

Old Oak & Park Royal Regeneration: Indicative Bus Network & Infrastructure Requirements

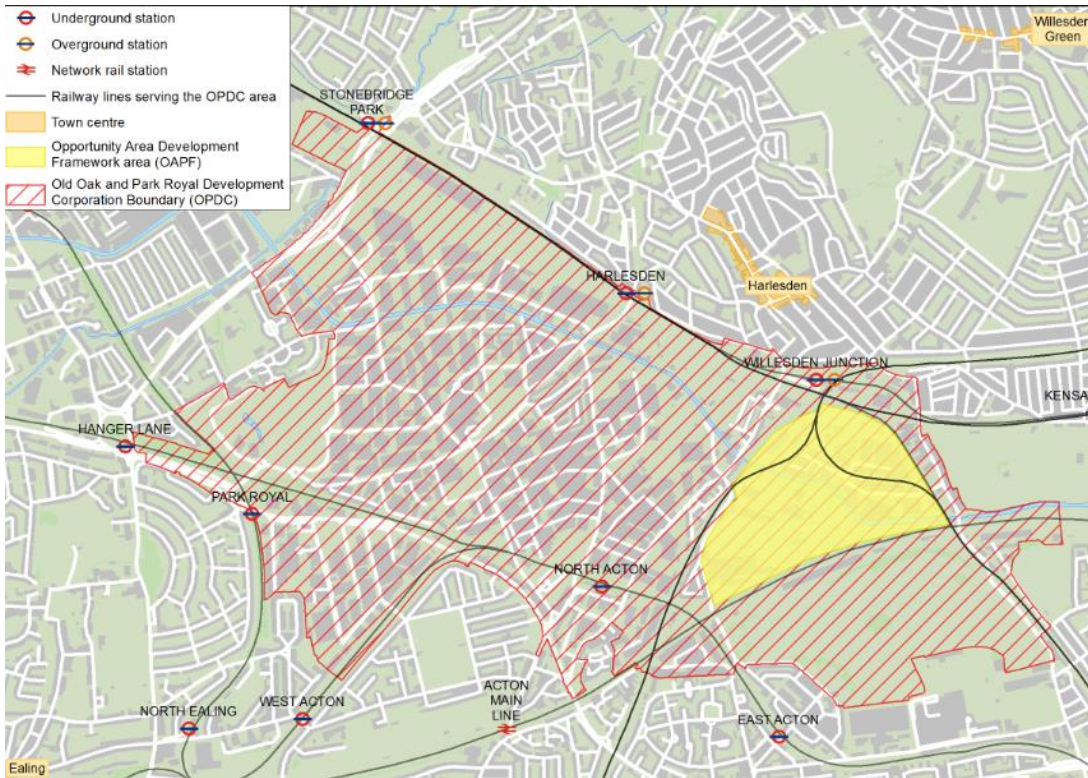
October 2016

Transport for London

Buses Network Development

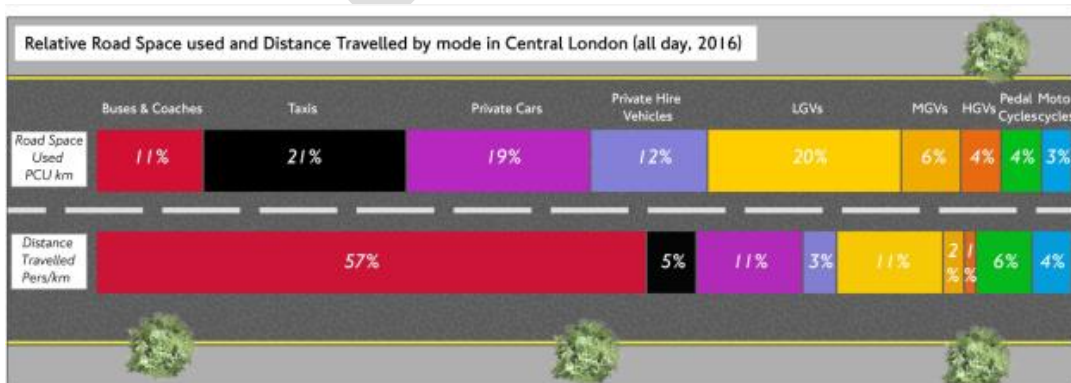
Introduction

Old Oak Common and Park Royal is a 650 hectare regeneration site that is planned to include new homes, retail, office, intensified industrial land along with new rail stations. Regeneration is overseen by the OPDC (Old Oak and Park Royal Development Corporation).



