outlines these options and explains how the decision to operate services from Maidenhead and Heathrow was reached.

2. Why does Crossrail serve the Great Western Corridor?

2.1 The case for Crossrail to serve the GWML corridor is based around meeting a range of strategic objectives:

- Tackling existing overcrowding: Existing National Rail services into Paddington, particularly on suburban services stopping within west London, are forecast to become significantly overcrowded by 2016. Overcrowding is also forecast to increase on sections of the parallel Central and Piccadilly lines in west London.
- Providing capacity for growth in London: The Mayor's London Plan forecasts significant employment and population growth in West London up to 2016. Crossrail is identified as part of the planned transport investment to accommodate this level of growth and to support development opportunities around Heathrow and at West Drayton, Hayes and Southall.
- Providing capacity for growth outside London: To ensure continuing economic success, the transport strategy for the "Western Policy Area", which includes the section of the GWML corridor outside London, aims to improve strategic rail links within and to this policy area. Crossrail is identified in the strategy as a priority scheme for achieving this continued economic growth by providing additional capacity on the GWML and by improving connections between London and the important regional centre of Slough.
- Improving international connections: Transport policies for the South East of England and London aim to improve and develop international transport connections. Crossrail is identified as making a major contribution to this objective by providing a new direct, high capacity rail link to Heathrow Airport from central and east London.

3. Constraints in planning Crossrail

3.1 The GWML is a four track railway which carries a range of rail services. The planning of the Crossrail service has had to take into account the diverse needs of all these different rail services.

3.2 Two of the four tracks, known as the "Fast Lines" carry high speed long distance services between Paddington and the West of England and Wales, as well as commuter services from locations to the west of Reading including Oxford and Newbury. Serving a wholly different purpose, high speed, short distance Heathrow Express services are integrated with these other services between Hayes & Harlington and Paddington.

3.3 The other set of tracks, known as the "Relief Lines", are used to carry shorter distance commuter services from Reading and other locations to the east, including Slough, to Paddington and a local stopping service between Heathrow and Paddington known as “Heathrow Connect”. Outside the morning and evening peak periods, the Relief Lines also carry freight traffic, a substantial proportion of which comprises aggregates and building materials that supply the London construction industry.

4. Summary of options considered

4.1 In 2001, Cross London Rail Links Ltd (CLRL) commenced identification and appraisal of route and service pattern options for Crossrail. Initially three different options for the Great Western termini were assessed:

- Ealing Broadway
- Slough and Heathrow
- Reading and Heathrow

4.2 For both the Slough and Reading options, a Crossrail service was proposed for Heathrow that would replace the existing Relief Line stopping service, whilst leaving the Fast Line Heathrow Express service unchanged.

4.3 Assessment of these three options raised serious issues surrounding cost, passenger benefits, environmental impacts of construction and impacts on other operators’ services in the corridor. As a result, none of these options were progressed further, but, in order to secure the benefits from Crossrail serving the corridor, further options were developed.

4.4 In 2003, an option for serving only Heathrow was developed by CLRL, under the direction of the Strategic Rail Authority (SRA). However this option would serve only a small number of stations in the corridor and limit Crossrail’s contribution to meeting the objectives identified above in Section 2. In addition, this option would, for operational reasons, require the withdrawal of the Heathrow Express service, which was strongly opposed by airport stakeholders.

4.5 Therefore in 2004 a further option to serve Maidenhead and Heathrow was developed by CLRL and the SRA. Following development and assessment, this option was selected for inclusion in the Crossrail scheme.

4.6 The following section summarises the results of the option appraisal process carried out for all these Great Western options and explains the reasons for the decision to serve Maidenhead and Heathrow.

5. Assessment of options

Ealing Broadway

Option description

Crossrail morning peak service pattern	12 trains per hour (tph): • 12 tph from Ealing Broadway
Number of GWML corridor stations served	2

Assessment of option

5.1 Since no National Rail services terminate at Ealing Broadway, the 12 trains per hour (tph) Crossrail service would comprise additional trains, added to the existing service that operates through the station.

5.2 Therefore, in order to accommodate these extra Crossrail trains on the GWML between Ealing Broadway and the tunnel portal at Royal Oak near Paddington, the railway's existing four track alignment would require widening to six tracks These works would be very costly and have significant adverse environmental impacts along the 8 kilometres (km) of affected alignment.

5.3 In addition, in order to handle these additional trains at Ealing Broadway, the existing station would require substantial reconstruction, including the remodelling of both the LUL and National Rail track layouts. This would be highly disruptive to existing rail services for a considerable period of time.

5.4 Analysis of the level of passenger demand and associated transport benefits of this option demonstrated that it would perform poorly relative to the objectives for serving the corridor and given the substantial costs of the option. Only two stations on the corridor would gain a direct Crossrail service, requiring passengers to interchange at Ealing Broadway from other services to access Crossrail. This would limit the attractiveness of Crossrail to passengers and reduce the benefit to overcrowding on the Piccadilly and Central lines that might otherwise arise. In addition, Crossrail would not serve Heathrow Airport or the designated development areas around West Drayton, Hayes and Southall.

