

### *H7. A312 – M4 to Hayes Road Link and Junction Capacity*

- Status: Proposed capacity enhancement of A312 link and the M4 and Bulls Bridge (Hayes Road) Junction
- Description: Enhancements to improve journey time reliability and reduce delays at junctions
- Potential influence on Growth Areas/Major Town Centres: Harrow & Wealdstone and Southall to Heathrow and Hounslow

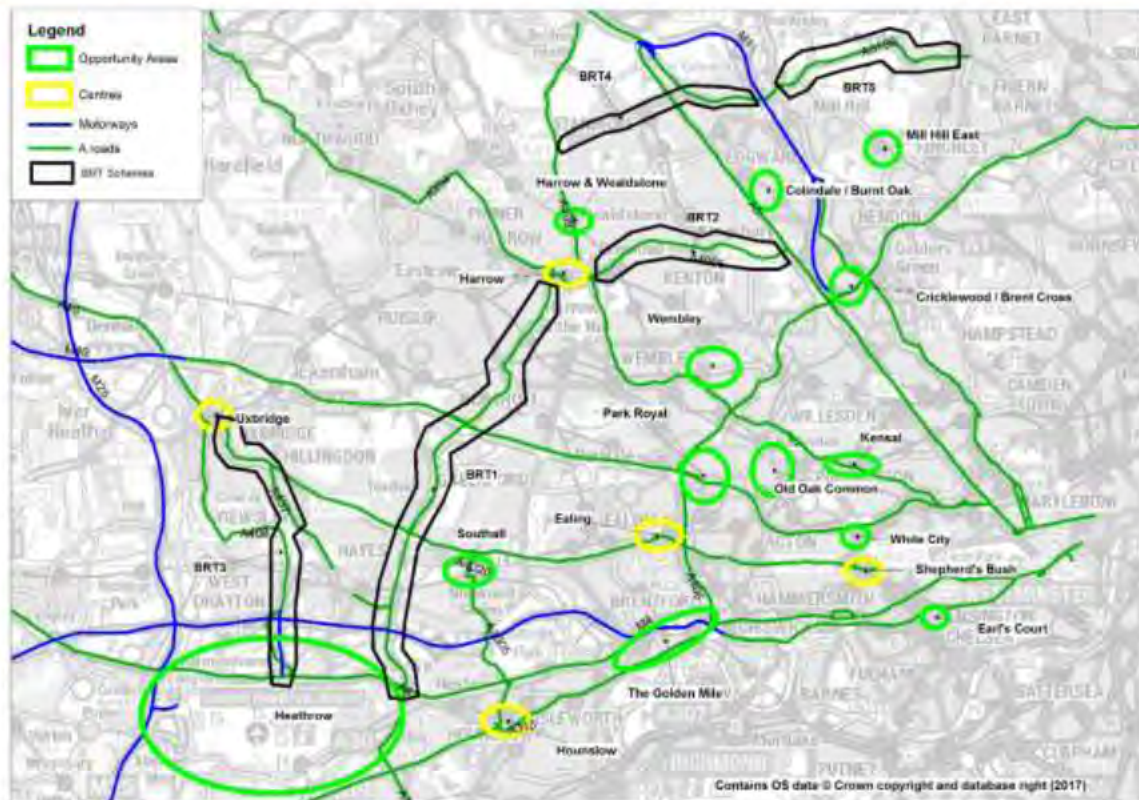
## **Orbital Bus Rapid Transit Schemes**

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### *Overview*

- 3.19 The focus of this study is on enhancing strategic sub-regional transport infrastructure across West London and so has a primary focus upon road and rail. Whilst bus-based public transport provision is usually focused upon local connectivity, given some of the restrictions in the ability to deliver new rail-based public transport solutions there is considered to be merit in considering bus-based solutions, as long as they are substantive in nature and can be deemed to contribute on a sub-regional level.
- 3.20 Consideration has been given to potential bus-based rapid transit systems in locations where the provision of new rail connections would be challenging. These would be schemes that utilise some or part of the existing highway network to provide bus connectivity between Growth Areas and Major Town Centres. To be classified as sub-regional in nature, it is considered that these services must be direct and either segregated or prioritised to ensure they are high speed. Types of measures could therefore include dedicated guided busways or priority bus infrastructure, accompanied by direct point-to-point inter-urban areas bus services.
- 3.21 Based on the evidence base, the primary focus of these types of services would be along the:
- the A312 / A4006 corridor (Heathrow – Harrow – Brent Cross);
  - the A408 / A437 / A4020 (Heathrow – Uxbridge); or
  - the A410 / A41 / A5109 corridor (Harrow – Edgware – East Barnet)
- 3.22 These corridors have limited current, or potential future, rail provision and so bus-based rapid transit schemes may offer an alternative public transport solution.
- 3.23 Significant proportions of both of these road corridors are dual carriageway in nature, or at least provide dual traffic lanes in either direction. This provides potential for allocation of some road-space to bus provision, albeit that this could impact upon general traffic.
- 3.24 The southern part of the A312 corridor and the A408 act as expressways, with the alignment set apart from surrounding built-up areas, offering potential for expansion of capacity (discussed further below under the orbital road scheme section). For the section of A312 leading into Harrow, as well as much of the A4006 and A410, the road corridors are embedded within residential areas, restricting the opportunities for dedicated busway / bus priority schemes.
- 3.25 For the purposes of the scheme development and subsequent appraisal process, five conceptual bus rapid transit corridors have been identified for consideration. These are set out in Figure 3.2 and described in further detail below. Notwithstanding the appraisal process in Section 4, each of these corridors would require detailed assessment to determine the engineering opportunities for delivering schemes.

Figure 3.3 Potential Bus Rapid Transit Corridors



*BRT1. A312 – Heathrow to Harrow*

- Status: Proposal for dedicated bus provision
- Description: High speed, direct bus-based transit, with dedicated bus infrastructure
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Heathrow to Harrow, with additional potential to provide services to Southall

*BRT2. A4006 – Harrow to Cricklewood/Brent Cross*

- Status: Proposal for dedicated bus provision
- Description: High speed, direct bus service, with dedicated bus priority
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Harrow to Cricklewood/Brent Cross and Collindale/Burnt Oak

*BRT3. A408/A437/ A4020 – Heathrow to Uxbridge*

- Status: Proposal for dedicated bus provision
- Description: High speed, direct bus-based transit, with dedicated bus infrastructure
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Heathrow to Uxbridge

*BRT4. A410/A41 – Harrow & Wealdstone to Edgware*

- Status: Proposal for dedicated bus provision
- Description: High speed, direct bus service, with dedicated bus priority
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Harrow & Wealdstone to Edgware and potential link to Mill Hill East

*BRT5. A5109 – Edgware to East Barnet*

- Status: Proposal for dedicated bus provision
- Description: High speed, direct bus service, with dedicated bus priority
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Edgware towards New Southgate

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## Long-List of Scheme Measures

- 3.26 Based upon the sets of rail, bus rapid transit, and road schemes outlined above, the following long-list of schemes was taken forward into the scheme appraisal process.

**Table 3.1 Long-List of Potential Sub-regional Transport Schemes**

R1	Denham/West Ruislip – Uxbridge High Street
R2	Uxbridge Vine Street – West Drayton
R3	West Drayton – Colnbrook - Staines
R4	Ruislip Gardens - Ickenham
R5	Greenford – West Ealing
R6	Southall – Brentford Goods
R7	Edgware – Mill Hill East
R8	Finsbury Park – Highgate – Alexandra Palace
R9	Neasden Junction - Neasden South Junction
R10	Dudding Hill Lines (Cricklewood Acton Wells Junction)
R11	Acton Canal Wharf Junction
R12	Acton East Junction
R13	Junction Road Junction to Carlton Road Junction
R14	Harringay Junction – Harringay Park Junction
R15	Kew East Junction / Old Kew Junction Chord
R16	Heathrow Southern Rail Access
H1	A406 – New Southgate – Colney Hatch
H2	A406 – Brent Cross (A5 to A1)
H3	A406 – Brent Park
H4	A406 – Hangar Lane Junction
H5	A406 – Hangar Lane (A40) to Uxbridge Road (A4020)
H6	A406 – M4 Junction
H7	A312 – M4 to Hayes Road
BRT1	A312 – Heathrow to Harrow
BRT2	A4006 – Harrow to Cricklewood/Brent Cross
BRT3	A408/A437/ A4020 – Heathrow to Uxbridge
BRT4	A410/A41 – Harrow & Wealdstone to Edgware
BRT5	A5109 – Edgware to East Barnet



## 4. Scheme Option Appraisal

### Appraisal Framework

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- 4.1 This section examines each of the individual schemes on the 'long-list' to determine the degree to which they deliver against the primary objectives of enhancing orbital connectivity, whether they will deliver positive impacts upon transport and the economy, and whether they are physically and/or financially deliverable.

#### Overarching Appraisal Criteria

- 4.2 A set of objectives appraisal criteria has been established based upon the underlying issues and opportunities identified within the Evidence Base, as well as requirements for deliverability. The Evidence identified three key issues, summarised in the report in Section 2, namely:

- The impact of highway congestion on strategic orbital routes
- The lack of strategic orbital rail connections
- The lack of connection between some of the Growth Areas and Town Centres

- 4.3 On the basis of these three issues, as well as the requirements for deliverability of schemes, a set of five objective appraisal criteria has been developed against which to appraise each scheme:

- 1) **Economic impact:** is the scheme likely to have a positive impact upon the sub-regional economy, either through reducing journey times, congestion or improving reliability?
- 2) **Orbital connectivity:** does the scheme enhance orbital connections across the West London Sub-region?
- 3) **Growth Area Connectivity:** does the scheme enhance connectivity between Growth Areas or with Major Town Centres?
- 4) **Physical deliverability:** can the scheme be delivered easily in physical terms e.g. is land available?
- 5) **Value for Money:** what is the cost of the scheme likely to be in relation to the scale of the potential impacts?

- 4.4 Each scheme has been appraised against an individual appraisal scale based upon the following criteria:

**Economic Impact:** whether the scheme will reduce journey times (e.g. reduce vehicle delays or provide a more direct or faster service) or improve the reliability of journey times so as to provide a positive economic impact in terms of direct transport benefits or wider benefits to the economy (e.g. enhance agglomeration – business-to-business connections)

- Scale: +3 (large positive impact) to 0 (neutral impact)

**Orbital Connectivity:** whether the scheme enhances orbital connectivity across the West London Sub-region, with specific reference to the importance of rail connections

- Scale: +3 (significant enhancement to orbital connectivity) to 0 (no notable improvement to orbital connectivity)



**Growth Area Connectivity:** whether the scheme enhances connectivity between the growth areas and or connections from the growth areas to the major town centres

- Scale: +3 (improved connectivity between multiple locations) to 0 (no notable improvement to connectivity)

**Physical Deliverability:** the degree to which the scheme is physically deliverable

- Scale: +2 (relatively easy to deliver) to -3 (practically undeliverable)

**Value for Money:** the likely expense of the scheme relative to the scale of potential benefits

- Scale: +2 (excellent value for money) to -2 (poor value for money)

- 4.5 In addition to the key appraisal criteria, an assessment of each scheme has been undertaken to determine whether it is **dependent** on being delivered alongside another scheme in order to provide any positive benefits and/or whether it is **complementary** to other proposed schemes.
- 4.6 At this stage, no detailed assessment of the responsibilities for delivery have been undertaken; however, the majority of the schemes would be subject to TfL jurisdictions, in terms of rail provision, bus rapid transit operations, or enhancements to the TfL Road Network (TLRN), which includes the whole of the A406 and the section of the A312 between the A40 and the A315.

## Scheme Appraisal

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- 4.7 Each set of schemes identified from the 'long-list' has been appraised against the criteria set out above.
- 4.8 It is important to recognise that the allocated scores are based solely on the ability for a scheme measures to deliver against the specified sub-regional criteria and whether it will enhance orbital connectivity across the sub-region. A low score is not indicative of a poor scheme, merely that it doesn't rank as highly in terms of maximising sub-regional orbital connectivity between growth areas.
- 4.9 The allocated scoring values for each scheme have been generated by applying the following:
- the information set out within the Evidence Report
  - the degree to which each scheme is consider to provide a sub-regional benefit
  - the degree to which the scheme is considered to meets the aims of the project to unlock growth constraints
  - strategic transport modelling outputs relating to passenger and vehicle flows and congestion
  - future growth predictions
  - professional unbiased review applied at a sub-regional level, without individual stakeholder preferences



## Rail Schemes

4.10 The appraisal of each individual rail scheme is set out below.

### *R1. Denham/West Ruislip – Uxbridge High Street*

- **Dependent:** no
- **Complementary:** with R2 would provide full north-south connection between Chiltern and West Coast Mainlines
- **Economic Impact:** +1 (some additional accessibility to Uxbridge permitted)
- **Orbital Connectivity:** +1 (a new but short, orbital rail connection)
- **Growth Area Connectivity:** 0 (limited additional connections)
- **Physical Deliverability:** -1 (some challenges with condition of surrounding land)
- **Value for Money:** -2 (high cost, with limited benefits)

### *R2. Uxbridge Vine St – West Drayton*

- **Dependent:** No
- **Complementary:** with R1 would provide full north-south connection between Chiltern and West Coast Mainlines
- **Economic Impact:** +2 (provides a connection to Heathrow)
- **Orbital Connectivity:** +2 (a new orbital rail connection)
- **Growth Area Connectivity:** +2 (fills one of the key identified connectivity gaps)
- **Physical Deliverability:** -3 (Formation almost entirely built over)
- **Value for Money:** -1 (despite potential benefits would be extremely high costs)

### *R3. West Drayton – Colnbrook - Staines*

- **Dependent:** No
- **Complementary:** With R2 could provide extended north-south rail connection
- **Economic Impact:** +1 (limited impact within West London)
- **Orbital Connectivity:** +2 (a new orbital rail connection)
- **Growth Area Connectivity:** 0 (does not support connections between growth areas)
- **Physical Deliverability:** -1 (partially open; however, challenges at southern end)
- **Value for Money:** -1 (relatively expensive for limited West London returns)

### *R4. Ruislip Gardens – Ickenham*

- **Dependent:** No
- **Complementary:** No
- **Economic Impact:** +1 (some additional accessibility to Uxbridge permitted)
- **Orbital Connectivity:** +1 (a new but very short, orbital rail connection)
- **Growth Area Connectivity:** 0 (limited additional growth area connections)
- **Physical Deliverability:** 0 (impacts on Ruislip Depot)
- **Value for Money:** -1 (limited benefits, despite relatively low costs)

#### *R5. Greenford – West Ealing*

- Dependent: No
- Complementary: No
- Economic Impact: 0 (limited additional accessibility permitted)
- Orbital Connectivity: +2 (a new orbital rail connection)
- Growth Area Connectivity: 0 (limited additional growth area connections)
- Physical Deliverability: +2 (existing line)
- Value for Money: +1 (very low cost, but limited benefits)

#### *R6. Southall – Brentford Goods*

- Dependent: No
- Complementary: No
- Economic Impact: +1 (reduced journey times but limited in geographic scope)
- Orbital Connectivity: +1 (a new orbital rail connection but limited in scope)
- Growth Area Connectivity: +2 (connection from Southall to The Golden Mile)
- Physical Deliverability: +2 (existing line)
- Value for Money: +1 (low cost, positive benefits)

#### *R6a. Southall – Brentford Goods – Brentford/Hounslow*

- Dependent: (R6)
- Complementary: (R6)
- Economic Impact: +2 (reduced journey times for a number of movements)
- Orbital Connectivity: +3 (a new orbital rail connection between multiple locations)
- Growth Area Connectivity: +3 (connections from Southall to The Golden Mile/Hounslow)
- Physical Deliverability: -2 (link to SWT line challenging to construct)
- Value for Money: 0 (high cost & disruption of scheme could outweigh benefits)

#### *R7. Edgware – Mill Hill East*

- Dependent: No
- Complementary: No
- Economic Impact: +1 (reduced journey times to Edgware)
- Orbital Connectivity: +2 (new orbital rail link)
- Growth Area Connectivity: +2 (connects Mill Hill East to Edgware)
- Physical Deliverability: -3 (significant challenges with both connection over M1 and sections of route that have been developed for housing)
- Value for Money: -1 (positive impacts, but extremely expensive scheme)

#### *R8. Finsbury Park – Highgate – Alexandra Palace*

- Dependent: No
- Complementary: No
- Economic Impact: +2 (reduced journey times Finsbury Park to Highgate)
- Orbital Connectivity: +1 (a new, but limited, orbital rail connection)
- Growth Area Connectivity: 0 (limited additional growth area connections)
- Physical Deliverability: 0 (alignment remains but challenges to join with other lines)
- Value for Money: 0 (expensive and limited benefits to West London)



#### *R9. Neasden Junction - Neasden South Junction*

- **Dependent:** Requires R10
- **Complementary:** R10 and, to a lesser degree, R12 and R15
- **Economic Impact:** +1 (reduced journey times from Wembley to south)
- **Orbital Connectivity:** +1 (permits some additional orbital movements)
- **Growth Area Connectivity:** +1 (permits some additional connectivity from Wembley to OPDC)
- **Physical Deliverability** +1 (existing tracks but constrained junction)
- **Value for Money:** +1 (limited benefits but low cost)

#### *R10. Dudding Hill Lines (Cricklewood to Acton Wells Junction)*

- **Dependent:** No
- **Complementary:** R9, R11, R12, R15
- **Economic Impact:** +3 (reduced journey times from Barnet to Brent/Ealing)
- **Orbital Connectivity:** +3 (significant new orbital rail connection)
- **Growth Area Connectivity:** +3 (multiple connections to growth areas)
- **Physical Deliverability** 0 (track in place but additional infrastructure required and some issues with arrangements around Cricklewood)
- **Value for Money:** +1 (existing alignment reduces costs and potentially significant benefits)

#### *R11. Acton Canal Wharf Junction*

- **Dependent:** R10
- **Complementary:** R10 and, to a lesser degree, R12, R15
- **Economic Impact:** +1 (reduced journey times from Harrow & Wealdstone to south)
- **Orbital Connectivity:** +1 (permits some additional orbital movements)
- **Growth Area Connectivity:** 0 (limited impact)
- **Physical Deliverability** 0 (in situ but would require flyover to connect to Watford – Euston Overground Line)
- **Value for Money:** -1 (potentially expensive for limited benefits)

#### *R12. Acton East Junction*

- **Dependent:** No
- **Complementary:** R10 and, to a lesser degree, R9, R11
- **Economic Impact:** +1 (reduced journey times to Ealing)
- **Orbital Connectivity:** +1 (permits some additional orbital movements)
- **Growth Area Connectivity:** +1 (additional connection to Ealing from growth areas)
- **Physical Deliverability** +1 (in situ, open to freight)
- **Value for Money:** +1 (low cost, with some potential benefits)

### *R13. Junction Road Junction to Carlton Road Junction*

- Dependent: R14
- Complementary: R14
- Economic Impact: +1 (reduced journey time for movements to Cricklewood)
- Orbital Connectivity: +1 (permits some additional orbital movements)
- Growth Area Connectivity: +1 (additional connection to Cricklewood from New Southgate with R14)
- Physical Deliverability: +2 (in situ, open to freight)
- Value for Money: +1 (low cost but limited benefits)

### *R14. Harringay Junction – Harringay Park Junction*

- Dependent: R13
- Complementary: R13
- Economic Impact: +1 (reduced journey time for some movements)
- Orbital Connectivity: +1 (permits some additional orbital movements)
- Growth Area Connectivity: +1 (additional connection to Cricklewood from New Southgate with R13)
- Physical Deliverability: +2 (in situ, open to freight)
- Value for Money: +1 (low cost but limited benefits)

### *R15. South Action to Kew East Junction / Old Kew Junction Chord*

- Dependent: No
- Complementary: R10 and, to a lesser degree, R9
- Economic Impact: +1 (reduced journey times for movements to Hounslow)
- Orbital Connectivity: +1 (permits some additional orbital movements)
- Growth Area Connectivity: +2 (provide direct connection from OPDC to The Golden Mile and Hounslow)
- Physical Deliverability: +2 (in situ)
- Value for Money: +2 (low costs and positive benefits)

### *R16. Heathrow Southern Access*

- Dependent: No
- Complementary: No
- Economic Impact: +3 (potential widespread reduction in access times to Heathrow)
- Orbital Connectivity: +1 (new rail connection, but limited for West London)
- Growth Area Connectivity: +1 (improved connectivity from Heathrow to Hounslow)
- Physical Deliverability: -1 (range of engineering challenges for delivery)
- Value for Money: 0 (potentially very important scheme but limited benefit to West London as a whole)



## Road Schemes

4.11 The appraisal of each individual road scheme is set out below.

### H1. A406 – New Southgate – Colney Hatch

- Dependent: No
- Complementary: All A406 scheme would complement each other, with those in closest proximity offering the greatest combined benefits
- Economic Impact: +1 (improved orbital vehicle journey time reliability)
- Orbital Connectivity: +1 (no new, but enhanced connectivity provided)
- Growth Area Connectivity: +1 (connectivity from New Southgate to Cricklewood)
- Physical Deliverability: -1 (constrained urban environment)
- Value for Money: 0 (value for money dependent upon scheme costs)

### H2. A406 – Brent Cross (A5 to A1)

- Dependent: No
- Complementary: All A406 scheme would complement each other, with those in closest proximity offering the greatest combined benefits
- Economic Impact: +2 (signification reductions in orbital vehicle journey times)
- Orbital Connectivity: +1 (no new, but enhanced connectivity provided)
- Growth Area Connectivity: +2 (connectivity from Cricklewood to east and south west)
- Physical Deliverability: -1 (large-scale infrastructure project)
- Value for Money: +1 (potential significant benefits but expensive scheme)

### H3. A406 – Brent Park

- Dependent: No
- Complementary: All A406 scheme would complement each other, with those in closest proximity offering the greatest combined benefits
- Economic Impact: +1 (reductions in orbital vehicle journey times)
- Orbital Connectivity: +1 (no new, but enhanced connectivity provided)
- Growth Area Connectivity: +2 (connectivity between Barnet growth areas and OPDC)
- Physical Deliverability: -1 (constrained land availability and railway crossing)
- Value for Money: +1 (potential significant benefits but expensive scheme)

### H4. A406 – Hangar Lane Junction

- Dependent: No
- Complementary: All A406 scheme would complement each other, with those in closest proximity offering the greatest combined benefits
- Economic Impact: +2 (significant reductions in orbital vehicle journey times)
- Orbital Connectivity: +1 (no new, but enhanced connectivity provided)
- Growth Area Connectivity: +2 (connections from Wembley/OPDC to The Golden Mile)
- Physical Deliverability: -1 (major infrastructure scheme in urban area with rail line)
- Value for Money: +1 (potential significant benefits but expensive scheme)



#### *H5. A406 – Hangar Lane (A40) to Uxbridge Road (A4020)*

- **Dependent:** No
- **Complementary:** All A406 scheme would complement each other, with those in closest proximity offering the greatest combined benefits
- **Economic Impact:** +1 (reductions in orbital vehicle journey times)
- **Orbital Connectivity:** +1 (no new, but enhanced connectivity provided)
- **Growth Area Connectivity:** +2 (connections from Wembley/OPDC to The Golden Mile)
- **Physical Deliverability:** -1 (constrained urban environment)
- **Value for Money:** 0 (value for money dependent upon scheme costs)

#### *H6. A406 – M4 Junction*

- **Dependent:** No
- **Complementary:** All A406 scheme would complement each other, with those in closest proximity offering the greatest combined benefits
- **Economic Impact:** +1 (reductions in orbital vehicle journey times)
- **Orbital Connectivity:** +1 (no new, but enhanced connectivity provided)
- **Growth Area Connectivity:** +1 (connections from Wembley/OPDC to The Golden Mile)
- **Physical Deliverability:** -1 (major infrastructure scheme in urban area with rail line)
- **Value for Money:** 0 (value for money dependent upon scheme costs)

#### *H7. A312 – M4 to Hayes Road*

- **Dependent:** No
- **Complementary:** No
- **Economic Impact:** +2 (potential reduction in delays and improvement in reliability of journey times)
- **Orbital Connectivity:** +1 (no new, but enhanced connectivity provided)
- **Growth Area Connectivity:** +2 (Connectivity from Harrow & Wealdstone and Southall to Heathrow and Hounslow)
- **Physical Deliverability:** -1 (constraints to land availability and rail/river crossings)
- **Value for Money:** +1 (significant potential benefits should off-set costs)

### **Bus Rapid Transit Schemes**

4.12 The appraisal of each individual bus rapid transit scheme is set out below.

#### *BRT1. A312 – Heathrow to Harrow*

- **Dependent:** No
- **Complementary:** BRT2
- **Economic Impact:** +1 (reduction in journey times for range of movements)
- **Orbital Connectivity:** +1 (enhanced public transport provision)
- **Growth Area Connectivity:** +1 (connectivity from Heathrow to Harrow)
- **Physical Deliverability:** 0 (high capacity road corridor provides some scheme Opportunities but limited available additional land)
- **Value for Money:** +1 (potential for benefits to outweigh costs)



*BRT2. A4006 – Harrow to Cricklewood/Brent Cross*

- Dependent: No
- Complementary: BRT1
- Economic Impact: +1 (reduction in journey times for range of movements)
- Orbital Connectivity: +1 (enhanced public transport provision)
- Growth Area Connectivity: +1 (connectivity from Harrow to Cricklewood)
- Physical Deliverability: -1 (restrictive urban environment and limited road space)
- Value for Money: 0 (benefits unlikely to outweigh scheme costs)

*BRT3. A408/A437/ A4020 – Heathrow to Uxbridge*

- Dependent: No
- Complementary: No
- Economic Impact: +1 (reduction in journey times for range of movements)
- Orbital Connectivity: +1 (enhanced public transport provision)
- Growth Area Connectivity: +1 (connectivity from Heathrow to Uxbridge)
- Physical Deliverability: 0 (some high capacity element of road corridor that could provide opportunities for scheme delivery)
- Value for Money: +1 (potential for benefits to outweigh costs)

*BRT4. A410/A41 – Harrow & Wealdstone to Edgware*

- Dependent: No
- Complementary: BRT5
- Economic Impact: +1 (reduction in journey times for range of movements)
- Orbital Connectivity: +1 (enhanced public transport provision)
- Growth Area Connectivity: +1 (connectivity from Harrow & Wealdstone to Edgware and potential link to Mill Hill East)
- Physical Deliverability: -1 (restrictive urban environment and limited road space)
- Value for Money: 0 (benefits unlikely to outweigh scheme costs)

*BRT5. A5109 – Edgware to East Barnet*

- Dependent: No
- Complementary: BRT4
- Economic Impact: +1 (reduction in journey times for range of movements)
- Orbital Connectivity: +1 (enhanced public transport provision)
- Growth Area Connectivity: 0 (limited impact)
- Physical Deliverability: -1 (restrictive road capacity)
- Value for Money: 0 (limited benefits relative to costs)

## Appraisal Summary

- 4.13 Table 4.1 provides an overarching summary of the scoring for each individual scheme, along with their inter-dependencies and potential complementary nature.

