

CRL/3/2

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**CROXLEY RAIL LINK
ORDER**

Keith Foley

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Proof of Evidence

OPERATIONAL MATTERS

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CONTENTS

1	INTRODUCTION	Page 3
2	SCOPE OF EVIDENCE	Page 4
3	ROLE OF LONDON UNDERGROUND LIMITED	Page 4
4	POSITION OF LONDON UNDERGROUND LIMITED IN RELATION TO THE CROXLEY RAIL LINK	Page 5
5	PROPOSED LEVELS OF TRAIN SERVICE WITH AND WITHOUT THE CROXLEY RAIL LINK	Page 6
6	OPERATIONAL IMPLICATIONS OF ALTERNATIVE OPTIONS	Page 12
7	CONCLUSION	Page 14
8	WITNESS DECLARATION	Page 14

1 INTRODUCTION

1.1 Personal details

1.1.1 My name is Keith Foley. I am the Head of Transport Planning for London Underground Limited (LUL) and a Chartered Member of the Institute of Logistics and Transport.

1.1.2 Since graduating with a degree in Mathematics in July 1995 I have worked in Transport Planning, firstly in consultancy but principally with LUL, which I joined in 1996. Since that time I have completed a Masters Degree in Transport Policy & Management and undertaken a number of different roles within the company.

1.1.3 I spent a number of years managing the development of service plans and reliability initiatives on the Sub-surface railway, the name for the combined Circle, District, Hammersmith & City and Metropolitan lines.

1.1.4 I then took up a senior management position managing the delivery and sponsorship of the upgrade of the Sub-surface railway working with Metronet Rail SSL Limited (the private company who held the benefit of the Public Private Partnership (PPP) contract for the upgrade). During this period I sponsored the development of the new S-stock trains now in operation on the Metropolitan line and the project to replace the current 95m long C-stock trains in operation on the Circle and Hammersmith & City lines with new 117m long S-stock. This involved signalling modifications and platform lengthening.

1.1.5 In 2007 I took up the position of Olympic Programme Sponsor where I managed the development of LUL's plans for the 2012 Games, co-ordinating with the Organising Committee (LOCOG) and the Olympic Delivery Authority (ODA).

1.2 Current Role and Responsibilities

- 1.2.1 I am employed by Transport for London (TfL) as the Head of Transport Planning within LUL's Strategy & Service Development Directorate. I have been employed by TfL/LUL for 16 years. I manage approximately 70 staff within the Transport Planning team. My main duties include being responsible for the service planning for the London 2012 Olympic Games, the lead sponsor on Crossrail Stations, network development issues including extending the Northern line to Battersea and the Croxley Rail Link extension of the Metropolitan line. I am also responsible for station planning and station development including modelling and assessments. I have been in my existing role since 29 June 2009.

2 SCOPE OF EVIDENCE

- 2.1 My evidence will cover the role that LUL plays in the delivery of the Croxley Rail Link (CRL) project and the operational aspects of the CRL once it enters into service.

3 ROLE OF LONDON UNDERGROUND LIMITED

- 3.1 LUL is responsible for operating the London-wide Underground network including Metropolitan line train services between Aldgate and Baker Street in central London to Watford (Met) station. Once the CRL is completed, Metropolitan line trains will be diverted to serve the new stations of Ascot Road and Watford Hospital and the existing stations of Watford High Street and the new terminus of Watford Junction. The Metropolitan line will no longer serve the Watford (Met) station which is proposed to be closed to passenger services as part of the scheme.

- 3.2 LUL will operate and maintain the two new stations and the new infrastructure up to the junction with Network Rail (NR)'s DC lines south of Watford High Street station. Metropolitan line services will then operate over the existing DC lines to Watford Junction. These lines will continue to be managed by NR. Watford High Street and Watford Junction stations will continue to be operated by the relevant train operating companies, currently LOROL and London Midland, respectively.
- 3.3 LUL is currently upgrading its Sub-surface railway including the Metropolitan line with new signalling, communications and rolling stock. The old A-stock will be replaced with new S8 trains by the end of 2012 and the full line upgrade will be completed by late 2018.
- 3.4 LUL will continue to maintain the track and related operational infrastructure running into Watford (Met) station in order to stable trains when they are not in use overnight and during off peak periods.