Slough and Heathrow

Option description

Crossrail morning peak service pattern	12 trains per hour (tph): • 4 tph from Slough • 4 tph from Hayes • 4 tph from Heathrow
Number of GWML corridor stations served (including Heathrow)	12

Assessment of option

5.5 Analysis of this option highlighted a number of issues that were similar to the Ealing Broadway option. In particular, because no services currently terminate at Slough, the Crossrail service would require additional services to be operated in the corridor. These additional Crossrail services would result in a higher overall train frequency in the corridor than the current four track alignment could accommodate.

5.6 In order to overcome this problem, this option would require the construction of two additional tracks between Airport Junction (close to Hayes and Harlington) and the Crossrail tunnel portal at Royal Oak – a distance of approximately 14 kilometres.

5.7 Although this option would allow Crossrail to achieve its stated objectives in the corridor, this would only be at a very high cost and adverse environmental impacts arising from the six tracking of the alignment.

Reading and Heathrow

Option description

Crossrail morning peak service pattern	12 trains per hour (tph): • 4 tph from Reading • 4 tph from Slough • 4 tph from Heathrow
Number of GWML corridor stations served (including Heathrow)	17

Assessment of option

5.8 Under this option, it would be possible to provide a Crossrail service to all stations on the GWML between Reading and Paddington, without needing to provide additional tracks on any section of the corridor. This would be possible since the proposed Crossrail service would substitute existing services in the corridor, some of which start at Reading, rather than require additional services to be operated. This means that, unlike the Ealing and Slough options, this option would avoid the major costs and adverse environmental impacts associated with providing additional tracks in the corridor.

5.9 Although this option would allow Crossrail to meet its objectives in the corridor, analysis showed that the first station where Crossrail would be likely to pick up considerable passenger traffic would be at Maidenhead, which is nearly 20km east of Reading.

5.10 This is because, even with Crossrail, Reading would be served by a number of alternative fast and semi-fast services which originate from locations such as Oxford, Newbury, Bristol and Cardiff. The fastest of these services reach Paddington in around 26 minutes, while Crossrail, because of the intermediate

stations stops made, would offer a journey time to Paddington of around 47 minutes. This means that the overwhelming majority of Reading passengers would choose fast services to reach Paddington and then, if necessary, interchange to Crossrail there.

5.11 The other intermediate station between Reading and Maidenhead is Twyford. This station is lightly used and would not be likely to generate large passenger flows for Crossrail.

5.12 In order to serve Reading with Crossrail, considerable investment would be required, including additional rolling stock, line electrification and associated bridge-raising. Additional costs would also be incurred in accommodating the longer Crossrail trains at Reading station. This is not a straightforward task, as it may need to be carried out as part of longer term plans to reconfigure the entire station comprehensively so as to improve capacity for all rail operators. Parts of this reconfiguration would require the costly relocation of the existing Reading signal box which controls all the tracks in the Reading area. .

Heathrow only

Option description

Crossrail morning peak service pattern	6 trains per hour (tph): • 6 tph from Heathrow
Number of GWML corridor stations served	4

Assessment of option

5.13 Under this option, the existing 4 tph Heathrow Express service to Paddington would be replaced by a higher frequency Crossrail service of 6 tph, with additional station stops added at Hayes & Harlington and Ealing Broadway. This is different from the earlier Slough and Reading options that assumed the retention of the Heathrow Express service in its present form.

5.14 This option would have the advantage of serving Heathrow Airport and, by limiting both the train frequency and the number of stations served, it could be accommodated on the existing tracks, thereby avoiding the high cost and adverse environmental impacts of constructing any new tracks in the corridor.

5.15 However, airport stakeholders were strongly opposed to the incorporation of Heathrow Express into Crossrail, with additional station stops added, as this would damage the premium quality and therefore the appeal of the service.

5.16 The relatively low service frequency and more limited number of stations served would provide little additional rail capacity in the corridor, particularly to the development areas in the West Drayton, Hayes and Southall area. This option would also do little to improve links between London and locations such as Slough in the Western Policy Area.

Maidenhead and Heathrow

Option description

Crossrail service pattern	10 trains per hour (tph): • 4 tph from Maidenhead • 2 tph from West Drayton • 4 tph from Heathrow
Number of GWML corridor stations served (including Heathrow)	15

Assessment of option

5.17 Development of this option was based upon the results of the earlier Reading option which demonstrated that, given the existence of alternative faster services from Reading, Maidenhead would be first station on the GWML where Crossrail would attract a significant number of passengers.