Table 4.1 Summary of the Appraisal of Long-list of Interventions

		Dependant	Complementary	Economic	Orbital Connectivity	Growth Area Connectivity	Physical Deliverability	Value for Money
R1	Denham/West Ruislip – Uxbridge High Street	No	R2	+1	+1	0	-1	-2
R2	Uxbridge Vine Street – West Drayton	No	R1	+2	+2	+2	-3	-1
R3	West Drayton – Colnbrook - Staines	No	R2	+1	+2	0	-1	-1
R4	Ruislip Gardens - Ickenham	No	No	+1	+1	0	0	-1
R5	Greenford – West Ealing	No	No	0	+2	0	+2	+1
R6	Southall – Brentford Goods	No	No	+1	+1	+2	+2	+1
R6a	Southall – Brentford Goods – Brentford / Hounslow	(R6)	(R6)	+2	+3	+3	-2	0
R7	Edgware – Mill Hill East	No	No	+1	+2	+2	-3	-1
R8	Finsbury Park – Highgate – Alexandra Palace	No	No	+2	+1	0	0	0
R9	Neasden Junction - Neasden South Junction	R10	R10, R12, R13	+1	+1	+1	+1	+1
R10	Dudding Hill Line	No	R9, R12, R13, R15	+3	+3	+3	0	+2
R11	Acton Canal Wharf Junction	R10	R10, R12, R15	+1	+1	0	0	-1
R12	Acton East Junction	No	R9, R10, R11	+1	+1	+1	+1	+1
R13	Junction Road Junction to Carlton Road Junction	R14	R14	+1	+1	+1	+2	+1
R14	Harringay Junction – Harringay Park Junction	R13	R13	+1	+1	+1	+2	+1
R15	South Action to Kew East Junction / Old Kew Junction Chord	No	R9, R10	+1	+1	+2	+2	+2
R16	Heathrow Southern Rail Access	No	No	+3	+1	+1	-1	0
H1	A406 – New Southgate – Colney Hatch	No	Other A406	+1	+1	+1	-1	0
H2	A406 – Brent Cross (A5 to A1)	No	Other A406	+2	+1	+2	-1	+1
H3	A406 – Brent Park	No	Other A406	+1	+1	+2	-1	+1
H4	A406 – Hangar Lane Junction	No	Other A406	+2	+1	+2	-1	+1



		Dependant	Complementary	Economic	Orbital Connectivity	Growth Area Connectivity	Physical Deliverability	Value for Money
H5	A406 – Hangar Lane (A40) to Uxbridge Road (A4020)	No	Other A406	+1	+1	+2	-1	0
H6	A406 – M4 Junction	No	Other A406	+1	+1	+1	-1	0
H7	A312 – M4 to Hayes Road	No	No	+2	+1	+2	-1	+1
BRT1	A312 – Heathrow to Harrow	No	BRT2	+1	+1	+1	0	+1
BRT2	A4006 – Harrow to Cricklewood/Brent Cross	No	BRT1	+1	+1	+1	-1	0
BRT3	A408/A437/ A4020 – Heathrow to Uxbridge	No	No	+1	+1	+1	0	+1
BRT4	A410/A41 – Harrow & Wealdstone to Edgware	No	BRT5	+1	+1	+1	-1	0
BRT5	A5109 – Edgware to East Barnet	No	BRT4	+1	+1	0	-1	0

## 5. Prioritisation of Schemes

### Initial Ranking of Schemes

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- 5.1 An initial ranking of schemes has been undertaken, utilising the appraisal outcomes, to identify schemes that are either considered undeliverable or offer limited benefits to the West London Sub-region in terms of enhancing orbital connectivity, specifically between the growth areas and town centres.

#### Not deliverable

- 5.2 The following rail schemes are considered to be extremely challenging to deliver without substantial tunnelling. This is primarily as a result of housing development on significant parts of the rail alignments.

*R2. Uxbridge Vine Street – West Drayton*

*R7. Edgware – Mill Hill East*

#### Low Ranking

- 5.3 In addition to those schemes deemed undeliverable, a number of other schemes were not considered to offer sufficient value for money from investment in terms of the scale of the benefits they would provide to the West London Sub-region in relation to their likely cost.

*R1. Denham/West Ruislip – Uxbridge High Street*

*R3. West Drayton – Colnbrook - Staines*

*R4. Ruislip Gardens – Ickenham*

*R8. Finsbury Park – Highgate – Alexandra Palace*

*R11. Acton Canal Wharf Junction*

*H1. A406 – New Southgate – Colney Hatch*

*H5. A406 – Hangar Lane (A40) to Uxbridge Road (A4020)*

*H6. A406 – M4 Junction*

*BRT2. A4006 – Harrow to Cricklewood/Brent Cross*

*BRT4. A410/A41 – Harrow & Wealdstone to Edgware*

*BRT5. A5109 – Edgware to East Barnet*



## Packaging of Schemes

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- 5.4 The remaining schemes on the 'long-list' were all ranked either medium or high and are considered to have potential to deliver benefits to the West London Sub-region in terms of enhanced orbital connectivity, in particular between growth areas and town centres.
- 5.5 Some of these schemes are conditional upon other schemes (or each other) or are complementary. Others provide the opportunity to re-schedule rail services to provide additional connectivity. The individual scheme measures have, therefore, been grouped into nine coherent packages of measures for further appraisal.

### Package 1: Ruislip (Chiltern Line) to Ealing Rail

#### *R5. Greenford – West Ealing*

- Utilisation of the existing R5 rail alignment would permit the running of rail services from the Chiltern Line down to the Great Western Main Line, allowing connections such as Ruislip to Ealing Broadway.
- Whilst the scheme provides an additional section of orbital rail connection, its function would be as much to facilitate radial movements across the sub-region.
- It does not provide any direct connectivity between growth areas and town centres.
- It is physically deliverable and low cost

### Package 2: Southall to 'The Golden Mile' Rail

#### *R6. Southall – Brentford Goods*

##### *R6a. Southall – Brentford Goods – Brentford / Hounslow*

- Utilisation of the existing R6 rail alignment would permit running of services from Southall to connect to areas within 'The Golden Mile'. An extension to Brentwood and Hounslow requires new rail provision to connect into the South West Trains 'Hounslow Loop'.
- The scheme provides new orbital rail connections, as well as directly connecting two growth areas, with the potential to connect to Hounslow Town Centre as well
- The route to Brentford Goods is physically deliverable, although the extension to connect into the 'Hounslow Loop' is challenging and would significantly add to the cost.

### Package 3: Dudding Hill Rail Line

#### *R10. Dudding Hill Line (Cricklewood to Acton Wells Junction)*

#### *R9. Neasden Junction - Neasden South Junction*

#### *R12. Acton East Junction*

- Utilisation of the existing R10 rail alignment would permit running of services from Thameslink Line near Cricklewood to connect to the existing Overground leading to Richmond, at Acton Wells Junction. The addition of the Neasden Junction permits

connections towards Wembley, whilst the Action East junction provides connection to Ealing. The combination of schemes provides a range of operational rail service options.

- The scheme provides an extensive new orbital rail connection and deliver connectivity from Cricklewood/Brent Cross to OPDC, as well as potentially Ealing.
- The core scheme is physically deliverable, albeit with some potential constraints at Cricklewood and delivering station but the existing track significantly reduces the cost.

#### Package 4: New Southgate to Cricklewood Rail

##### *R13. Junction Road Junction to Carlton Road Junction*

##### *R14. Harringay Junction – Harringay Park Junction*

- Utilisation of both the R13 and R14 alignments would permit through running services from the Great Northern route through to the Thameslink Line.
- The scheme would provide some additional orbital connectivity and permit rail connections from New Southgate to Cricklewood/Brent Cross
- The scheme is physically deliverable and relatively low cost

#### Package 5: OPDC to The Golden Mile / Hounslow Rail

##### *R15. South Action to Kew East Junction / Old Kew Junction Chord*

- Utilisation of the R15 alignment would permit rail services from the Overground Line from Willesden Junction to Brentford and Hounslow.
- The scheme would provide additional orbital connections and provide specific direct rail connectivity from OPDC to 'The Golden Mile' and Hounslow.
- The scheme is physically deliverable and relatively low cost

#### Package 6: Southern Rail Access to Heathrow

##### *R16. Heathrow Southern Access*

- A variety of alignments have been considered to provide southern rail connectivity into Heathrow
- The scheme would provide some new orbital rail connectivity for West London, although is dependent upon the choice of alignment. It could provide connectivity from Heathrow to Hounslow, although the Piccadilly Line provides some connection already.
- The scheme would be challenging to deliver and high cost.



## Package 7: A406 Road Schemes

### H2. A406 – Brent Cross (A5 to A1)

### H3. A406 – Brent Park

### H4. A406 – Hangar Lane Junction

- Delays have been identified around the A406 corridor in West London and these are projected to increase over time. Junction and link capacity enhancements would facilitate improvements in relative journey times and journey time reliability.
- Whilst not providing new physical connections, the scheme would improve orbital accessibility, through reduced journey times, and so improve connectivity from Cricklewood/Brent Cross, Wembley, OPDC and 'The Golden Mile'.
- The urban land-use constraints would make the scheme challenging to deliver and relatively expensive.

## Package 8: Heathrow to Southall / Harrow - Road and Rapid Transit

### H7. A312 – M4 to Hayes Road

### BRT1. A312 – Heathrow to Harrow

- Delays have been identified around the A312 corridor in West London and these are projected to increase over time. Junction and link capacity enhancements would facilitate improvements in relative journey times and journey time reliability.
- The H7 scheme, whilst not providing new physical connections, would improve orbital accessibility, through reduced journey times. Delivered alongside a rapid transit scheme would provide additional public transport connectivity. Both elements would improve connectivity from Heathrow to Harrow, with some benefits for Southall as well.
- Expansion of capacity along part of the A312 is deliverable, although potentially expensive.

## Package 9: Heathrow to Uxbridge Rapid Transit

### BRT3. A408/A437/ A4020 – Heathrow to Uxbridge

- A rapid transit scheme would provide an enhanced orbital public transport connection from Heathrow to Uxbridge.
- Parts of the route may already have capacity to accommodate dedicated provision for the service; however, other elements may be challenging and expensive to deliver

## Package Prioritisation

- 5.6 Based upon further appraisal of the packages of measures against the overarching objectives, a prioritisation process has been undertaken, with the identification of four levels of scheme measures.
- 5.7 The outcomes from the process are summarised within Table 5.1

Table 5.1 Prioritisation of Packages

Package		Economic	Orbital Connectivity	Growth Area Connectivity	Physical Deliverability	Value for Money	Prioritisation Level
P1	Ruislip (Chiltern Line) to Ealing Rail	0	+2	0	+2	+1	L4
P2	Southall to The Golden Mile Rail	+1	+2	+2	+1	+1	L2
P3	Dudding Hill Rail Line	+3	+3	+3	0	+2	L1
P4	New Southgate to Cricklewood Rail	+1	+1	+1	+1	+2	L3
P5	OPDC to The Golden Mile / Hounslow Rail	+1	+1	+2	+2	+2	L2
P6	Southern Rail Access to Heathrow	+3	+1	+1	-1	0	L3
P7	A406 Road Schemes	+2	+1	+2	-1	+1	L2/L3
P8	Heathrow to Southall / Harrow - Road and Rapid Transit	+2	+1	+2	-1	+1	L2/L3
P9	Heathrow to Uxbridge Rapid Transit	+1	+1	+1	0	+1	L4

- 5.8 The Dudding Hill Line package of measures is considered to perform strongly against the appraisal criteria. The scheme offers a range of potential rail service operations that would provide additional sub-regional connectivity. Notably it would also complement two of the other rail packages, P3 and P5, offering the potential for rail connections from New Southgate, across the heart of the West London Sub-region, through to Hounslow and Feltham.



## Appendix A -

A.1

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ECONOMICS · RESEARCH · ANALYSIS

West London Transport  
Infrastructure Constraints.  
Outcomes

A Draft Report by  
Regeneris Consulting and  
Systra

**SYSTRA**

West London Alliance

# West London Transport Infrastructure Constraints: Outcomes

March 2017

Regeneris Consulting Ltd  
[www.regeneris.co.uk](http://www.regeneris.co.uk)



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# 1. Introduction

## Overview

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- 1.1 The West London Alliance (WLA) has commissioned Regeneris and Systra to carry out the West London Transport Infrastructure Constraints study. The focus of the research is to quantify the economic costs of inadequate orbital road and rail infrastructure in the sub-region, with a view to identifying those specific infrastructure interventions and investments at the scheme level that would yield the greatest return to the economy if they were introduced.
- 1.2 The types of infrastructure which are within scope includes strategic orbital road and rail connections between growth areas across West London.
- 1.3 The West London Alliance (WLA) is a sub-regional partnership of seven West London councils which includes Barnet, Brent, Ealing, Hammersmith and Fulham, Harrow, Hillingdon, and Hounslow. The West London Vision for Growth is a key strategy document prepared by WLA which sets out an aspiration to deliver an ambitious growth programme across the area. The programme is overseen by leaders of six participating boroughs (not including LB Hillingdon) who work together through the West London Economic Prosperity Board (WLEB).
- 1.4 The WLA is undertaking a programme of research which can be used to develop their evidence base and support lobbying activity at a sub-regional level. This study aligns with the development of a new London Plan by the newly elected Mayor of London and the related development of new Local Plans across WLA member boroughs, and will also complement the development of the Mayors Transport Strategy.
- 1.5 The study is being carried out in two stages. **Part One** identifies the costs of constraints to the sub-regional economy based on a review of exiting literature and transport studies. This part of the study has been completed and has been summarised within the Evidence Report.
- 1.6 This report covers **Part Two** of our research that utilises the evidence base from Part 1 to identify a long-list of potential scheme interventions to address the identified major infrastructure constraints across the sub-region. Each potential intervention is appraised and prioritised so as to provide a short-list of scheme interventions that are considered most likely to support the future growth of the West London sub-region.

## Report Structure

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- 1.7 The remainder of this report is set out under the following headings:
  - Evidence of the impact of transport constraints on sub-regional economy
  - Scheme Option Development
  - Scheme Option Appraisal
  - Prioritisation of Scheme Options
  - Summary and Conclusions

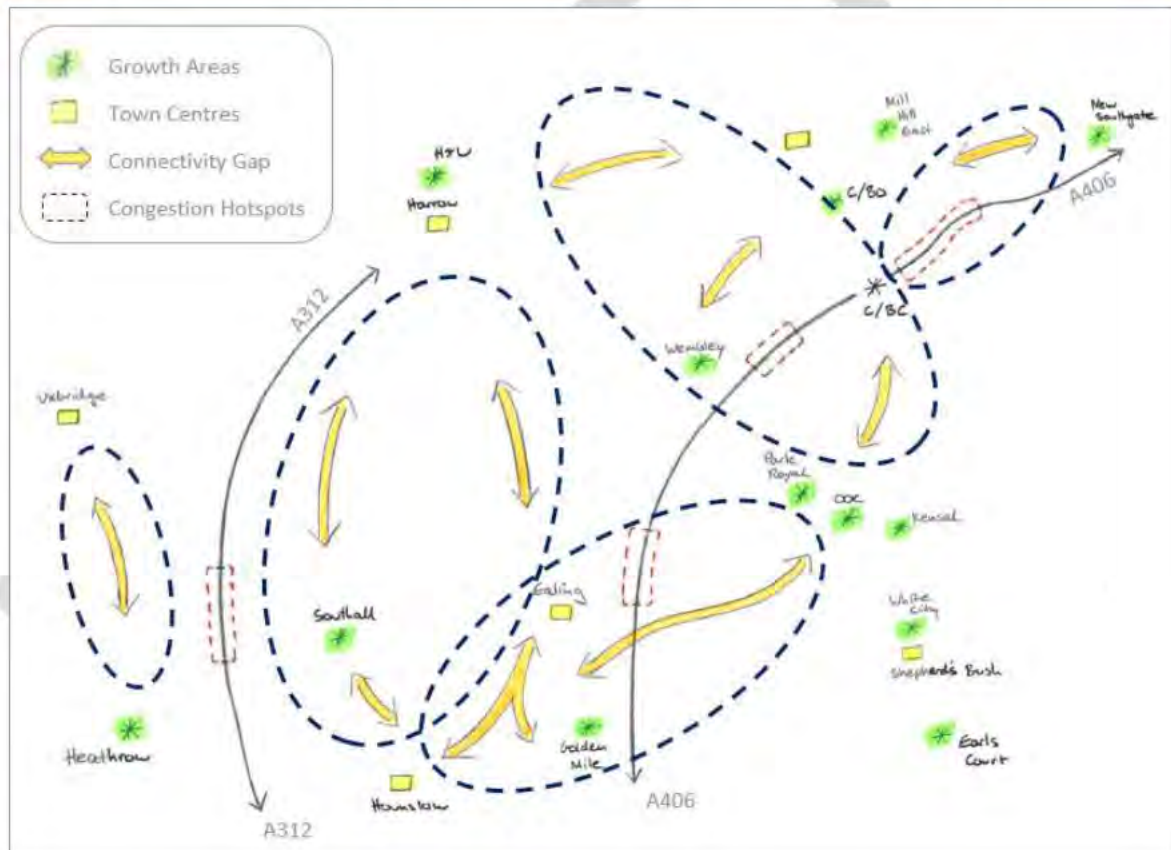


## 2. Overview of Evidence Base

### Introduction

- 2.1 The scope of the study focuses upon strategic orbital transport corridors but also provides due consideration to parts of the radial network where they connect to the orbital corridors to provide sub-regional connectivity.
- 2.2 The Part One Evidence Report provides a detailed analysis of the current policy context, key trends and projections, as well as current orbital connectivity, including between the set of 14 designated 'growth areas' and major sub-regional town centres.
- 2.3 Figure 2.1 presents a summary of the identified 'connectivity gaps' and 'congestion hotspots' between the 'growth areas' and town centres.

Figure 2.1 Connectivity Gaps and Congestion Hotspots between Growth Areas and Town Centres



- 2.4 The gap analysis identifies five separate areas with orbital connectivity issues:
- Connections across Barnet
  - Connections from Barnet 'growth areas' to Harrow and Brent 'growth areas'
  - Connections from Harrow to Ealing and Hounslow
  - Connections from OPDC and Ealing to Hounslow
  - Connections from Hillingdon to Heathrow

- 2.5 The evidence base also demonstrates a clear projected demand for orbital travel, in particularly around the A406 corridor for not simply road travel but also public transport. There are significant potential flows between Barnet, Brent and Ealing, as well as Hounslow.
- 2.6 Whilst Transport for London's 5-year business plan will deliver significant public transport enhancements, not least through Crossrail and Underground upgrades, these primarily focus on radial movements into and out from Central London, with limited improvement to orbital provision.

## Conclusions

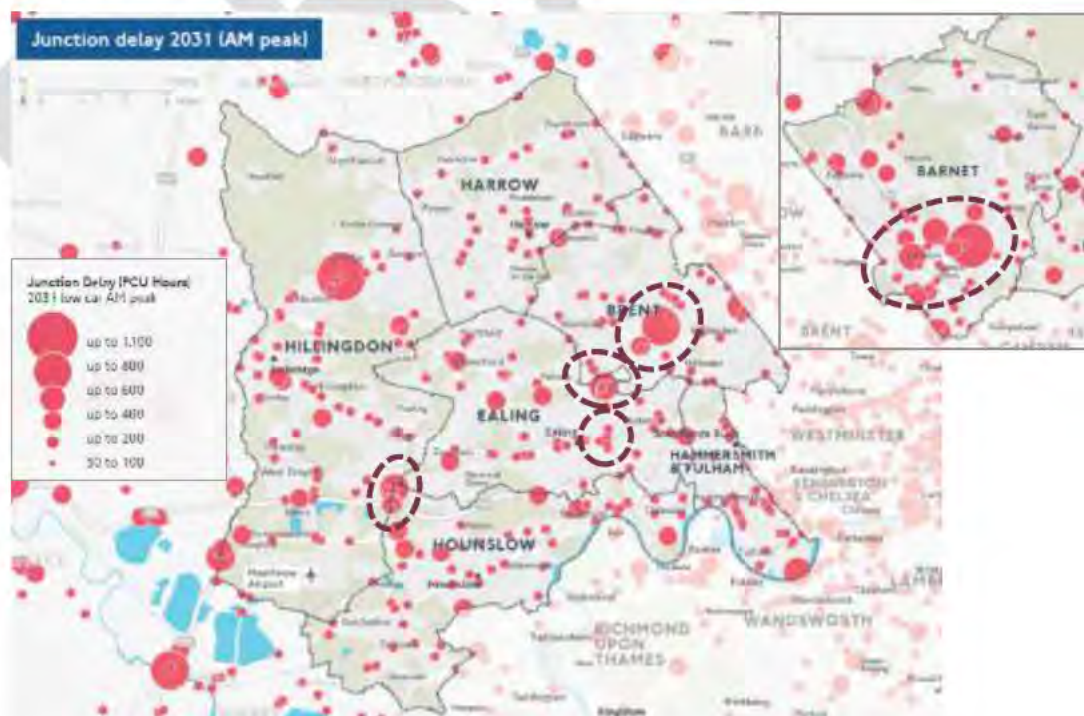
### Key Infrastructure Constraints

- 2.7 Three categories of sub-regional orbital transport constraints have been identified

#### Highway Congestion

- 2.8 The A406 and A312 have been identified as key orbital highway routes. Both are subject to congestion during peak periods, not only in terms of absolute delays but also the unreliability of journey times (a key issue for business travel).
- 2.9 Specific localities identified include:
- A406 junctions with A1/A41/M1/A5
  - A406 around Brent Park
  - A406 Hangar Lane (A40)
  - A406 between A40 and A4020 (Uxbridge Road)
  - A312 between M4 and Hayes Road

Figure 2.2 Forecast Highway Network Junction Delay (2031)



Source: TfL West London Sub-regional Transport Plan (2016 Update)



### Lack of Orbital Rail Connections

- 2.10 Comparative analysis of public transport and road journey times demonstrates the impact that limited orbital rail provision has upon the ability to travel by public transport
- 2.11 Whilst there are orbital bus services, these are projected to become subject to similar levels of congestion as other highway movements

### Lack of Orbital Connectivity between Growth Areas

- 2.12 Connections between the identified Growth Areas (e.g. OPDC and Heathrow), and with the major Town Centres, will be a key issue in facilitating economic growth across the sub-region
- 2.13 Even allowing for the spatial distribution of the sites across the sub-region (with peripheral sites inevitably less inter-connected) there are a range of constraints between some Growth Areas
- 2.14 Key issues include connections to and from:
  - the four 'Growth Areas' within Barnet
  - Harrow & Wealdstone
  - Southall
- 2.15 In addition, there are also limitations in the orbital connections to Heathrow from other Growth Areas and Town Centres across the sub-region

### Developing Schemes

- 2.16 The baseline analysis has provided the evidence base that there are a range of significant constraints affecting orbital travel across West London. More significantly a number of these constraints affect connectivity to, from and between 'growth areas' within the sub-region, in particular with their links to Major Sub-regional Town Centres.
- 2.17 These transport constraints will restrict the movement of people and goods between these areas impacting upon the scale of housing, employment and business (GDP) growth that can be achieved.

### Scheme Types

- 2.18 There are a range of measures that can be investigated to begin to mitigate against the identified transport constraints. These include measures to manage overall demand for travel and to influence the choice of mode made by travellers. Whilst these options should be pursued, there are unlikely to be sufficient in themselves to resolve the issues identified, unless delivered alongside infrastructure schemes.
- 2.19 In terms of infrastructure measures that will have a positive impact at a sub-regional level, these are primarily limited to the types of scheme set out within Table 2.1.

**Table 2.1 Indicative Sub-regional Infrastructure Scheme**

<b>Infrastructure Type</b>	<b>Category of Scheme</b>	<b>Indicative schemes</b>
Highway Network Enhancements	Expand junction capacity	Signalisation Additional approach lanes/expanded junction Grade separation
	Expand link capacity	Lane capacity
	Provide new capacity	New highway links
	Intelligent transport systems	Managed highway corridors
Bus Network Enhancements	Increased service capacity	Higher frequency services Larger vehicles
	New service provision	New routes
	Bus priority measures	Priority at junctions (physical, technological) Bus lanes
Rail Network Enhancements	Increased service capacity	Higher frequency services / new service patterns / signal enhancements Longer trains / higher capacity trains
	New heavy rail links	Passenger services on freight routes Rail spurs / junctions Rail links
	Light transit schemes	Light rail / trams / bus-based transit

- 2.20 Whilst bus provision will continue to be an important aspect of orbital travel in the short and medium term, the evidence base dictates that underlying highway network congestion will restrict the role that buses can play in providing strategic connectivity across the sub-region.
- 2.21 The primary focus of sub-regional infrastructure investment should therefore be around road and rail investment to provide the required capacity to support the levels of growth forecast. Whilst the use of new technologies will be an important facet in maximising the use of the transport networks, the evolving spatial distribution of housing and employment densities will require new transport infrastructure links to provide effect connections between the developing areas of the sub-regional economy.



## 3. Scheme Option Development

### Overview

---

- 3.1 The Part One Evidence Base has demonstrated that there are both current and projected future constraints on orbital travel across the sub-region and that these will impact upon connectivity between the significant 'growth areas' and major sub-regional town centre in West London.
- 3.2 The primary focus of enhancements should be along the A406 and A312 corridor, focusing on both road and rail provision, as well as potential connections across Barnet and towards Harrow, as well as connections from Uxbridge to Heathrow.

### Developing a 'Long-List' of Schemes

- 3.3 This section sets out a 'long list' of scheme options that could offer some potential to address the identified constraints, with a description of the key attributes of each scheme and the role they would play in enhancing connectivity, in particular between the Growth Areas and Major Town Centres.
- 3.4 Three broad types of scheme are considered:
  - Orbital rail schemes
  - Orbital bus rapid transit schemes
  - Orbital road schemes

## Orbital Rail Schemes

---

### Overview

- 3.5 The Evidence Base identified a range of strategic orbital connections for which there is currently limited, or no, rail provision. The development of schemes to address these connectivity gaps is challenging within a built-up environment where land availability restricts the opportunities to construct new rail lines. An initial assessment has, therefore, been undertaken of freight lines and disused lines to gain an understanding of potential infrastructure that could be (re)instated for passenger rail services.

### Freight Lines and Disused Lines

- 3.6 An initial approach to identifying potential for rail schemes was to review all existing rail freight lines and disused rail lines across the West London sub-region or within neighbouring boroughs. From this process a total of 14 separate lines have been identified that could, theoretically, facilitate alternative passenger service routes. All these lines either currently, or historically, connect to the existing operational passenger rail network and so, if deliverable, would permit not only new connections in themselves, but also the potential to provide wider connectivity across the sub-region.
- 3.7 At this stage of the process, no pre-judgement was applied as to the suitability of any of these freight or disused lines in meeting the study aim, nor were any others lines intentionally left of the list.

3.8 The 14 identified freight and disused lines are summarised below and presented within Figure 3.1.

- 1) Denham/West Ruislip – Uxbridge High Street
- 2) Uxbridge Vine Street – West Drayton
- 3) West Drayton – Colnbrook - Staines
- 4) Ruislip Gardens - Ickenham
- 5) Greenford – West Ealing
- 6) Southall – Brentford Goods
- 7) Edgware – Mill Hill East
- 8) Finsbury Park – Highgate – Alexandra Palace
- 9) Neasden Junction - Neasden South Junction
- 10) Dudding Hill Lines (Cricklewood Acton Wells Junction)
- 11) Acton Canal Wharf Junction
- 12) Acton East Junction
- 13) Junction Road Junction to Carlton Road Junction
- 14) Harringay Jn – Harringay Park Junction

Figure 3.1 Freight Lines and Disused Rail Lines



3.9 The diagrammatic representation indicates there are a number of existing freight or disused rail lines that provide some form of orbital connectivity. Others, whilst not specifically for orbital movements, may facilitate wider orbital movements through the provision of connections between other existing lines.

