

Written submissions received for the Transport Committee’s meeting about the Mayor and TfL’s plans for Crossrail 2.

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TfL response to GLA Transport Committee Crossrail 2, pre-meeting request regarding alternative options assessed in north east and east London.

20 May 2013

Crossrail 2 is intended to address both growth and congestion relief. The proposed northern branches as defined in the current public consultation material address both of these goals. They have been identified as our preferred route for the regional scheme through a comprehensive and robust project development process involving the assessment and refinement of a large number of options. These included an eastern branch to Barking (and potentially beyond) via Stratford. The reasons the two northern branches are being pursued and the eastern branch is not are set out below.

TfL's analysis of future demand shows that by 2031 the greatest congestion will be on Underground lines in north London. Severe crowding is forecast on both the Piccadilly and Victoria lines between Finsbury Park and the West End, despite the planned line upgrades on these lines. On the other hand, crowding on lines from the east is not forecast to be as severe at this time. Furthermore, greater potential exists to increase capacity of infrastructure on the eastern routes like Crossrail and the Central line, beyond committed upgrades. Following respective upgrades, the Piccadilly and Victoria Lines will be amongst the highest frequency metro lines in the world and generating further capacity on these particular lines will be very difficult to achieve. Crossrail 2 is, however, ideally placed to address these capacity challenges.

In order to effectively play this congestion relief role, the proposed Alexandra Palace branch of Crossrail 2 will have to offer an attractive frequency to potential users. A frequency of less than 20 tph would be far lower than that offered by the upgraded Piccadilly and Victoria lines and would not be sufficiently attractive. A consequence of this requirement is that there can only be two branches at this end of the route - the core section will have a maximum capacity of 30 tph and the minimum frequency considered feasible on any other branches would be 10tph. This means there can only be one further branch alongside the Alexandra Palace branch.

The Lea Valley route is favoured as the second branch over an eastern route for a number of reasons:

- (i) it serves one of the most important growth areas in London, offering great potential for new housing and employment;
- (ii) It is a highly cost effective option since it involves relatively little new tunnelling and it takes over an existing national rail alignment;
- (iii) An eastern route to Barking via Stratford would be both costly and problematic in planning terms:

- The route would add an estimated £4bn at minimum to the overall cost of the scheme.¹ This reflects the need for lengthy additional sections of tunnelling and expensive new underground stations at Stratford and Barking, and potentially, at Hackney Wick (which would add a further £250m to the scheme costs).
- Initial engineering discussions with the London Legacy Development Corporation suggested a new Crossrail 2 station beneath Stratford Regional would be unlikely to be feasible, so any station would instead have to be at Stratford International, and therefore offer limited interchange with LU.
- Delivering an alignment through the Queen Elizabeth Olympic Park, would also be difficult and, therefore, expensive.
- Such an alignment would require extensive safeguarding protection from piling, which could restrict development potential in the Hackney Wick, Stratford and Barking areas.

TfL is committed to addressing the transport challenges facing east London in other ways. It is currently working with its partners to secure commitment for a wide range of schemes which together will deliver very strong benefits for the East sub – region, including:

- Crossrail 1 will significantly enhance transport connectivity and capacity in east London with services to Stratford and Shenfield, as well Canary Wharf to Abbey Wood
- Rail based public transport access to Barking Riverside
- 3-car services across the entire DLR network,
- Barking to Gospel Oak line electrification, quicker journey times and longer trains
- 12-car trains on Essex Thameside services throughout peak hours
- Central Line upgrade, inc. EVO (walk-through) rolling stock
- A new station at Beam Park
- Improved public transport accessibility to the QE Olympic Park
- New east London river crossings
- Bus priority enhancements

¹ Cost estimates were devised at a very high level, but are based on an extrapolation of the cost estimates Mott MacDonald have undertaken for the rest of Crossrail 2.

- Enhanced HS1 domestic services and international services calling at Stratford
- New river crossings

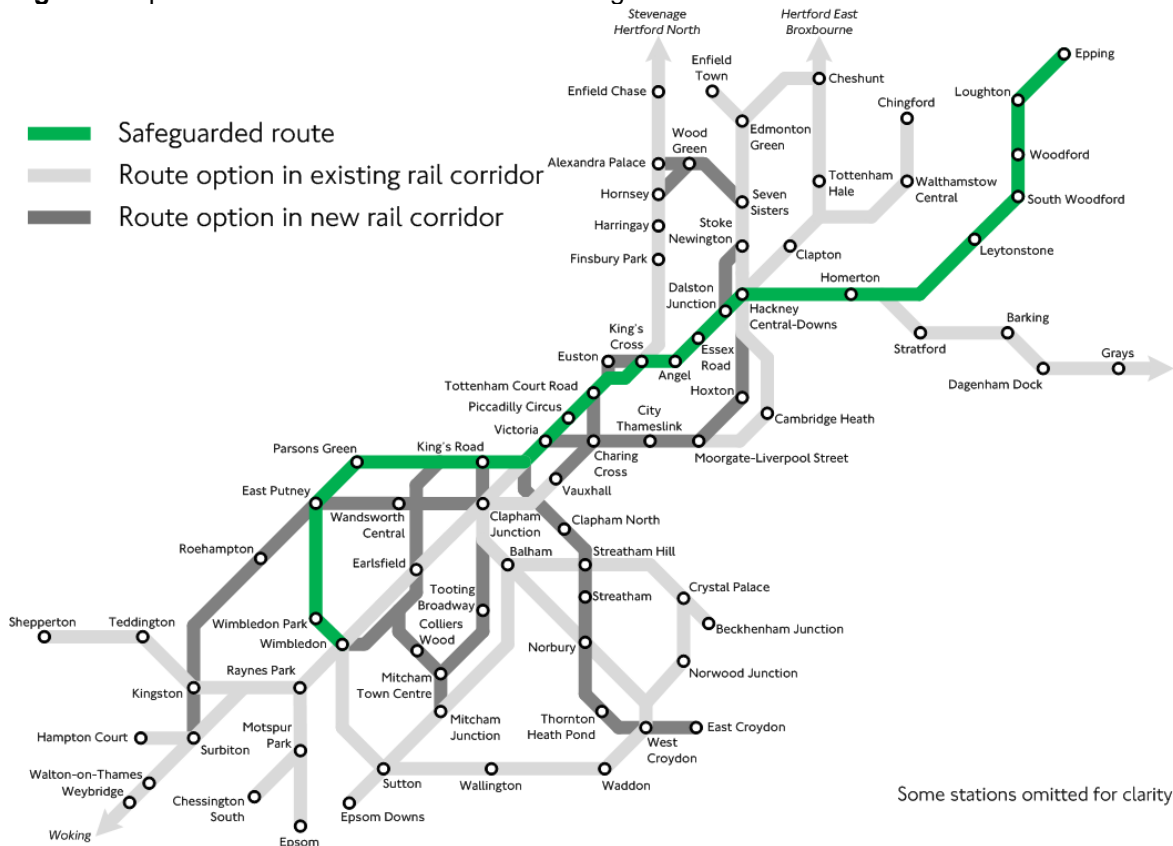
Crossrail 2 Optioneering Analysis Summary

June 2013

1 Introduction

- 1.1.1 There is a long history of proposals for cross-London rail lines. These have come to the fore in the last two decades with the implementation of the Thameslink programme and notably Crossrail. Proposals for a line running from the north-east to the south-west of London were first formally made in the 1974 London Rail Study and were again included in the 1989 Central London Rail Study. An alignment for the Chelsea-Hackney Line (CHL) was safeguarded by the Secretary of State in 1991 and subsequently refreshed in 2008.
- 1.1.2 Given this long history, there have inevitably been a number of proposals for alignments serving the broad CHL corridor which differ from the safeguarded route. This paper sets out the options considered by Transport for London (TfL) during the course of its review of Crossrail 2 as the scheme is now known. This includes work prior and post the request in 2009 from the Department for Transport to the Mayor of London to review whether the current safeguarded route (dating back to 2008) is still necessary and, if so, whether it is the optimal alignment to meet London and the UK's needs. The full extent of the options considered can be seen in **Figure 1**.

Figure 1: Options considered for the Crossrail 2 alignment



2 Background Optioneering (2007-2009)

- 2.1.1 In 2007 TfL's London Rail division undertook some high-level analysis of the potential impacts of CHL and identified a large number of alternative alignments, including many from previous studies. The study looked at options for alignments in three sections: south/south-west London, central London and north/north-east London. Together with the options from previous studies, this meant that over 100 options were identified in total, although in reality some of the sections were not compatible, leaving approximately 64 options to be considered further.
- 2.1.2 Representative options were evaluated against a qualitative set of objectives and very high-level indicative costs were estimated. Whilst no decisions were taken as a result of the 2007 study, the results provided useful background for the subsequent review undertaken by TfL, which is described in the next section.

3 Long-list option assessment 2010 - 2011

- 3.1.1 In 2008, the Secretary of State for Transport asked the Mayor of London to review whether there was a case for removing the CHL safeguarding or whether it needed to be retained. If the latter opinion was reached, the Mayor

was to review whether the safeguarded alignment best met the current and future needs of London.

- 3.1.2 The question of the need for a scheme in the CHL corridor was addressed during the development of the Mayor's Transport Strategy (MTS) 2010. Analysis showed that a new line was necessary (see Figure 32 of the MTS and paragraph 263). Proposal 9 formalises this position and further supports the need to review the route to ensure it provides the maximum benefits and value for money.
- 3.1.3 This review, drawing on previous work such as the 2007 review (as referenced in Section 2), commenced with a number of internal TfL workshops identifying options which could be studied in more detail. Options were evaluated by considering them against the emerging MTS goals and whether they served a number of key locations in south-west, central and north-east London. A range of options was developed to take into account the varying key locations to be served (shown in Table 1) and different technologies and operating models which could be used. This ensured that the options to be tested were not too narrowly focused and that genuine choices could be presented at the conclusion of the analysis phase.

Table 1: Key locations, stations and crowded lines / corridors for Crossrail 2 alternative routes

	South	Central	North
Key Locations	Poor accessibility (e.g. Mitcham, Tooting); Outer London Centres; Putney; Streatham; Wandsworth, VNEB ⁱ	West End; City	Hackney; Dalston; Wood Green; Lee Valley; Areas of Deprivation (London Plan); Outer London.
Stations / Strategic Interchanges	Clapham Junction; Wimbledon; Balham.	Victoria; King's Cross / St. Pancras; Waterloo; Euston; Tottenham Court Road; Other termini.	Finsbury Park; Tottenham Hale; Hackney Central / Downs.
Crowded lines / corridors	Northern line; Southern; SWML.	Victoria; Piccadilly; Northern; Central.	Victoria; Piccadilly; WAML.

ⁱ Vauxhall Nine Elms Battersea Opportunity Area

- 3.1.4 The options, which are set out in Table 2, were tested against an enhanced base. This modelling scenario represents TfL's best estimation of the transport network schemes (with funding committed or uncommitted) which will be delivered before 2031. Testing against this enhanced base means that the case for Crossrail 2 has been assessed against a likely future transport network rather than the current one.