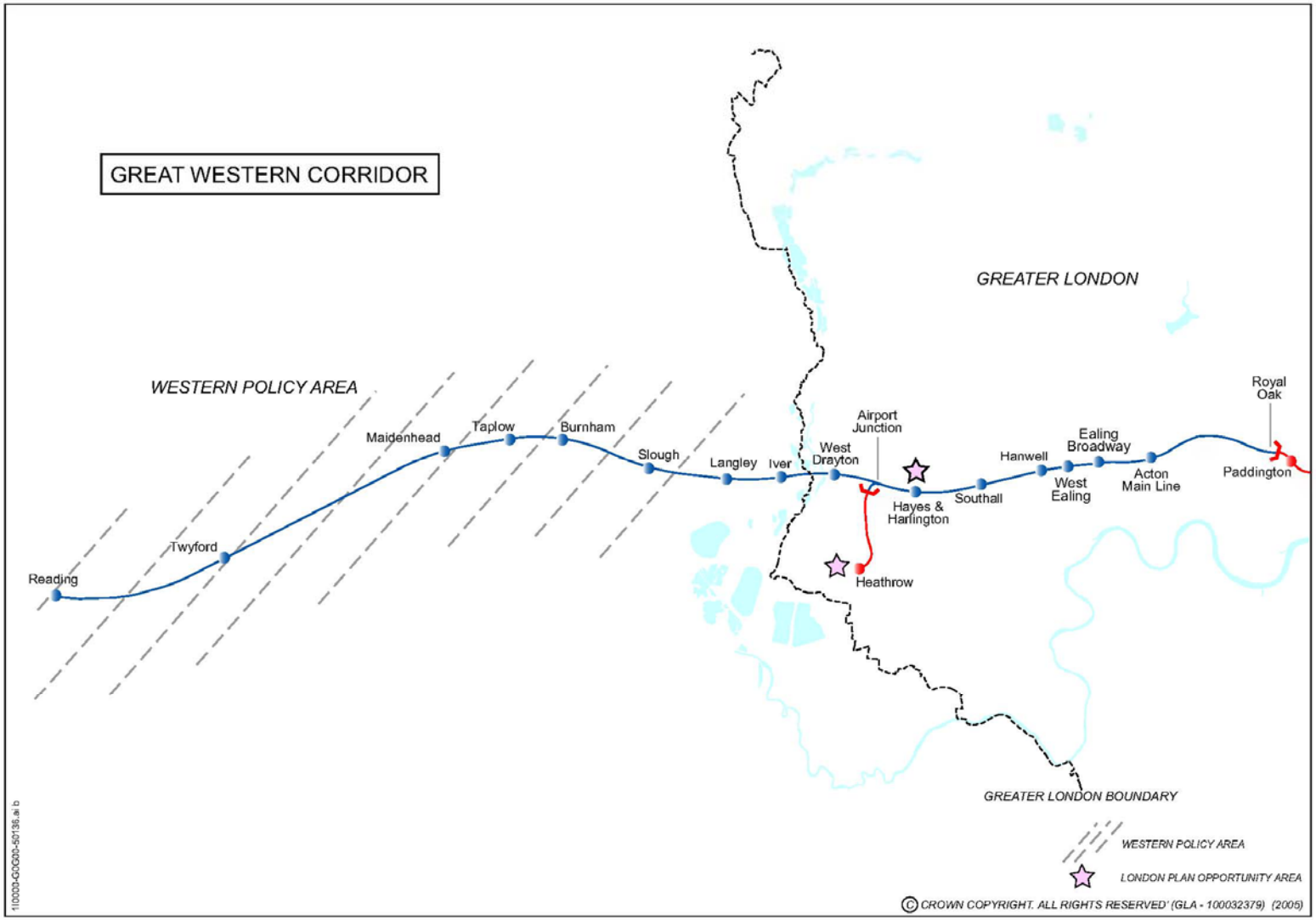
5.18 Although no trains currently terminate at Maidenhead, analysis showed that a reliable Crossrail service could be operated which would meet the needs of other rail operators, without requiring any additional tracks in the corridor. The service pattern developed would permit all stations between Maidenhead and Paddington to be served by Crossrail, thereby spreading the benefits of the project over a wide area, including Heathrow and the development sites at West Drayton, Hayes & Harlington and Southall. This option would also result in a significant increase in capacity between London and parts of the Western Policy Area.

5.19 With this option, Maidenhead would continue to be served by a non-Crossrail service into Paddington station. This service would originate from Reading and run at a peak frequency of 2 tph calling at Twyford, Maidenhead, Slough, Hayes and Ealing Broadway and offering a journey time from Maidenhead to Paddington of around 32 minutes. This compares to a Crossrail journey time between these two stations of around 40 minutes.

5.20 Terminating at Maidenhead would not prevent any future extension of the Crossrail service to Reading. The works required to terminate Crossrail trains at Maidenhead would not be wasted by a subsequent extension, as it is likely that a proportion of the service would continue to terminate at Maidenhead

6. Conclusion

6.1 Following appraisal of the options described above, Maidenhead and Heathrow were selected as the western termini for Crossrail. This option would provide a robust and beneficial service pattern for Crossrail as well as meeting the needs of other rail services in the corridor, including main line passengers services and freight. The proposed Crossrail service pattern would permit all stations between Maidenhead and Paddington to be served by Crossrail, thereby spreading its benefits over wide area, as well as allowing the retention of the Heathrow Express service to Paddington.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GREATER LONDON
WESTERN POLICY AREA
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Twyford
Maidenhead
Taplow
Burnham
Slough
Langley
Iver
West Drayton
Airport Junction
Heathrow
Hayes & Harlington
Southall
Hanwell
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