3.10 A brief description of each identified line is provided below.



#### *R1. Denham/West Ruislip – Uxbridge High St*

- Status: Closed in 1939
- Description: Land either side of line now flooded brick pits or reservoirs
- Potential role: Link Central Line/Chiltern Mainline to Uxbridge as alternative to Metropolitan Line. Potential to link Uxbridge to Old oak Common or Paddington via Greenford. Note: the same role could be provided by 4. Ruislip Gardens – Ickenham Link
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Uxbridge to Wembley and OPDC

#### *R2. Uxbridge Vine St – West Drayton*

- Status: Closed in 1962
- Description: Formation almost entirely built over
- Potential role: Link from Uxbridge to Heathrow/Great Western Mainline
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Uxbridge to Heathrow and Southall

#### *R3. West Drayton – Colnbrook - Staines*

- Status: West Drayton – Colnbrook mothballed; Colnbrook to Staines closed
- Description: Operable to Colnbrook – but Heathrow new runway may obliterate it. South of Colnbrook M25 J14 to J13 has covered formation
- Potential role: Link from West London to South West Trains network at Staines
- Potential influence on Growth Areas/Major Town Centres: n/a

#### *R4. Ruislip Gardens – Ickenham*

- Status: London Underground stock transfer line
- Description: In situ but would require alterations Ruislip LUL Civil Engineers Depot
- Potential role: Link Central Line/Chiltern Mainline to Uxbridge as alternative to Metropolitan Line. Potential to link Uxbridge to Old oak Common or Paddington via Greenford. Note: the same role could be provided by 1. Denham/West Ruislip – Uxbridge High Street
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Uxbridge to Wembley and OPDC

#### *R5. Greenford – West Ealing*

- Status: Open
- Description: Underutilised currently served by shuttle from West Ealing
- Potential role: Various potential options for linking Chiltern routes to Great Western Mainline – but duplicated by Greenford – Old Oak Common which would link to HS2. Extend Crossrail Paddington terminators to Uxbridge
- Potential influence on Growth Areas/Major Town Centres: Limited unless delivered alongside other schemes (e.g. 1 or 4)

#### *R6. Southall – Brentford Goods*

- Status: Open to freight traffic as far as Transport Avenue
- Description: Deliverable as far as aggregates terminal – closed and built on thereafter. Link to SWT Windsor Lines only possible by crossing Great West
- Potential role: Potential to link Southall into South West Trains network. Junction faces Reading at Southall so no easy access to east towards Ealing/Central London
- Potential influence on Growth Areas/Major Town Centres: Connectivity between Southall and The Golden Mile. Greater potential if scheme could connect to South West Trains network e.g. connections to Hounslow.

#### *R7. Edgware – Mill Hill East*

- Status: Closed in 1930s/40s
- Description: Formation largely unbuilt on but would require crossing under M1 at Mill Hill Broadway
- Potential role: Extension of Northern Line from Mill Hill East to Edgware
- Potential influence on Growth Areas/Major Town Centres: Connectivity between Mill Hill East and Edgware

#### *R8. Finsbury Park – Highgate – Alexandra Palace*

- Status: Closed (date unknown)
- Description: Route intact some building on Alexandra Palace branch, part of route used as footpath
- Potential role: Primarily a radial route with little direct role from a West London Sub-regional context
- Potential influence on Growth Areas/Major Town Centres: Connectivity between Mill Hill East and Finsbury Park

#### *R9. Neasden Junction - Neasden South Junction*

- Status: Open to freight
- Description: Fully operational
- Potential role: Potential to link Uxbridge/Amersham/Aylesbury to Old Oak Common via Dudding Hill Lines
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Wembley to OPDC with Schemes 10



#### *R10. Dudding Hill Lines (Cricklewood Acton Wells Junction)*

- Status: Open to freight
- Description: In situ and links possible from MML slow lines to Dudding Hill Lines from Hendon and north, but no link from slow lines from Cricklewood station and south thereof
- Potential role: Link MML to Old Oak Common via new interchange on North London Line
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Cricklewood/Brent Cross to OPDC. Additional connections to Wembley with Scheme 9. Additional connection to Ealing with Scheme 12. Potential to connect with The Golden Mile and Hounslow with Scheme 15.

#### *R11. Acton Canal Wharf Junction*

- Status: Open to freight
- Description: In situ links North London Line to West Coast Mail Line – but would need flyover to link to Euston – Watford DC lines rather than West Coast Mail Line fast/slow lines
- Potential role: Watford – Old Oak – Richmond service via Euston – Watford DC lines
- Potential influence on Growth Areas/Major Town Centres: Potential connections from Harrow and Wembley to The Golden Mile and Hounslow with Schemes 10 and 15.

#### *R12. Acton East Junction*

- Status: Open to freight
- Description: Links Great Western Main Line with North London Line
- Potential role: Link North London Line to Great Western Main Line and services to Heathrow
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Ealing to Cricklewood/Brent Cross with Scheme 10.

#### *R13. Junction Road Junction to Carlton Road Junction*

- Status: Open to freight
- Description: Open but to access Dudding Hill line at present requires at grade crossing of Midland Main Line
- Potential role: Link Barking – Gospel Oak to Dudding Hill Lines and North London Line
- Potential influence on Growth Areas/Major Town Centres: Connection from Cricklewood/Brent Cross to New Southgate with Scheme 14.

#### *R14. Harringay Jn – Harringay Park Junction*

- Status: Open to freight
- Description: In situ but access from Southbound ECML is complex
- Potential role: Route inner suburban Great Northern services onto North London Line
- Potential influence on Growth Areas/Major Town Centres: Connection from New Southgate to Cricklewood/Brent Cross with Scheme 13.



## Alterations to current rail network routes and service patterns

- 3.11 In addition to considering rail scheme along alignments that are not currently utilised for passenger services, consideration has also been given to potential alterations to routes and service patterns utilising existing infrastructure.

### *R15. Kew East Junction / Old Kew Junction Chord*

- Status: Open
- Description: in situ
- Potential Role: Permits rail service from Old Oak Common to Hounslow
- Potential influence on Growth Areas/Major Town Centres: Connection from Hounslow/The Golden Mile to OPDC

## New Rail Alignments

- 3.12 The final alternative approach to (re)opening existing or disused passenger routes is to create entirely new rail alignments. This clearly not only requires substantial infrastructure investment but can also be extremely challenging within an urban environment.
- 3.13 Whilst there are pockets of unbuilt land across the whole of the sub-region, these invariable are clusters of land and do not form natural transport corridors. In particular, in the vicinity of town centres, as well as many of the regeneration areas, there is rarely available land through which to develop a new rail alignment. Any new alignments are, therefore, as a minimum, likely to require connection with existing alignments on the approaches to major centres.
- 3.14 Previous work has been undertaken to consider potential new rail alignments to connect into Heathrow. A western access (WRATH) has already received backing from Central Government but would not directly benefit West London. There are also a range of proposals for a southern access to Heathrow from Feltham, Ashford and Staines. Whilst it is recognised that, from amongst the West London Sub-Region, the benefits of the southern access schemes would primarily be for residents and businesses within LB Hounslow, it is still considered a scheme of sufficient magnitude, which improves orbital travel, to be included within the initial long-list of schemes.
- 3.15 To deliver any additional new rail alignments in West London is likely to require either substantial demolition of existing properties or tunnelling. Neither option is particularly attractive, politically or financially.

### *R16. Heathrow Southern Access*

- Status: Proposal for new rail alignment
- Description: Variety of proposed alignments from Feltham, Ashford, and Staines
- Potential Role: Permits rail services to connect with South West Trains line
- Potential influence on Growth Areas/Major Town Centres: Connection from Heathrow to Hounslow



## Orbital Road Schemes

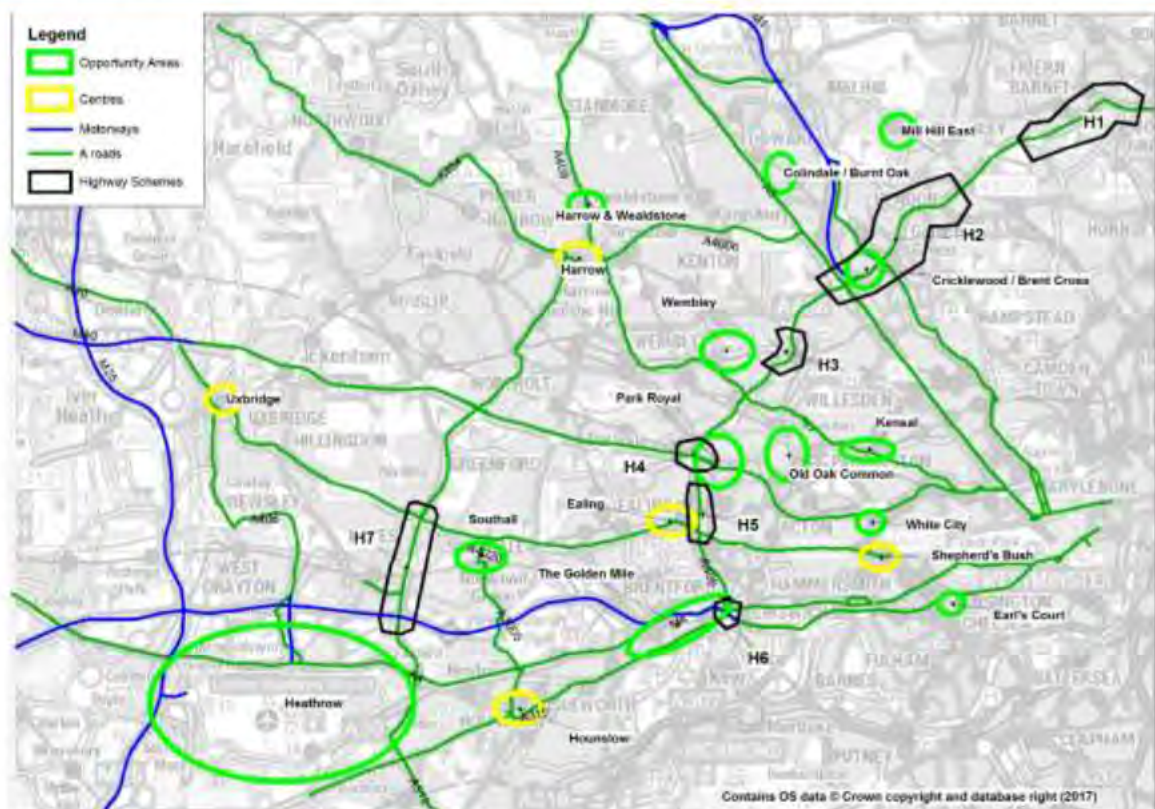
### Overview

- 3.16 The Evidence Base for the study has demonstrated a range of capacity constraints and congestion hotspots across the two main orbital road corridors of the A406 and A312/A4006. A number of these areas suffer not only from the scale of delays, but also the degree to which the delays can vary from day-to-day, creating uncertainty for strategic orbital road trips. The future modelling indicates that this situation is likely to deteriorate significantly for some parts of the network.
- 3.17 An initial assessment has been undertaken to examine specific areas where investment in highway infrastructure could generate positive benefits for orbital road travel. The type of schemes that are likely to be deliverable will include increasing of link capacities (e.g. providing additional carriageway provision) or expanding, or enhancing the operation, of junctions. In a similar manner to the analysis of rail provision, it is unlikely that new strategic road alignments can be delivered due to land constraints requiring expensive tunnelling.

### Capacity Enhancements and Operational Improvements

- 3.18 For the purposes of the scheme development and subsequent appraisal process, seven conceptual locations for capacity enhancements and/or operational improvements have been identified for consideration. These are set out in Figure 3.3 and described in further detail below.

Figure 3.2 Potential Highway Capacity Enhancements and Operational Improvements





#### *H1. A406 – New Southgate to Colney Hatch*

- Status: Proposed link capacity enhancement
- Description: Enhancements to improve journey time reliability
- Potential influence on Growth Areas/Major Town Centres: Connectivity from New Southgate to Cricklewood/Brent Cross

#### *H2. A406 – Brent Cross (A5 to A1)*

- Status: Proposed link and junction capacity enhancement
- Description: capacity enhancements to reduce current and projected delays across these four major interchanges on the A406
- Potential influence on Growth Areas/Major Town Centres: Cricklewood/Brent Cross to New Southgate, Wembley, and OPDC.

#### *H3. A406 – Brent Park*

- Status: Proposed link and junction capacity enhancement
- Description: Capacity enhancement to reduce delays caused by access/egress from Brent Park area
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Cricklewood/Brent Cross to Wembley and OPDC

#### *H4. A406 – Hangar Lane Junction*

- Status: Proposed junction capacity enhancement
- Description: Junction enhancement to reduce conflicts of movement through the junction to reduce delay
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Wembley and OPDC to The Golden Mile

#### *H5. A406 – Hangar Lane (A40) to Uxbridge Road (A4020)*

- Status: Proposed A406 link capacity enhancement
- Description: Capacity enhancement or improvement to operational performance of section of A406 to reduce overall delays and improve journey time reliability
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Wembley and OPDC to The Golden Mile

#### *H6. A406 – M4 Junction*

- Status: Proposed A406/M4 junction capacity enhancement
- Description: Junction enhancement to reduce conflicts of movement through the junction to reduce delay
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Wembley and OPDC to The Golden Mile



### *H7. A312 – M4 to Hayes Road Link and Junction Capacity*

- Status: Proposed capacity enhancement of A312 link and the M4 and Bulls Bridge (Hayes Road) Junction
- Description: Enhancements to improve journey time reliability and reduce delays at junctions
- Potential influence on Growth Areas/Major Town Centres: Harrow & Wealdstone and Southall to Heathrow and Hounslow

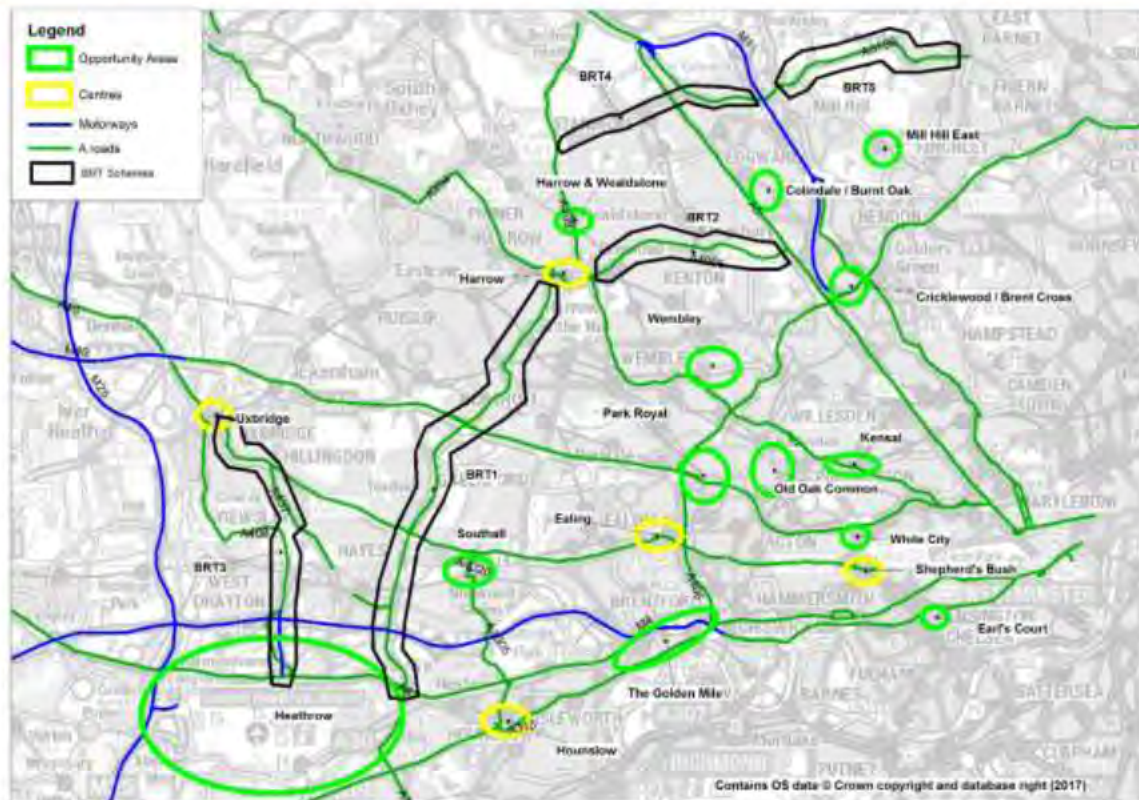
## **Orbital Bus Rapid Transit Schemes**

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### *Overview*

- 3.19 The focus of this study is on enhancing strategic sub-regional transport infrastructure across West London and so has a primary focus upon road and rail. Whilst bus-based public transport provision is usually focused upon local connectivity, given some of the restrictions in the ability to deliver new rail-based public transport solutions there is considered to be merit in considering bus-based solutions, as long as they are substantive in nature and can be deemed to contribute on a sub-regional level.
- 3.20 Consideration has been given to potential bus-based rapid transit systems in locations where the provision of new rail connections would be challenging. These would be schemes that utilise some or part of the existing highway network to provide bus connectivity between Growth Areas and Major Town Centres. To be classified as sub-regional in nature, it is considered that these services must be direct and either segregated or prioritised to ensure they are high speed. Types of measures could therefore include dedicated guided busways or priority bus infrastructure, accompanied by direct point-to-point inter-urban areas bus services.
- 3.21 Based on the evidence base, the primary focus of these types of services would be along the:
- the A312 / A4006 corridor (Heathrow – Harrow – Brent Cross);
  - the A408 / A437 / A4020 (Heathrow – Uxbridge); or
  - the A410 / A41 / A5109 corridor (Harrow – Edgware – East Barnet)
- 3.22 These corridors have limited current, or potential future, rail provision and so bus-based rapid transit schemes may offer an alternative public transport solution.
- 3.23 Significant proportions of both of these road corridors are dual carriageway in nature, or at least provide dual traffic lanes in either direction. This provides potential for allocation of some road-space to bus provision, albeit that this could impact upon general traffic.
- 3.24 The southern part of the A312 corridor and the A408 act as expressways, with the alignment set apart from surrounding built-up areas, offering potential for expansion of capacity (discussed further below under the orbital road scheme section). For the section of A312 leading into Harrow, as well as much of the A4006 and A410, the road corridors are embedded within residential areas, restricting the opportunities for dedicated busway / bus priority schemes.
- 3.25 For the purposes of the scheme development and subsequent appraisal process, five conceptual bus rapid transit corridors have been identified for consideration. These are set out in Figure 3.2 and described in further detail below. Notwithstanding the appraisal process in Section 4, each of these corridors would require detailed assessment to determine the engineering opportunities for delivering schemes.

Figure 3.3 Potential Bus Rapid Transit Corridors



**BRT1. A312 – Heathrow to Harrow**

- Status: Proposal for dedicated bus provision
- Description: High speed, direct bus-based transit, with dedicated bus infrastructure
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Heathrow to Harrow, with additional potential to provide services to Southall

**BRT2. A4006 – Harrow to Cricklewood/Brent Cross**

- Status: Proposal for dedicated bus provision
- Description: High speed, direct bus service, with dedicated bus priority
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Harrow to Cricklewood/Brent Cross and Collindale/Burnt Oak

**BRT3. A408/A437/ A4020 – Heathrow to Uxbridge**

- Status: Proposal for dedicated bus provision
- Description: High speed, direct bus-based transit, with dedicated bus infrastructure
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Heathrow to Uxbridge



*BRT4. A410/A41 – Harrow & Wealdstone to Edgware*

- Status: Proposal for dedicated bus provision
- Description: High speed, direct bus service, with dedicated bus priority
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Harrow & Wealdstone to Edgware and potential link to Mill Hill East

*BRT5. A5109 – Edgware to East Barnet*

- Status: Proposal for dedicated bus provision
- Description: High speed, direct bus service, with dedicated bus priority
- Potential influence on Growth Areas/Major Town Centres: Connectivity from Edgware towards New Southgate

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## Long-List of Scheme Measures

- 3.26 Based upon the sets of rail, bus rapid transit, and road schemes outlined above, the following long-list of schemes was taken forward into the scheme appraisal process.

**Table 3.1 Long-List of Potential Sub-regional Transport Schemes**

R1	Denham/West Ruislip – Uxbridge High Street
R2	Uxbridge Vine Street – West Drayton
R3	West Drayton – Colnbrook - Staines
R4	Ruislip Gardens - Ickenham
R5	Greenford – West Ealing
R6	Southall – Brentford Goods
R7	Edgware – Mill Hill East
R8	Finsbury Park – Highgate – Alexandra Palace
R9	Neasden Junction - Neasden South Junction
R10	Dudding Hill Lines (Cricklewood Acton Wells Junction)
R11	Acton Canal Wharf Junction
R12	Acton East Junction
R13	Junction Road Junction to Carlton Road Junction
R14	Harringay Junction – Harringay Park Junction
R15	Kew East Junction / Old Kew Junction Chord
R16	Heathrow Southern Rail Access
H1	A406 – New Southgate – Colney Hatch
H2	A406 – Brent Cross (A5 to A1)
H3	A406 – Brent Park
H4	A406 – Hangar Lane Junction
H5	A406 – Hangar Lane (A40) to Uxbridge Road (A4020)
H6	A406 – M4 Junction
H7	A312 – M4 to Hayes Road
BRT1	A312 – Heathrow to Harrow
BRT2	A4006 – Harrow to Cricklewood/Brent Cross
BRT3	A408/A437/ A4020 – Heathrow to Uxbridge
BRT4	A410/A41 – Harrow & Wealdstone to Edgware
BRT5	A5109 – Edgware to East Barnet



## 4. Scheme Option Appraisal

### Appraisal Framework

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- 4.1 This section examines each of the individual schemes on the 'long-list' to determine the degree to which they deliver against the primary objectives of enhancing orbital connectivity, whether they will deliver positive impacts upon transport and the economy, and whether they are physically and/or financially deliverable.

#### Overarching Appraisal Criteria

- 4.2 A set of objectives appraisal criteria has been established based upon the underlying issues and opportunities identified within the Evidence Base, as well as requirements for deliverability. The Evidence identified three key issues, summarised in the report in Section 2, namely:

- The impact of highway congestion on strategic orbital routes
- The lack of strategic orbital rail connections
- The lack of connection between some of the Growth Areas and Town Centres

- 4.3 On the basis of these three issues, as well as the requirements for deliverability of schemes, a set of five objective appraisal criteria has been developed against which to appraise each scheme:

- 1) **Economic impact:** is the scheme likely to have a positive impact upon the sub-regional economy, either through reducing journey times, congestion or improving reliability?
- 2) **Orbital connectivity:** does the scheme enhance orbital connections across the West London Sub-region?
- 3) **Growth Area Connectivity:** does the scheme enhance connectivity between Growth Areas or with Major Town Centres?
- 4) **Physical deliverability:** can the scheme be delivered easily in physical terms e.g. is land available?
- 5) **Value for Money:** what is the cost of the scheme likely to be in relation to the scale of the potential impacts?

- 4.4 Each scheme has been appraised against an individual appraisal scale based upon the following criteria:

**Economic Impact:** whether the scheme will reduce journey times (e.g. reduce vehicle delays or provide a more direct or faster service) or improve the reliability of journey times so as to provide a positive economic impact in terms of direct transport benefits or wider benefits to the economy (e.g. enhance agglomeration – business-to-business connections)

- Scale: +3 (large positive impact) to 0 (neutral impact)

**Orbital Connectivity:** whether the scheme enhances orbital connectivity across the West London Sub-region, with specific reference to the importance of rail connections

- Scale: +3 (significant enhancement to orbital connectivity) to 0 (no notable improvement to orbital connectivity)



**Growth Area Connectivity:** whether the scheme enhances connectivity between the growth areas and or connections from the growth areas to the major town centres

- Scale: +3 (improved connectivity between multiple locations) to 0 (no notable improvement to connectivity)

**Physical Deliverability:** the degree to which the scheme is physically deliverable

- Scale: +2 (relatively easy to deliver) to -3 (practically undeliverable)

**Value for Money:** the likely expense of the scheme relative to the scale of potential benefits

- Scale: +2 (excellent value for money) to -2 (poor value for money)

- 4.5 In addition to the key appraisal criteria, an assessment of each scheme has been undertaken to determine whether it is **dependent** on being delivered alongside another scheme in order to provide any positive benefits and/or whether it is **complementary** to other proposed schemes.
- 4.6 At this stage, no detailed assessment of the responsibilities for delivery have been undertaken; however, the majority of the schemes would be subject to TfL jurisdictions, in terms of rail provision, bus rapid transit operations, or enhancements to the TfL Road Network (TLRN), which includes the whole of the A406 and the section of the A312 between the A40 and the A315.

## Scheme Appraisal

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- 4.7 Each set of schemes identified from the 'long-list' has been appraised against the criteria set out above.
- 4.8 It is important to recognise that the allocated scores are based solely on the ability for a scheme measures to deliver against the specified sub-regional criteria and whether it will enhance orbital connectivity across the sub-region. A low score is not indicative of a poor scheme, merely that it doesn't rank as highly in terms of maximising sub-regional orbital connectivity between growth areas.
- 4.9 The allocated scoring values for each scheme have been generated by applying the following:
- the information set out within the Evidence Report
  - the degree to which each scheme is consider to provide a sub-regional benefit
  - the degree to which the scheme is considered to meets the aims of the project to unlock growth constraints
  - strategic transport modelling outputs relating to passenger and vehicle flows and congestion
  - future growth predictions
  - professional unbiased review applied at a sub-regional level, without individual stakeholder preferences



## Rail Schemes

4.10 The appraisal of each individual rail scheme is set out below.

### *R1. Denham/West Ruislip – Uxbridge High Street*

- **Dependent:** no
- **Complementary:** with R2 would provide full north-south connection between Chiltern and West Coast Mainlines
- **Economic Impact:** +1 (some additional accessibility to Uxbridge permitted)
- **Orbital Connectivity:** +1 (a new but short, orbital rail connection)
- **Growth Area Connectivity:** 0 (limited additional connections)
- **Physical Deliverability:** -1 (some challenges with condition of surrounding land)
- **Value for Money:** -2 (high cost, with limited benefits)

### *R2. Uxbridge Vine St – West Drayton*

- **Dependent:** No
- **Complementary:** with R1 would provide full north-south connection between Chiltern and West Coast Mainlines
- **Economic Impact:** +2 (provides a connection to Heathrow)
- **Orbital Connectivity:** +2 (a new orbital rail connection)
- **Growth Area Connectivity:** +2 (fills one of the key identified connectivity gaps)
- **Physical Deliverability:** -3 (Formation almost entirely built over)
- **Value for Money:** -1 (despite potential benefits would be extremely high costs)

### *R3. West Drayton – Colnbrook - Staines*

- **Dependent:** No
- **Complementary:** With R2 could provide extended north-south rail connection
- **Economic Impact:** +1 (limited impact within West London)
- **Orbital Connectivity:** +2 (a new orbital rail connection)
- **Growth Area Connectivity:** 0 (does not support connections between growth areas)
- **Physical Deliverability:** -1 (partially open; however, challenges at southern end)
- **Value for Money:** -1 (relatively expensive for limited West London returns)

### *R4. Ruislip Gardens – Ickenham*

- **Dependent:** No
- **Complementary:** No
- **Economic Impact:** +1 (some additional accessibility to Uxbridge permitted)
- **Orbital Connectivity:** +1 (a new but very short, orbital rail connection)
- **Growth Area Connectivity:** 0 (limited additional growth area connections)
- **Physical Deliverability:** 0 (impacts on Ruislip Depot)
- **Value for Money:** -1 (limited benefits, despite relatively low costs)

#### *R5. Greenford – West Ealing*

- Dependent: No
- Complementary: No
- Economic Impact: 0 (limited additional accessibility permitted)
- Orbital Connectivity: +2 (a new orbital rail connection)
- Growth Area Connectivity: 0 (limited additional growth area connections)
- Physical Deliverability: +2 (existing line)
- Value for Money: +1 (very low cost, but limited benefits)

#### *R6. Southall – Brentford Goods*

- Dependent: No
- Complementary: No
- Economic Impact: +1 (reduced journey times but limited in geographic scope)
- Orbital Connectivity: +1 (a new orbital rail connection but limited in scope)
- Growth Area Connectivity: +2 (connection from Southall to The Golden Mile)
- Physical Deliverability: +2 (existing line)
- Value for Money: +1 (low cost, positive benefits)

#### *R6a. Southall – Brentford Goods – Brentford/Hounslow*

- Dependent: (R6)
- Complementary: (R6)
- Economic Impact: +2 (reduced journey times for a number of movements)
- Orbital Connectivity: +3 (a new orbital rail connection between multiple locations)
- Growth Area Connectivity: +3 (connections from Southall to The Golden Mile/Hounslow)
- Physical Deliverability: -2 (link to SWT line challenging to construct)
- Value for Money: 0 (high cost & disruption of scheme could outweigh benefits)

#### *R7. Edgware – Mill Hill East*

- Dependent: No
- Complementary: No
- Economic Impact: +1 (reduced journey times to Edgware)
- Orbital Connectivity: +2 (new orbital rail link)
- Growth Area Connectivity: +2 (connects Mill Hill East to Edgware)
- Physical Deliverability: -3 (significant challenges with both connection over M1 and sections of route that have been developed for housing)
- Value for Money: -1 (positive impacts, but extremely expensive scheme)