Map 1: OPDC boundary

The existing highway network in Old Oak Common is limited and road permeability within Park Royal restricted. Additional infrastructure is required for buses to effectively serve the site and improve public transport links to it from the wider area. This would improve bus reliability, capacity and connectivity. It would also unlock the site, providing an effective PT mode that could provide the capacity to move thousands of people per weekday. Some interventions would also reduce the cost of running the network with benefits for TfL's overall budget. For a development of such a high density, modes that move large numbers of people are vital to minimising congestion. Buses have a key role in achieving as they are the most efficient users of road space as the chart below for Central London, where density is similar to the proposed development at Old Oak Common, shows.

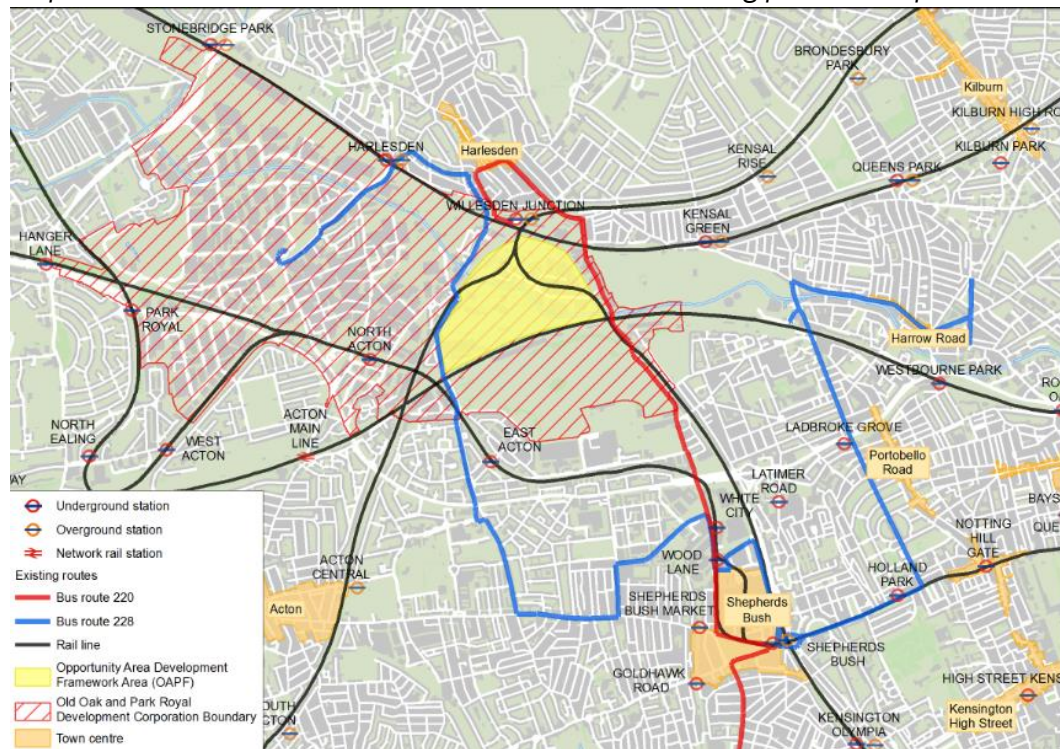


OLD OAK COMMON – CURRENT NETWORK

Currently, there are two bus routes that boarder the Old Oak Common/HS2 site. These are:

- Route 220 – provides direct links to Harlesden, Shepherd’s Bush, Hammersmith, Putney and Wandsworth.
- Route 228 – provides direct links to Park Royal, Shepherd’s Bush, Ladbroke Grove and Maida Hill.