Table 2: The long-list of options

ID	Options
1	Enhanced Base: Basis for testing options
2	Safeguarded Route
3	Alternatives to Crossrail 2

4	Metro: Victoria – Tottenham Court Road - Euston - King's Cross. Simple core section, incorporating Euston
5	Metro and DLR extension: Clapham Junction – Victoria – Charing Cross – Finsbury Park; DLR Charing Cross – Bank. Use DLR depot
6	Metro: Balham - Clapham Junction - Safeguarded - Hackney - Tottenham Hale. To test difference of core against alternative central route against inner fixed points.
7	Metro: Balham - Clapham Junction - Victoria - Charing Cross - City Thameslink - Moorgate - Hackney - Tottenham Hale
8	Cross-London Metro - Longer Congestion Buster: Sutton / Mitcham - Wimbledon - Clapham Junction - Core - Finsbury Park - Wood Green. Avoids but relieves Clapham Junction
9	Cross-London Metro - Express Metro: Surbiton / Sutton - Wimbledon - Clapham Junction - Core - Dalston - Wood Green / Stratford and Barking
10	Cross-London Metro - Radial Corridors: Croydon - A23 corridor - Core - Dalston – A10 corridor - Enfield / Cheshunt
11	Cross-London regional rail: SWML & WAML SWML Inners and WAML Inners via alternative City Route. City route allows WAML suburban services to continue to serve Liverpool Street.
12	Cross-London regional rail Southern & Great Northern / C2C: Sussex RUS / Brighton Mainline – Core – Great Northern Inners and C2C to Grays

3.1.5 A package of alternative schemes was also assessed (as Option 3) to ascertain whether the potentially substantial investment in Crossrail 2 would provide more benefits if it were used to implement a number of smaller schemes.

3.1.6 A range of Crossrail 2-specific objectives were developed, in order to test the options against. These were closely aligned to the goals of the MTS and are as follows:

- To increase capacity and alleviate crowding on London's transport network (in particular the Victoria, Piccadilly and Northern lines)
- To improve National Rail termini dispersal
- To support economic development and growth by enhancing connectivity
- To ensure value for money
- To improve transport quality
- To reduce CO2 emissions

3.1.7 The original 11 options were assessed against these objectives. The scoring was agreed by the TfL Crossrail 2 Working Group in March 2011 and can be found in Table 3.

Table 3: Scoring ¹ of options against the Appraisal Framework

Option	2	3	4	5	6	7	8	9	10	11	12
To provide improved journey opportunities in London Plan growth & development areas	2	2	1	2	2	1	2	2	1	1	2
Provide an improvement in accessibility to jobs (within 45	2	0	0	0	1	1	0	2	2	1	1

¹ Scored from +3 (strong positive impact) through to -3 (strong negative impact) with a score of 0 representing a neutral impact. Affordability was scored as follows: 3: <£5bn; 2: £5-7.99bn; 1: £8-10.99bn; 0: £11-13.99bn; -1: £14bn-16.99bn; -2: £17-19.99bn; -3: >£20bn.

Option	2	3	4	5	6	7	8	9	10	11	12
minutes) from key locations											
To achieve improvements in connectivity between centres of employment & population in south west & north east London - particularly in parts of London where LUL & rail network is limited.	2	1	0	1	2	1	2	3	2	1	1
To improve access to international gateways	1	2	1	1	1	0	1	1	1	0	1
To achieve positive change in public transport reliability in northeast & southwest London	2	2	0	0	1	1	2	2	2	3	3
To support economic development and growth by enhancing connectivity	9	7	2	4	7	4	7	10	8	6	8
To provide crowding relief throughout London	3	2	0	1	2	2	0	2	2	2	3
To provide crowding relief of key radial route to and within central London- such as the Piccadilly Line	1	1	3	3	1	1	3	1	1	1	2
To provide crowding relief of key radial route to and within central London-such as the Victoria Line	2	2	3	3	3	0	3	3	3	2	3
To provide crowding relief of key radial route to and within central London-such as the Northern Line	0	0	0	1	2	2	1	1	1	1	2
To provide crowding relief of key radial route to and within central London- such as the District Line	3	2	0	1	1	1	1	2	1	2	1
To provide crowding relief of key radial route to and within central London- such as the Central Line	3	0	0	0	0	0	0	1	1	2	1
To provide crowding relief of key radial route to central London- such as the Great Northern Line (national rail)	0	1	3	3	2	1	3	2	3	2	3
To provide crowding relief of key radial route to central London- such as the South West Main Line (national rail)	1	3	0	1	1	1	1	2	1	3	1
To provide crowding relief of key radial route to central London- such as the Windsor lines (national rail)	2	2	0	-1	-1	-1	0	1	-1	2	-1
To provide crowding relief of key radial route to central London- such as the South Coast Main Line (Vic) (national rail)	0	-1	0	0	0	1	1	1	3	-1	3
To provide crowding relief of key radial route to central London- such as the South Coast Main Line (LB) (national rail)	0	1	1	1	1	1	0	1	2	1	1
To improve termini dispersal & provide improvements to key interchange station in/into central London in particular King's Cross	-2	0	0	1	0	1	0	-1	-1	1	-2
To improve termini dispersal & provide improvements to key	1	0	0	1	2	1	0	0	-1	1	-1

Option	2	3	4	5	6	7	8	9	10	11	12
interchange station in/into central London in particular Victoria											
To improve termini dispersal & provide improvements to key interchange station in/into central London in particular Euston	1	3	0	0	-1	0	-1	-2	-2	1	-1
To improve termini dispersal & provide improvements to key interchange station in/into central London in particular Liverpool Street station	1	0	0	1	1	-1	1	1	1	-1	2
To improve termini dispersal & provide improvements to key interchange station in/into central London in particular Waterloo	1	2	0	2	1	2	1	2	1	2	1
To provide crowding relief at key stations and interchanges other than those mentioned above	1	-3	-2	-3	-3	-3	-1	-2	0	-3	-3
To provide capacity for more people to travel to & from central London	3		0	0	1	1	2	2	2	3	3
To increase capacity and alleviate crowding on London's transport network (in particular the Victoria, Piccadilly and Northern Lines) & improving termini dispersal	21	15	8	15	13	10	15	17	17	21	18
To improve transport quality - through the provision of new direct less crowded journeys	1	2	0	1	2	2	2	2	2	2	2
To improve transport quality	1	2	0	1	2	2	2	2	2	2	2
Affordable and fundable	0	2	2	1	0	0	-2	-3	-1	-1	-1
A positive business case	0		0	0	0	0	0	0	0	0	0
To ensure value for money	0	2	2	1	0	0	-2	-3	-1	-1	-1
To provide a change in CO ₂ emissions from ground based transport in the Crossrail 2 corridor	1	1	0	0	1	1	1	1	1	2	2
To reduce CO ₂ emissions	1	1	0	0	1	1	1	1	1	2	2
MTS BENEFITS TOTAL	32	27	12	21	23	17	23	27	27	30	29
Ranking	1	4	11	9	7	10	7	4	4	2	3

3.1.8 During the scoring workshop, the Working Group decided to favour alignments towards Hackney and north-east London over alignments to Finsbury Park which were the focus of a number of the options. Three main reasons underpinned this decision:

- the existence of three rail lines between King's Cross and Finsbury Park (with a fourth for Thameslink currently being delivered) meaning that no new connectivity was provided;
- the original objective of providing better rail access for Hackney and north-east London; and

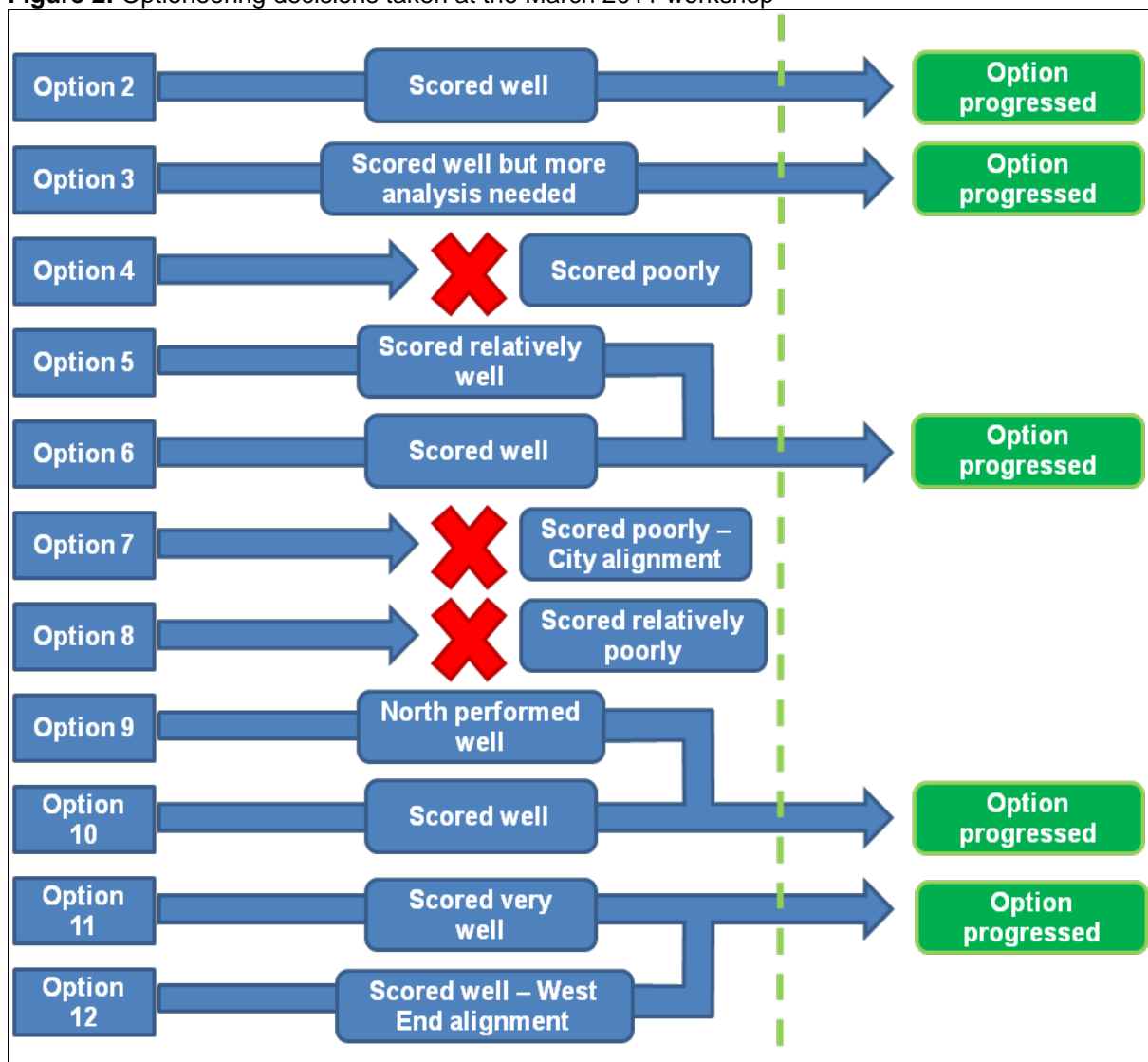
- the apparent ability of a line intercepting the Victoria line at either Seven Sisters and / or Tottenham Hale to achieve similar crowding reductions to those possible at Finsbury Park.