4 POSITION OF LONDON UNDERGROUND LIMITED IN RELATION TO THE CROXLEY RAIL LINK

- 4.1 LUL has long supported the principle of the CRL and was for a period in the 1990s the organisation charged with progressing its development. Although this role has since been taken over by Hertfordshire County Council (HCC), LUL has remained heavily involved in the work that has taken place since that time. Its support is demonstrated by the decision to become a joint promoter (with HCC) of the Transport and Works Act Order (TWAO), with authority to proceed with the submission of the TWAO application being received from the TfL Board on 7 December 2011.

4.2 Ever since the CRL's inception the scheme has been based on the assumption that the opening of the new section of line to Watford Junction would require the closure of the existing line to Watford (Met) station to passenger services. The business case for this requirement is outlined in the proof of evidence presented by Mr Hunter. From an operational perspective, the continued use of Watford (Met) as a terminus station would have an adverse impact on the train service capacity and reliability on the remainder of the Metropolitan line.

4.3 The business case would be worse should a service to Watford (Met) be retained (even at a low frequency of 2 trains per hour [tph]) throughout the day, given the existing low level of demand outside the peaks and further reduction that would occur once the route to Watford Junction opens. Retaining Watford (Met) would require reducing the service to Watford Junction and this would result in a dis-benefit because a less frequent service on the proposed alignment to Watford Junction outweighs the benefit of keeping Watford (Met) open for existing users. Splitting the service would reduce the frequency and increase the average waiting time for users across all relevant Metropolitan line stations.

5 PROPOSED LEVELS OF TRAIN SERVICE WITH AND WITHOUT THE CROXLEY RAIL LINK

5.1 Without the Croxley Rail Link

5.1.1 The Metropolitan line currently operates 22.5 tph through Finchley Road station at peak times, with 7.5 tph directed to Watford (Met) station. This service uses 50 trains of the mixed A Stock / S8 Stock fleet (LUL have nearly completed the process of replacing A Stock with S8 Stock). In the off-peak, the service frequency to Watford (Met) station is 4 tph.

- 5.1.2 LUL's current planning assumption is that following the completion of the Sub-surface railway upgrade, a new timetable will be implemented that schedules 28 tph on the Metropolitan line through Finchley Road at peak times.
- 5.1.3 Without the CRL, this 28tph service is currently assumed to involve 12 tph running to Uxbridge, 4 tph to Amersham, 2 tph to Chesham and 10 tph to Watford. This frequency would use 52 trains - the highest number that can reliably be made available for service from the new 58-train S8 Stock fleet.
- 5.1.4 At the south end of the line 16 tph will run through to the terminus at Aldgate, while the remaining 12 tph will reverse in the dedicated terminating/reversing platforms at Baker Street.
- 5.1.5 At most off-peak times the post-upgrade train frequency is expected to be 16-18 tph, with 6-8 tph running to Uxbridge, 2 tph to Amersham, 2 tph to Chesham and 6 tph to Watford. 12 tph would run through to Aldgate, with the remaining 4 tph reversing at Baker Street.
- 5.1.6 The increased number of trains assumed to go to Watford in 2018 is not a function of high demand at Watford (Met) station, but simply the result of the need to reverse trains at a location that ensures service reliability while delivering a high frequency on the core route through Finchley Road.

5.2 With the Croxley Rail Link

- 5.2.1 The proposal for all Watford-bound Metropolitan line trains to serve Watford Junction has been consistently demonstrated to deliver higher value for money than options which continue to run a service to Watford (Met). The programme to upgrade the Sub-surface railway will have replaced all of the rolling stock on the

Metropolitan line by the end of 2012. By 2016 the installation of a new signalling system will have commenced, starting with the out of London sections of line.

5.2.2 For LUL to operate the planned post-upgrade 10 tph Watford branch peak service to Watford Junction (instead of Watford (Met)) without reducing the service on the remainder of the Metropolitan line, an additional two trains would be required. This is because the operating time to the new terminus from Croxley is longer (11 minutes) than to Watford (Met) (3 minutes) and therefore in order to operate the same frequency, more rolling stock would be required.