#### *R8. Finsbury Park – Highgate – Alexandra Palace*

- Dependent: No
- Complementary: No
- Economic Impact: +2 (reduced journey times Finsbury Park to Highgate)
- Orbital Connectivity: +1 (a new, but limited, orbital rail connection)
- Growth Area Connectivity: 0 (limited additional growth area connections)
- Physical Deliverability: 0 (alignment remains but challenges to join with other lines)
- Value for Money: 0 (expensive and limited benefits to West London)



#### *R9. Neasden Junction - Neasden South Junction*

- **Dependent:** Requires R10
- **Complementary:** R10 and, to a lesser degree, R12 and R15
- **Economic Impact:** +1 (reduced journey times from Wembley to south)
- **Orbital Connectivity:** +1 (permits some additional orbital movements)
- **Growth Area Connectivity:** +1 (permits some additional connectivity from Wembley to OPDC)
- **Physical Deliverability** +1 (existing tracks but constrained junction)
- **Value for Money:** +1 (limited benefits but low cost)

#### *R10. Dudding Hill Lines (Cricklewood to Acton Wells Junction)*

- **Dependent:** No
- **Complementary:** R9, R11, R12, R15
- **Economic Impact:** +3 (reduced journey times from Barnet to Brent/Ealing)
- **Orbital Connectivity:** +3 (significant new orbital rail connection)
- **Growth Area Connectivity:** +3 (multiple connections to growth areas)
- **Physical Deliverability** 0 (track in place but additional infrastructure required and some issues with arrangements around Cricklewood)
- **Value for Money:** +1 (existing alignment reduces costs and potentially significant benefits)

#### *R11. Acton Canal Wharf Junction*

- **Dependent:** R10
- **Complementary:** R10 and, to a lesser degree, R12, R15
- **Economic Impact:** +1 (reduced journey times from Harrow & Wealdstone to south)
- **Orbital Connectivity:** +1 (permits some additional orbital movements)
- **Growth Area Connectivity:** 0 (limited impact)
- **Physical Deliverability** 0 (in situ but would require flyover to connect to Watford – Euston Overground Line)
- **Value for Money:** -1 (potentially expensive for limited benefits)

#### *R12. Acton East Junction*

- **Dependent:** No
- **Complementary:** R10 and, to a lesser degree, R9, R11
- **Economic Impact:** +1 (reduced journey times to Ealing)
- **Orbital Connectivity:** +1 (permits some additional orbital movements)
- **Growth Area Connectivity:** +1 (additional connection to Ealing from growth areas)
- **Physical Deliverability** +1 (in situ, open to freight)
- **Value for Money:** +1 (low cost, with some potential benefits)

### *R13. Junction Road Junction to Carlton Road Junction*

- Dependent: R14
- Complementary: R14
- Economic Impact: +1 (reduced journey time for movements to Cricklewood)
- Orbital Connectivity: +1 (permits some additional orbital movements)
- Growth Area Connectivity: +1 (additional connection to Cricklewood from New Southgate with R14)
- Physical Deliverability +2 (in situ, open to freight)
- Value for Money: +1 (low cost but limited benefits)

### *R14. Harringay Junction – Harringay Park Junction*

- Dependent: R13
- Complementary: R13
- Economic Impact: +1 (reduced journey time for some movements)
- Orbital Connectivity: +1 (permits some additional orbital movements)
- Growth Area Connectivity: +1 (additional connection to Cricklewood from New Southgate with R13)
- Physical Deliverability +2 (in situ, open to freight)
- Value for Money: +1 (low cost but limited benefits)

### *R15. South Action to Kew East Junction / Old Kew Junction Chord*

- Dependent: No
- Complementary: R10 and, to a lesser degree, R9
- Economic Impact: +1 (reduced journey times for movements to Hounslow)
- Orbital Connectivity: +1 (permits some additional orbital movements)
- Growth Area Connectivity: +2 (provide direct connection from OPDC to The Golden Mile and Hounslow)
- Physical Deliverability +2 (in situ)
- Value for Money: +2 (low costs and positive benefits)

### *R16. Heathrow Southern Access*

- Dependent: No
- Complementary: No
- Economic Impact: +3 (potential widespread reduction in access times to Heathrow)
- Orbital Connectivity: +1 (new rail connection, but limited for West London)
- Growth Area Connectivity: +1 (improved connectivity from Heathrow to Hounslow)
- Physical Deliverability -1 (range of engineering challenges for delivery)
- Value for Money: 0 (potentially very important scheme but limited benefit to West London as a whole)



## Road Schemes

4.11 The appraisal of each individual road scheme is set out below.

### H1. A406 – New Southgate – Colney Hatch

- Dependent: No
- Complementary: All A406 scheme would complement each other, with those in closest proximity offering the greatest combined benefits
- Economic Impact: +1 (improved orbital vehicle journey time reliability)
- Orbital Connectivity: +1 (no new, but enhanced connectivity provided)
- Growth Area Connectivity: +1 (connectivity from New Southgate to Cricklewood)
- Physical Deliverability: -1 (constrained urban environment)
- Value for Money: 0 (value for money dependent upon scheme costs)

### H2. A406 – Brent Cross (A5 to A1)

- Dependent: No
- Complementary: All A406 scheme would complement each other, with those in closest proximity offering the greatest combined benefits
- Economic Impact: +2 (signification reductions in orbital vehicle journey times)
- Orbital Connectivity: +1 (no new, but enhanced connectivity provided)
- Growth Area Connectivity: +2 (connectivity from Cricklewood to east and south west)
- Physical Deliverability: -1 (large-scale infrastructure project)
- Value for Money: +1 (potential significant benefits but expensive scheme)

### H3. A406 – Brent Park

- Dependent: No
- Complementary: All A406 scheme would complement each other, with those in closest proximity offering the greatest combined benefits
- Economic Impact: +1 (reductions in orbital vehicle journey times)
- Orbital Connectivity: +1 (no new, but enhanced connectivity provided)
- Growth Area Connectivity: +2 (connectivity between Barnet growth areas and OPDC)
- Physical Deliverability: -1 (constrained land availability and railway crossing)
- Value for Money: +1 (potential significant benefits but expensive scheme)

### H4. A406 – Hangar Lane Junction

- Dependent: No
- Complementary: All A406 scheme would complement each other, with those in closest proximity offering the greatest combined benefits
- Economic Impact: +2 (significant reductions in orbital vehicle journey times)
- Orbital Connectivity: +1 (no new, but enhanced connectivity provided)
- Growth Area Connectivity: +2 (connections from Wembley/OPDC to The Golden Mile)
- Physical Deliverability: -1 (major infrastructure scheme in urban area with rail line)
- Value for Money: +1 (potential significant benefits but expensive scheme)



#### *H5. A406 – Hangar Lane (A40) to Uxbridge Road (A4020)*

- **Dependent:** No
- **Complementary:** All A406 scheme would complement each other, with those in closest proximity offering the greatest combined benefits
- **Economic Impact:** +1 (reductions in orbital vehicle journey times)
- **Orbital Connectivity:** +1 (no new, but enhanced connectivity provided)
- **Growth Area Connectivity:** +2 (connections from Wembley/OPDC to The Golden Mile)
- **Physical Deliverability:** -1 (constrained urban environment)
- **Value for Money:** 0 (value for money dependent upon scheme costs)

#### *H6. A406 – M4 Junction*

- **Dependent:** No
- **Complementary:** All A406 scheme would complement each other, with those in closest proximity offering the greatest combined benefits
- **Economic Impact:** +1 (reductions in orbital vehicle journey times)
- **Orbital Connectivity:** +1 (no new, but enhanced connectivity provided)
- **Growth Area Connectivity:** +1 (connections from Wembley/OPDC to The Golden Mile)
- **Physical Deliverability:** -1 (major infrastructure scheme in urban area with rail line)
- **Value for Money:** 0 (value for money dependent upon scheme costs)

#### *H7. A312 – M4 to Hayes Road*

- **Dependent:** No
- **Complementary:** No
- **Economic Impact:** +2 (potential reduction in delays and improvement in reliability of journey times)
- **Orbital Connectivity:** +1 (no new, but enhanced connectivity provided)
- **Growth Area Connectivity:** +2 (Connectivity from Harrow & Wealdstone and Southall to Heathrow and Hounslow)
- **Physical Deliverability:** -1 (constraints to land availability and rail/river crossings)
- **Value for Money:** +1 (significant potential benefits should off-set costs)

### **Bus Rapid Transit Schemes**

4.12 The appraisal of each individual bus rapid transit scheme is set out below.

#### *BRT1. A312 – Heathrow to Harrow*

- **Dependent:** No
- **Complementary:** BRT2
- **Economic Impact:** +1 (reduction in journey times for range of movements)
- **Orbital Connectivity:** +1 (enhanced public transport provision)
- **Growth Area Connectivity:** +1 (connectivity from Heathrow to Harrow)
- **Physical Deliverability:** 0 (high capacity road corridor provides some scheme Opportunities but limited available additional land)
- **Value for Money:** +1 (potential for benefits to outweigh costs)



*BRT2. A4006 – Harrow to Cricklewood/Brent Cross*

- Dependent: No
- Complementary: BRT1
- Economic Impact: +1 (reduction in journey times for range of movements)
- Orbital Connectivity: +1 (enhanced public transport provision)
- Growth Area Connectivity: +1 (connectivity from Harrow to Cricklewood)
- Physical Deliverability: -1 (restrictive urban environment and limited road space)
- Value for Money: 0 (benefits unlikely to outweigh scheme costs)

*BRT3. A408/A437/ A4020 – Heathrow to Uxbridge*

- Dependent: No
- Complementary: No
- Economic Impact: +1 (reduction in journey times for range of movements)
- Orbital Connectivity: +1 (enhanced public transport provision)
- Growth Area Connectivity: +1 (connectivity from Heathrow to Uxbridge)
- Physical Deliverability: 0 (some high capacity element of road corridor that could provide opportunities for scheme delivery)
- Value for Money: +1 (potential for benefits to outweigh costs)

*BRT4. A410/A41 – Harrow & Wealdstone to Edgware*

- Dependent: No
- Complementary: BRT5
- Economic Impact: +1 (reduction in journey times for range of movements)
- Orbital Connectivity: +1 (enhanced public transport provision)
- Growth Area Connectivity: +1 (connectivity from Harrow & Wealdstone to Edgware and potential link to Mill Hill East)
- Physical Deliverability: -1 (restrictive urban environment and limited road space)
- Value for Money: 0 (benefits unlikely to outweigh scheme costs)

*BRT5. A5109 – Edgware to East Barnet*

- Dependent: No
- Complementary: BRT4
- Economic Impact: +1 (reduction in journey times for range of movements)
- Orbital Connectivity: +1 (enhanced public transport provision)
- Growth Area Connectivity: 0 (limited impact)
- Physical Deliverability: -1 (restrictive road capacity)
- Value for Money: 0 (limited benefits relative to costs)

## Appraisal Summary

- 4.13 Table 4.1 provides an overarching summary of the scoring for each individual scheme, along with their inter-dependencies and potential complementary nature.

Table 4.1 Summary of the Appraisal of Long-list of Interventions

		Dependant	Complementary	Economic	Orbital Connectivity	Growth Area Connectivity	Physical Deliverability	Value for Money
R1	Denham/West Ruislip – Uxbridge High Street	No	R2	+1	+1	0	-1	-2
R2	Uxbridge Vine Street – West Drayton	No	R1	+2	+2	+2	-3	-1
R3	West Drayton – Colnbrook - Staines	No	R2	+1	+2	0	-1	-1
R4	Ruislip Gardens - Ickenham	No	No	+1	+1	0	0	-1
R5	Greenford – West Ealing	No	No	0	+2	0	+2	+1
R6	Southall – Brentford Goods	No	No	+1	+1	+2	+2	+1
R6a	Southall – Brentford Goods – Brentford / Hounslow	(R6)	(R6)	+2	+3	+3	-2	0
R7	Edgware – Mill Hill East	No	No	+1	+2	+2	-3	-1
R8	Finsbury Park – Highgate – Alexandra Palace	No	No	+2	+1	0	0	0
R9	Neasden Junction - Neasden South Junction	R10	R10, R12, R13	+1	+1	+1	+1	+1
R10	Dudding Hill Line	No	R9, R12, R13, R15	+3	+3	+3	0	+2
R11	Acton Canal Wharf Junction	R10	R10, R12, R15	+1	+1	0	0	-1
R12	Acton East Junction	No	R9, R10, R11	+1	+1	+1	+1	+1
R13	Junction Road Junction to Carlton Road Junction	R14	R14	+1	+1	+1	+2	+1
R14	Harringay Junction – Harringay Park Junction	R13	R13	+1	+1	+1	+2	+1
R15	South Action to Kew East Junction / Old Kew Junction Chord	No	R9, R10	+1	+1	+2	+2	+2
R16	Heathrow Southern Rail Access	No	No	+3	+1	+1	-1	0
H1	A406 – New Southgate – Colney Hatch	No	Other A406	+1	+1	+1	-1	0
H2	A406 – Brent Cross (A5 to A1)	No	Other A406	+2	+1	+2	-1	+1
H3	A406 – Brent Park	No	Other A406	+1	+1	+2	-1	+1
H4	A406 – Hangar Lane Junction	No	Other A406	+2	+1	+2	-1	+1



		Dependant	Complementary	Economic	Orbital Connectivity	Growth Area Connectivity	Physical Deliverability	Value for Money
H5	A406 – Hangar Lane (A40) to Uxbridge Road (A4020)	No	Other A406	+1	+1	+2	-1	0
H6	A406 – M4 Junction	No	Other A406	+1	+1	+1	-1	0
H7	A312 – M4 to Hayes Road	No	No	+2	+1	+2	-1	+1
BRT1	A312 – Heathrow to Harrow	No	BRT2	+1	+1	+1	0	+1
BRT2	A4006 – Harrow to Cricklewood/Brent Cross	No	BRT1	+1	+1	+1	-1	0
BRT3	A408/A437/ A4020 – Heathrow to Uxbridge	No	No	+1	+1	+1	0	+1
BRT4	A410/A41 – Harrow & Wealdstone to Edgware	No	BRT5	+1	+1	+1	-1	0
BRT5	A5109 – Edgware to East Barnet	No	BRT4	+1	+1	0	-1	0

## 5. Prioritisation of Schemes

### Initial Ranking of Schemes

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- 5.1 An initial ranking of schemes has been undertaken, utilising the appraisal outcomes, to identify schemes that are either considered undeliverable or offer limited benefits to the West London Sub-region in terms of enhancing orbital connectivity, specifically between the growth areas and town centres.

#### Not deliverable

- 5.2 The following rail schemes are considered to be extremely challenging to deliver without substantial tunnelling. This is primarily as a result of housing development on significant parts of the rail alignments.

*R2. Uxbridge Vine Street – West Drayton*

*R7. Edgware – Mill Hill East*

#### Low Ranking

- 5.3 In addition to those schemes deemed undeliverable, a number of other schemes were not considered to offer sufficient value for money from investment in terms of the scale of the benefits they would provide to the West London Sub-region in relation to their likely cost.

*R1. Denham/West Ruislip – Uxbridge High Street*

*R3. West Drayton – Colnbrook - Staines*

*R4. Ruislip Gardens – Ickenham*

*R8. Finsbury Park – Highgate – Alexandra Palace*

*R11. Acton Canal Wharf Junction*

*H1. A406 – New Southgate – Colney Hatch*

*H5. A406 – Hangar Lane (A40) to Uxbridge Road (A4020)*

*H6. A406 – M4 Junction*

*BRT2. A4006 – Harrow to Cricklewood/Brent Cross*

*BRT4. A410/A41 – Harrow & Wealdstone to Edgware*

*BRT5. A5109 – Edgware to East Barnet*



## Packaging of Schemes

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- 5.4 The remaining schemes on the 'long-list' were all ranked either medium or high and are considered to have potential to deliver benefits to the West London Sub-region in terms of enhanced orbital connectivity, in particular between growth areas and town centres.
- 5.5 Some of these schemes are conditional upon other schemes (or each other) or are complementary. Others provide the opportunity to re-schedule rail services to provide additional connectivity. The individual scheme measures have, therefore, been grouped into nine coherent packages of measures for further appraisal.

### Package 1: Ruislip (Chiltern Line) to Ealing Rail

#### *R5. Greenford – West Ealing*

- Utilisation of the existing R5 rail alignment would permit the running of rail services from the Chiltern Line down to the Great Western Main Line, allowing connections such as Ruislip to Ealing Broadway.
- Whilst the scheme provides an additional section of orbital rail connection, its function would be as much to facilitate radial movements across the sub-region.
- It does not provide any direct connectivity between growth areas and town centres.
- It is physically deliverable and low cost

### Package 2: Southall to 'The Golden Mile' Rail

#### *R6. Southall – Brentford Goods*

##### *R6a. Southall – Brentford Goods – Brentford / Hounslow*

- Utilisation of the existing R6 rail alignment would permit running of services from Southall to connect to areas within 'The Golden Mile'. An extension to Brentwood and Hounslow requires new rail provision to connect into the South West Trains 'Hounslow Loop'.
- The scheme provides new orbital rail connections, as well as directly connecting two growth areas, with the potential to connect to Hounslow Town Centre as well
- The route to Brentford Goods is physically deliverable, although the extension to connect into the 'Hounslow Loop' is challenging and would significantly add to the cost.

### Package 3: Dudding Hill Rail Line

#### *R10. Dudding Hill Line (Cricklewood to Acton Wells Junction)*

#### *R9. Neasden Junction - Neasden South Junction*

#### *R12. Acton East Junction*

- Utilisation of the existing R10 rail alignment would permit running of services from Thameslink Line near Cricklewood to connect to the existing Overground leading to Richmond, at Acton Wells Junction. The addition of the Neasden Junction permits

connections towards Wembley, whilst the Action East junction provides connection to Ealing. The combination of schemes provides a range of operational rail service options.

- The scheme provides an extensive new orbital rail connection and deliver connectivity from Cricklewood/Brent Cross to OPDC, as well as potentially Ealing.
- The core scheme is physically deliverable, albeit with some potential constraints at Cricklewood and delivering station but the existing track significantly reduces the cost.

#### Package 4: New Southgate to Cricklewood Rail

##### *R13. Junction Road Junction to Carlton Road Junction*

##### *R14. Harringay Junction – Harringay Park Junction*

- Utilisation of both the R13 and R14 alignments would permit through running services from the Great Northern route through to the Thameslink Line.
- The scheme would provide some additional orbital connectivity and permit rail connections from New Southgate to Cricklewood/Brent Cross
- The scheme is physically deliverable and relatively low cost

#### Package 5: OPDC to The Golden Mile / Hounslow Rail

##### *R15. South Action to Kew East Junction / Old Kew Junction Chord*

- Utilisation of the R15 alignment would permit rail services from the Overground Line from Willesden Junction to Brentford and Hounslow.
- The scheme would provide additional orbital connections and provide specific direct rail connectivity from OPDC to 'The Golden Mile' and Hounslow.
- The scheme is physically deliverable and relatively low cost

#### Package 6: Southern Rail Access to Heathrow

##### *R16. Heathrow Southern Access*

- A variety of alignments have been considered to provide southern rail connectivity into Heathrow
- The scheme would provide some new orbital rail connectivity for West London, although is dependent upon the choice of alignment. It could provide connectivity from Heathrow to Hounslow, although the Piccadilly Line provides some connection already.
- The scheme would be challenging to deliver and high cost.



## Package 7: A406 Road Schemes

### H2. A406 – Brent Cross (A5 to A1)

### H3. A406 – Brent Park

### H4. A406 – Hangar Lane Junction

- Delays have been identified around the A406 corridor in West London and these are projected to increase over time. Junction and link capacity enhancements would facilitate improvements in relative journey times and journey time reliability.
- Whilst not providing new physical connections, the scheme would improve orbital accessibility, through reduced journey times, and so improve connectivity from Cricklewood/Brent Cross, Wembley, OPDC and 'The Golden Mile'.
- The urban land-use constraints would make the scheme challenging to deliver and relatively expensive.

## Package 8: Heathrow to Southall / Harrow - Road and Rapid Transit

### H7. A312 – M4 to Hayes Road

### BRT1. A312 – Heathrow to Harrow

- Delays have been identified around the A312 corridor in West London and these are projected to increase over time. Junction and link capacity enhancements would facilitate improvements in relative journey times and journey time reliability.
- The H7 scheme, whilst not providing new physical connections, would improve orbital accessibility, through reduced journey times. Delivered alongside a rapid transit scheme would provide additional public transport connectivity. Both elements would improve connectivity from Heathrow to Harrow, with some benefits for Southall as well.
- Expansion of capacity along part of the A312 is deliverable, although potentially expensive.

## Package 9: Heathrow to Uxbridge Rapid Transit

### BRT3. A408/A437/ A4020 – Heathrow to Uxbridge

- A rapid transit scheme would provide an enhanced orbital public transport connection from Heathrow to Uxbridge.
- Parts of the route may already have capacity to accommodate dedicated provision for the service; however, other elements may be challenging and expensive to deliver

## Package Prioritisation

5.6 Based upon further appraisal of the packages of measures against the overarching objectives, a prioritisation process has been undertaken, with the identification of four levels of scheme measures.

5.7 The outcomes from the process are summarised within Table 5.1

Table 5.1 Prioritisation of Packages

Package		Economic	Orbital Connectivity	Growth Area Connectivity	Physical Deliverability	Value for Money	Prioritisation Level
P1	Ruislip (Chiltern Line) to Ealing Rail	0	+2	0	+2	+1	L4
P2	Southall to The Golden Mile Rail	+1	+2	+2	+1	+1	L2
P3	Dudding Hill Rail Line	+3	+3	+3	0	+2	L1
P4	New Southgate to Cricklewood Rail	+1	+1	+1	+1	+2	L3
P5	OPDC to The Golden Mile / Hounslow Rail	+1	+1	+2	+2	+2	L2
P6	Southern Rail Access to Heathrow	+3	+1	+1	-1	0	L3
P7	A406 Road Schemes	+2	+1	+2	-1	+1	L2/L3
P8	Heathrow to Southall / Harrow - Road and Rapid Transit	+2	+1	+2	-1	+1	L2/L3
P9	Heathrow to Uxbridge Rapid Transit	+1	+1	+1	0	+1	L4

5.8 The Dudding Hill Line package of measures is considered to perform strongly against the appraisal criteria. The scheme offers a range of potential rail service operations that would provide additional sub-regional connectivity. Notably it would also complement two of the other rail packages, P3 and P5, offering the potential for rail connections from New Southgate, across the heart of the West London Sub-region, through to Hounslow and Feltham.



## Appendix A -

A.1

DRAFT

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19 January 2018

## **West London Orbital Railway Outline Case & Technical Report 2017**

Dear Luke,

It was good to meet with you before Christmas regarding your aspirations for a potential West London orbital rail service; thank you for providing an opportunity for Joseph and me to initially engage. In the meeting we were glad to listen to the West London Alliance's aims for the potential area served, and to be introduced to some of the benefits identified in a report you commissioned from WSP. Network Rail fully supports the principle of enhancing rail services and the many benefits these can provide to communities and the economy.

With mind to the potential benefits, we discussed some high level challenges which we would be happy to further explore in collaboration with yourselves and related stakeholders such as TfL. Development work could look to further identify and, where possible, address risks to inform possible endorsement of a new rail service. These challenges arise in two related areas; operational feasibility of new services in the timetable, and risks which may arise and be explored in further development of identified supportive enhancements affecting cost and deliverability.

### **Challenges arising in the operational feasibility of new services**

The proposed new services would utilise mixed and intensely used existing railway infrastructure and interface with several complex timetables. There are a number of areas to consider, notably:

- At the northern end of the proposed route, services would interface and potentially conflict with the timetable of Midland Main Line which has been formally declared 'congested infrastructure' north of Cricklewood.
- At the southern end, proposed services would interface and potentially conflict with the timetable of Arriva Rail London services on the North London Line and Southwestern trains on the Hounslow loop.
- Throughout the route, and notably at the busy Acton Wells Junctions, the proposed services would interface and potentially conflict with the timetables of several freight services.

Considering these interfaces, It was good to see that WSP's report referenced a piece of timetable analysis conducted by Network Rail for a proposed service from Hounslow to Old Oak Common, and that it incorporated a few of its conclusions for infrastructure requirements. However, to take this forward and consider challenges such as those above, we would recommend that additional timetable analysis is undertaken to cover the wider operational scope given in WSP's report. This can be undertaken by Network Rail Capacity Planning, or assured by them if undertaken by a third party. My team can assist in producing a cost estimate for the work, engagement with the wider rail industry for integral planning assumptions, and can sponsor the analysis if required.

Additionally, the initial piece of analysis to Hounslow identified challenges which would need to be addressed in any further development on proposed services. For example, interaction with freight services challenges the possibility to run a consistent clockface pattern and that running on current headways presents performance risks other railway users may find unsatisfactory. With WSP's report considering a further increased service pattern of 8tph, these risks may become more apparent.

### **Challenges arising in further development of identified enhancements**

As enhancements are developed on the rail network risks to cost and deliverability can be identified and considered. As well as covering a mixed and intensely used infrastructure, the enhancements identified in WSP's report would often need to be delivered in a constrained and changeable urban environment. Whilst a formal cost review has not been undertaken by Network Rail, the given spot estimates in the report may not be an accurate reflection on the final cost of a project or programme, for reasons such as:

- Although the report allocated £30m and £5m respectfully for Bollo Lane and Church Lane Level Crossings in Acton, it did not sufficiently develop potential solutions. Further development may consider risks such as land availability and road traffic which may negatively impact cost.
- Doubling of Acton Wells Junction is correctly incorporated as a required enhancement, but the operational use and surrounding geography present significant risks. The site would cross over the Central Line and 'Wycombe Single' line, and be in close proximity to the Great Western Main Line and new HS2 infrastructure. These factors, and a constrained urban environment, would present challenges such as site access, engineering possessions, and land availability for new bridge and layout construction.
- Resignalling is incorporated with a spot estimate of £8m. Such resignalling projects can vary considerably in price, depending on factors such as headways, equipment, interfacing technology, and also any operational cost of industrial capability when relocating control to new signaling panels.
- New and enhanced stations are recommended at several locations along the route, with varying cost estimates. Land requirements, gradient on site for freight running, and pedestrian capacity at notable interchanges are examples of further considerations which may affect cost estimates.
- New bi-mode or innovative rolling stock could potentially provide new services. These may require supportive development work to both analyse impact on the network through such means as gauging clearance, power supply, and land requirements for any stabling strategy.



Following on from a wider piece of timetable analysis, you may decide to further develop your proposals in full, or in part, with mind to considered risks like those above. We are happy to support the principle of enhanced rail services in West London but, in order to reach a point at which we can jointly endorse and deliver a proposal, we would recommend it be developed through the appropriate pathways and with supportive business cases. My team and I would be willing to further meet with yourselves and stakeholders in TfL to discuss appropriate next steps.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'R Walker', with a long horizontal stroke extending to the right.

Rupert Walker  
Strategy and Planning Director (South)  
System Operator  
Network Rail





## West London Economic Prosperity Board

**21 November 2017**

<b>Title</b>	<b>Orbital Rail in West London</b>
<b>Report of</b>	Amar Dave, LB Brent
<b>Wards</b>	All
<b>Status</b>	Public
<b>Urgent</b>	No
<b>Enclosures</b>	APPENDIX 1: Summary of “GRIP” approach to delivering rail projects APPENDIX 2: West London Orbital rail key facts
<b>Officer Contact Details</b>	Luke Ward, Head of Growth, Employment and Skills, West London Alliance, wardlu@ealing.gov.uk

### Summary

This report provides the Board with an update on work relating to the West London Orbital rail line. It sets out next steps, an indicative project plan and governance arrangements for taking the scheme to construction and delivery promptly, should it proceed to the next stage.