3.1.9 The group came to conclusions using four route categories, as shown in Table 4. The process is illustrated in Figure 2. These decisions followed on from the workshop and the appraisal results (see Table 3) and identified eight options across the four categories.

Table 4: Decisions on options taken by the Working Group

Category	Observations	Decision
i: Safeguarded and alternatives (2 and 3)	The safeguarded option scored better but it was felt that not enough analysis had been done on the alternatives.	Both options (2 and 3) to be assessed further.
ii: Central London metro options (4 to 7)	Option 4 scored poorly due to its length. Option 7 did not score well given its alignment through the City rather than the West End. Options 5 and 6 scored moderately, with each having elements that scored well.	The best performing elements of Options 5 and 6 to be combined to form an optimised central London scheme.
iii: Cross-London automated options (8 to 10)	Option 8 scored relatively poorly particularly given its high cost. Options 9 and 10 scored well but Option 10 was deemed to be better given its much lower cost. The northern part of Option 9 contributed particularly to its high rating.	Option based on Option 10 to be taken forward but with best-performing elements of Option 9.
iv: Regional options (11 and 12)	Options 11 and 12 both scored very well, although Option 11's City alignment reduced its score. A particular benefit of Option 12 was felt to be the relief to the southern end of the Northern line.	An option based on Option 11 with the Option 12 central London alignment to be taken forward.

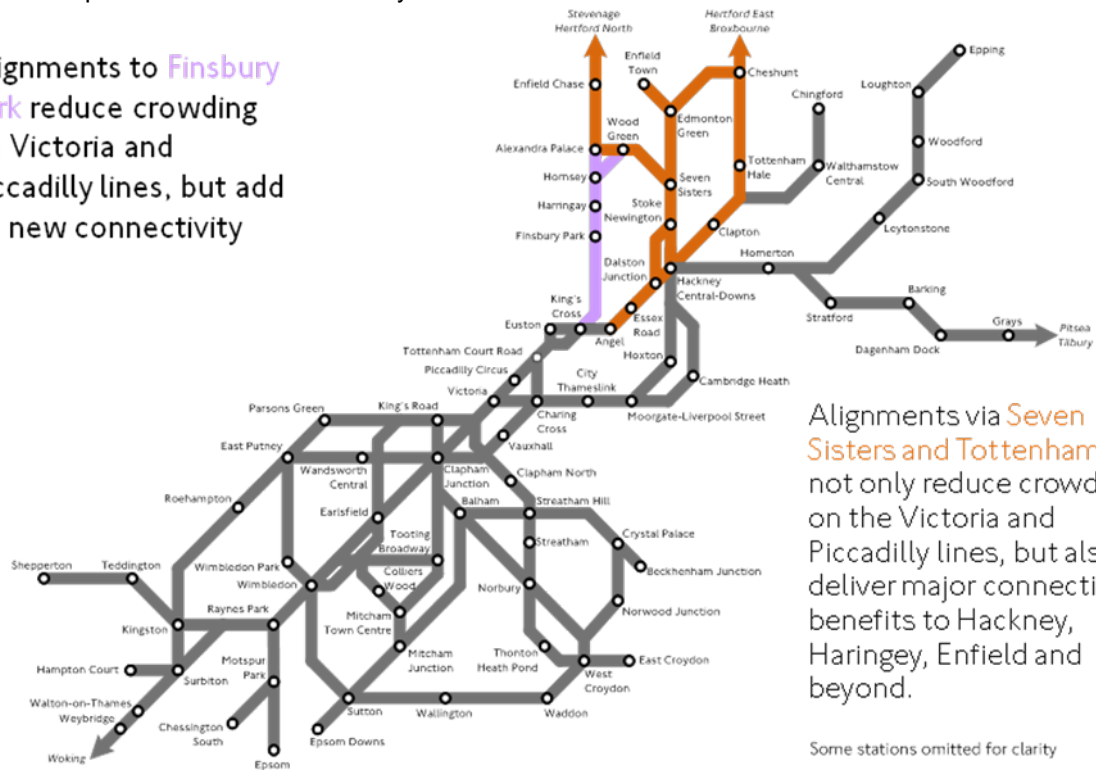
Figure 2: Optioneering decisions taken at the March 2011 workshop



3.1.10 Figure 3 to Figure 7 summarise the merits and drawbacks at a strategic level of the different alignments considered as part of the option development.

Figure 3: Option assessment summary 1

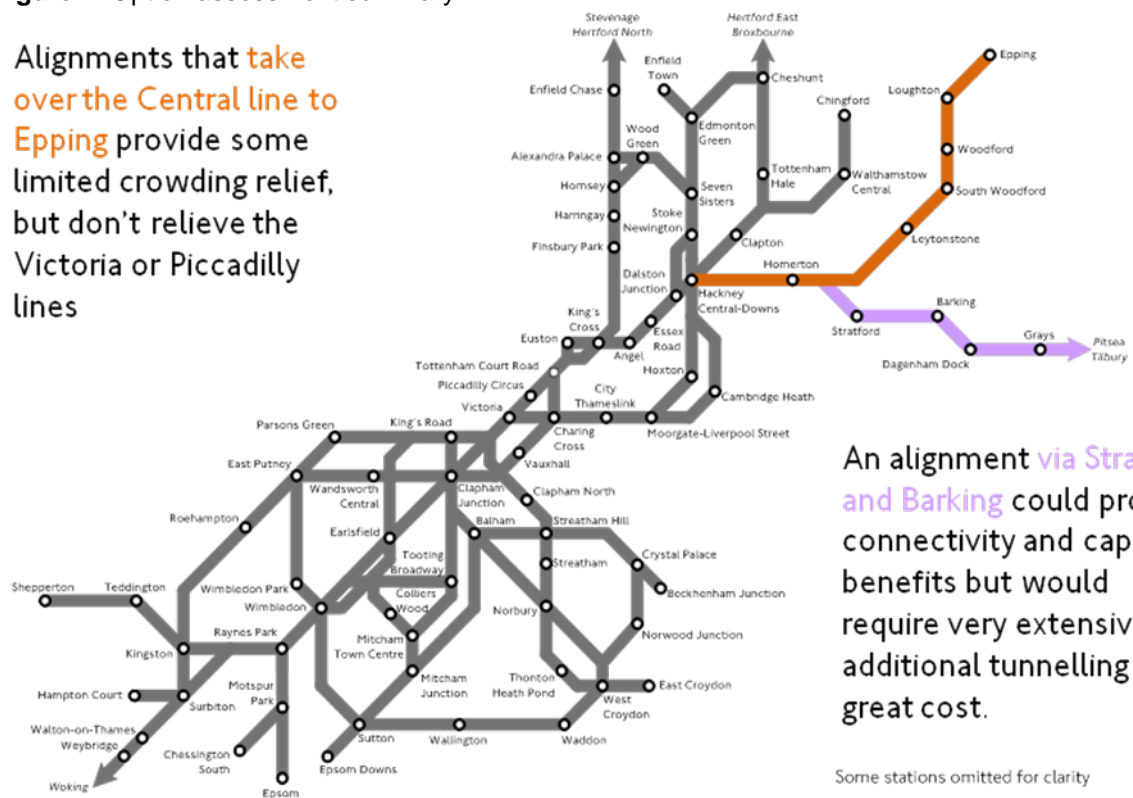
Alignments to **Finsbury Park** reduce crowding on Victoria and Piccadilly lines, but add no new connectivity



Alignments via **Seven Sisters and Tottenham Hale** not only reduce crowding on the Victoria and Piccadilly lines, but also deliver major connectivity benefits to Hackney, Haringey, Enfield and beyond.

Figure 4: Option assessment summary 2

Alignments that **take over the Central line to Epping** provide some limited crowding relief, but don't relieve the Victoria or Piccadilly lines



An alignment **via Stratford and Barking** could provide connectivity and capacity benefits but would require very extensive additional tunnelling at great cost.

Figure 5 Option assessment summary 3

Alignments **via the West End** performed best, along routes similar to the current safeguarding (but serving Euston)

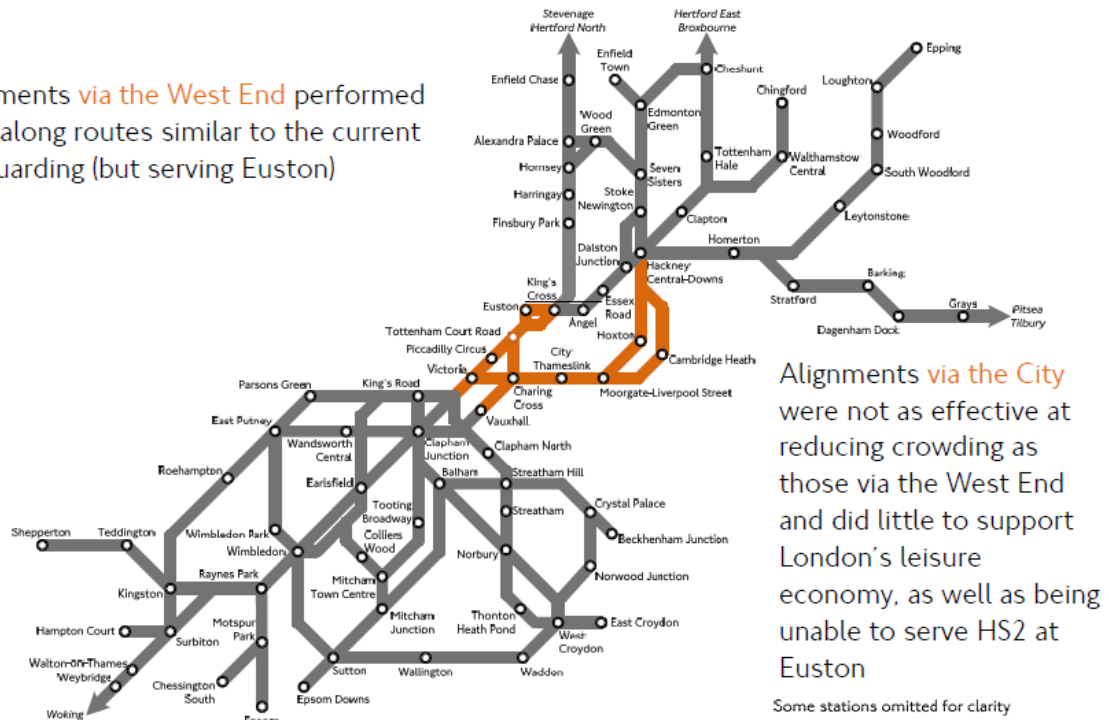


Figure 6: Option assessment summary 4

Alignments that provide **interchange with the Northern Line in south London**, appear to offer considerable potential to relieve what is currently the most crowded section of Tube network