5.2.3 However, the case for purchasing more than one train as part of the CRL is weak, would not offer good value for money and is not affordable within the project. Therefore, the full 10 tph service cannot be operated as far as Watford Junction. The optimal service for the CRL is a 6 tph peak service to Watford Junction, which is the best service that can be provided utilising only one additional train and meets LUL's Customer Service Delivery Standards of a 'turn-up-and-go' service.

5.2.4 A 'turn-up-and-go' service is generally defined as one with a train frequency of at least 6 tph, which means that passengers should never have to wait for more than 10 minutes for a train. For services with a lower frequency than 6 tph, the trains are generally publicised at adhering to a set timetable. In transport planning terms, a 'turn-up-and-go' service delivers significantly greater passenger benefits (both perceived and actual) than a timetabled service.

5.2.5 LUL has considered very carefully how the CRL can be provided with a 'turn-up-and-go' service to Watford Junction, whilst crucially maintaining the high benefits of a reliable 28 tph service (through Finchley Road) from the upgrade of the Sub surface railway on the wider Metropolitan line.

- 5.2.6 With a 6 tph service to Watford Junction, it will be necessary for 4 tph to reverse elsewhere on the Metropolitan line at a location closer to the trunk section of the line (than either Watford (Met) or Watford Junction) in order to be able to maintain the planned capacity across the busiest sections of the line without the need for an unaffordable additional train. LUL is carefully considering alternative locations for reversing these trains and Rickmansworth is currently the favoured option.
- 5.2.7 To ensure the train service can operate reliably while overcoming disruption resulting from incidents and variability in passenger loadings and platform dwell times, LUL routinely schedules 'layovers' (the length of time for which a terminating train is scheduled to stand at a terminus platform or siding before returning in the opposite direction) that include a 'recovery margin' above the minimum time (typically 4 minutes) required to turn the train around.
- 5.2.8 As LUL plans to retain the track at Watford (Met) station as a stabling facility (and emergency reversing facility at times of severe service perturbation), it would be technically possible to reverse trains at that facility (whether or not it was to remain open for passenger service). However, the distance from the preceding Metropolitan 'main line' station at Moor Park is still significant – nearly 5 km or around 7 minutes running time in each direction – such that the rolling stock time consumed in running 4 tph to the Watford (Met) station would require layovers on both Watford (Met) and Watford Junction 'reversers' to be scheduled at only 6-6.5 minutes for the overall service pattern to remain operable with 53 trains available for peak service. Analysis suggests this could result in around 30% of Watford (Met) and Watford Junction trains starting their next southbound trip late.
- 5.2.9 LUL are carefully reviewing the optimal location to reverse trains to ensure that the service provided across the entire Metropolitan line is the most reliable and

efficient one possible and also reduce the potential for any “knock-on” impacts on the other services which interface with that line, i.e. the Hammersmith & City, Circle, District and Piccadilly lines and Chiltern Railways services. Various options are under consideration, with detailed analysis being undertaken to determine the most suitable location.

- 5.2.10 For example, there is an existing reversing facility, including sidings, at Rickmansworth which could be used to reverse 4 tph during peak periods. The shorter distance and running time to Rickmansworth (approximately 3.5 km or 4 minutes from Moor Park) would use less rolling stock time, enabling longer layovers of approximately 8-9 minutes to be scheduled for both Rickmansworth and Watford Junction ‘reversers’. This would reduce the risk of the affected trains starting their next southbound trip late by approximately 50% when compared with reversing 4 tph at Watford (Met).
- 5.2.11 Reversing the 4 tph at Rickmansworth would result in a lower peak train frequency serving Croxley, but a higher peak frequency serving Rickmansworth. Average weekday passenger numbers are currently more than double (128% higher) at Rickmansworth than Croxley, so this would represent a net benefit.
- 5.2.12 Off-peak services are lower frequency, use a lower proportion of the total S8 fleet and would not be constrained by the number of trains available. LUL would therefore be able to simply divert the planned 6 tph post-upgrade off-peak service, which would have run to Watford (Met), to Watford Junction.
- 5.2.13 As outlined in paragraph 4.3, a split service option running trains to both Watford (Met) and Watford Junction in the peak periods would reduce the frequency of the service available to Watford Junction. A split service would also increase the

operational complexity of the service which in turn increases the risk of poor reliability across the entire line.