Map 3: Local catchment of Old Oak Common and existing public transport links.



Map 3 shows these routes and their links along with rail services that are expected to serve the site. The two main issues with the current public transport network are:

- Many areas within 5 miles of Old Oak Common do not have a direct PT link to it.
- 12 routes run within a mile of Old Oak Common but require infrastructure along with new highway infrastructure to serve the site.

For these routes to serve the area rather than introducing multiple new routes at huge additional operating cost, changes to highway infrastructure are required. These routes are the 7, 72, 187, 218 (planned from 2017), 220, 266, 283, 302 and 487. Much of North and West London could be connected to the site with restructures or extensions to these routes to serve the site, subject to further analysis, business case development and public consultation.

UNLOCKING OLD OAK COMMON THROUGH INFRASTRUCTURE

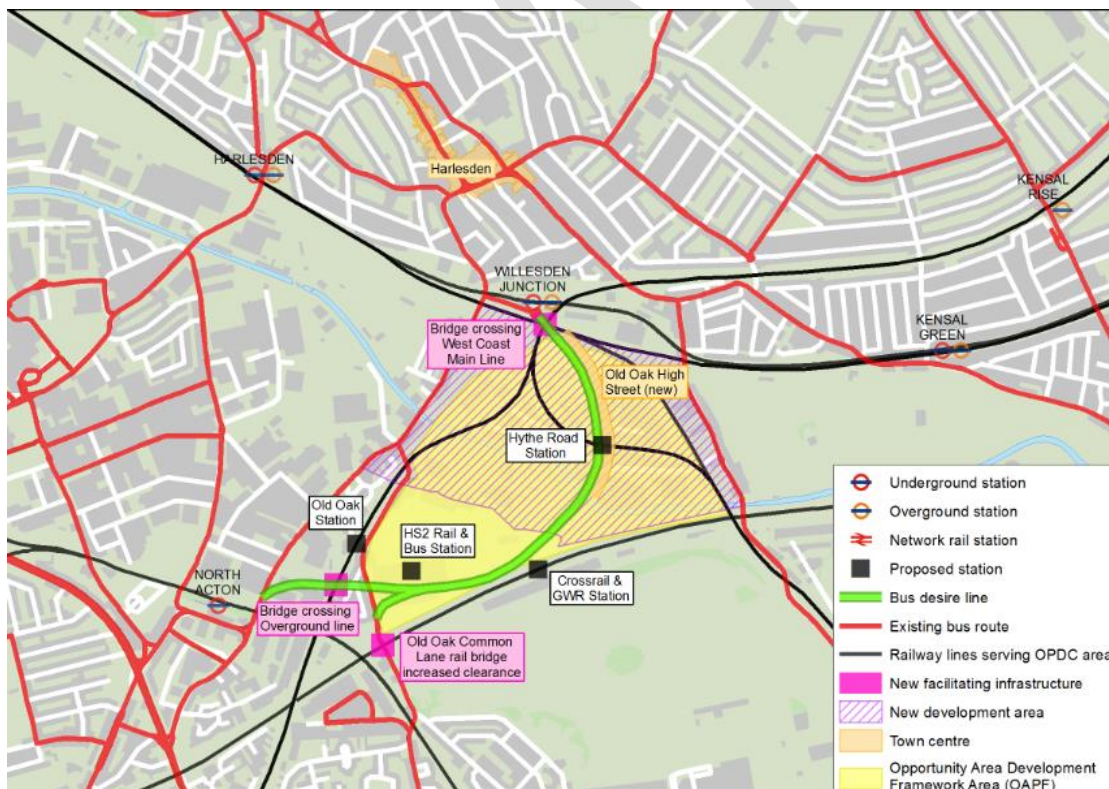
The next section outlines specific infrastructure interventions that would allow integration of the site with the comprehensive bus network that already exists in the surrounding area.