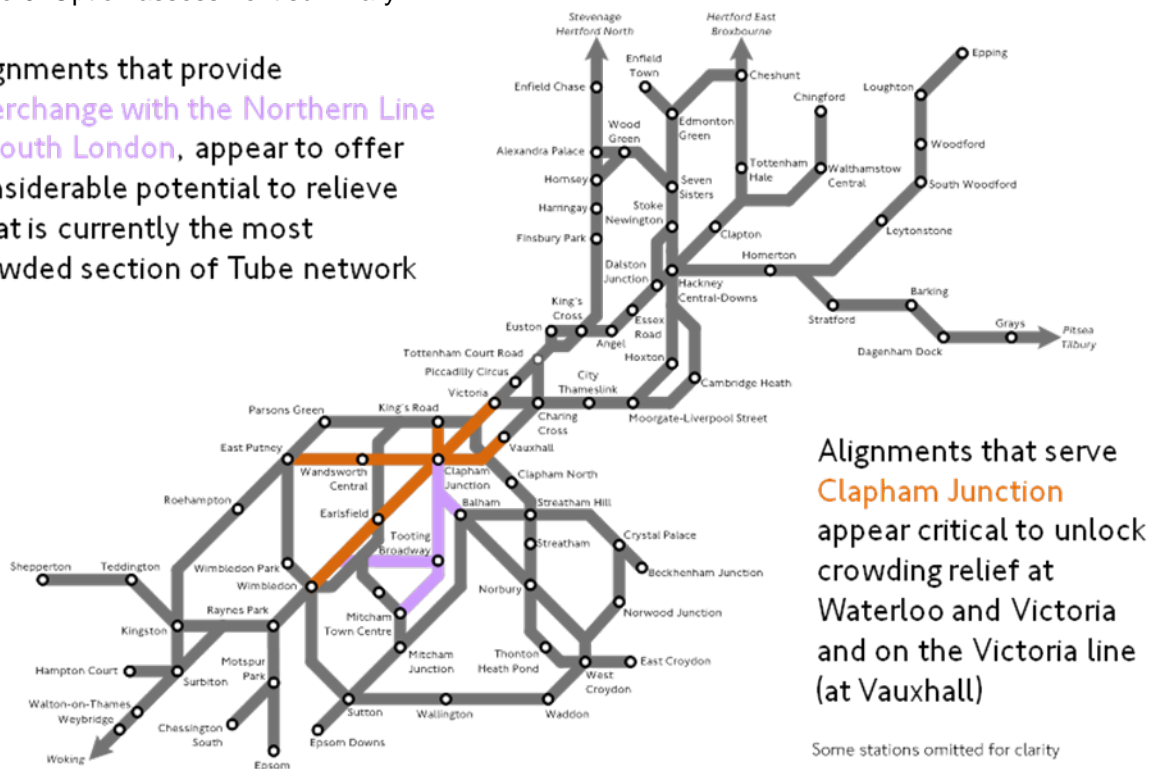
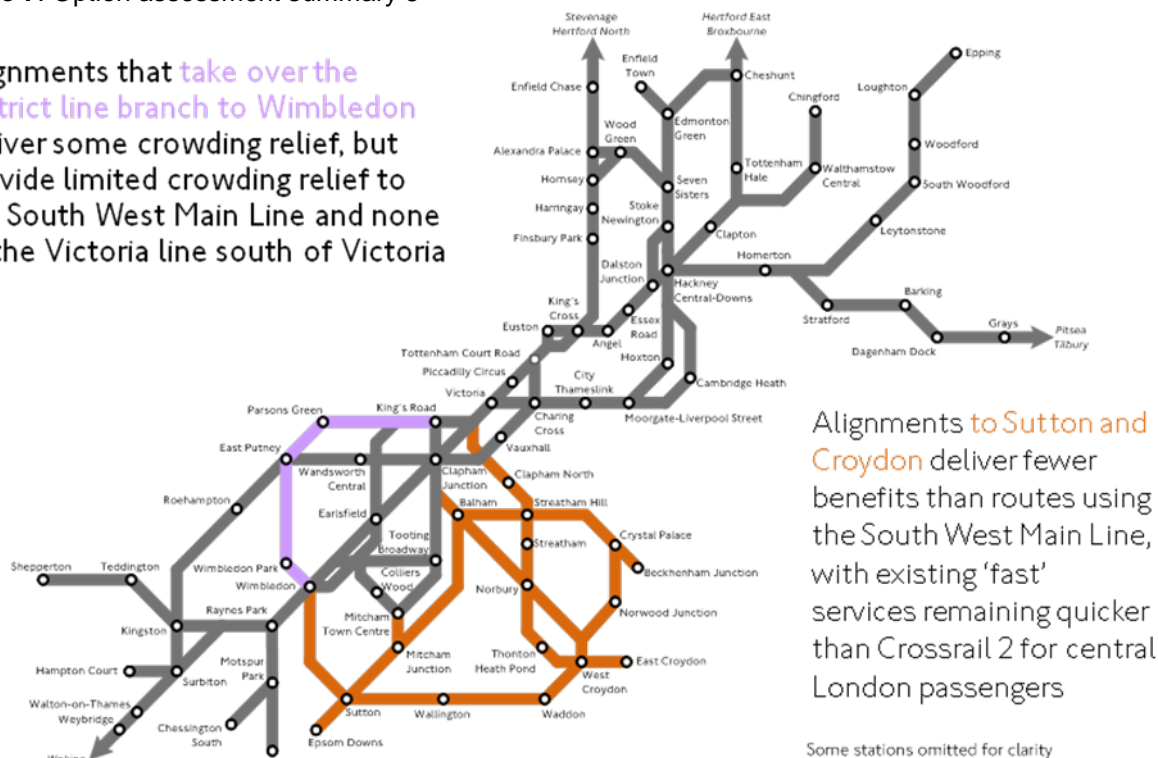


Figure 7: Option assessment summary 5

Alignments that **take over the District line branch to Wimbledon** deliver some crowding relief, but provide limited crowding relief to the South West Main Line and none to the Victoria line south of Victoria



4 Optimisation process and short-list of options

4.1.1 The sifting process outlined above left eight options to be taken forward in some form. This included the safeguarded route, which was retained due to its relatively high score in the assessment and to act as a benchmark against which other options could be assessed. Further work was undertaken to optimise the remaining options, with the intention to take forward the best performing elements from these options into a shortlist of two or three options. This process is illustrated in Figure 8.

4.1.2 The Working Group used the results from the earlier optioneering process to determine whether elements from different options could be combined into new alignments to meet the Crossrail 2 objectives better. Further consideration of the alternatives package showed that it did not deliver sufficient benefits, despite individual schemes within the package performing reasonably well. The reasons identified for not progressing the package are:

- The alternatives package could cost two-thirds as much as a new line across London while only delivering a fraction of the benefits and was therefore, unable to meet the central London congestion challenge of the late 2020s;
- The dispersed nature of the schemes in the alternatives package means that it failed to provide a step change in capacity or crowding relief;
- The emerging HS2 agenda which would see Euston becoming the terminus of a high-speed link to Birmingham in 2026 with a northern

extension around 2033. This would have significant impacts on the flow of passengers in the Euston area which would need to be served and the alternatives package was largely unable to accommodate this increase in demand;

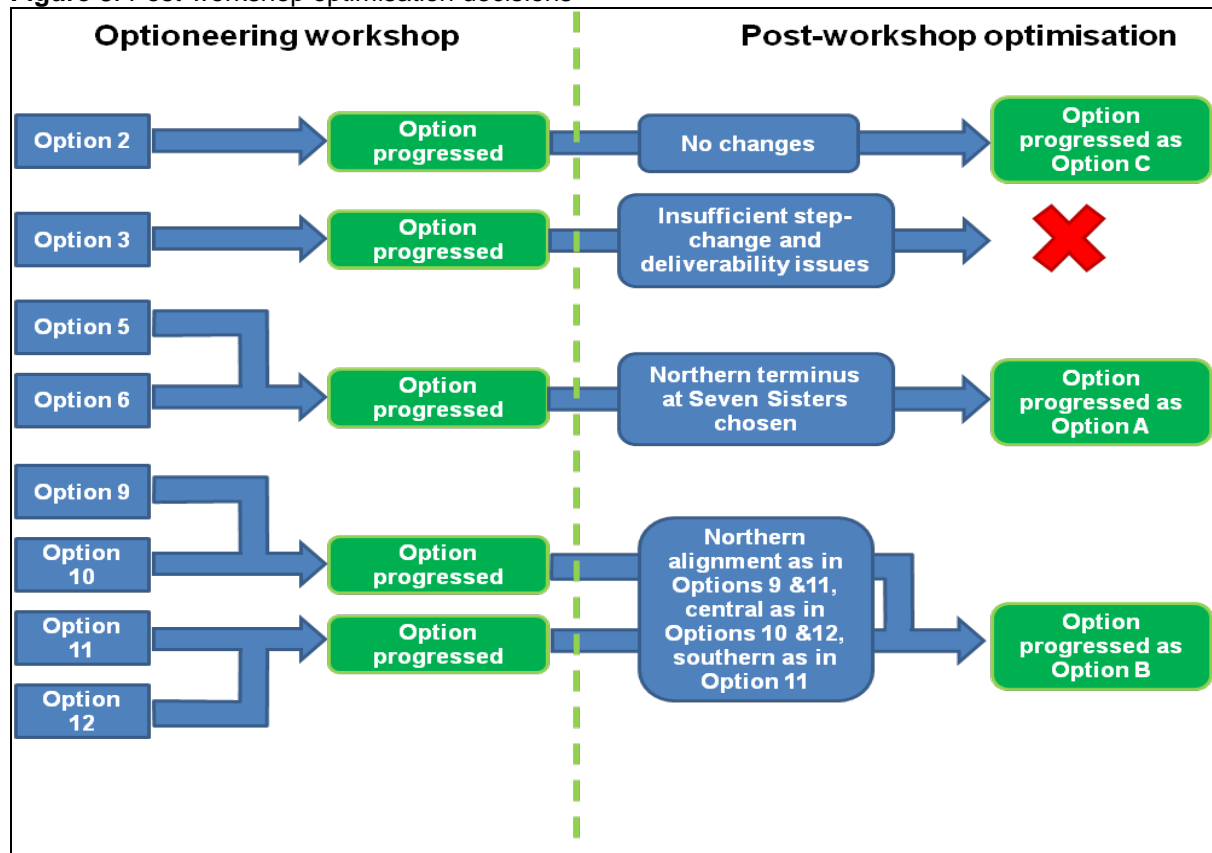
- Finally, several of the schemes in the package fall outside of the Mayor's remit, which may make them difficult to deliver as a package;
- and

4.1.3 The remaining six options were combined into two schemes to provide a metro scheme and a regional scheme:

- Metro scheme: both options 5 and 6 scored relatively well and the best performing elements were combined to create a new London metro option to deliver crowding and congestion relief to the Victoria line, whilst helping relieve Waterloo, Victoria and to a lesser extent, Liverpool Street National Rail termini.
- Regional scheme: elements of the cross-London metro options 9 and 10 performed well, as did elements of the cross-London regional options 11 and 12. It was possible to combine the best performing elements into a sensible and consistent alignment to best meet the needs of the south-west, core and north-east to create a new regional alignment to relieve crowding on the Victoria, Piccadilly and Northern lines and the SWML by diverting crowded trains from Waterloo onto Crossrail 2.