### Recommendations

**The Board is asked to:**

- 1) NOTE overall progress on the project and IDENTIFY any additional actions or activities not already included within sections 2 and 3.**
- 2) IDENTIFY any stakeholders at national, London or local level who will need to be engaged with any future engagement activity associated with the project.**
- 3) COMMENT on the project plan set out in section four of the report**

#### **1. WHY THIS REPORT IS NEEDED**

The West London Economic Prosperity Board (WLEPB) has previously identified the West London Orbital (WLO) rail line as a scheme of shared priority. It has agreed that progress and next steps relating to the project be a standing item on its agenda, as suggested by the Deputy Mayor for Transport during their meeting with her over summer 2017.

There is, at present, a range of activity being undertaken in relation to the scheme and this report provides the Board with an opportunity to comment on and shape this work ahead of the expected publication of the final Mayor's Transport Strategy (MTS) in early 2018.

The intention is that, subject to the MTS containing the required references to the WLO, the momentum this project has will allow the initiation of the delivery phase of the project relatively quickly. If the MTS does not explicitly support the WLO proposition then the current body of work completed to date would nonetheless allow West London boroughs to present a "shovel ready" infrastructure project to London and national decision makers if and when the time is right.

**FIGURE 1: Route of the line**



## 2. MAIN BODY

This remainder of this report is divided into a number of sections, covering:

- **Summary of work undertaken to date**



- **Immediate next steps between now and late 2017**
- **Activity required from early 2018 onwards (should the project continue)**
  - **Notional project plan for the delivery of the line**
  - **Risks, Issues, Challenges**
  - **Next steps**

## 2.1 Summary of work undertaken to date:

- The Board agreed the West London Orbital Scheme as a **shared priority** at its meeting on 22 March 2017.
- **Feasibility Study and outline business case** into the line completed and approved by the Board on 22 September 2017. The Study found the following:
  - The scheme is **technically feasible** with a strong strategic case and healthy passenger demand supporting 8 trains per hour in each direction.
  - The scheme represents **High value for money** according to the Department for Transport's definition, with a "Benefit-Cost Ratio" (BCR) of 2.2:1.
  - Scheme cost currently estimated to be in the region of £265m.
  - In line with the rest of the over ground network the scheme would likely require an operating subsidy based on income of c.£9m p.a. and operating costs of c. £15m p.a. Credible options for closing this subsidy gap have been identified and will be investigated through a separate funding study.
- Boroughs are incorporating the scheme into **Local Plans**.
- The Board has submitted a **joint response to the Mayor's Transport Strategy** that included referent to the West London Orbital. Furthermore, London Councils are actively supporting the scheme and this was reflected in the pan-London MTS response.
- On 29 September 17, Leaders were joined by the Deputy Mayor for Transport along with senior representatives from TfL, Network Rail and OPDC for a **tour of the line**, all of whom emphasised their support for the project. The Deputy Mayor suggested it might be a suitable candidate for a future [significant] round of Housing Infrastructure Funding and said she would be recommending that the scheme is clearly recognised as a priority in the final MTS
- Ongoing engagement with representatives from GLA, TfL, NR and civil society to embed the scheme into the strategic planning framework of London.

## 2.2 November 2017 to the Publication of the Mayor's Transport Strategy (expected in early 2018)

The key milestone expected in the coming months is the publication of the final Mayor's Transport Strategy (MTS). It is important to recognise that there are things that need to be done in the meantime, both in terms of developing a deeper understanding of the functioning and economics of the scheme, and also in terms of building a wider base of support across local and London government, the rail sector, Government, and of course local communities. These include:

- Commissioning and **delivering the funding study** commissioned by leaders (specification attached as Appendix one). Not necessary to be completed before publication of MTS.
- Further **development of the longer-term project plan** and delivery timeline after publication of the MTS, and the securing of adequate resources for this work going forward. This project plan needs to include 1) technical and planning staged and 2) Scheme construction.
- Establishment of **Shadow governance** arrangements, reporting to the EPB and consisting of LG, TfL, NR, GLA, DfT etc. The technical working group consisting of transport officers will also be maintained as this moves towards becoming a serious capital programme we will need to clarify governance and accountability arrangements that will be fit for purpose and retain a key role for local Leaders
- **Ongoing engagement** – meeting with senior members of DfT, developing relationships with NR and GLA planning and transport colleagues, offering solutions and constructive achievable approaches for dealing with some of the trickier technical aspects of the scheme such as Acton Wells and Bollo Lane. Embedding in to London planning system.
- There is currently a high level of innovation in train technology, including the development of **battery-powered trains**, which have been referenced a number of times by the Board and wider stakeholders as being of interest in relation to the WLO. Discussion is currently being undertaken with the industry to determine the feasibility of operating battery trains on the WLO. There may be an opportunity to test a battery powered train in West London during the first part of 2018.
- From March – May purdah will define the political context so there will be a need to ensure the project plan allows for the implications of this and we will seek support to ensure cross-party information sharing and engagement before then.

In the event that the MTS publication is put back (e.g. after the May borough elections), the above actions still hold, with a bit more time to establish the necessary emphasis on engagement, partnerships and governance. Maintaining impetus whilst managing expectations and avoiding any unhelpful financial or political exposure will define this phase.

### **2.3 Activity required from early 2018 onwards (should the project continue)**

Work to date has focused on understanding the outline case for the West London Orbital with the objective, subject to there being reasonable grounds, of securing sufficient hooks within the MTS to allow the scheme to proceed to more detailed development and delivery. Assuming the MTS includes the backing for WLO that is anticipated, the following will be required in order to progress. It should be noted that delivery of the programme below will require significant resourcing, which will be sought from a variety of sources as appropriate:



- As part of delivery of the wider project plan it will be necessary to commission a series of **more detailed planning products** (the so-called “GRIP Stages”) that cover things like the detailed layout of specific sections of track, train timetables, station locations and finances. Ideally all studies would be commissioned out as a package of work to a single provider who would also act as a strategic partner for the project.
- Work with London and national government on a **funding package** for resourcing this work (estimated to be roughly £5m+, although the exact figure will need to be determined following more detailed scoping). In order to reduce bureaucracy and speed up the delivery of the line it is suggested at this stage that the Board agrees that next stage studies will be commissioned out as a package to a single organisation.
- Develop a more **comprehensive community and public engagement approach** to delivering the scheme to ensure the views and wishes of communities and businesses from all backgrounds are heard and able to influence the outcome of the project
- Full **embedding in to local, pan-London and national planning frameworks** so that the project can be taken forward within the context of wider strategy.

## 2.4 Other points the Board should be aware of

There are a significant number of rail projects happening in London that are likely to interact in some way with the WLO. E.g. High Speed 1, Crossrail, and the Chiltern Line extension. It will be important that as these progress they do so in a way that does not preclude WLO. This is a risk to the project (see section 4) and will need to be carefully managed through careful and ongoing engagement with key partners including DfT, Network Rail and TfL.

## 3. Outline programme

Three broad work streams have been identified as being required over the coming years to take the project forward. These can be undertaken simultaneously and are:

1. Technical planning studies
2. Funding package development
3. Community and civic engagement and consultation
4. Governance process/meetings & other milestone

Should the MTS contain reference to the project, discussions will commence with TfL and other relevant parties on securing sufficient resource to take this work forward.

**NOTE: This programme plan will be continually updated and kept under review as the scheme progresses and additional information becomes available.**

### 3.1 Work stream 1: Technical planning process and studies

This work stream sets out how the technical planning and construction work associated with developing the line will be taken forward.

Project	Description	Output	Timescale
Local Plan alignment	To embed scheme in planning authority local plans, including GLA and OPDC	Local Plans all contain a shared, aligned message relating to the line.	Currently underway
Bollo Lane technical study	To identify detailed technical solution for addressing Bollo Lane crossings	High level engineering solution identified that addresses level crossings at Bollo Lane	Early 2018
GRIP 2	Define the scope of the investment and identify constraints. Confirm that the outputs can be economically delivered and aligned with network strategy. Includes detailed time tabling and technical solutions e.g. to Acton Wells.	Detailed outline business case	January – September 2018
GRIP 3	Develops options for addressing constraints. Assesses and selects the most appropriate option that delivers the stakeholders' requirements together with confirmation that the outputs can be economically delivered.	Full business case	September 2018 – April 2019
<b>KEY MILESTONE: Project Mandate</b>	<b>Formal agreement from key stakeholders to commence line construction (subject to GRIPs 2 and 3, and a suitable resourcing package being in place.</b>	<b>Project construction approved</b>	<b>Early-mid 2019</b>
GRIP 4	Initiation of the development of the chosen single option. MAIN OUTPUT: Reference design for whole scheme.	Outline designs	Mid 2019
GRIP 5 – 8	Detailed design and delivery. Need to allow time for significant uncertainty e.g. possible JR, public enquiries, technical complications etc.	GRIP 5. detailed designs	October 2019 – project delivery (currently 2026, dependent on GRIPS 2 & 3)
		GRIP 6. Stations built, tested and commissioned	
		GRIP 7. Handing of stations to operators	
		GRIP 8: Orderly	



		project closure	
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### 3.2 Work stream 2: Funding package development

This work stream sets out how the line's construction and operation will be resourced in a sustainable, economically and socially acceptable way.

<b>Project</b>	<b>Description</b>	<b>Timescale</b>
Funding options study	Identify achievable and acceptable options for securing resourcing for both line construction and to address/minimise any potential operating subsidy that may be required.	Early 2018
Locally-available capital funding options	Identify quantum of available locally-raisable capital in further detail.	TBC - following publication of MTS.
Externally available capital funding options	Engagement with GLA, DfT and TfL on construction funding. Possibly including future "HIF2" funding.	TBC – following publication of MTS
Subsidy elimination model	Structure business model of new service to require zero-subsidy in medium term. E.g. via pricing structure or zone segments	TBC – following publication of MTS. Funding package will need to be in place by first part of 2019 however.

### 3.3 Work stream 3: Community engagement and consultation

This work stream describes how local residents, businesses, groups and elected representatives will be engaged and consulted with throughout the life of the project:

<b>Project</b>	<b>Description</b>	<b>Timescale</b>
Development of consultation and communications plan linked to project plan	To ensure a strategic and coordinated approach to community engagement and consultation that accounts for the views of all stakeholders	Plan in place by March 2018
Equalities Impact Assessment	A full audit of the qualities impacts of the scheme so any positive or negative impacts can be identified and addressed.	Currently anticipated to be completed in early 2019 once the operation of the line and differential impacts on different groups is fully understood.
Consultation grip including elected members, community groups, lobbying	A full database of interested parties to ensure through communication throughout the life of the project	Ongoing

organisations etc.		
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### 3.4 Work stream 4: Governance process/meetings & other milestones

This work stream sets out the various governance channels that will need to be involved in the development of the line, should the project progress:

**West London Economic Prosperity Board:** Top-level governance for West London local public services. Top-level governance for West London local public services

**Technical Group:** Comprising transport planning professionals from the relevant West London Boroughs, plus representatives from TfL, Network Rail, GLA and DfT as required. This group will provide commissioning expertise and capacity, and also undertake a quality assurance function of all project outputs prior to them being used to inform any planning or funding decisions.

**Network Rail:** It will be crucial that Network Rail are involved in the project and are supportive of its objectives. Engagement is currently underway to establish the most appropriate governance channels for Network Rail.

**TfL Board:** As the most likely final operator of the Line it will be important for the project to be embedded into the decision making and governance structures of TfL and London Government (GLA) more broadly. This will be done via the London Plan and MTS process.

**Central Government:** In particular DfT, DCLG and the Treasury will have a role enabling the delivery of the line as part of if greater emphasis on investing in infrastructure nationally, and on providing funding as part of the national Industrial Strategy.

## 4. Risks, Issues, Challenges

A full risk matrix will be developed in the first part of 2018. In summary however at this early stage in the project the key risks are:

- **Technical:** Acton Wells Junction and Bollo Lane level crossings: These represent the greatest technical challenges along the route.
- **Resources,** Subsidy and construction – with an expected operating subsidy of c.£5m p.a. based on the best available information and construction costs in the region of £265m resourcing this project presents a significant challenge and will require a coordinated strategic approach.
- **Dependencies with other schemes:** There are a large number of rail schemes at various stages of development that have potential implications for WLO. These include HS2 and Crossrail but also the Chiltern line, North London Line, and development at Brent-Cross on the Thameslink line. These all require coordination to ensure a strategic approach to rail and that none of these schemes preclude each other.
- **Pace and momentum** – It will be important to maintain progress going forward (if the scheme is included in the MTS).



## **5. IMMEDIATE NEXT STEPS**

Should the WLEPB approve the recommendations set out within this paper then officers will progress the project along the lines set out within section 2.2 and 2.3.

Officers within West London boroughs will also begin the process of embedding the scheme into local planning frameworks, including Local Plans.

## **6. REASONS FOR RECOMMENDATIONS**

Long term projections of the London population and economy show that transport infrastructure is likely to become an increasing constraint on growth. We also know that with a falling rate of car ownership in outer London that the role of high quality transport infrastructure that connects the places that people live and work is crucial. The recommendations set out in this report address these issues and will put West London in a good position to grow well into the future.

## **7. ALTERNATIVE OPTIONS CONSIDERED AND NOT RECOMMENDED**

The feasibility study outline case commissioned by Leaders looked at all alternative options for making orbital journeys across West and North London. The West London Orbital proposal described here reflects the outcome of that analysis.

## **8. POST DECISION IMPLEMENTATION**

TfL and the GLA will continue to be engaged with to secure the inclusion of the WLO in to the forthcoming Mayor's Transport Strategy and the London Plan.

The longer-term "road map" in section 3 of this report setting out how the WLO will be brought to reality by the 2020s will be refined and defined in further detail. This road map will be incorporated into the medium and longer-term planning activity of individual West London Boroughs and of the WLA.

## **9. IMPLICATIONS OF DECISION**

### **9.1 Corporate Priorities and Performance**

9.1.1 The West London Vision for Growth highlights improved orbital transport infrastructure as a priority for the sub-region.

### **9.2 Resources (Finance & Value for Money, Procurement, Staffing, IT, Property, Sustainability)**

9.2.1 It should be noted that delivery of the programme below will require significant resourcing should it progress covering programme management, ongoing technical feasibility work, and construction. This will be sought from a variety of sources as appropriate.

### **9.3 Social Value**

9.3.1 The proposal set out here supports improved health and wellbeing outcomes for people and businesses in West London by enabling them to move around more quickly and cheaply and by improving the quality of the environment.

9.3.2 The line also responds positively to a number of recognised challenges for residents in West London. For example, it will reduce the level of pollution and particulate matter that travellers are exposed to compared to equivalent journeys by road. It will also improve journey times and reduce costs per mile compared with car travel, this will help to boost the disposable incomes of travellers and also give them more time per day not caught in traffic. The line will give people living in areas of higher deprivation and with lower income levels greater accessibility to at least 100,000 new jobs that are expected to be created in the existing regeneration schemes in Brent Cross, OPDC, Wembley, and the Hounslow Opportunity Area.

#### **9.4 Legal and Constitutional References**

9.4.1 This work falls within the following sections of the WLEPB's Functions and Procedure Rules:

- Representing the participating local authorities in discussions and negotiations with regional bodies, national bodies and central government on matters relating to economic prosperity for the benefit of the local government areas of the participating authorities.
- Representing the participating authorities in connection with the Greater London Authority, London Councils and the London Enterprise Panel, for the benefit of the local government areas of the participating authorities, in matters relating to the economic prosperity agenda
- Representing the participating local authorities in discussions and negotiations in relation to pan-London matters relating to economic prosperity.

#### **9.5 Risk Management**

9.5.1 The risk of not taking early action to improve joined up, high quality across West London is that growth across West London boroughs is lower than might otherwise have been the case, resulting in few jobs, a smaller tax base, and lower levels of investment than would otherwise be the case.

#### **9.6 Equalities and Diversity**

9.6.1 This work currently has no equality or diversity implications. If brought to fruition, however, the WLO line would connect many of the sub-region's most deprived communities with employment opportunities and growth areas across London, and allow them to access jobs and employment opportunities at a lower cost and more quickly than would often be possible by other forms of public transport or private car. A full Equalities Impact Assessment (EIA) will be undertaken should this work progress to the stage of development that would require this.

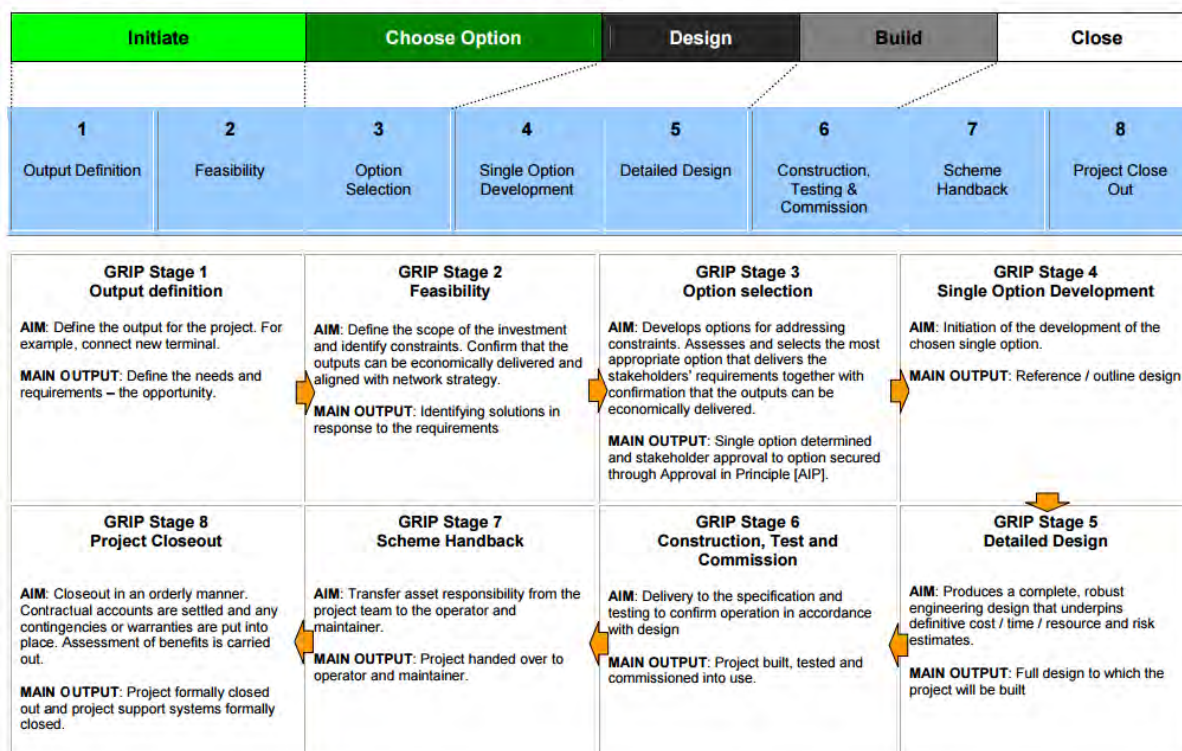


## **9.7 Consultation and Engagement**

- 9.7.1 This work does not currently affect the public. All West London boroughs, plus the GLA, TfL and the Old Oak Command and Park Royal Development Corporation, as well as the business community have all been heavily involved in the development of the proposals to date. Should the work progress to being an actual project full community engagement and consultation plan will be developed alongside the EIA.

## APPENDIX 1:

### Guide to Rail Investment Process (GRIP)





## **APPENDIX 2: KEY FACTS ABOUT THE LINE (as of October 2017)**

- The route is technically feasible and runs for around 11 miles starting at either Brent Cross or Cricklewood before merging with existing mainline services at Acton Central and running to Hounslow. The Barnet–Acton Central stretch of line is approximately 4 miles long.
- Possible sites for new stations and stabling identified at: Brent Cross/Cricklewood, Neasden, Harlesden, and Old Oak Common Lane. Existing stations used from Acton Central-Hounslow
- Eight trains per hour in each direction
- High Value for Money scheme with a “Benefit-Cost Ratio” (BCR) to the wider economy and society of 2.2:1.
- TfL have modelled peak three-hour demand at 3,000 passengers anti-clockwise and 2,500 passengers clockwise in 2031. This suggests that the level of **passenger demand may be able to sustain a regular four-trains-per-hour service** along the line.
- Early passenger demand modelling suggests potential for this to be largely self-funding with c.£265m build cost (including risk).
- It would drastically improve orbital travel times around West London. For example **a journey from Barnet to Park Royal (enabling a change on to CrossRail or HS2 services) would take approximately 12.5 minutes**. A trip from **Acton to Cricklewood/Brent Cross would take approximately 16.5 minutes**. A journey along the whole line from Barnet to Hounslow would take approximately 39 minutes (times the same for reverse journeys).
- It would connect town centres and regeneration areas, including the **45,000 new homes and 86,000 new jobs** that will be created at Old Oak Common, Wembley and Brent Cross, putting a greater number of jobs and homes within easy reach of one another and supporting intensification in growth areas.
- It would **remove a significant number of cars from the road, reducing congestion and improving journey times**, particularly along the A406, as the population of the capital approaches 10 million over the next 20 years.
- It would **allow passengers in outer London to access new services on Crossrail and High Speed Two** via an interchange with the Dudding Hill Line at Park Royal.
- It would help to **reduce passenger demand for central London Stations** such as Kings Cross and Paddington for orbital journeys that currently require travellers to go into central London before then travelling back out to reach their destination.

## Old Oak Common Lane Station – Proposal 2

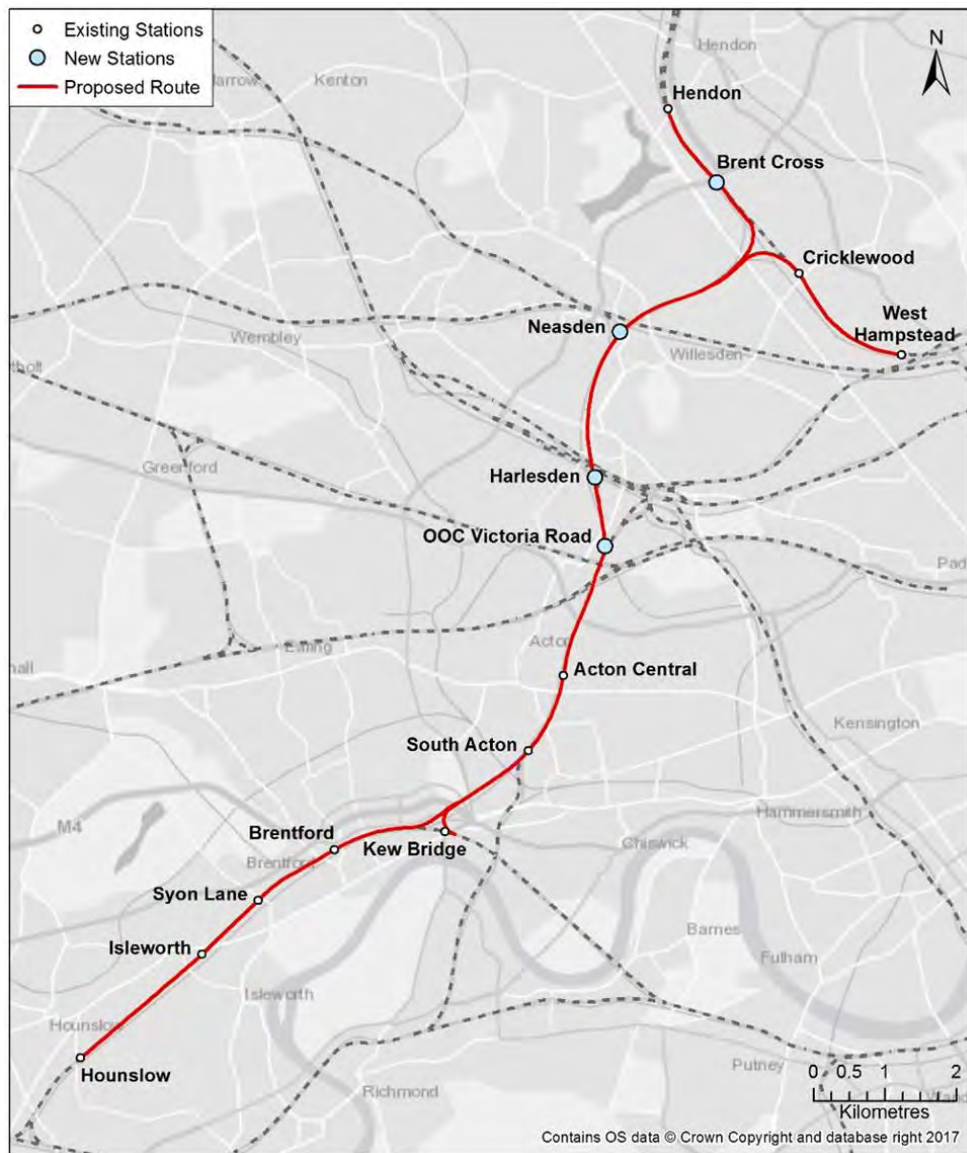
### West London's response to TfL's consultation on new Stations in Old Oak Common

Thank you for the opportunity to respond to this consultation. The proposals set out in the consultation document represent a significant and positive step forward for unlocking regeneration in the Old Oak Common area, supporting economic growth, reducing community severance, and are also an important opportunity for West London government to engage with and support future economic growth in the area.

This response relates specifically to the Old Oak Common Lane station (proposal 2) in the consultation document, as this proposal links explicitly to a separate but closely related transport project that West London partners have been developing with TfL and GLA, and which is contained within the draft MTS in the form of proposal 83. This scheme is the so-called "West London Orbital" (WLO) over ground line connecting Brent Cross and Wembley regeneration areas with Hounslow and Acton via Old Oak Common Lane. A map of the WLO is set out below:

**Figure 1: Route of the West London orbital and its stations**



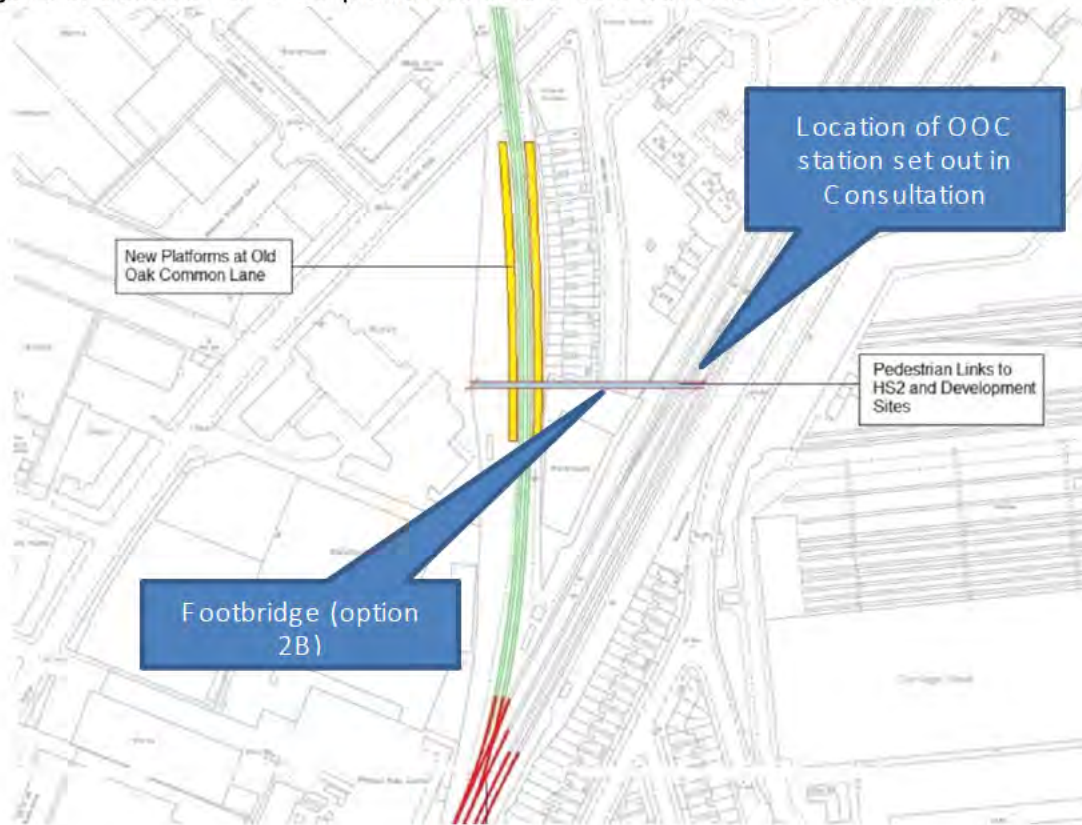


An outline case and technical feasibility study into the WLO has been completed by consultants in partnership with TfL and with constructive engagement from OPDC. This study has identified the following:

- The scheme is **technically feasible** with a strong strategic case and healthy passenger demand supporting 8 trains per hour in each direction.
- The scheme represents **High value for money** according to the Department for Transport's definition, with a "Benefit-Cost Ratio" (BCR) of **2.2:1**.
- Scheme cost currently estimated to be in the region of £265m.
- **Potential to unlock c.20,000 net new homes** and connect over 100,000 new jobs across West London
- New stations at Neasden, Harlesden and Old Oak Common Lane – Victoria Road
- **The station at OOC – Victoria Road** in particular would be key to the line and would strongly connect residents in the areas around Old Oak Common with the 65,000 jobs and 30,000 homes in the OPDC area, as well as provide connections to Crossrail and HS 2.