This would:

- minimise journey times and maximise passenger benefits
- provide a reliable network
- improve connectivity and links to surrounding area
- make the development sustainable
- minimise resource and cost to operating budget
- extra capacity to meet demand from the site
- provides a fully accessible and inclusive mode of transport

North-South Bus Spine Alignment

Currently, there are no roads fully crossing the Old Oak site in any direction. Various development proposals cover the northern two-thirds of Old Oak Common while the HS2 station is proposed at the southern third of the site. Willesden Junction Station is located to the north along with Harlesden Town Centre – the closest existing town centre to the site where a comprehensive bus network already exists.



Map 4: Green line shows bus 'desire line' linking existing and proposed attractors

Map 4 shows key attractors and the current network (shown in red). The green line shows the highway 'desire line' and how these attractors could be linked using the most direct route. This clearly shows a North-South alignment is required to link these attractors efficiently. A

bus corridor following this green line would also allow integration with the existing network that serves Harlesden and Old Oak Common Lane.

A further highway connection to North Acton under the West London Line would allow further integration and better access to the site. It is noted there are a number of challenges in creating a direct highway link between Victoria Road and Old Oak Common Lane.

Infrastructure required for North-South Bus Spine

Map 4 shows the following infrastructure is required to deliver this alignment:

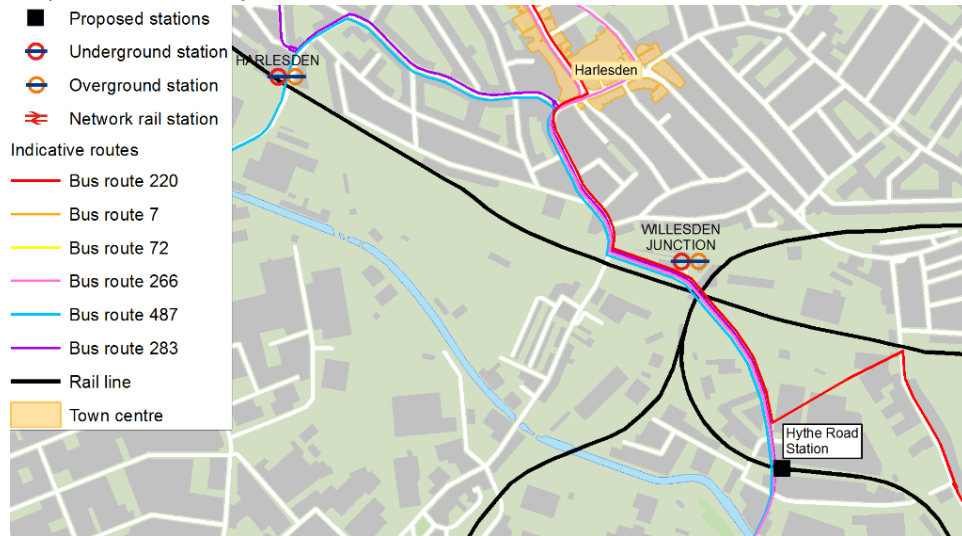
- A bridge linking the north side of Old Oak Common to Willesden Junction Station over the West Coast Main Line (WCML) and Harlesden town centre (via Station Approach or Harrow Road).
- A high quality bus priority corridor running along Old Oak High Street between WCML bridge, proposed Hythe Road Station and the proposed HS2 Rail and Bus Station.
- A bus road link between HS2 Rail/Bus Station, and North Acton Station area.

The benefits of this specific highway alignment are:

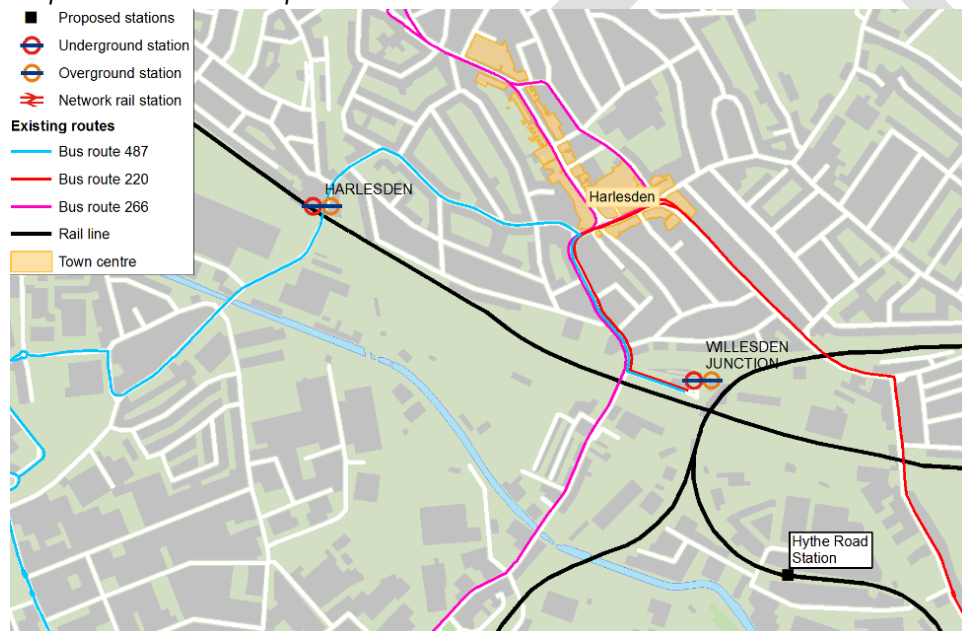
- Minimises journey times and provides a reliable network. Concentrates demand for the bus network in the site that would provide trip capacity into the many thousands per day. This is critical to the sustainability of the site by providing an efficient low emission mode suitable to cater to high density development.
- Minimises cost to TfL Buses of extending routes to serve the site and section 106 to pay for it.
- Better integration with existing bus network.
- Increases catchment of this regeneration site to surrounding town centres. In particular, Harlesden, Neasden, Acton, Willesden and Hammersmith that have no direct rail connection from OOC.
- Facilitates link between Park Royal and Old Oak Common by extension of route 487

While a high quality bus spine corridor is vital to providing a simple, reliable and frequent corridor, providing network coverage across the site is also important. Roads linking to Old Oak Lane and Scrubs Lane to development sites at Genesis are required to cover this area even though the north-south bus spine is expected to have the greatest capacity need due to the key attractors it would link.

Map 5: With bus spine – routes can be extended into the site



Map 6: Without bus spine – terminus needs to be maintained



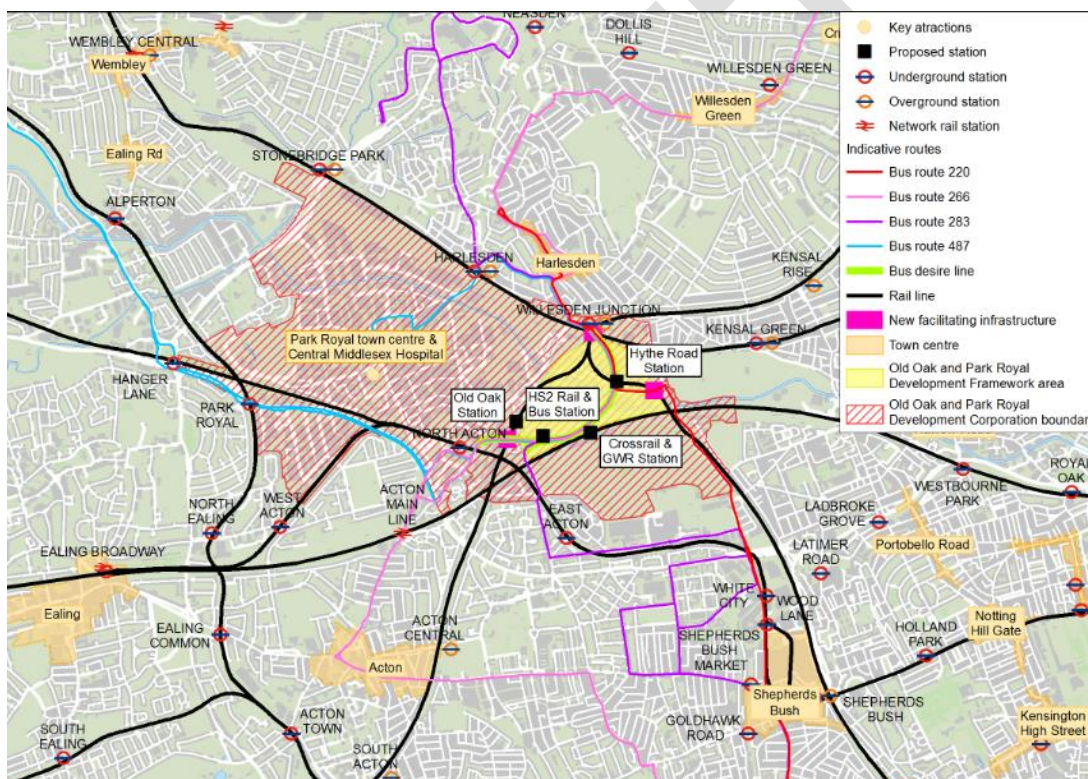
Black = rail links serving OOC, green = route 487, red = route 220