4.1.4 It is these two options which were developed in greater detail and are subject to further assessment and analysis, and which now form the focus of the 2013 consultation.

Figure 8: Post-workshop optimisation decisions



5 Refinement of the short-listed options

- 5.1.1 Following the decision to short-list three options, further analysis and refinement was undertaken. This further work focused on an engineering feasibility study and extensive transport modelling of the options. The result of this work led to changes being made to the options.
- 5.1.2 It was found that the original Metro Option of running a service from Alexandra Palace to Clapham Junction was not feasible, due to the scale of interchange which the southern terminus would see and the need to reach a depot or significant stabling site in the south. This, together with the transport benefits of serving Tooting and Wimbledon, meant that an extended Metro option was proposed. Further development work showed that this option was both feasible and beneficial. It therefore formed part of the public consultation in 2013.
- 5.1.3 Further analysis work also suggested that the safeguarded route did not perform as well as the new optimised routes. The key elements which led to this conclusion included:
- The safeguarded alignment was unable to adequately address crowding and congestion on key parts of London's rail network, especially the

Victoria and Piccadilly lines, as it did not intercept them north of King's Cross;

- The improvements in the District and Central lines which have, or are forecast to, occur before Crossrail 2 would be in place erode the benefits of the safeguarded route;
- Taking over existing parts of the Underground system could make it difficult to deliver the same capacity as the new options. The safeguarded route is not heavy rail and therefore does not have the capacity of National Rail routes, nor is it new infrastructure which would allow the very high frequency of the Metro option.

6 Eastern Branch Option

- 6.1.1 A branch towards the regeneration areas adjacent to the Thames in East London was considered as an alternative to the West Anglia Main Line branch as part of the Regional scheme. Public transport demand modelling was carried out to determine the case for this branch. A sensitivity test to increase the land-uses in the opportunity areas was also carried out to reflect the higher quantum of development which could be realised if Crossrail 2 were implemented.
- 6.1.2 The analysis shows that the Eastern branch has overall benefits in terms of crowding reductions and journey time savings. However, it is the branch's relative costs and benefits when compared with the other branches which weaken its case for inclusion in the overall scheme.
- 6.1.3 A high-level cost estimate for the Eastern branch was developed based on the costs estimated for the other elements of the Crossrail 2 scheme contained in the 2012 Cost Report produced for TfL by Mott MacDonald. Representative stations were chosen for the major underground stations on the branch (Stratford International and Barking) to approximate their costs. The ratio of the length of the tunnelled section of a Crossrail 2 scheme with an eastern branch to the length of the tunnelled section of Crossrail 2 with a WAML branch was calculated. Costs of tunnels, systems and indirect costs were factored by this ratio, leading to an overall cost estimate approximately £3.5 billion higher for the Eastern branch than the WAML branch when optimism bias was included. This is likely to be a conservative estimate given the challenging alignment issues around the Queen Elizabeth Olympic Park and additional costs due to land and property impacts. This also does not include an additional station at Hackney Wick, a strong local authority aspiration.
- 6.1.4 The other options for meeting the challenges in north and east London also need to be considered. Following their respective upgrades, the Piccadilly and Victoria lines will be amongst the highest frequency metro lines in the world and generating further capacity on these particular lines will be very difficult to achieve. Crossrail 2 is, however, ideally placed to address these capacity challenges. Alternative solutions will also need to be tunnelled given the developed nature of the corridor.

- 6.1.5 In order to play this congestion relief role effectively, the proposed Alexandra Palace branch of Crossrail 2 will have to offer an attractive frequency to potential users. A frequency of fewer than 20 tph would be far lower than that offered by the upgraded Piccadilly and Victoria lines and would not be sufficiently attractive. A consequence of this requirement is that there can only be two branches at this end of the route - the core section will have a maximum capacity of 30 tph and the minimum frequency considered feasible on any other branches would be 10tph.
- 6.1.6 TfL is committed to addressing the transport challenges facing east London and a number of other solutions appear viable. It is currently working with its partners to secure commitment for a wide range of schemes which together will deliver very strong benefits for the East sub-region, including:
- Crossrail 1 which will significantly enhance transport connectivity and capacity in east London with services to Stratford and Shenfield, as well as Canary Wharf to Abbey Wood;
 - Rail based public transport access to Barking Riverside;
 - Three-car services across the entire DLR network;
 - Barking to Gospel Oak line electrification, quicker journey times and longer trains;
 - Twelve-car trains on Essex Thameside services throughout peak hours;
 - Central line upgrade, including EVO (walk-through) rolling stock;
 - A new station at Beam Park;
 - Improved public transport accessibility to the Queen Elizabeth Olympic Park;
 - New east London river crossings;
 - Bus priority enhancements; and
 - Enhanced HS1 domestic services and international services calling at Stratford.

7 Conclusions

- 7.1.1 Based on the optioneering process described in this Summary document, it was concluded that two options - a Metro and a Regional scheme, best meet the objectives outlined and are taken forward for public consultation.

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Paul Harwood
Network Rail
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17 May 2013

Dear Val

Re: GLA Transport Committee meeting on Crossrail 2

I look forward to meeting with you and the transport committee next week to discuss the current consultation on proposals for Crossrail 2.

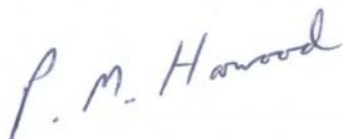
Network Rail and Transport for London (TfL) are undertaking the consultation jointly. This is a continuation of our increasingly joined up approach to transport planning and also recognition that such schemes must be considered in the context of impact upon both TfL operations and the national rail network.

The consultation material sets out what we see as the main issues regarding the 'metro' and 'regional' schemes. As a partner in the consultation, Network Rail will seek to provide a balanced approach in briefing externally, explaining the potential benefits of both options.

With regard to the regional scheme, I would emphasise that modelling of the potential capacity benefits for national rail services is still at an early stage. Exploring options for addressing the capacity issues on the Wessex lines into Waterloo is of course a key priority and we are keen to more fully understand stakeholder views and aspirations in order to inform more extensive planning of a scheme.

I hope this is useful ahead of our discussion. In the meantime, if you would like any further information, please contact Rob Smith in our public affairs team on 020 3356 9396.

Yours sincerely

A handwritten signature in blue ink, reading 'P. M. Harwood', written in a cursive style.

Paul Harwood **Principal Strategic Planner (London and South East)**

Valerie Shawcross AM
Chair of the Transport Committee
London Assembly
City Hall
The Queen's Walk
London
SE1 2AA

Paul Harwood
Network Rail
King's Place
London
N1 9AG

24 June 2013

Dear Valerie

Re: London Assembly Transport Committee meeting on 21 May 2013

Thank you for the opportunity to speak to the transport committee on 21 May as part of your investigation into the strategic case for Crossrail 2. Please find below some information and comments relating to the frequency of train services for south west London.

At this early stage of consultation, no final decisions have been taken about the Crossrail 2 Regional scheme train service pattern, or the origin points of services, as that level of detailed engineering feasibility has not yet taken place. It is the intention that Crossrail 2 would provide fast and frequent services to a range of destinations across south west London, and possibly beyond into Surrey.

Certain centres, such as Kingston, could have more trains overall than is the case today – with all those on Crossrail 2 providing faster and direct journeys to the West End. In addition to the Crossrail 2 services, on some routes, there would still be direct National Rail services provided by other Train Operating Companies to/from Waterloo but at reduced frequency.

Importantly, ultimately the balance of train service would be determined by demand, but initial work we have completed suggests that in order to accommodate a Crossrail 2 service some stations in the suburban area would no longer have a direct Waterloo service - but it is expected most stations still would.

The key trade off between the Metro and Regional option that suburban stakeholders in the South West should consider is – under the Metro option, existing Waterloo frequencies would be maintained, and the option would exist at Wimbledon or Clapham Junction for interchange into a new set of fast services into central London on Crossrail 2. Under the Regional option those new Crossrail 2 services would operate directly from the suburban routes without the need for interchange, but Waterloo services would in turn be reduced on those routes.

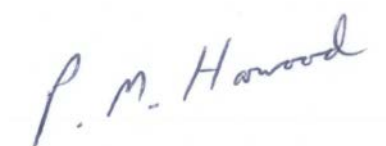
The consultation also notes that, depending on a number of factors and allied with other works, the diversion of some suburban services into Crossrail 2 could release some capacity

for additional services to be provided on National Rail routes into Waterloo for outer commuters. There could be some value associated with this freed up capacity, but It is important to note that this possibility only exists if there is a significant reduction in the residual suburban service into Waterloo.

I hope this information is helpful to you in understanding, at a very early stage, some of the possible trade offs that we would welcome your comments on. If you would like any further information on these points, please contact Chris Deacon in our public affairs team on 07711 602 149 / christopher.deacon@networkrail.co.uk

We would be happy to hold further briefings with members from the South West suburban area if you believe that would be helpful.

Yours sincerely

A handwritten signature in blue ink that reads "P. M. Harwood". The signature is written in a cursive, flowing style.

Paul Harwood

**Principal Strategic Planner
(London and South East)
Network Rail**

Dear Ms Shawcross,

I am a director of Alpark Ltd and currently advising The Athos Group who are carrying out new housing and commercial developments in Chelsea, Battersea and Wandsworth.

The residents of Chelsea neither want or have use for a Crossrail station at Kings Road. The vast majority will use a taxi or car.

The residents of Battersea and Wandsworth are, however, starved of adequate public transport. Furthermore there are announced proposals for 20,000 new homes to be delivered within the next 10 years between Nine Elms and Wandsworth town centre plus numerous Embassies and ambassadorial staff moving into the same area. There are also multi-million square foot mixed use developments taking place at Battersea Power Station and Wandsworth Town Centre.

Why then is Crossrail 2 proposed to go to Kings Road Chelsea where there is low demand when there is such massive demand growing to service a population undergoing rapid expansion along the South bank of the River?

The Northern Line extension is helpful but does not extend to Wandsworth and the latter is not close enough to Clapham Junction for it to be of any benefit.

The existing overland railways have no expansion potential and have been running beyond peak hour capacity for a number of years.

Kings Road has very little employment space and the residential stock is low density and it makes little sense to be serving this area of London when such dire need exists along the South bank of the river.