Proposal 2 (option 2B) in the consultation documents refers to the foot bridge to Victoria Road but not to the linked station at Victoria Road that would connect WLO with the OOC link. **We support option 2B subject to the proposed station at OOC Lane connecting directly to and not precluding the WLO station at Victoria Road.** Previous work by TfL and supported by all West London boroughs has set out where this station would be and how it would link to the OOC station being consulted on, set out in figure 2 below:

Figure 2: Location of WLO platforms at Old Oak Common – Victoria Road



More broadly, we note that suburban metropolitan rail schemes such as the WLO this will become increasingly essential in the years ahead if the Mayor is to meet the target of reducing the percentage of journeys by car in London to only 20% by 2041 against the context of the population approaching 10m by the 2040s. The majority of this growth expected to occur in precisely the sorts of outer-London areas that the West London orbital connects. Schemes with strong cross-party support such as the WLO are also more likely to prove successful.

Furthermore, the WLO line would go a significant distance to reducing any potential community severance associated with regeneration at OPDC, by connecting people and businesses in the communities around OPDC with the many jobs and homes that will be created there in the coming years.

**We would welcome ongoing dialogue with the OOC Team at TfL and the GLA in relation to this proposal as it moves forward following this consultation to ensure close alignment of these two projects.**



Please note, that a detailed response to the Mayor's Transport Strategy has been submitted by the West London Alliance cross-party group of local authorities in relation to the WLO scheme. See below in appendix one for this.

**For further information please contact:**

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West London Alliance

[wardlu@ealing.gov.uk](mailto:wardlu@ealing.gov.uk)

#### **MTS Question 19.**

*Proposals 78 to 95 set out the Mayor's draft plans to use transport to support and direct good growth, including delivering new rail links, extensions and new stations, improving existing public transport services, providing new river crossings, decking over roads and transport infrastructure and building homes on TfL land (see pages 202 to 246).*

*- To what extent do you agree or disagree that these plans would ensure that transport is used to support and direct good growth? Please also describe any other measures you think should be included.*

We support proposal 83, that the Mayor, through TfL and relevant boroughs, will examine the feasibility of delivering a new London Overground rail link between Hounslow and Old Oak, and assess options for an extension towards Cricklewood. This scheme, named the "West London Orbital" line, makes use of existing underused twin-track freight lines and passenger lines along its entire length. The line runs from West Hampstead and Hendon at one end and Hounslow at the other, and would connect the major regeneration areas of Brent Cross, Wembley,

and Park Royal whilst supporting the unlocking of significant potential new housing intensification and regeneration opportunities around Neasden, the Golden Mile and potentially also Staples Corner. It would allow for housing intensification in places like Gladstone Park. The line would provide orbital travellers, who are currently required to make orbital journeys using the heavily congested and polluted the A406 North Circular Road, with a significantly faster and more convenient alternative that improves their transport experience.

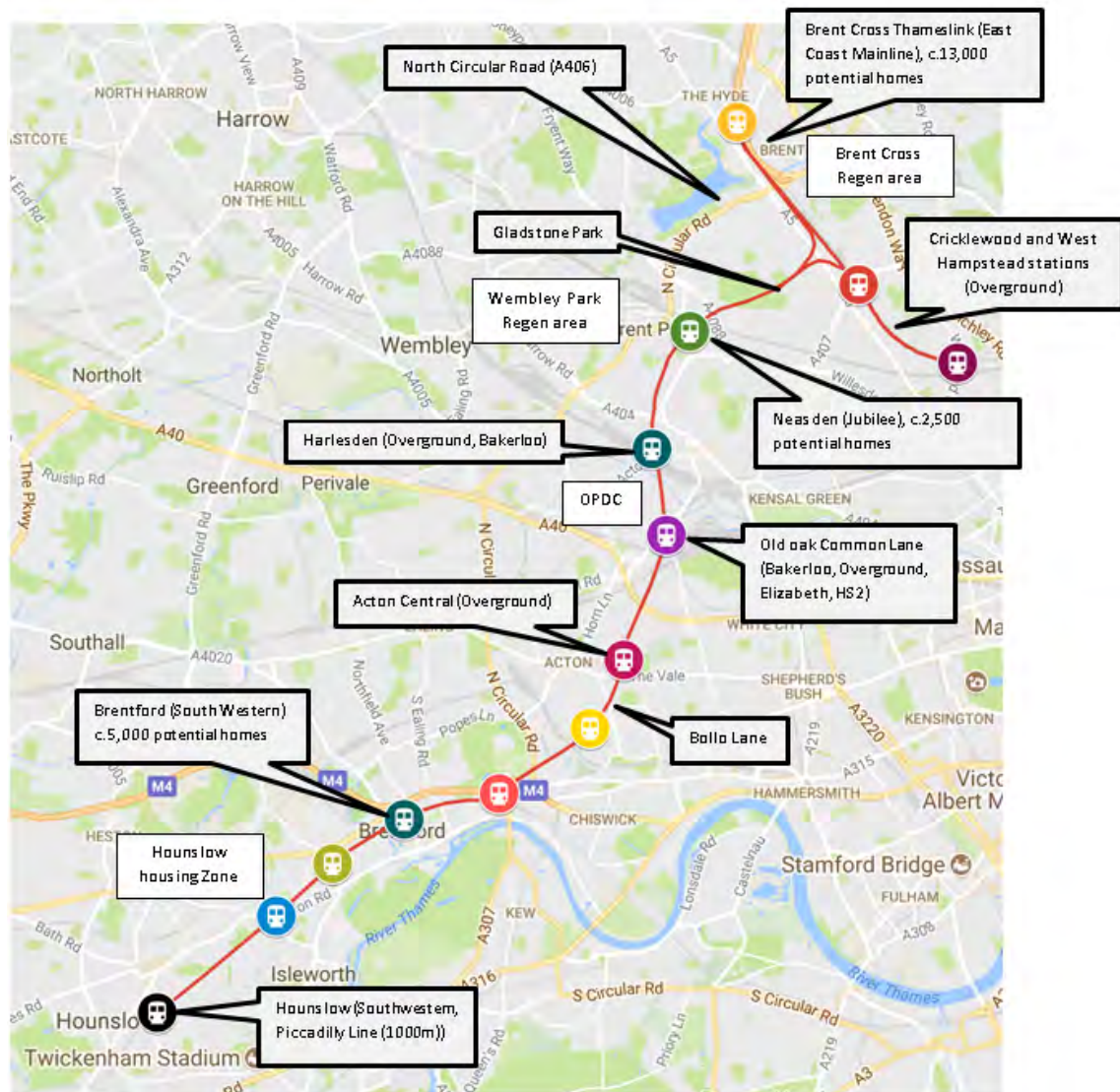
West London boroughs have jointly commissioned a feasibility study with the support of TfL into the operation of the line. The key points can be summarised as:

- The scheme is **technically feasible** including in relation to Acton Wells Junction and Bollo Lane level crossings, although further detailed work is now needed through the formal GRIP stages.
- Forecasts derived from TfL's modelling suite indicate **significant levels of passenger demand** for the scheme and benefits for passengers across the public transport network.
- **BCR of more than 2:1** according to DfT methodology.
- Analysis by boroughs has identified potential to unlock approximately **22,000 new homes** along the length of the line, including in the vicinity of a number of new stations. This would yield in the region of £200m of Community Infrastructure Levy.
- With WLO there will be **significant time savings for public transport users** and a competitive alternative to car use. The level of competitiveness would depend on when the car journey is being made, e.g. peak periods or off-peak.
- Stronger **integration of the OPDC area the communities that surround it**, helping to weave it into the wider London economy. The West London Orbital Line would allow orbital travellers to change to Crossrail and HS2 lines without needing to first travel in to London.
- **Strong strategic fit with the priorities set out in both the draft MTS and emerging London Plan** including 1) improving the transport experience, 2) New homes and new jobs, and 3) Healthy streets and healthy people. The Scheme is also consistent with the Mayors focus on "Good Growth" as set out in the emerging London plan.
- The scheme **makes better use of under-utilised orbital freight lines**, sweating assets and maximising value from London's existing transport infrastructure and minimising any disruption to residents and businesses associated with major new schemes.

In addition, the West London Economic Prosperity Board (WLEPB), a formally constituted cross-party committee consisting of the leaders of six West London boroughs has made this scheme a standing item on its agenda and have given it formal cross-party political support. Through the Committee the West London boroughs have also agreed to incorporate the scheme in their Local Plans so that it now forms part of their integrated long-term strategic planning in the future, as suggested by the Deputy Mayor for Transport.

**Figure 1: Route of the West London Orbital Line** (including connections and new housing)

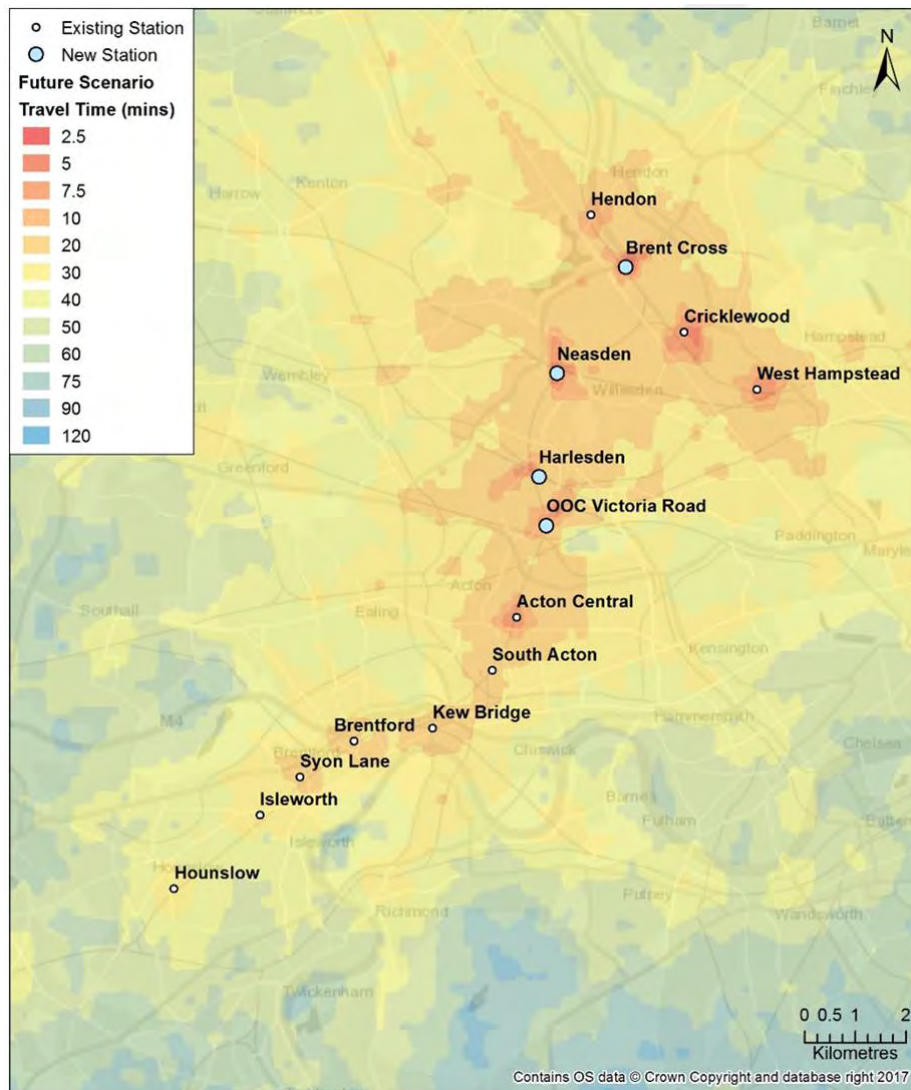




We note that suburban metropolitan rail schemes such as this will become increasingly essential in the years ahead if the Mayor is to meet the target of 80% of all journeys being by foot, bike or public transport by 2041, against the context of the population approaching 10m by the 2040s and the majority of population growth expected to occur in precisely the sorts of outer-London areas that the West London orbital connects. Schemes with strong cross-party support such as this are also more likely to prove successful.

As well as its technical deliverability, housing supply/regeneration benefits and good strategic fit the line has the potential to offer London an opportunity to test innovative new approaches to suburban-metro rail such as making use of Battery-powered rolling stock rather than polluting diesel units. It supports the principle of "*good growth*" by making better use of what are currently notably under-used freight lines that happen to connect some of the most significant housing and employment growth areas in London including Brent Cross, Wembley, Park Royal, and the Golden Mile in Hounslow, significantly reducing journey times between these areas as shown in figure 2 below:

**Figure 2: Travel time between West London Orbital stations, including new stations at Neasden, Harlesden and Old Oak Common Lane (from feasibility study)**



The feasibility study has proved invaluable in identifying a general characteristic of orbital schemes and suburban metro-rail lines in London. This is that fares for orbital journeys, which by definition don't run across multiple fare zones, tend to be lower than for equivalent radial journeys into and out of central London that do cut across fare zones. This reduces the income generated per passenger for orbital journeys compared with an equivalent radial line and increases the likelihood of an operating subsidy being required.

Given the fact that the majority of future growth in London will be in outer-London this is an unsustainable position, and is not just an issue for the West London Orbital Line but for orbital lines more generally that will need to be addressed strategically if the GLA wants to meet its objective of mode shift away from the car. Many car journeys take place in outer London where the majority of Londoners live, and these drivers will need good quality public transport alternatives if they are to make the mode shift from their cars in the coming years. There are a number of practical and achievable solutions for addressing any potential operating subsidy that could be implemented relatively easily. These include:



- 1) The use of modestly higher “premium” fares so that orbital rail journeys yield the same per passenger as the equivalent radial journey. Fares such as this are already successfully in use by the Channel Tunnel Rail Link or the Heathrow Express service.
- 2) Part of the line e.g. around the OPDC area could be re-designated as Zone 1 London, enabling higher fares and supporting further growth in the regeneration area which will increasingly become a core part of the central business district of London in the coming years.
- 3) Operating costs could be brought down significantly through greater use of technology that serves as a case study for innovation and best practice nationally e.g. battery-powered rolling stock.
- 4) Introduction of fare “segments” alongside the existing fare “zones”.

As well as operating costs, there are a number of viable options for meeting capital requirements associated with construction of the line itself based predominantly around capturing the uplift in land values associated with the line. These include through the development of new housing and employment space along the route of the line, a variety of external sources, and possibly Central Government, e.g. future rounds of Housing Infrastructure Funding (HIF2).

Furthermore, analysis by borough planning departments of the land that the line would pass through has identified capacity for approximately 22,000 new housing units and approximately £200m of CIL. We believe that, given the positive feasibility case, high value-for-money case, passenger demand numbers and strategic fit of the line there will be viable options for securing additional funding from a range of sources including government and the private sector.

Further, more detailed GRIP stages are now needed to explore the detailed specification of the line, and well as to develop a more focused funding package for its construction and subsequent operation building on the analysis described above.

**We invite the Mayor and TfL to make this scheme a part of the story of transport in London through the Mayor’s Transport Strategy and London Plan, and to continue to work with West London boroughs to bring this line to completion by the 2020’s.** Specifically, this includes incorporating the scheme into the final MTS so that there are sufficient hooks to move the project forward, and to support further detailed work on the line and on scheme funding through the GRIP stages. The leaders of the West London Economic Prosperity Board have already agreed to commission a more detailed scheme funding study that will sit alongside the technical feasibility/5-Case study and which will be completed before the publication of the final Mayor’s Transport Strategy.

## Appendix 1: Sub-Regional Scale Infrastructure “Long List” of Options

Possible shared sub-regional priority schemes, which have been derived from Local Plans, West Trans, and West London Housing Officers.

Scheme	Description	Time period	Sub-regional Priority
Airport Expansion at Heathrow	Agree a shared position on a third runway.	Long	High
Orbital passenger rail connecting regeneration schemes	Connecting OPDC, Brent Cross and Brentford via Wembley along the current “Dudding Hill” freight line, which would be activated as a passenger line	Long	High
Hangar Lane Junction Works	Increase capacity of the Hangar Lane junction to improve journey times and reduce congestion	Med	High
Crossrail Spur to Wembley	Promote HS2 or Cross Rail spur connecting Wembley to OPDC	Med	Med
A5 Corridor	improved the functioning and capacity of the A5 as a major part of the capital's infrastructure	Med	Med
Tunnelling of A406	Major upgrade of A406 including tunnelling and widening large sections	Long	Low
Tunnelling A406 at New Southgate	Tunnelling this section of the A406 alongside the development of a new Crossrail 2 station at New Southgate	Long	Med
Southall Rail Link	Greater connectivity to the borough through investment in strategic rail infrastructure such as Cross rail and HS2 at Old Oak Common by promoting a spur to Wembley	Long	Med
Golden Mile	Improved connections between Golden Mile and OPDC, and to Heathrow	Med	Med
Cycle Quiet ways	Cycle quiet ways across the whole sub-region	Short	Med

Sub-regional projects that are already due to be delivered:

Staples corner	Increase capacity of the Staples Corner junction to improve journey times and reduce congestion	Short	Medium
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**West London Alliance boroughs**

**Proposed strategic rail schemes**

- H** Hounslow - Old Oak - Brent Cross Overground extension
- I** Southall Crossrail link
- J** SWT loop service enhancement
- K** Southern Rail - Heathrow

**Road network challenges**

- A** Harrow improvements to Harrowcross Hill station including new station
- B** Brent Brent Cross Thameslink station - to unlock 7,500 homes - as a potential terminus for Brent Cross-Old Oak-Hounslow orbital train line
- C** Ealing/Brent Package of rail and road infrastructure including at Crispy Corner to maximize the potential of the Old Oak Crossrail station
- D** Ealing Ealing to Hounslow new homes and jobs in Southall
- E** Hounslow Ealing rail link into Heathrow with a stop at Bedford Lakes
- F** Hammersmith and Fulham Hammersmith potential flyover
- G** Hillingdon Various to support homes and jobs in the borough

**Strategic road networks**

**West London Alliance boroughs**

**Traffic hotspots/girdlocks**

**Road network challenges**

**Strategic road networks**

**Scale:** 0 1 hour 2.5km 5km

## West London Economic Prosperity Board

21 September 2016

<b>Title</b>	<b>Sub-Regional Transport Infrastructure Priorities</b>
<b>Report of</b>	Paul Najsarek, Chief Executive LB Ealing
<b>Wards</b>	All West London Boroughs
<b>Status</b>	Public
<b>Urgent</b>	No
<b>Enclosures</b>	Appendix 1: Sub-Regional Scale Infrastructure Long List of Options Appendix 2: Borough-Scale Infrastructure Priorities Appendix 3: West London Vision Map (Infrastructure)
<b>Officer Contact Details</b>	Luke Ward ( WLA Interim Head of Growth, Employment and Skills ) 07738 802929 <a href="mailto:WardLu@ealing.gov.uk">WardLu@ealing.gov.uk</a>

## Summary

On 8 June 2016 the West London Economic Prosperity Board agreed the Vision for Growth Action Plan, which included a focus on identifying a small number of shared priorities relating to transport infrastructure. Accordingly, officer groups have been working to develop a “*long list*” of *potential transport infrastructure priorities* that will allow leaders and senior officers across West London to have a discussion about which ones might be identified as shared priorities, subject to further detailed transport modelling and cost-benefit analysis, and incorporated into Local Plans to form the basis of Lobbying Activity with the GLA, TfL and government. The full long list of transport infrastructure options can be found in Appendix One of this report. A shorter set of proposed priorities (para 1.6) has been extracted from this long list following individual discussions with growth directors.



## Recommendations

The Board is requested to:

1. Review the infrastructure “Short List” of recommended schemes set out in para 1.6 of this report as well as the longer list set out in Appendix 1.
2. Suggest which schemes should be either added or removed (up to a maximum of five) to the recommended schemes in 1.6. Agree which schemes reflect shared priorities to be taken forward.
3. Agree the next steps set out in section 4 of this report, which state that following the identification of shared priorities by the West London Economic Prosperity Board (WLEPB) further analysis will be commissioned by Growth Directors to refine proposals, a more detailed programme will be developed by West London planning officers, and the prioritised schemes will be incorporated into the refresh process for WLEPB member Local Plans.

### 1. WHY THIS REPORT IS NEEDED

- 1.1 At its meeting on 7 June 2015 the West London Economic Prosperity Board (EPB) agreed the Vision for Growth Action Plan, which contained a focus on agreeing and delivering a shared West London agenda relating to infrastructure planning and prioritisation.
- 1.2 Specifically, the EPB agreed that it would identify a small number of shared priorities relating to **transport infrastructure**.
- 1.3 Accordingly, a number of officer groups<sup>1</sup> have been working to develop a “long list” of options for sub-regional transport infrastructure priorities that will allow the EPB to have a discussion about which of these represent truly shared sub-regional priorities that all boroughs can agree will be embedded across all planning activity, for instance through refreshed local plans, a refreshed London Plan, and London Transport Strategy. Recommendations for what will be on the “Short List” of transport priorities are set out in paragraph 1.6 below.
- 1.4 The intention is that by coordinating sub-regional lobbying activity (both political and officer-level) around a smaller number of shared priorities that have a basis in both policy and evidence, there is a higher likelihood that these will secure funding and proceed to delivery phase within a reasonable time frame.
- 1.5 The full list developed by officers can be found in appendix two of this report along with an infrastructure “Vision Map” that was created earlier in the year.

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<sup>1</sup> WestTrans, West London Planning Officers Group

- 1.6 The “Short List” of recommended transport schemes that has been distilled from the full list of sub-regional-level options in Appendix One is set out in the table below:

<b>Scheme</b>	<b>Description</b>	<b>Time period</b>	<b>Priority</b>
Airport Expansion at Heathrow	Agree to adopt a shared position on a third runway	Long	High
Orbital passenger rail connecting regeneration schemes	Connecting OPDC, Wembley, Brent Cross and Brentford via Wembley along the current “Dudding Hill” freight line, which would be activated as a passenger line.	Long	High
Hangar Lane Junction	Increase capacity of the Hangar Lane junction to improve journey times and reduce orbital congestion	Med	High

- 1.7 It should be noted that this work on transport infrastructure priorities will sit alongside future West London activity relating to digital infrastructure and the “Smart Cities” agenda, specifically in relation to reducing overall demand for transport capacity using technology e.g. encouraging more flexible ways of working (e.g. at home), driverless cars, drone delivery, and “Road Trains” for freight.
- 1.8 Clearly some of the schemes are contentious (particularly Heathrow) and due consideration needs to be given to the approach and timing of any further discussion about prioritisation to avoid creating political challenges locally, whilst recognising the significant benefits these would bring to West London’s economy.

## **2. REASONS FOR RECOMMENDATIONS**

- 2.1 To develop and articulate a shared West London view and approach to transport infrastructure needs and priorities, in line with the agreed West London vision for growth action plan.

## **3. ALTERNATIVE OPTIONS CONSIDERED AND NOT RECOMMENDED**

- 3.1 An alternative would be to have no agreed shared transport infrastructural needs or priorities underpinning the West London vision for growth. This would mean the Board’s expressed aim of developing the sub-regional scope and ambition for collaborative work on sustained economic development and growth in West London.



#### 4. POST DECISION IMPLEMENTATION (APPROACH AND NEXT STEPS)

- 4.1 This item represents the first opportunity that the board has had to discuss shared transport infrastructure priorities. This, combined with the current review of the London Plan and the expected “Fiscal Reset” that was announced by the Chancellor on 1 July 2016, means that there is a window to influence national and London-wide thinking relating to infrastructure investment.
- 4.2 Alongside the identification of actual schemes or projects West London boroughs will need to work to identify the most appropriate pathway that will result in the infrastructure priorities it identifies from the long list to be lobbied for effectively and incorporated into the London plan and the London Transport Strategy.
- 4.3 Fundamentally, the agreement of transport infrastructure priorities requires broad political agreement combined with a consistent approach to lobbying and influencing key stakeholders, including the GLA, TfL, and HM Treasury and Government Departments.
- 4.4 Following agreement of priorities by the EPB the immediate next steps are:
1. September 2016: WLEPB member boroughs **to incorporate prioritised transport schemes into the refresh process for their Local Plans**.
  2. October 2016: West London Transport Officers Group (West Trans) will develop a **detailed programme plan** for delivery of the schemes identified by the WLEPB, including timescales, communications and lobbying, planning, and financing arrangements. To be completed by March 2017.
  3. October 2016: Growth Directors to commission **more detailed economic appraisals of the recommended schemes** (particularly the orbital rail and Hangar Lane proposals) to better understand the economic benefits and viability of each, and to validate their inclusion in local and London-wide planning frameworks
  4. April 2017: Prioritised schemes embedded in to engagement and lobbying activity by members of the WLEPB in order to secure agreement by the GLA, TfL and government.

#### 5. IMPLICATIONS OF DECISION

##### 5.1 Corporate Priorities and Performance

- 5.1.1 Agreed priorities will underpin the boroughs’ shared West London vision for growth and action plan; and will inform borough spatial local development frameworks and local plans and associated service business plans towards delivery e.g. economic development strategies and service plans.

## **5.2 Resources (Finance & Value for Money, Procurement, Staffing, IT, Property, Sustainability)**

- 5.2.1 Any future resource implications will be fully developed and appraised as part of the work being overseen by the growth directors and reported at a future meeting. The Programme Plan development referred to in section 4 above (post-decision implementation) will be undertaken within the existing resources and remit of the planning officers group.

## **5.3 Legal and Constitutional References**

- 5.3.1 There are no legal powers necessary for this work to continue.
- 5.3.2 West London Economic Prosperity Board Functions and Procedure Rules section 3.1.8 states that the a function of the Board is: "Seeking to influence and align government investment in West London in order to boost economic growth within the local government areas of the participating authorities"

## **5.4 Risk Management**

- 5.4.1 Risk assessment and management will be conducted as part of the work by directors to develop priorities.

## **5.5 Equalities and Diversity**

- 5.5.1 Equalities and diversity assessment and management will be conducted as part of the work by directors to develop priorities, and embedded into any specific transport infrastructure schemes prioritised to be taken forward.

## **5.6 Consultation and Engagement**

- 5.6.1 The West London planning policy officers' group and the West Trans group of transport planners have been consulted on this work, under the auspices of the West London growth directors' board and West London chief executives.

## **5.7 Insight**

- 5.7.1 Through the involvement of the West London planning policy officers' group and the West Trans group of transport planners this work has drawn on officer expertise and borough planning priorities within existing spatial plans e.g. public local plans.

# **6. BACKGROUND PAPERS**

- 6.1 None



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*West London Alliance*

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date:	7 June 2017
our reference:	46912

## **IMPROVING ORBITAL RAIL IN WEST LONDON**

Dear Val,

We are writing to you jointly as the members of the West London Economic Prosperity Board (WLEPB), a formally constituted cross-party joint committee comprising the leaders of the London Boroughs of Barnet, Brent, Ealing, Hammersmith & Fulham, Harrow, and Hounslow.