5.2.14 Service recovery following disruption takes longer with two terminus stations compared to just one, and thus causes more disbenefit with a more complex operation. Any option that requires the need to ensure trains serve an additional terminus would reduce the flexibility LUL's service controllers have when trying to recover the services, which would mean it takes longer to return the service to normal operation. This is regardless of how the trains are split between the two terminus stations e.g. evenly, 2 tph/4 tph respectively.

5.2.15 Were LUL to need to serve both Watford Junction and Watford (Met) then the service provision to either destination would be below the 6 tph 'turn up and go' frequency and it would be very unlikely that a clock-face service could be achieved. The service would probably be scheduled with uneven gaps which at times would result in passengers facing waits of up to 20 minutes. This would be a serious disincentive to passengers using the service.

5.2.16 As part of the station closure process for Watford (Met), London TravelWatch have suggested that consideration be given to a split service to Watford (Met) and Watford Junction for a period of two years in order to determine the actual passenger numbers and issues involved with the running of a split service prior to a final decision on the closure of Watford (Met). Although such a token service might benefit a limited number of existing Watford (Met) passengers, these benefits would be outweighed by the disbenefits to other existing and new passengers who live nearer to a CRL station. This is due to a less frequent service to Watford Junction and increased average waiting times. Proposals to alleviate the impact of the scheme for existing Watford (Met) passengers must be

balanced against the impact on the overall benefits of the scheme. The split service option, in the context of the transport and business case, is covered in more detail in Mr Hunter's proof of evidence.

6 OPERATIONAL IMPLICATIONS OF ALTERNATIVE OPTIONS

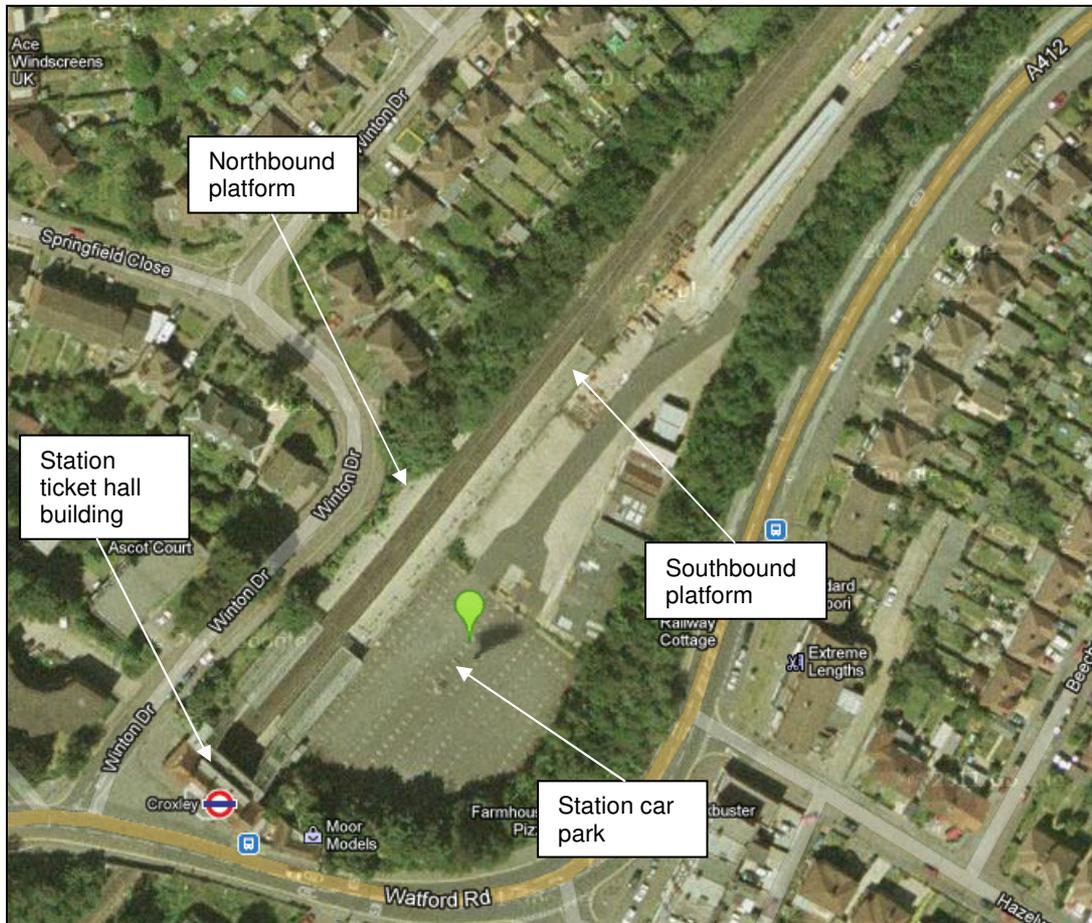
6.1 Mr Hunter deals with the transport appraisal of these options in his proof of evidence and my comments below on the operational implications of alternative options should be read in the light of that evidence.