I have responded to TfL's consultation request but really feel this message needs to be considered at high level.

Yours sincerely,

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Title Briefing Note – TfL and Crossrail Two Options

For John Biggs AM

Cc: Clive Dutton Kieran Read
 Murray Woodburn, Julian Sanchez (ESEL)

Prepared by Stephen Hoier and Shona Elliott

1 Summary

- 1.1 TfL claim that a long list of possible options has been assessed against a set of criteria relating to the policies in the MTS and London Plan and the best options chosen to go forward into **a statutory consultation which will be held from 22April to 8 June this year ahead of asking DfT to confirm the existing safeguarded or replace it by another.**
- 1.2 **Eastern option (see Appendix A) – dismissed after very limited appraisal**
- 1.3 Included in the long list of options was an “eastern option” in an existing corridor through Hackney, Homerton, Stratford, Barking, Dagenham Dock and onto Grays. It is the view of most officers in the East/ South East London transport partnership that this option seems to have been summarily ruled out after very limited “testing”. TfL argue that the eastern option would have 5% more benefits and would carry 10% more passengers than the other options but that it would cost 15% more as it would involve a new station under the existing Barking station. However, there has been very little data released on the cost components of the eastern option. ESEL officers pointed out that if the new Barking station is built it could bring the opportunity of a wholesale regeneration of Barking town centre and may well attract developer contributions. In a sense this eastern option is something of a spinal railway for the London Thames Gateway. Its speedy elimination is indicative of how after 20 years being worked up, the Thames Gateway “linear city” has been quietly dropped.
- 1.4 The two shortlisted options chosen to go forward into the consultation alongside the original safeguarded (Chelsea – Hackney) scheme (c) the safeguarded alignment linking Wimbledon to Epping both “tilt” from the north-east to south-west alignment of that to what is now a north-south west alignment They both serve Euston in order to handle the dispersal of additional passengers brought into the HS2 terminus.
- 1.5 The two options now presented are:

Option A (+) – the Metro scheme

- a London focused metro scheme involving a new cross London Tunnel between Alexandra Palace and Wimbledon via Seven Sisters, Euston, Clapham Junction and Victoria, providing key interchange with national rail services at each end.

Option B – the London Regional scheme

- a broader suburban scheme providing regional benefits that is more akin to Crossrail 1, which includes a similar tunnel to Option A (+) in the core section but connects with national rail services to the north and south west, thus connecting some lines on the South West Trains network to lines in the Lea Valley to the north. It would provide relief to the main line services into Waterloo and other main line termini.

- 1.6 This option has already gained the support of London First in a report produced by Lord Andrew Adonis and by a Local Authority Forum set up by TfL- this Forum only includes local authorities affected by the proposed alternative options and unsurprisingly it has also endorsed the London Regional scheme. Costs of these schemes range from £9.5bn to £12bn (excluding Optimism bias).

2. Cause for concern and reason for representations

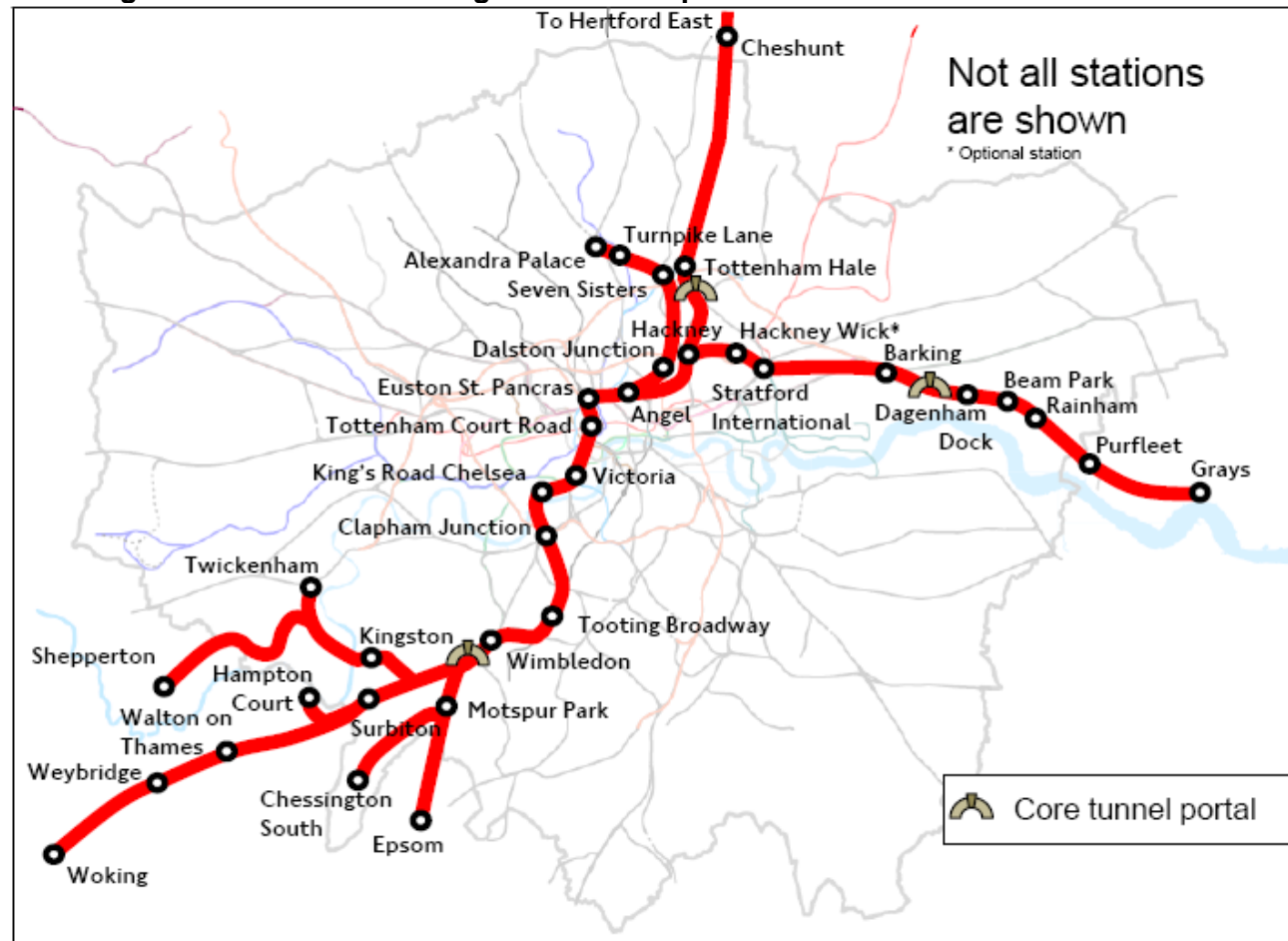
- 2.1 Although it is not explicitly stated anywhere we are picking up unmistakable vibes on the TfL network that the East (of London) has had more than its fair share of transport investment and its time for other parts to get theirs. This of course flies in the face of the main driver for planning the capital- London's redevelopment towards the east and the London Plan which focuses about half of the population growth and over 30% of employment growth broadly in east London. Population and employment growth projections from a TfL population and employment growth sensitivity test of September 2012 showed that the Eastern branch option could benefit from Crossrail 2 with a full Opportunity/ Intensification area build out 2011-2031 and further growth 2031-2041 with total additional population of 101,000 and employment growth of 85,000 (see appendix 3). If all the options went ahead the eastern branch would generate 52% of all population growth and 79% of all job growth in the GLA area. It also needs noting that the population and employment growth projections for beyond 2041 to refresh the London Plan where the expectation is of further build up in the east will not be available until later this year and after the consultation closes.
- 2.2 ESEL officers also believe that some of the regeneration and user benefits claimed for the London Regional scheme will have already been delivered by incremental investment in West Anglia routes so that 4 tracking extends up the Lea Valley long before Crossrail 2 could be delivered.
- 2.3 It should also be noted that TfL's own maps of crowding on routes from 2031 show most routes in the east (roughly through the City and East GLA constituency) subject to significant crowding with few routes in the rail corridors for the northern bearing options for Crossrail 2 with significant crowding. This seems to be behind strange messages from proponents of the London Region Crossrail 2 scheme that this railway is "more about regeneration than congestion relief." The eastern option clearly has mega regeneration benefits and brings most congestion relief hence the 10% more passengers the eastern option would carry. It is simply asserted that the eastern option would cost 15% more as a killer flaw aborting any further appraisal of the scheme. It should be noted that in the Crossrail 2 paper to TFL Finance and Policy committee of 13/3/2013 there was no mention at all of an eastern option
- 2.4 Other recent examples where TfL have made claims for cost benefit appraisal have prompted immediate doubts. They had to admit at an inquiry that the Woolwich

Crossrail station would bring very positive benefits they had initially denied. Their claim that the benefit to cost ratio for a ferry at Gallions is greater than a bridge is extraordinary given a ferry costs 30% of the capital cost of a bridge but carries only 10% the traffic, cannot handle public transport, is not 24 hour in operation and would have significant refurbishment/replacement costs. Planning the future of London and a scheme set to cost £12bn surely deserve more open, transparent planning so that scheme alternatives are open to proper scrutiny enabling a better selection process.

3. Representations needed

- 3.1 At the very least, representations are needed to bring the full working papers on the eastern option appraisal into the public domain. It could almost be argued it is a civic duty in London's interests to ensure the best option is not being foregone. Of great interest are the cost assumptions particularly around the new Barking station. We would ask John Biggs to raise these issues as the appropriate GLA constituency member
- 3.2 In addition, we should argue with TfL that the eastern option should be included in the strategic consultation being proposed from the end of April. A first step should be a letter to the full TfL Board ahead of their meeting on 27/3 which will endorse the recommendation of the TfL F& P committee. This letter would point out that what looks the best option for London risks being foregone and that it should be an option in the consultation
- 3.3 If necessary this information on the eastern option should be sought under an FoI enquiry. It needs to be remembered that neither CTRL/HS1 or Crossrail 1 proceeded as per the initial concepts. They were realised as much more consensus schemes with different features and facilities. Crossrail 1 failed when it addressed only congestion relief and gave Tower Hamlets tunnels and no stations. It succeeded not just by delivering 2 stations in Tower Hamlets but also fulfilling a whole series of criteria (around 12) they included: regeneration benefits; town centre support; labour market advantages as well as congestion relief. Judging by these past examples, it is unlikely that the London Regional scheme for Crossrail 2 will be delivered as it stands
- 3.4 We have secured a meeting with London First on 18/3. The objectives of this meeting should be: to express concern that LF have seemingly endorsed a scheme prematurely when they can only have had partial information for appraisal; to ask for their support to ensure all the appraisal on the eastern option is placed in the public domain and if that confirms our view that it is the best option to further support it being an option in strategic consultation. There is little we could lose by such robust representations. TfL have said other options to achieve the benefits of the eastern option could go forward. This boils down to the possibility that the DLR extension could go forward - but only to Barking Reach and not to Dagenham Dock. A £150m investment in the extension of the Gospel Oak to Barking Line to serve the Barking riverside regeneration area is being considered instead. These are not significant consolation for losing something like the eastern option of Crossrail 2.