Routes 220 and 487 shown in map 5 have circuitous routings in the Harlesden, Park Royal and Willesden Junction areas due to the highway network. In addition, route 266 passes near to the OOC area via Victoria Road, a route that provides links to the town centres of Harlesden, Willesden, Cricklewood and Brent Cross areas not connected directly by rail.

Map 5 shows how a north-south spine could allow high frequency double-deck routes 220 and 266, and single-deck routes 283 and 487 to be rerouted through the site. This would provide around 1,000-1,500 passenger capacity per hour to meet trip generation from this site. Existing trips would need to be assessed further to ensure impacts to existing passengers are avoided where possible.

The following direct public transport links to Willesden Junction, Cargiant, Old Oak High Street, HS2/Crossrail Station would be provided to:

- Brent Cross
- Cricklewood High Road
- Willesden High Road
- Harlesden Town Centre
- Central Middlesex Hospital/Park Royal
- North Acton
- Acton High Street
- Alperton (Housing zone)
- Sudbury
- Northolt
- East Acton
- White City Estate/Loftus Road
- Wood Lane
- Hammersmith Town Centre
- Fulham
- Putney High Street
- Wandsworth town centre
- Neasden
- Brent Park/St. Raphael's Estate



Map 7: Links to North and West London by creation of north-south spine - routes 220, 266, 283 and 487

Unless there is a North-South Bus Spine, two of the highest frequency and capacity routes, the 220 and 266 cannot serve the site. Consequently route 220 would need to keep its stand and turnaround at Willesden Junction Station forecourt. In addition, linking the centre of Park Royal and Old Oak Common by public transport would be very circuitous and may not be viable.

This is because:

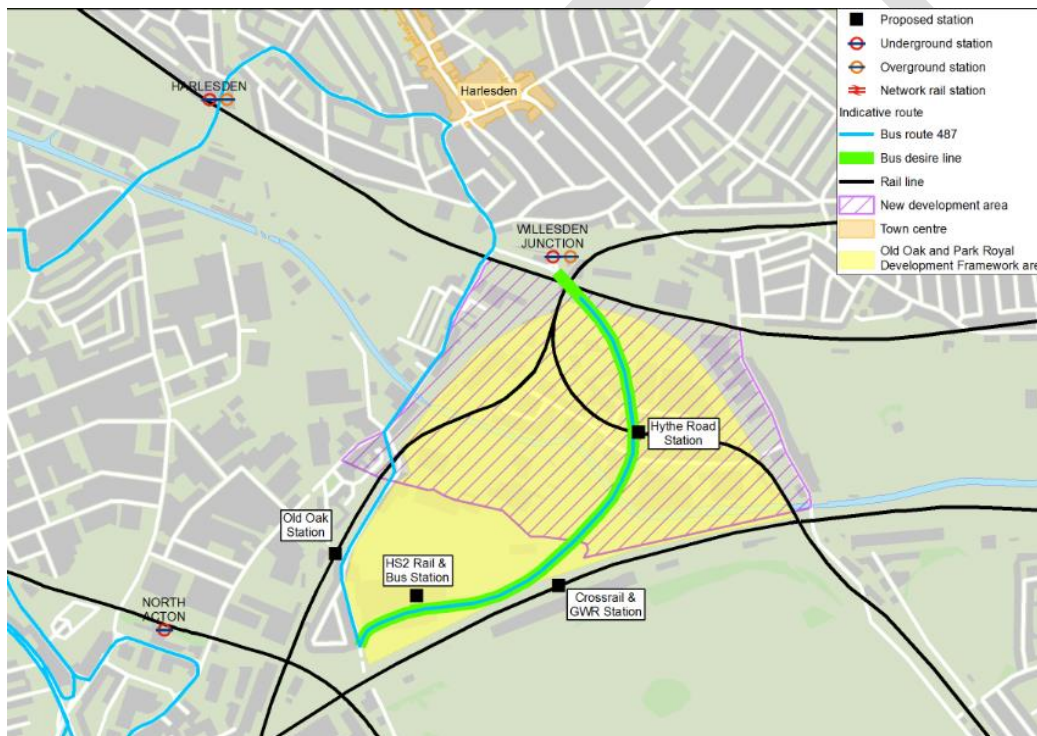
- Routes 220 and 266 are already long routes that run between Wandsworth and Willesden Junction, and Acton and Brent Cross respectively. These routes cannot be lengthened by much without impacting reliability and becoming difficult to manage.

- Running an additional route to the 266 to link LB Brent key centres at Harlesden, Willesden and Cricklewood at 5 bph would cost at least £2.5 million in operating cost every year.
- Route 487 would need to complete a “Z” shape routeing to link the OOC site and Park Royal. This would be the case for any route linking both sites without new infrastructure. This may be too unattractive for this link to be viable.

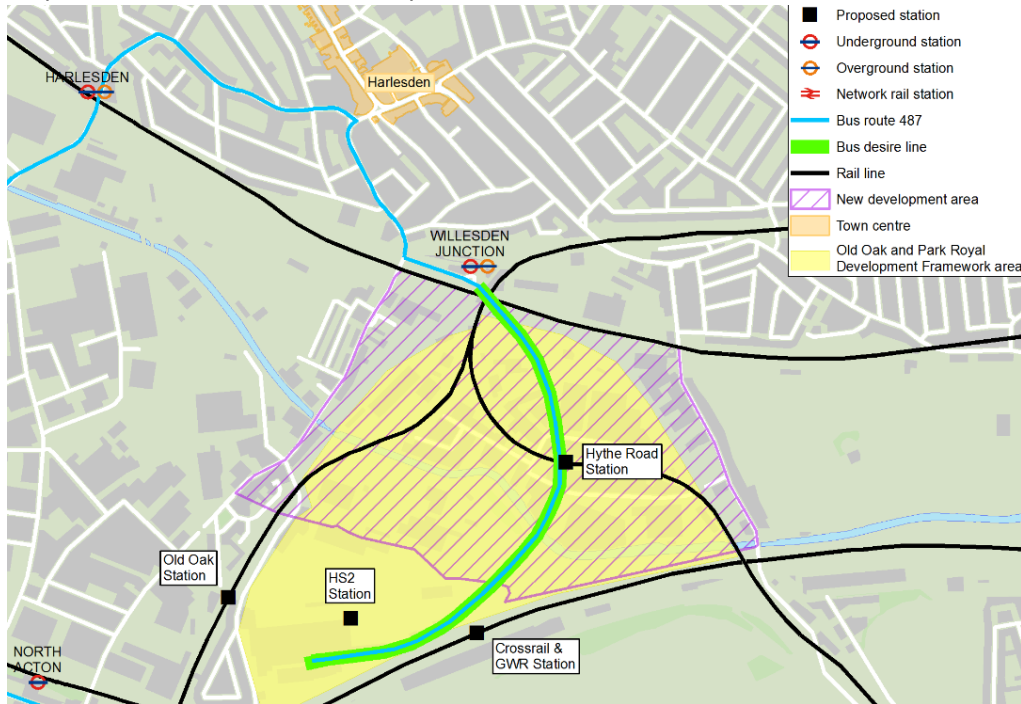
Bus standing, toilets and a turnaround facility would also be required at the northern end of the site without the North-South Bus Spine. This is because a lack of an outlet further north would mean it would have to be terminus for any route extended into the site. ‘Double-running’ would not be attractive and have a negative impact on route 266 through passengers.