6.2 Croxley Shuttle

6.2.1 The option of keeping Watford (Met) open and running a shuttle service between it and Croxley station has been considered. However, this would cause significant operational difficulties. The layout of Croxley station is not suitable for regular reversal of trains, having two through platforms only and no bay platform which could be used for such movements (see plan overleaf). To construct a bay platform would involve significant extra cost, the likely acquisition of additional land and possible loss of spaces in the station car park. It would also be necessary to incur the substantial cost of an additional train to operate the service and a new crossover junction which is an operational requirement to allow the reversing movement to take place. Reversing trains at Croxley would jeopardise the ability to run the proposed frequency of trains on the line to Watford Junction and impact on the reliability of the service on the remainder of the Metropolitan line.

6.2.2 Once the CRL is operational, most existing users of Watford (Met) would find it more convenient to use one of the new or newly served stations rather than having to interchange at Croxley between a shuttle service and services from/to Watford Junction. A shuttle service from Watford (Met) is likely to be lightly used because of its low frequency and the requirement to change at Croxley. The significant

additional costs, together with the operational difficulties, means that this option is therefore not considered viable. Note that this option (and that for a split service) has been assessed with both current and post-Sub surface railway upgrade service patterns.



6.3 Amersham/Chesham Service

6.3.1 The option of LUL running direct services from say Amersham/Chesham to Watford (Met), via the 'north curve' section of track between Rickmansworth and Croxley, has been considered. This would save 9-10 minutes on affected journeys by avoiding the need to change at Moor Park for passengers travelling between the Amersham/Chesham and Watford branches of the Metropolitan line.

6.3.2 LUL origins-destinations data show that fewer than 500 passengers per weekday make journeys that would benefit from this change – around 0.2% of journeys on the Metropolitan line – while even a minimal 2 tph Amersham to Watford service would use two trains – just under 4% of the rolling stock available for peak services. These trains would have to be redeployed from busier routes elsewhere on the line. Although the number of people using the service could be expected to increase slightly owing to the direct route provided, this would be insufficient to make the business case strong enough to justify the additional expenditure of additional rolling stock or diversion of existing trains. Providing a ‘north curve’ service would therefore impose significant economic costs on Metropolitan line users on the wider network and provide very low value for money. For these reasons, this option has been discounted.

7 CONCLUSIONS

7.1 My evidence to the inquiry covers the overall operational impacts of the scheme on LUL’s services.

8 WITNESS DECLARATION

8.1 I hereby declare as follows:

- This proof of evidence includes all facts which I regard as being relevant to the opinions that I have expressed and that the inquiry’s attention has been drawn to any matter which would affect the validity of that opinion;
- I believe the facts that I have stated in this proof of evidence are true and that the opinions expressed are correct; and,
- I understand my duty to the inquiry to help it with matters within my expertise and I have complied with that duty.