Appendix A – Options to safeguarded scheme including the eastern option



Crossrail – Original Options, including Eastern Alignment

Findings of Crossrail 2 Eastern branch test:

- Passenger numbers: Number of passengers using Crossrail 2 to enter central London from the north in AM peak is 10% greater with eastern branch
- Higher employment growth potential on eastern branch means greater potential for 'counter-peak' demand
- Initial further growth testing resulted in around 5% more demand from both eastern branch and West Anglia Mainline

Crowding:

- Impact of eastern branch on benefits: +5%
- Impact of eastern branch on costs: +15%

Test	AM Peak Hour rail-based Public Transport passenger kms		
	Crowded	Very crowded	Severely crowded
2031 Reference Case	55%	36%	15%
2031 Enhanced Base	51%	30%	11%
2031 CR2 Opt B	47%	22%	5%
2031 CR2 Eastern branch	46%	22%	4%

TfL Conclusion:

- Additional costs of the eastern branch outweigh the additional benefits
- Therefore, it is not intended to further pursue the eastern branch option

Appendix 2

Crossrail 2 – Specification of further population and employment growth sensitivity test

September 2012

	Name	Contact Details	Signature
Author	Stefan Trinder	stefantrinder@tfl.gov.uk	
Reviewer(s):	Stephen Pauling Philip Keen David Christie		

Version Number	Issue Date	Description	Rev. Approved
0.1	24 Sept 2012	First Draft	
0.2			

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1. Background

I. Context and Purpose

Crossrail 2 is a strategic rail scheme running through London on a south-west to north-east axis. Crossrail 2 will add significant capacity to London's rail based public transport network, in a similar manner to Crossrail 1. Crossrail 2 will also significantly improve accessibility to the corridors that it will serve and therefore has the potential to be the catalyst for development growth.

The target opening year for Crossrail 2 is 2031. 2031 is also the furthest time horizon that is currently regularly considered in TfL's strategic transport models. Therefore, TfL's strategic transport modelling of Crossrail 2 does not reflect the population and employment growth within the catchment areas of the stations that could be expected to occur as a result of the improved accessibility offered by Crossrail 2.

Population and employment growth is particularly relevant for potential branches of Crossrail 2 that serve growth locations, such as London Plan identified Opportunity Areas, or Areas for Intensification. It is widely acknowledged through discussion with stakeholders that the growth potential at some of these locations would be increased with the improved accessibility Crossrail 2 would offer. As a result, if route options serving growth locations are assessed against 'reference case' levels of development they could be assessed less favourably in comparison to route options serving established areas.

The core purpose of this sensitivity test is to reflect the development Crossrail 2 would be expected to enable in growth locations, to inform the ongoing programme of Crossrail 2 route option analysis.

II. High-level approach

The 'reference case' land-use assumptions in TfL's strategic models to 2031 are aligned with the GLA's growth forecasts detailed in the London Plan. The London Plan includes population growth of around 1.25m and employment growth of around 0.75m in the period 2011 – 2031.

This sensitivity test is intended to reflect the additional growth potential that Crossrail 2 could realise in the 10 year period after it's opening (i.e. the period 2031 to 2041). The test will focus on the additional growth potential in identified growth locations served by Crossrail 2 in outer and inner London. Development potential at these sites is likely to be closely linked to the improved accessibility provided by Crossrail 2.

Crossrail 2 is also likely to enable further development in central London (the Central Activities Zone, CAZ). The scale of development potential in the CAZ is determined more by transport capacity than accessibility, as accessibility is already excellent. The scale of development in the CAZ is also closely linked to economic conditions, such as the attractiveness of London as an investment destination at an international

level. Therefore, additional development potential in the CAZ is considered beyond the scope of this piece of work.

2. Methodology

In modelling terms the methodology involves defining a revised land-use scenario in LTS, running LTS and feeding the resulting public transport demand matrix into Railplan.

The following steps describe how the land-use scenario has been developed:

1. **‘Reference Case’ base:** The starting point is the 2031 reference case, which represents a consistent base line used across TfL’s strategic modelling
2. **Full development of Opportunity and Intensification Areas on potential Crossrail 2 alignments:** On a pan-London basis the sum of identified growth potential in London Plan Opportunity and Intensification Areas is greater than the expected total population and employment growth in London to 2031. Therefore, ‘reference case’ growth in Opportunity and Intensification Areas is constrained to conform to London’s overall forecast growth. This constraint has been removed for Opportunity and Intensification Areas located on the corridors served by Crossrail 2.
3. **Reflect revised Opportunity Area and Intensification Area growth assumptions:** Since publication of the London Plan much work has been undertaken developing Opportunity Area Planning Frameworks (OAPF) for individual Opportunity Areas. In some cases the scale of growth, or distribution of growth within the Opportunity Area, is refined through development of OAPFs. Therefore, growth assumptions in OAPFs that have been through public consultation or have been published since the writing of the London Plan have been reviewed and the scenario growth assumptions updated accordingly. This resulted in alterations to the distribution and scale of growth in the Upper Lea Valley Opportunity Area.
4. **Borough officer review of growth assumptions:** Meetings were held with borough officers on a sub-regional basis to assess the scale of potential further growth (upon a ‘baseline’ defined in stage 3 above) that could reasonably be expected to occur at or around Crossrail 2 stations in a 10 year period following opening (2041). Where boroughs responded with comprehensive projections within the catchment of potential Crossrail 2 stations these were implemented in the scenario and no further changes were made. This currently applies to LB Merton and LB Barking & Dagenham. Responses received from LB Haringey and LB Tower Hamlets cover some areas within the catchment of possible Crossrail 2 stations and not others. For those areas where data was provided no further changes were made in following stages. For those areas where no data was provided the following stages apply.

5. **Indicative further growth assumptions:** two-thirds of the population and employment growth in the period 2011 – 2031 (2031 population and employment as defined in stage 3 of this methodology) was added to the population and employment figures defined in Stage 3 of this methodology. The underlying assumption being that the construction of Crossrail 2 would ensure that the existing development plans to 2031 are achieved and that once Crossrail 2 is operating growth will continue at a slightly higher pace. This includes the likelihood that the vastly improved accessibility at and around Crossrail 2 stations in Inner and Outer London will result in an intensification of use of existing floorspace.
6. **Review of growth potential:** The London Riverside and Upper Lea Valley Opportunity Areas cover large tracts of land. Growth assumed in the period to 2031 is concentrated in pockets within these larger areas. Therefore, the scale and distribution of growth potential in these areas in a 'with Crossrail 2' scenario was reviewed. As a result, the scale of population growth in Enfield and Havering at locations close to potential Crossrail 2 stations was revised up by 10,000 and 15,000 respectively on those figures arrived at following step 5.

Notes:

It should be noted that not all of the population and employment will necessarily be accommodated in new developments. The improved accessibility provided by Crossrail 2 is likely to increase land values and result in more intensive use of existing floorspace.

3. Scenario specification

The following tables provide an overview at a borough level of the scale of growth assumptions proposed for the "Crossrail 2 with growth to 2041" sensitivity test. The reference case growth is for the entire borough, whereas the further growth includes only those areas near a proposed Crossrail 2 station. Therefore, the growth assumptions are broken down by section of route, to illustrate the growth assumed by route segment. There is no double counting in the below tables, e.g. if a borough appears in more than one table then the growth potential has been split accordingly by section of alignment.

Core north route

Borough	Reference Case Growth	Areas near Crossrail 2 stations only
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	2011 - 2031		Further 2011 - 2031, with full Opportunity / Intensification Area build-out		Further Growth: 2031 - 2041, with Crossrail 2		Net change from 2031 reference case	
	Population	Employment	Population	Employment	Population	Employment	Population	Employment
Islington	24,929	36,531	0	0	2,000	2,000	2,000	2,000
Hackney	41,578	16,470	3,500	-2,000*	17,000	5,000	20,000	3,000
Total	66,507	53,000	3,500	-2,000*	19,000	7,000	22,000	5,000

West Anglia Mainline branch, to Hertford East via Tottenham Hale

Borough / County	Reference Case Growth 2011 - 2031		Areas near Crossrail 2 stations only					
			Further 2011 - 2031, with full Opportunity / intensification Area build-out		Further Growth: 2031 - 2041, with Crossrail 2		Total change from 2031 reference case	
	Population	Employment	Population	Employment	Population	Employment	Population	Employment
Enfield	14,439	11,709	7,000	-4,500*	21,000	5,000	28,000	500
Haringey	35,153	11,019	4,000	1,500	9,000	2,000	13,000	4,000
Waltham Forest	19,825	5,222	3,000	0	3,500	500	6,500	500
Hertfordshire**	42,822	28,488	0	0	19,000	9,000	19,000	9,000
Total	112,239	56,438	14,000	-3,000*	52,500	16,500	66,500	14,000

Alexandra Palace branch, via Seven Sisters and Turnpike Lane

Borough	Reference Case Growth 2011 - 2031		Areas near Crossrail 2 stations only					
			Further 2011 - 2031, with full Opportunity / intensification Area build-out		Further Growth: 2031 - 2041, with Crossrail 2		Total change from 2031 reference case	
	Population	Employment	Population	Employment	Population	Employment	Population	Employment
Haringey	35,153	11,019	500	0	15,000	4,000	15,500	4,000

Borough / County	Reference Case Growth 2011 - 2031		Areas near Crossrail 2 stations only					
			Further 2011 - 2031, with full Opportunity / intensification Area build-out		Further Growth: 2031 - 2041, with Crossrail 2		Total change from 2031 reference case	
	Population	Employment	Population	Employment	Population	Employment	Population	Employment
Barking & Dagenham	60,116	4,720	3,000	4,000	4,000	1,000	7,500	5,000
Hackney	41,578	16,470	500	500	2,500	1,000	2,500	1,000
Havering	41,126	6,733	500	4,500	21,000	5,000	21,500	9,500
Newham	95,135	19,370	12,000	30,500	34,000	28,000	46,000	58,500
Tower Hamlets	93,537	73,935	0	4,500	11,000	2,000	11,500	6,500
Essex**	23,585	10,597	0	0	12,000	4,500	12,000	4,500
Total	355,077	131,826	16,000	44,000	84,500	41,500	101,000	85,000

Eastern branch option to Grays, via Barking and Stratford

Southern route

Borough /	Reference Case Growth	Areas near Crossrail 2 stations only
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County	2011 – 2031		Further 2011 – 2031 growth (full Opportunity / Intensification Area build-out)		Further Growth: 2031 - 2041, with Crossrail 2		Net change from 2031 reference case	
	Population	Employment	Population	Employment	Population	Employment	Population	Employment
Kensington	17,830	21,760	0	0	500	1,500	500	1,500
Kingston	10,949	4,716	0	0	6,500	2,000	6,500	2,000
Merton	2,851	4,653	1,500	0	2,500	6,000	4,000	6,000
Richmond	8,673	4,872	0	0	3,000	1,500	3,000	1,500
Wandsworth	35,742	10,162	0	0	5,500	2,500	5,500	2,500
Surrey**	54,222	44,074	0	0	20,500	16,000	20,500	16,000
Total	130,900	95,584	1,500	0	38,500	29,500	39,000	29,500

Notes:

* In developing the Upper Lea Valley Opportunity Area Planning Framework, growth was refocused towards residential development, with lower growth in employment. As a result, some boroughs have lower employment growth with full Opportunity Area build-out than in the reference case.