Over the last 18 months we've been working together to deliver a shared economic plan, the West London *Vision for Growth*, which is already allowing us to improve prospects for our residents and businesses. The Vision contains within it an emphasis on enhancing transport infrastructure and connectivity between regeneration areas, reducing congestion on the road network, unlocking new housing growth, improving air quality, and allowing people from all backgrounds to move around easily without an excessive toll on their wallets.

### **1. A shared priority for West London boroughs**

One transport scheme of particular interest has emerged from this work, based on independent analysis commissioned by officers, which appears to meet a pressing strategic need. This scheme is the Dudding Hill Rail Line, currently an orbital freight line connecting the regeneration areas of Brent Cross, Wembley and Park Royal, and then down to Hounslow metropolitan town centre. Taking into account planned future growth in these areas, we know from TfL's Railplan model that passenger demand would be sufficient to justify a regular four-trains-per-hour orbital service along the line, cutting the existing journey times by car by half or more whilst taking pressure of the A406 North Circular Road.

You will see attached with this letter a copy of the report that was agreed by the WLEPB in March this year identifying the Dudding Hill Line as a shared priority and instructing officers to proceed with the development of a more detailed feasibility study.

Our shared focus on this particular scheme reflects the fact that we know that West London is currently significantly less well served by orbital connections than other parts of London. One need only look to the East to see the huge impact of the DLR and London Overground network on improving travel times and unlocking growth in areas previously considered inaccessible by public transport.

The Dudding Hill passenger line would also support the Mayor's priorities as set out in A City for All Londoners if converted to a combined passenger and freight line. It would:

- Connect growth areas, putting a greater number of jobs and houses within easy reach of one another.
- Provide Londoners with improved options and capacity for orbital journeys that do not rely on cars as the capital's population approaches 10 million people by the 2030s.
- Allow passengers to access new services on Crossrail and High Speed Two via an interchange with the Dudding Hill Line at Old Oak Common, bringing more jobs within travel distance of West Londoners than ever before and reducing congestion around Heathrow Airport.
- Reduce passenger demand in central London Stations for orbital journeys that currently require travellers to journey into central London before then travelling back out to reach their destination.

Historically Dudding Hill was a passenger line, but for more than a century now it has been used almost exclusively for the movement of freight. Our goal now is simply to bring it back into passenger use within the next ten years.

## **2. What are we doing now?**

We are already translating our shared political commitment to moving the scheme forward by jointly commissioning an industry-standard "five-business case" feasibility study on it. Once complete, this study will allow us to demonstrate the strategic, economic, and environmental case for a Dudding Hill passenger service, and crucially how it would align with and support other infrastructure schemes in West London including a possible future West Coast Mainline connection to Park Royal, High Speed Two, the Elizabeth Line (Crossrail), as well of course as the wider regeneration at Old Oak Common and Park Royal. The study will also quantify the volume of new housing the scheme will unlock, and how it would improve the accessibility of hard-to-reach areas (as measured by PTAL) along the route.

The study will be completed well before the expected closure of the forthcoming consultation on the draft Mayor's Transport Strategy (MTS). Officers are also developing proposals for scheme development, financing, and delivery.

## **3. Our ask: How we would like to work with you to deliver the Dudding Hill line.**

If the outcome of the independent feasibility study is positive, we would like to work with you and your teams at the GLA and TfL to bring a Dudding Hill passenger service to reality by the mid-2020s.

There is a golden opportunity, through the London Plan and the MTS processes, to realise fairly quickly a deliverable, well connected, and politically supported piece of new infrastructure for London that connects some of our largest growth areas, unlocks new housing, helps the environment, and is consistent with both the priorities of the Mayor and all of the boroughs it passes through.

Specifically we would welcome your consideration about the following:

1. Inclusion of Dudding Hill within the Mayor's Transport Strategy.
2. Support for further dialogue between the West London Alliance group of councils and officers at the GLA and TfL on the delivery of a Dudding Hill service by the mid-2020s. This would include for example work to understand the timetabling of such a service, engagement with Network Rail to influence their plans to incorporate the line, possible inclusion of Dudding Hill as a future overground concession, and whether the line would be best powered by electric or diesel rolling stock.
3. Exploration of options for funding the development and delivery of the line. Local government is willing to demonstrate on-going commitment by paying its fair share, and seeks support from London Government, for example in terms of financing expertise, and possibly joint resourcing of the technical GRIP studies that would be required to bring the line to fruition.

Local government in West London stands ready to support the delivery of this scheme with a sense of shared purpose and across party lines. We hope you will give it serious consideration for inclusion in the draft Transport Strategy and look forward to the opportunity to discuss with you when we meet in July.

Yours Sincerely,



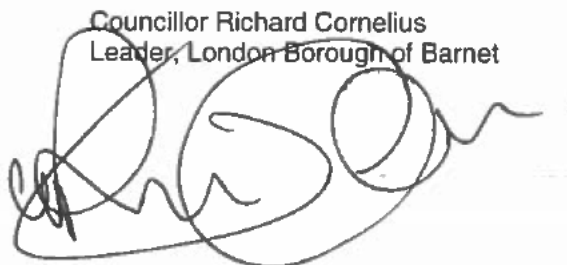
Councillor Muhammed Butt  
Leader, London Borough of Brent



Councillor Richard Cornelius  
Leader, London Borough of Barnet



Councillor Julian Bell  
Leader, London Borough of Ealing



Councillor Stephen Cowan  
Leader, London Borough of  
Hammersmith & Fulham



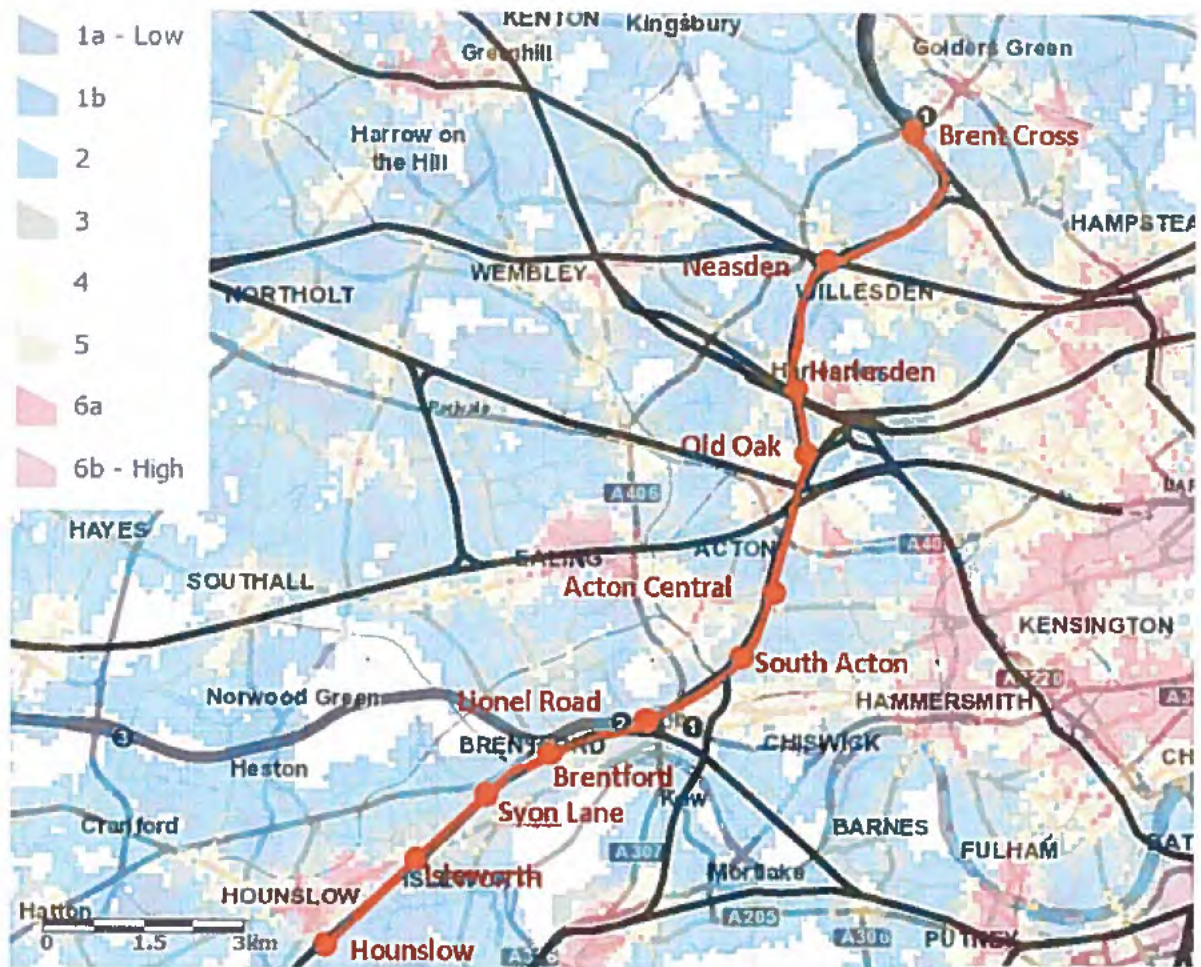
Councillor Sachin Shah  
Leader, London Borough  
of Harrow



Councillor Steve Curran  
Leader, London Borough of Hounslow



**FIGURE ONE: Proposed Dudding Hill passenger service:**





## West London Economic Prosperity Board

**20 September 2017**

<b>Title</b>	<b>West London Orbital Rail (WLO) progress and next steps</b>
<b>Report of</b>	<i>Amar Dave</i>
<b>Wards</b>	<i>All</i>
<b>Status</b>	Public
<b>Urgent</b>	<i>No</i>
<b>Enclosures</b>	<b>Appendix 1:</b> Correspondence from the Committee to the Deputy mayor for Transport <b>Appendix 2:</b> Feasibility Study (five business case) undertaken by WSP on behalf of the Committee.
<b>Officer Contact Details</b>	Luke Ward, Head of Growth, Employment and Skills, West London Alliance, E: <a href="mailto:wardlu@ealing.gov.uk">wardlu@ealing.gov.uk</a> M: 07738 802 929

### Summary

This report provides leaders with an update and proposed next steps on work to deliver a West London orbital Railway, following their meeting with the Deputy Mayor for Transport in July 2017.

It also presents the feasibility study commissioned by the Board in March 2017, now at final draft stage, which finds the line to be technically feasible and with a strong value for money case, to be delivered in two phases with the first phase running from West Hampstead to Hounslow and the second running from Hendon to Isleworth via Brent Cross (See appendix two). The line has potential to unlock significant new housing growth across boroughs and is consistent with the strategic priorities of boroughs and of London Government. There remain a number of challenges to be overcome in relation to scheme funding and the economics of orbital transport infrastructure in London, which the Study suggests solutions to and are described in Section 2 of this report.

Section 3 proposes next steps for the project in terms of governance and project management arrangements, partnership working with TfL and the GLA.

The next objective of this work is to work with TfL to allow this project to be taken forward to the next, more detailed phase and to develop a detailed funding package.

### Recommendations

**The committee is asked to:**

- NOTE that final draft feasibility study finds the West London Orbital Rail line to**



be technically feasible with significant passenger demand and significant value for money and regeneration benefits.

2. AGREE to delegate the signing off of the feasibility study to the West London Growth Directors Board.
3. AGREE to continue to work with GLA and TfL to maximise the chances that the West London Orbital Line continues to be endorsed as a priority infrastructure scheme for London, in particular through inclusion in the final Mayor's Transport Strategy (MTS)
4. AGREE to undertake a more detailed identification of the options and optimal approach for funding the construction and operation of the Line, to be completed by November 2017.
5. AGREE that this project be a standing item for the Committee in the future, as suggested by the Deputy Mayor for Transport.
6. AGREE to incorporate the West London Orbital/Dudding Hill Line into individual borough Local Plans, as suggested by the Deputy Mayor for Transport.
7. NOTE that the tour of the line the Committee previously requested has been confirmed for 29 September noon – 3pm, and that Members will be accompanied by the Deputy Mayor for Transport. The tour will be by coach.

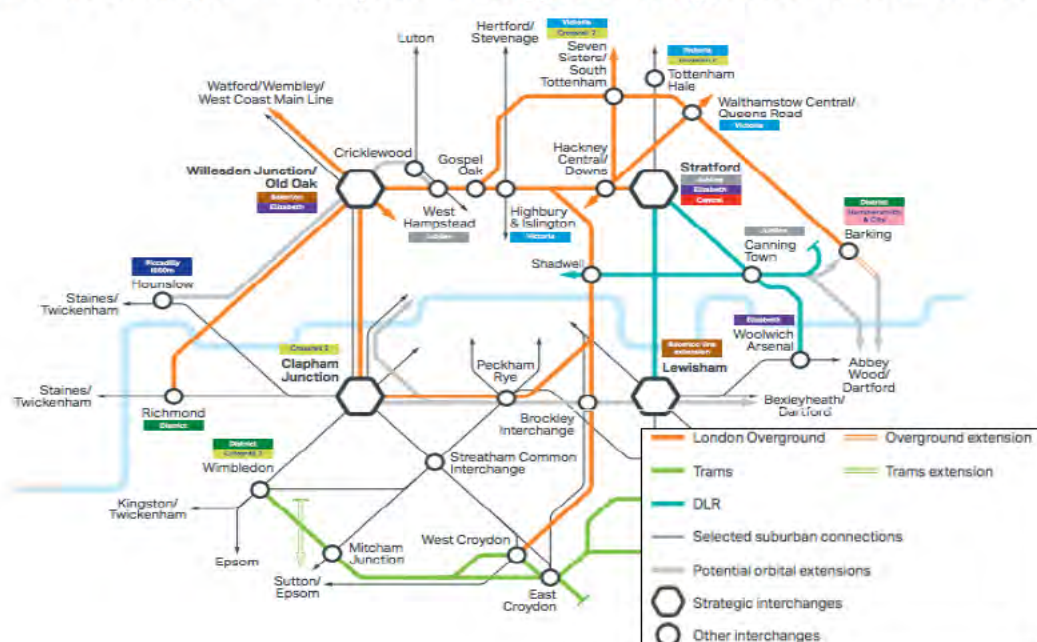
## 1. WHY IS THIS REPORT NEEDED

This report explains how previous decisions made by the committee have been actioned, and sets out next steps towards making a West London Orbital Railway Line a reality.

The West London Economic Prosperity Board (WLEPB) identified the Dudding Hill Rail Line, also known as the "West London Orbital Line", as a shared priority based on a range of evidence commissioned by Growth Directors in March 2017.

Leaders have since worked with TfL and the GLA to ensure the line was included in the draft Mayors Transport Strategy (MTS). This has been achieved (see figure 1 below).

**Figure 1: Draft Mayor's Transport Strategy including West London Orbital**





A *Feasibility Study* has been commissioned by officers at the request of the Committee. This feasibility study is now at final draft stage (Appendix 2). The key message of the Study is that the scheme is technically feasible with a significant level of latent passenger demand and strong value for money. It also has the potential to unlock in the region of 15,000 - 20,000 new homes across the sub-region. The study has also demonstrated a high degree of strategic fit between the priorities and objectives of West London boroughs and of TfL in relation to improving the transport experience for travellers, reducing congestion, connecting growth areas, and on making our high streets healthier more pleasant places to be.

Given the strong strategic alignment of the scheme with London priorities and its technical feasibility both TfL senior officers and the Deputy Mayor for Transport have indicated their support in principle (see Appendix 1) for the scheme and requested that arrangements are made for putting in place programme management and governance mechanisms, covered in section three below.

## **2. REASONS FOR RECOMMENDATIONS**

These recommendations have been designed to allow this project to progress from being a 'strategy piece' of work to a project delivered in partnership with London Government.

The key challenge now in terms of moving this project forward relates to resourcing the capital costs of building the line (approximately £250m) and of minimising any operating subsidy associated with the day-to-day running of the line should it be built. There are a range of practical and tested solutions available to address both of these points, which are summarised in section two below and also set out in Appendix two. The Committee should note that a requirement for subsidy is a general characteristic of orbital transport schemes, which have lower fares compared with equivalent radial routes. This project therefore provides a real opportunity to find a solution to this issue that will benefit London more broadly in the future as the population of outer London boroughs continues to increase.

## **3. KEY AREAS OF ACTIVITY**

3.1 The following sections summarise current activity in relation to the main work areas relevant to the project:

- i. Political engagement
- ii. Technical feasibility and viability
- iii. Scheme funding
- iv. Community engagement

### ***i. Political Engagement***

The following points emerged from the meeting with the Deputy Mayor for Transport in July:

- Support for this scheme in principle. The Deputy Mayor noted there is good strategic fit between WLOt and the priorities set out in the draft Mayor's Transport Strategy (MTS).

- Should the feasibility study yield a positive result then it was noted that there was good reason to include it in the final MTS. It will need to be incorporated into all borough Local Plans as they are developed.
- She noted the work of the Economic Prosperity Board, and the fact that boroughs were working together on the scheme was a notable strength.
- The role of the orbital line in unlocking new housing supply and employment space is fundamental to the overall viability and resourcing of the line.

### **Next Steps**

- The Deputy Mayor requested that this work be progressed from a 'strategy piece' to a project focused on delivering an operating rail line.
- Consequently, West London and TfL/GLA officers are working together on developing an appropriate governance structure and timeline for achieving this, including strands focused on:
  - technical feasibility
  - scheme financing
  - influencing
  - community engagement
- The Deputy Mayor suggested that the line becomes a standing item on the agenda for the WLEPB. See next steps and recommendations. She also requested a joint West London Strategic Land Availability Assessment (SLAA) that would identify and confirm the level of development the land would unlock.
- Growth Directors Board will continue to progress this work with input from a wider network of interested parties within and outside of local government

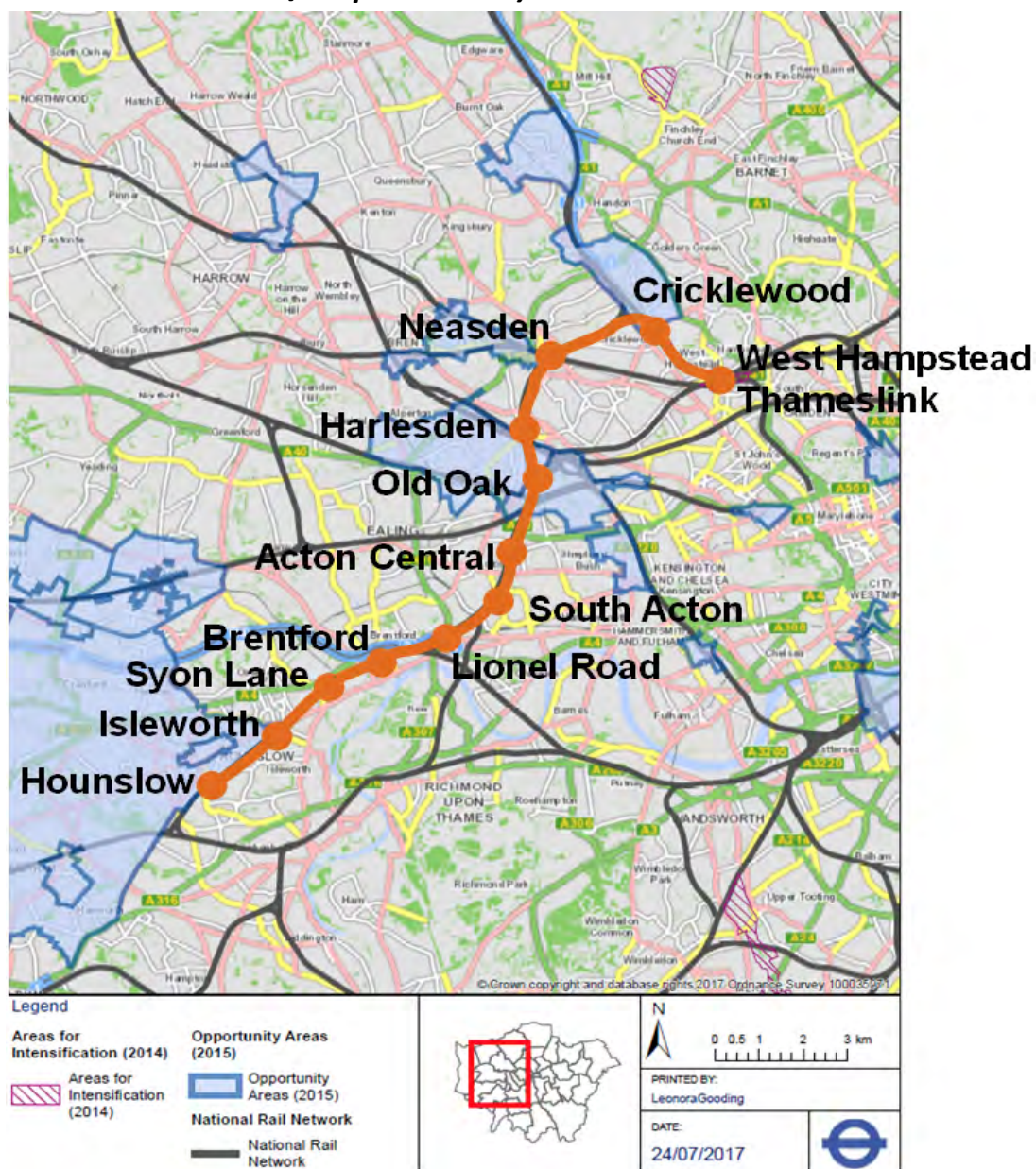
### **ii. Technical Feasibility Study**

- Growth Directors have commissioned a "five-case" feasibility study which is currently at final draft stage (see Appendix 2). The key messages are:
  - That the West London Orbital has a good overall case. It is technically deliverable and with demand to service up eight trains per hour in each direction (about 6,000 people per direction per hour during each rush hour period). This is higher than the demand originally modelled by TfL.
  - Taking into account the positive impact of the line on improving journey time and reducing congestion the study finds the line to have a very strong overall value for money case.
  - It is currently estimated that the line would help to unlock around 15,000 – 20,000 new homes across the affected boroughs, including potentially a major new regeneration scheme around Neasden Junction.
  - The preferred route is for there to be four trains per hour from West Hampstead to Hounslow *AND* four trains per hour from Hendon to Isleworth via Brent Cross. These would be delivered in two phases starting with West Hampstead to Hounslow route. See figure 2 below
  - The track would not be electrified in the first instance, possibly implying diesel rolling stock but also creating an opportunity to test innovations such as new battery-powered trains. This approach would reduce both the capital costs of line construction and the operating costs of the line. It would also significantly support the environmental case for the line by

negating the need for diesel trains and minimising negative impacts on air quality.

- New Stations at Neasden, Harlesden. Possibly also at Old Oak Common Lane.
- New platforms at West Hampstead, Hendon, Cricklewood, Brent Cross/Staples Corner, Kew Bridge, Hounslow
- There is an area of high train congestion in the Acton Wells area which will require careful timetabling and is the most technically challenging section of the route.
- Level Crossings need to be addressed at Bollo Lane and Churchfield Road (Ealing).

**FIGURE 2: ROUTE IF THE LINE (phase 1 shown, phase 2 from Neasden to Hendon via Brent Cross/Staples Corner)**





## Next Steps on feasibility

- Findings from the feasibility study be incorporated into the West London response to the draft MTS that was requested by leaders, and used as the basis for taking forward more detailed planning work into the line.

### *iii. Resourcing*

Now that the feasibility study has found the line to be technically feasible and with sufficient passenger demand and strategic fit, focus can turn to resourcing the construction and operation of the line. There are three elements relating to funding:

- 1) Funding the **project costs associated with completing further, more detailed resource management, programme planning and design work** (e.g. “GRIP” studies) and project management that will be required prior to any actual ground works commencing. It is considered imperative that this work continues at pace during 17/18 in order to maintain momentum secure wider buy-in to the scheme.
- 2) Funding the **capital costs associated with construction of the line itself**: e.g. stations; track reconfiguration; turn backs, rolling stock leasing, stabling and other associated infrastructure. Currently somewhere between £100m and £400m. Most likely to be somewhere around the centre of the range at £250m. Funding for construction can come from a variety of sources including from development of new housing and employment space along the route of the line, a variety of external sources, and possibly also Central Government. It will also be possible to bring down construction costs through innovation and the use of new technology e.g. battery powered trains that would negate the need for more expensive stabling and maintenance facilities for diesel rolling stock.
- 3) Addressing the **operating subsidy** that is likely to be required once the line is up and running, despite the high passenger demand and relatively low construction costs for this kind of project. This requirement for subsidy is primarily due the fact that fares for orbital journeys, that by definition don’t run across multiple fare zones, are significantly lower than for radial journeys into and out of central London. This reduces the income generated per passenger for orbital journeys compared with an equivalent radial line. This is not then just a challenge for the West London Orbital Line but for orbital public transport schemes more generally. This will need to be addressed strategically to meet the Mayor’s target to have only 20% of journeys by car by 2041.

There are a number possible solutions for addressing operating subsidy that would merit further consideration including 1) the use of modestly higher fares such as are already used by the Channel Tunnel Rail Line or the Heathrow Express service. 2) part of the line e.g. the OPDC area could be re-designated as Zone 1 London, allowing higher fares. 3) operating costs could be brought down through greater use of technology that serves as a case study for innovation and best practice nationally e.g. battery-powered rolling stock.

## Next Steps for resourcing

There are a number of viable and tested options for resourcing both the (capital) construction of the Line itself through development and external funding, and also for addressing any recurring operating subsidy (revenue) associated with the line. There is an urgent need to assemble a realistic funding package alongside the development of more detailed technical work into the line itself.

### ***iv. Member and Community Engagement***

Now that the feasibility study is completed, and should the scheme be taken forward, it will become increasingly important to engage with and account for the views of the wider set of councillors, MPs, community interest and industry groups, the press, local activists as well of course as local communities.

At the point where a decision is made to proceed a communications and engagement plan will be developed to include:

- Member and political briefings
- Public communications and engagement
- Full equalities impact assessment

Until the outcome of the feasibility study and final content of the MTS is known it will be important to manage stakeholder expectations and not to over-promise, therefore it is recommended not to commence any formal consultation at this stage.

## **3.2 Programme Governance**

During the leaders' meeting with the Deputy Mayor in July she asked that project management arrangements for delivering the line be considered so that it is ready should the project be progressed further. Officers and TfL have subsequently been in discussion to see how this might work in practise based on experience with other similarly-scaled schemes from elsewhere in London, notably the Bakerloo Line Extension project. She also asked that this project become a standing item on the EPB's agenda in order to provide consistent democratic oversight. Detailed governance, funding and programme arrangements will return to future committees. It is recommended that the West London Orbital Line become a standing item on the agenda of the Committee.

## **3.3 Next steps and timings**

<b>Step</b>	<b>Description</b>	<b>When</b>
<b>Feasibility Study Completed, preferred route identified</b>	Completion of technical feasibility identifying line viability, preferred route, housing growth potential, and Benefit-Cost Ratio	September
<b>Tour of the line (29 September)</b>	Leaders and Deputy mayor for London to go on a focused tour of the line to understand its route	29 September

	and its role unlocking housing and employment growth.	
<b>MTS Consultation Closes (2 October 2017)</b>	Deadline for formally communicating to the GLA West London's evidence-based objective to realise an operational West London Orbital line.	2 October
<b>Funding Options Commissioned</b>	To identify in detail the development land to be unlocked by the scheme	Completed by November
<b>MTS Published</b>	The point at which the scheme will be mandated to proceed or not by GLA	Late 2017
<b>Project commence (Late 2017 or early 2018)</b>	Should the final MTS confirm the continued support of GLA and TfL for the WLO scheme, an operational budget and project governance arrangements will need be put in place to progress to the next GRIP stage..	Late 2017 subject to mobilisation

#### **4. ALTERNATIVE OPTIONS CONSIDERED AND NOT RECOMMENDED**

- 4.1 Not taking action to improve orbital connectivity around West London will result in increasing congestion and worsening air quality for travellers in the sub-region, with associated costs for the health and well being of individuals, the economy, and the environment.

#### **5. POST DECISION IMPLEMENTATION**

- 5.1 Following the Committee, should the recommendations be accepted, the West London Orbital Line will be added to the Committee forward Plan as a standing item.
- 5.2 Alongside this officers will continue to work with TfL, the GLA and Network Rail on the Governance aspects of the project.
- 5.3 Finally, the West London Orbital Line shall be incorporated into the West London response to the Mayor's Transport Strategy Consultation response the Committee requested at its meeting on 21 June 2017, and which was also asked for by the Deputy Mayor for Transport in her meeting with Leaders on 31 July 2017.