** The data relating to county councils outside of London relates only to areas close to London, not the entire county.

London-wide and study area context

	Reference Case Growth 2011 - 2031		Areas near Crossrail 2 stations only					
			Further 2011 – 2031 growth (full Opportunity / Intensification Area build-out)		Further Growth: 2031 - 2041, with Crossrail 2		Net change to 2041, from 2031 Reference Case	
	Population	Employment	Population	Employment	Population	Employment	Population	Employment
GLA area	1,072,088	654,578	37,000	39,000	157,500	68,000	194,500	107,000
Whole study area	1,192,718	737,738	37,000	39,000	209,500	97,500	246,000	136,500

The total growth in areas near Crossrail 2 stations detailed above is hypothetical as in practice only 2 out of the 3 identified routes to the north / east of the CAZ are likely to be pursued. The maximum growth in 10 years following Crossrail 2 opening within the catchment area of stations is anticipated if the eastern branch option and West Anglia Mainline branch option are chosen. In the GLA area this would equate to population growth of around 180,000 and employment growth of around 100,000.

The London Plan forecasts annual population and employment growth of around 50,000 and 32,000 respectively in the GLA area over the period 2007 to 2031. If the same rate of growth were to continue to 2041, then the proposed scenario would represent around one-third of London's population growth in the period 2031 - 2041 being located within the broad Crossrail 2 catchment area. The scenario also represents around one-third of employment growth in the period 2031 – 2041 to be located in the broad catchment of Crossrail 2 stations in inner and outer London. The majority of employment growth is focussed in and around the Olympic Park. Further employment growth would be expected in the catchment area of Crossrail 2 stations in the CAZ.

4. Interpretation

Of the three branch options under consideration in the north / east it is anticipated that it will only be viable to serve two with a high enough frequency to achieve the improvement in accessibility required to meet the Crossrail 2 objectives.

The easterly route option serving Stratford and beyond has the greatest further growth potential. In particular, improved accessibility to the north-west of the Olympic Park area (around Hackney Wick and the media centre) and Stratford International could transform the area into a major employment centre, in a consistent manner with OAPF and Newham vision for the area.

The route option through the Upper Lea Valley also offers significant growth potential, albeit more residential in nature than the easterly route option. The alignment through more established areas to Alexandra Palace also has growth potential, but to a lesser extent than the other route options.

Crossrail 2 growth potential to the south of central London is lower than in the north. Indeed, much of the growth potential identified on the southern alignment is in the areas of Surrey bordering the GLA area. However, there is likely to be significant further growth potential in areas of Surrey and Hampshire as a result of improved 'outer' South West Trains (SWT) services. This exercise has focussed on growth potential within the catchment areas of Crossrail 2 stations, and therefore has not considered the growth potential created by enhanced longer distance SWT services. TfL' Land-Use Transport Interaction model (Lon-LUTI) has identified that growth potential in these areas could be significant.

Michael Edwards, Senior Lecturer in the Economics of Planning, Bartlett School, UCL (and Just Space network)

Had I been able to come I would have wanted to prepare a short statement on the following points:

1. The issues surrounding "regeneration benefits" are very opaque. There is strong evidence that what we call "regeneration" increasingly benefits land and property owners and richer sections of the community at the expense of the low- and middle-income Londoners in whose name Regeneration is justified. Evidence presented by Just Space and others to the EiP on the 2009 draft replacement London Plan (now adopted as the 2011 London Plan) made this point very forcefully and carried great weight with the Panel - see their report §2.94-2.103. A subsequent Research Report by the GLA (WP 48 by Ennis and Douglass) also concluded that we lack the evidence to conclude that "regeneration" does benefit deprived populations.

The Committee should thus discount claims made for "regeneration benefits": there may be benefits for property development and for property owners but the effects on the general population through rising rents and prices consequent on accessibility improvements will probably be negative because of the displacement and income effects.

2. It is very easy, in the current policy context, for a transport scheme radically to amplify displacement and 'gentrification' effects. The cautionary tale here is Dalston Junction. [I have to declare an interest here because I played a small role in the adoption of what became the Overground ring (working with my colleague Professor Sir Peter Hall and with Drummond Robson I helped get this project on the GLA agenda in 2000 Hall, P, Edwards, M, Robson, D (1999), *London's Spatial Economy: the dynamics of change* London, London Development Partnership (LDP) and Royal Town Planning Institute. Eprint free at <http://discovery.ucl.ac.uk/1369585/>)] The Overground ring is a great success but what went wrong at Dalston was a TfL decision to build a very high-cost / high value transport interchange which has led TfL to develop a largely private-market residential scheme to cover its massive costs in decking over the station. The potential for large scale social housing expansion there to meet desperate regeneration needs has thus been lost. The Committee should confer with Planning and Housing Committees to ensure that, whatever does get built, channels its benefits to intended recipients and is not captured and diverted into property-owners' receipts.

3. Thirdly I would strongly support the "Rod Eddington" position, that smaller-scale transport investments (of which TfL has many in its bottom drawer) are likely to yield much greater net benefits than massive tunnelling projects. Furthermore suburban orbital bus and cycling investments are likely to be highly beneficial to London residents and businesses and to have the best environmental payoffs too. Yet more radial lines would serve further to centralise London's employment and property values.

If you or the committee would like us to expand on these points please let me know.

Following the extraordinary success of TFL's Overground network, which has attracted passengers far in excess of the computer-model forecasts, London's next infrastructure priority should be to create a second Outer Orbital network.

Orbirail, the continuous circular line from Clapham Junction back to Clapham Junction, completed the present Overground system on 9 December. The first priority should be two further Overground investments: electrification of the line from Gospel Oak to Barking, allowing a continuous outer circular service to run around the northern half of the system from Richmond to Barking, and then extension from Richmond via Kingston to Wimbledon, there connecting with Croydon Tramlink. (The trains could reverse at a new siding south of Earlsfield station).

The second priority would be to extend the Tramlink as London's first true Tram-Train system, running on the same tracks (as in German cities) from Elmers End to Lewisham, there connecting with the DLR and thus completing an outer circle via Stratford.

The third priority would be to extend the Overground from Acton-Old Oak to Cricklewood-Brent Cross, soon to become a major new outer London centre rivalling Shepherd's Bush-White City, Stratford and the new Croydon Centre, linking it there to a new Bus Rapid Transit System on the North Circular Road all the way round to Barking and Ilford.

None of these schemes involves mega-expenditure. They just involve upgrading infrastructure that is already there. What's needed is the same imagination that fuelled Tram-Trains in Karlsruhe and Kassel, and BRT schemes in cities like Bogotá and Brisbane.
END

Needless to say, all the others went for Crossrail 2.

Tim Bellenger, Director, Policy and Investigation, London TravelWatch

London TravelWatch is generally happy with the concept of Crossrail 2 – the previously safeguarded Chelsea – Hackney line, on account of its' benefits in terms of reducing overcrowding on the current network, providing additional capacity for growth, and enabling regeneration to take place.

The planning for it needs to take account of the proposals for HS2 in the Euston – St.Pancras area, and what proposals emerge for airport expansion either at Stansted or at Heathrow.

In terms of questions that need to be asked about the two options that are being put forward I would suggest the following :-

1. How will existing frequencies of trains be maintained on the sections of route being 'relieved' e.g. Wimbledon to Waterloo and Seven Sisters – Hackney – Liverpool Street?
2. What accessibility improvements would be gained on existing lines where there is an interchange i.e. Alexandra Palace, Turnpike Lane, Seven Sisters, Angel, Euston and Tooting Broadway?

3. If the Metro option is chosen will Clapham Junction and Seven Sisters / Tottenham Hale / Turnpike Lane be able to cope with a vast increase in interchanging passengers? (This was given as a reason for not extending the Battersea Northern Line branch to Clapham Junction).
4. What are the likely impacts on / for road transport of these proposals?
5. What would be the consequences of building HS2 without Crossrail 2?

Stephen Colebourne

Hi Caroline,

I'm twitter user @ukrailblog who tweeted to you this morning. We've also met a couple of times before wrt some ideas I had particularly on proposals in London.

The Crossrail 2 proposals as currently outlined do concern me on a number of grounds in South West London (I'm also concerned about NW London, but know the area less well). In particular:

- there has been no published information on how Earlsfield will be served. Currently, every train from Wimbledon on the slow lines stops there, but all those trains would be diverted to the new tunnel via Tooting leaving Earlsfield with (in all probability) a reduced service.

- there has been no discussion of changing commute patterns. Current commuters from Epsom/Kingston/Wimbledon have a service to Waterloo from where many walk to their offices. Others use the tube to travel on to Canary Wharf, or via the Jubilee, Northern or Victoria lines to the West End. CR2 changes this so all trains run to Victoria and Tottenham Court Road rather than Waterloo. This will seriously change the lives of many for what they may perceive to be the worse. TfL argue that Canary Wharf will be accessed by changing at Tottenham Court Road, yet Crossrail 1 is now forecast to be effectively full by 2031, making this not a viable option.

- the Crossrail 2 scheme is currently targetted to provide a maximum of 9 extra tph for long distance services by separate work (not included in the main budget) of a single extra track in the Raynes Park area. This will be expensive and difficult to build, and disruptive to existing services. This is not a sensible use of public money, as the RUS indicates that it is capacity on the long-distance services that is the real pinch-point in the SW, not capacity on the London suburbans. Clearly, TfL has less interest in long-distance services, but the Government will probably think differently, putting a block on CR2.

- the totality of the proposals for long-distance will still have every last train path into London used. Everything will be at maximum capacity and full. This is surely nonsense, as it means that the slightest delay or disruption has huge knock on effects.

I've drawn up an alternative plan that is cheaper and solves the problems above:

<http://ukrail.blogspot.co.uk/2013/02/crossrail-ssw.html>

It also enables relief of East Croydon by diverting some trains from Horsham via Wimbledon:

<http://ukrail.blogspot.co.uk/2013/03/mole-valley-link.html>

The Crossrail SSW plan is capable of significant tweaking (based on how much you want to spend). But the key is to provide a new non-stop no-station tunnel from Esher to Clapham Junction. This then frees up the existing lines for a more balanced, resilient and reliable inner and outer suburban service.

While I will be responding to the consultation, I'd love to discuss these matters further on the political side to influence the Transport Committee's investigations. In my opinion, TfLs current scheme is too London focussed to gain the government funding necessary for it to go ahead, which I reckon should concern the committee.

Stephen