#### **6. IMPLICATIONS OF DECISION**

##### **6.1 Corporate Priorities and Performance**

- 6.1.1 This report relates directly to the delivery of the West London Vision for Growth, which has been agreed by the members of the West London Alliance.



Specifically, it focuses on delivering the emphasis in the Vision for Growth on improving orbital connectivity around the sub-region.

## **6.2 Resources (Finance & Value for Money, Procurement, Staffing, IT, Property, Sustainability)**

- 6.2.1 Please see section 3.1.iii. of this report covering resourcing. Given the scale and complexity of the scheme bespoke resourcing arrangements will need to be agreed covering scheme delivery and detailed feasibility. Should the scheme be progressed resourcing will return to the committee at a future date for detailed discussion and decision making.

## **6.3 Social Value**

- 6.3.1 This annual report supports the delivery of the objectives set out in the Vision for Growth, which is intended to improve the outcomes of people from all backgrounds across West London including by making it easier for them to get around easily and with the minimum toll on their pocket.

## **6.4 Legal and Constitutional References**

- 6.4.1 This work falls within the following sections of the WLEPB's Functions and Procedure Rules:

- Representing the participating local authorities in discussions and negotiations with regional bodies, national bodies and central government on matters relating to economic prosperity for the benefit of the local government areas of the participating authorities.
- Representing the participating authorities in connection with the Greater London Authority, London Councils and the London Enterprise Panel, for the benefit of the local government areas of the participating authorities, in matters relating to the economic prosperity agenda.
- Representing the participating local authorities in discussions and negotiations in relation to pan-London matters relating to economic prosperity.

- 6.4.2 The Joint Committee's role and purpose on behalf of the Participating Boroughs relates to ensuring appropriate, effective and formal governance is in place for the purposes of delivering the West London Vision for Growth and advancing Participating Boroughs' aspirations for greater economic prosperity in West London, including promoting "the Economic Prosperity Agenda", in partnership with employers, representatives from regional and central government, and education and skills providers.

- 6.4.3 The purpose of the Joint Committee will be collaboration and mutual cooperation and the fact that some functions will be discharged jointly by way of the Joint Committee does not prohibit any of the Participating Boroughs from promoting economic wellbeing in their own areas independently from the Joint Committee. The Joint Committee is not a self-standing legal entity but is part of its constituent authorities. Any legal commitment entered into pursuant of a decision of the Joint Committee must be made by all of the Participating

Boroughs.

## **6.5 Risk Management**

- 6.5.1 There is a risk that by not engaging with the full range of levers that have an impact on the overall economic success of an area the sub-region will not achieve the level of economic outcomes in terms of jobs, investment, or housing that might otherwise be the case over the medium and long term.

## **6.6 Equalities and Diversity**

- 6.6.1 The Vision for Growth recognises the need to ensure that people from all backgrounds are able to benefit from growth. Individual programmes within the Vision will have equality impact assessments undertaken on a case by case basis.

## **6.7 Consultation and Engagement**

- 6.7.1 All boroughs affected by the West London Orbital line have been involved in this work, including the commissioning and delivery of the technical feasibility study undertaken by WSP.

## **6.8 Insight**

- 6.8.1 See feasibility study at Appendix 2.

## **7. BACKGROUND PAPERS**

**Appendix 1:** Correspondence from the Committee to the Deputy Mayor for Transport

**Appendix 2:** Feasibility Study (five business case) undertaken by WSP on behalf of the Committee. This will be available 4 September.

# Transport for London

## West London Orbital

Chris Porter



EVERY JOURNEY MATTERS



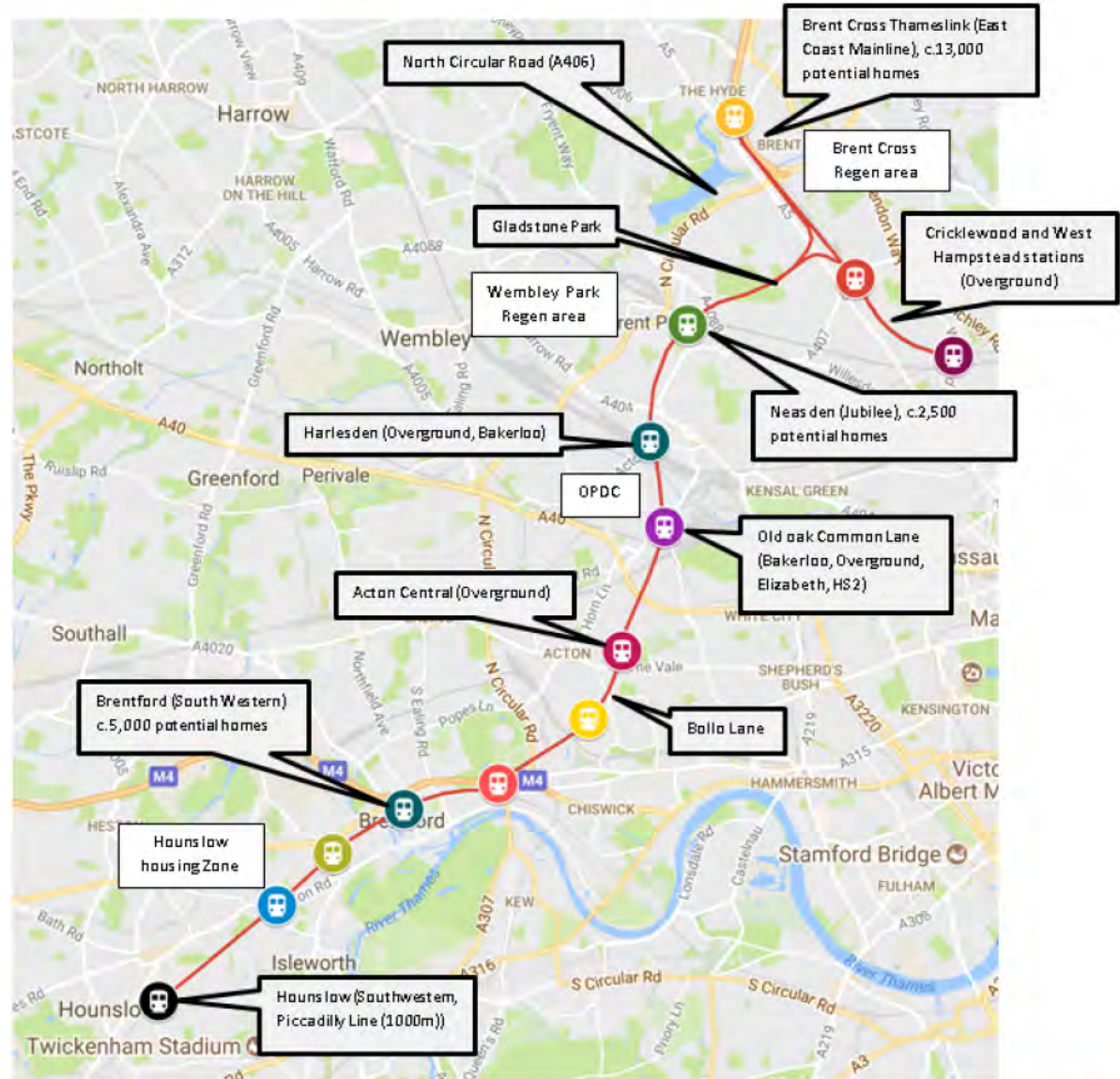
# Introduction

1. Mayor's Transport Strategy
2. Previous Work
3. Project Delivery Overview
4. Project Delivery by Stage
5. Immediate next steps



# West London Orbital Route

WLO route including connections and new housing



# Previous Project Work

- Scheme Options Assessment
- Railplan Modelling
- Initial technical feasibility
- High level business case development
- Early consideration of funding options





# Project Delivery Overview

Stage 1 - Current Phase (6 months up to Autumn 2018)  
Review and Update existing work, confirm desired outcomes



Stage 2 - Next Phase (9-12 months)  
Further Design work (GRIP 2), Business Case development and public consultation



Stage 3 - Future Phase (18-24 months)  
Scheme development to single preferred option (GRIP 3 & 4) and more public consultation



Stage 4 - Future Phase (12-18 months)  
Transport & Works Act Order (or similar) preparation and submission



## Project Delivery – Stage 1 (Current)

Review work undertaken to date including the published business case, technical feasibility and cost estimates and update as appropriate

Currently active work streams that will feed into the updated business case:

- Technical Assessment – Engineering and Operational
- Output definition study
- Transport modelling
- Consents Strategy
- Development Capacity Study
- Funding Study



# Project Delivery – Stage 1 (Current)

Review work undertaken to date including the published business case, technical feasibility and cost estimates and update as appropriate

## Technical Options Assessment :

- Identify potential operational constraints
- Assessing all work previously completed / underway in this area
- Review likely (high level) scheme cost

## Output Definition Study:

- Technical options/feasibility assessment
- Deliver a Network Rail GRIP I Output Definition report





## Project Delivery – Stage 1 (Current)

Review work undertaken to date including the published business case, technical feasibility and cost estimates and update as appropriate

### Transport Modelling:

- A range of modelling including both LTS and Railplan model runs for the scheme
- Synergies with other studies including for the Great West Corridor and Old Oak Overground stations

### Funding Study:

- Investigate the full range of potential funding options for the scheme
- Where appropriate consider possible financing opportunities



# Project Delivery – Stage 1 (Current)

Review work undertaken to date including the published business case, technical feasibility and cost estimates and update as appropriate

## Consents Strategy:

- Confirm the preferred consents route for the scheme
- High level review of likely property impacts resulting from the scheme

## Development Capacity Study:

- Ensure the scheme is included as an intervention option in all existing and planned growth area studies as appropriate
- Confirm high level growth and regeneration opportunities along the route – building from local studies



# Stage 1: Initial Key Issues facing WLO

- Timetabling difficulties
- Route Complexity
- Heavily used route by freight movement
- Complex junctions to consider including Acton Wells





## " Project Delivery – Stage 2 (Future)

Further Design Work – Undertake GRIP2 design study – Post Autumn 2018

- Develop multi-disciplinary option designs to GRIP2 level
- Complete initial Environmental Appraisal and Assessment
- Complete full operational assessment of WLO, including timetable modelling
- Develop Operational Concept (Rolling stock/stabling and maintenance requirements)
- Develop cost estimates
- Develop Strategic Outline Business Case
- Develop GRIP 3/4 requirements
- Agree train route and frequency that meets business /stakeholder objective
- Produce a full strategic outline business case
- Carry out an initial public consultation on the principle of the WLO scheme



# Project Delivery – Phase 3 (Future)

## Scheme Development to single preferred option

- Undertake GRIP 3 (Single Option Selection) and GRIP 4 (Concept Design & Approval in principle) design studies
- Update strategic outline business case
- Second public consultation based on single preferred option





# Project Delivery – Phase 4 (Future)

## Transport & Works Act Order (or similar) preparation

- Preparation of TWAO evidence including an Environmental Statement and Transport Assessment
- Minor amendments to the design based on consultation responses
- At least one further (wrap up) public consultation
- Confirmation of funding
- Outline business case





# West London Orbital

West London Economic  
Prosperity Board  
21 June 2018

Chris Porter  
Transport for London



EVERY JOURNEY MATTERS

# Introduction

1. Mayor's Transport Strategy
2. WLO route
3. Delivery Approach
4. Programme Plan
5. What do we need to do?
6. Key Risks





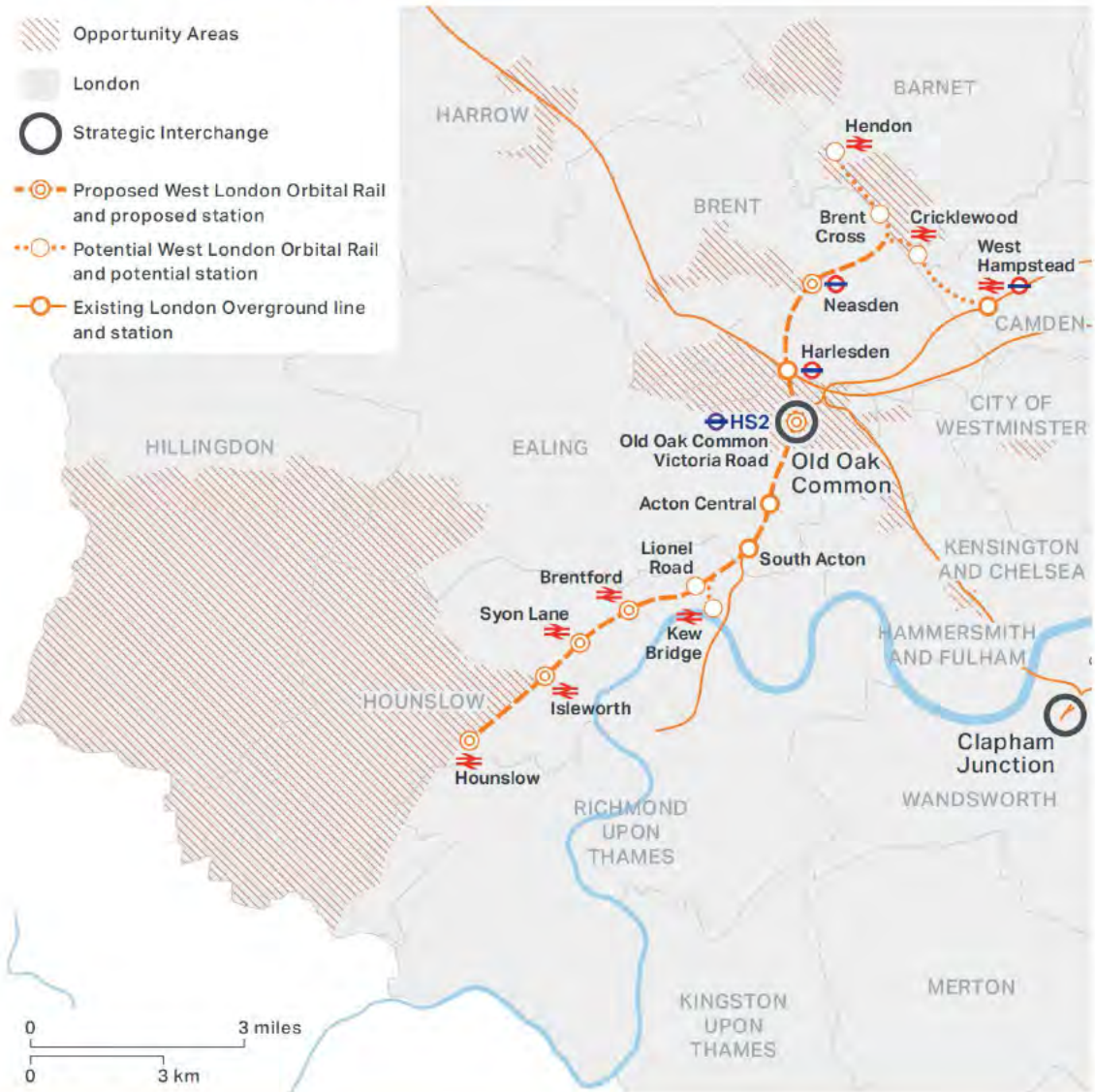
# Mayor's Transport Strategy 2018

## Proposal 88

The Mayor, through TfL, the West London Alliance boroughs and Network Rail, will work towards the delivery of a new London Overground 'West London Orbital' line connecting Hounslow with Cricklewood and Hendon via Old Oak, Neasden and Brent Cross.

Possible connections to:

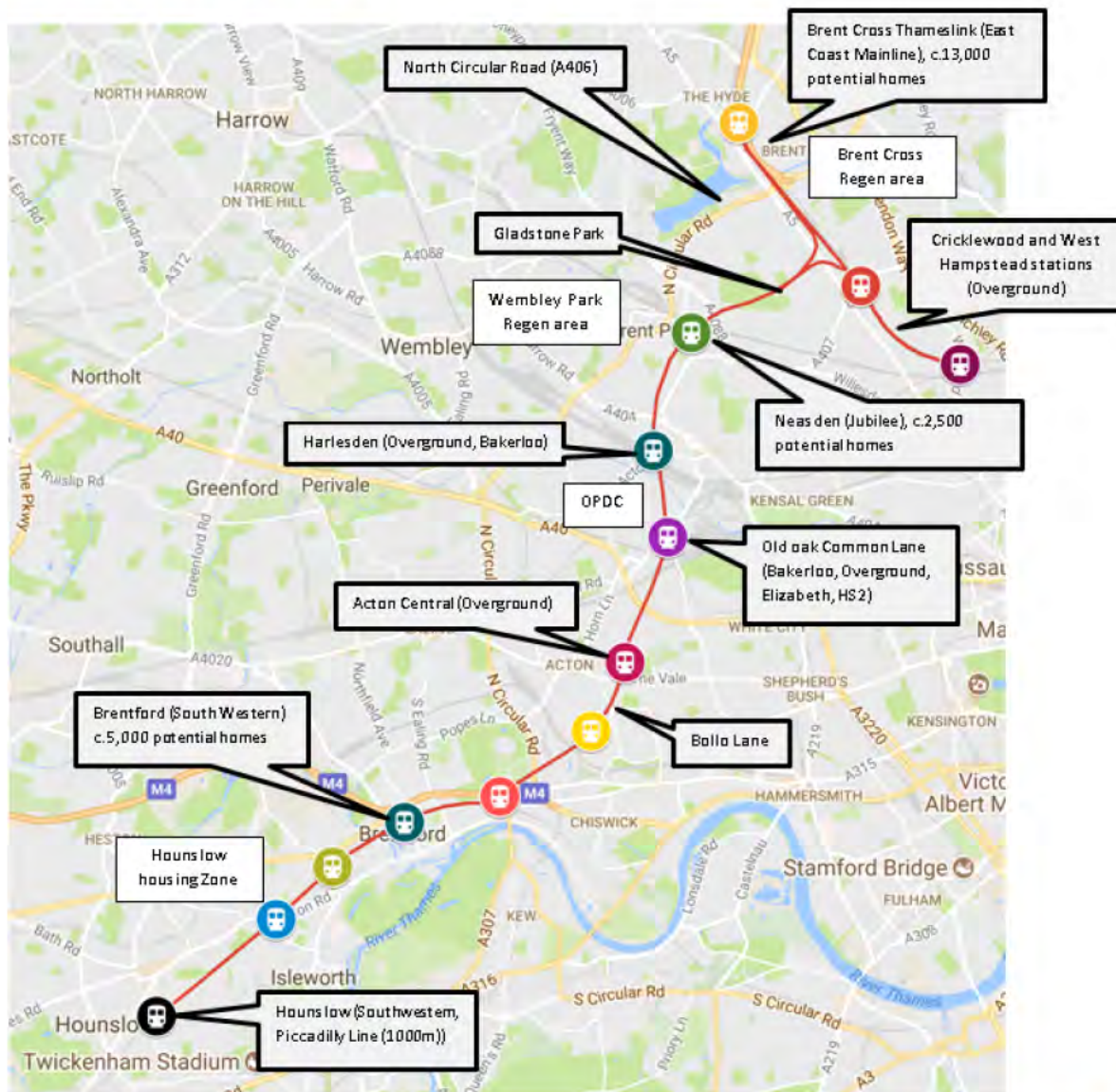
- Thameslink
- Jubilee Line
- Bakerloo Line
- Elizabeth Line
- Metropolitan Line
- Overground at West Hampstead, Harlesden
- National Rail at Brent Cross West(TBC), Brentford to Hounslow



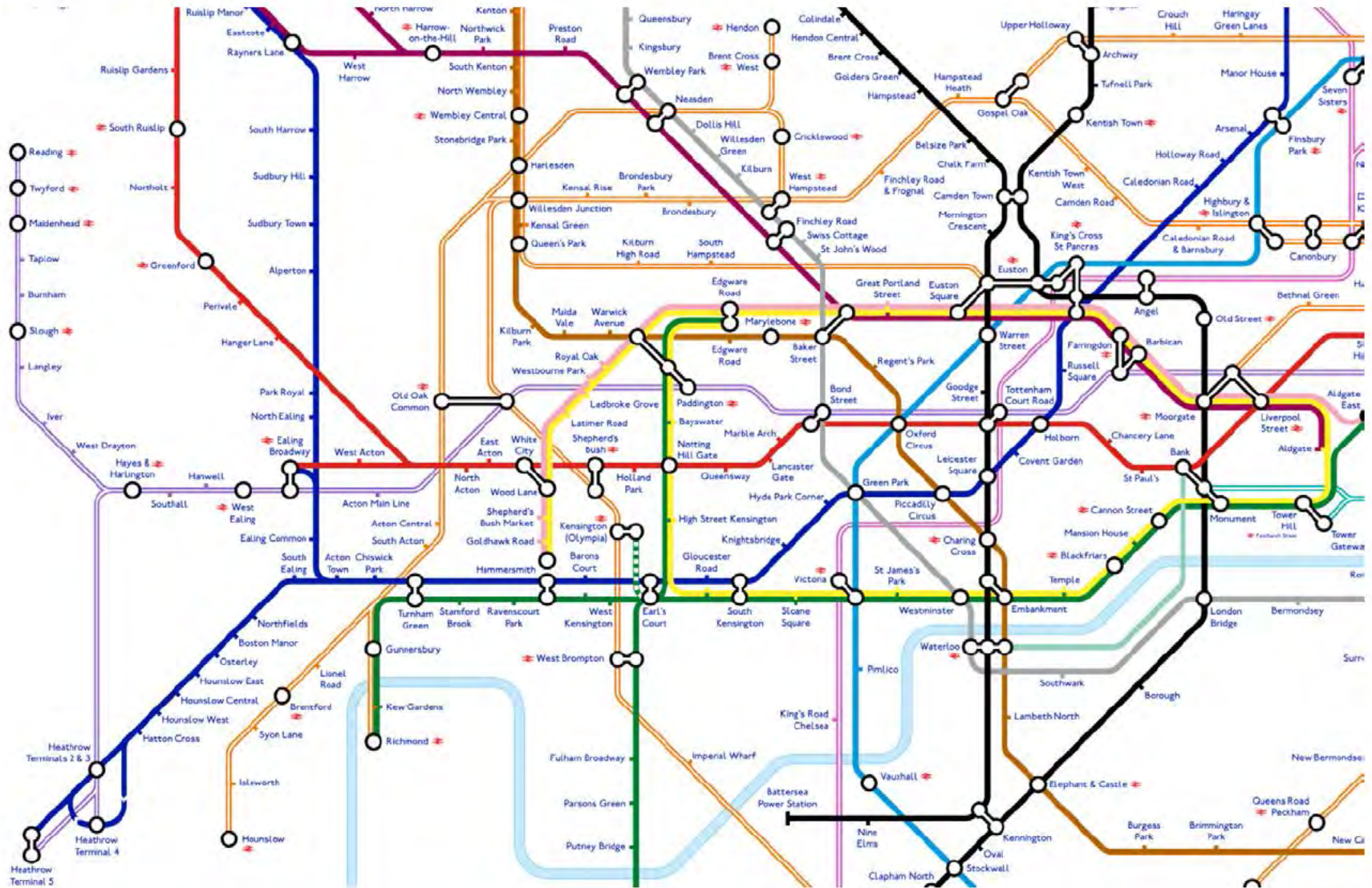


# West London Orbital Route

WLO route including potential stations and links to and new housing sites



# Connections to other lines



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## Wide ranging public and political support

- Cross borough (and party) support across west London
- Mayor and deputy mayor support as demonstrate by the letter to the borough leaders and MTS press release
- Very positive local and regional press coverage
- Strong support with local residents
- Ongoing liaison, consultation and engagement will be necessary to ensure continued support



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# How can this be delivered?

Joined up working will be key

Three emerging strands:

1. Rail project (TfL led, significant council involvement)
2. Regeneration, place-making, complementary measures (council led, TfL support)
3. Funding development for preparatory planning (jointly led)



Governance: Project to be overseen by a cross-organisation programme board, with delivery led by a cross-agency delivery team



# Project Delivery Overview

Stage 1 - Current Phase (6 months up to Autumn 2018)  
Review and Update existing work, confirm desired outcomes



Stage 2 - Next Phase (9-12 months)  
Further Design work (GRIP 2), Business Case development and public consultation



Stage 3 - Future Phase (18-24 months)  
Scheme development to single preferred option (GRIP 3 & 4) and more public consultation



Stage 4 - Future Phase (12-18 months)  
Transport & Works Act Order (or similar) preparation and submission



# Project Delivery – Immediate Deliverables

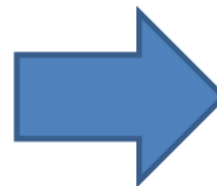
Review work undertaken to date including the published business case, technical feasibility and cost estimates and update as appropriate

Phase 1: 6-9 months work to review and update and develop current studies.

TfL commitment of c£230k to carry out this work

## Key deliverables:

- Updated transport modelling and demand forecasting report
- Baseline technical report (including timetabling)
- Network Rail GRIP 1: Output definition report
- Funding and Financing study
- Land assembly report
- Consents strategy
- Development capacity study
- Communications and engagement plan



Updated Business Case  
Autumn 2018

Delivered by TfL in liaison with local authorities





# Phasing and timeline (provisional)

Local Government Programme		TfL Programme		Joint Programme	
Phase 1: Local Plan alignment and embedding. - Local Plan requirement definition, including Reg 18 and Reg 19 consultation questions - Agreement of shared approach and timelines	6 months (by Aug 2018)	Phase 1: Review and update - Review of feasibility work - Further demand modelling - Timetabling - Update business case - Confirm consents route	6 months (c.Aug 2018)	Governance and project arrangements - Convene board and delivery group - Secure capacity (TfL and borough) - Agree project timeline and required decisions	2 months by May 2018
Phase 2a: Local Plan consultations and development - Reg 18 and 19 consultation - Site allocation and safeguarding - Incorporate development boundaries for CIL capture into LPs. - Alignment of funding and development routes	18 Months (by March 2019)	Phase 2: Further design work, GRIP 2 - Multi-disciplinary design study - Environmental assessment - Operational assessment - Cost estimates - SOBC - Develop GRIP 3 and 4 requirements	9-12 months (c.Sept 2019)	Funding and land assembly: - Define WLO development areas - Agree appropriate link to local plans - Link funding study outputs and local plans via West London EPB	9 months (by Dec 2018)
Phase 2b - Commissioning of evidence bases required to bring scheme forward e.g. employment land, land availability, housing need	2 years (all completed by 2020)	Stage 3 – Single preferred option (GRIP 3 and 4) - Undertake GRIP 3 (Single Option Selection) and GRIP 4 (Concept Design & Approval in Principle) design studies. - Second public consultation	18 – 24 months (c.Sept 2021)	Funding package agreed	TBC
Phase 3: Local plans adopted between 2019 and early 2021	All plans adopted by 2021	Stage 4 – Transport & Work Act Order - Evidence base (environmental and transport assessment) - Confirm funding - SOBC update	12 – 18 months (c.March 2023)		
Delivery					



## Key Risks

- Identifying funding for scheme development and construction (CIL, MCIL, TfL, GLA, DfT, Planning Delivery Fund, HIF 2 etc)
- Level crossings at Bollo Lane, Acton Wells 4-tracking, congestion along southern half of scheme
- Unlocking SIL intensification in discussion with GLA
- Reducing any operating subsidy that is a characteristic of orbital infrastructure that does not cut across fare zones.

All have possible ways forward – no show-stoppers identified to date



# What do councils now need to consider/do?

1. Continue to **embed the scheme** into Local Plans.  
Specifically:
  - Reg 18 and 19 consultations
  - Strategic narrative and vision/master planning around stations
  - Complementary measures
1. Work with GLA to **secure funding contributions**, e.g. **HIF 2** funding when announced later in 2018.
2. Incorporate into **Corporate Plans**
3. Commence **work on land assembly** along the line – to be led by consultants via funding study (match funding from TfL being sought)
4. Be ready to contribute **strategic input** (officer time)
5. Prepare planning and transport functions for WLO-related applications and activity





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