Example: Route 487 without or with a North-South bus spine:

Map 8: Without North-South bus spine (this routeing is so circuitous it may not be viable to run)



Map 9: With North-South bus spine



Willesden Junction Station Bus Stands

Routes 220 and 487 currently stand at Willesden Junction Station forecourt along with rail replacement services during engineering works. This stand and turnaround facility needs to be retained unless a north-south bus spine alignment is provided. If the latter is provided, there may no longer be a need for these two routes to stand here as route 487 could be extended to Old Oak Common Bus Station and route 220 rerouted to run directly between Scrubs Lane, North-South Bus Spine, Willesden Junction and Harlesden Town Centre rather than its current circuitous alignment. This may assist in commercial development proposals for the station.

Old Oak Common / HS2 Bus Station

A new bus station has been secured as part of the proposed HS2 rail station. This is a critical piece of infrastructure that will provide most of the required standing provision required for the bus network in this area. The benefits are:

- Creation of interchange hub between multiple bus and rail services.
- Increases the catchment of the rail station spreading its connectivity benefits.
- A strong terminus to maximise patronage and revenue.
- Avoids unnecessary mileage for routes to reach standing elsewhere minimising operating cost by ending routes at a key attractor.
- Concentrates standing reduces the need for land to be set aside for standing/turning buses around elsewhere.

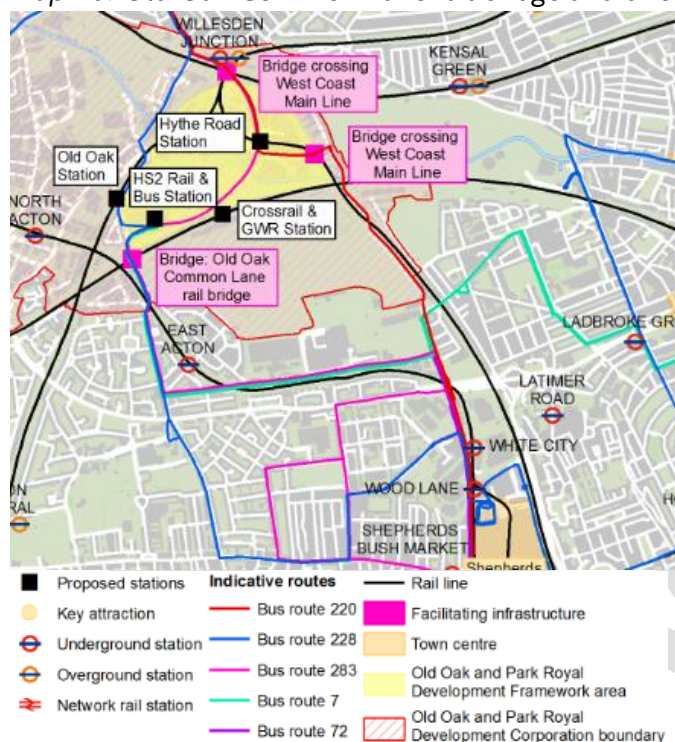
This facility is currently secured as part of the proposed HS2 rail station.

Old Oak Lane Rail Bridge – Increasing Clearance to allow Double-Decks to run below Great Western Mainline

Bridge works would allow extension of double-deck route 7 to HS2 and allow for route 72 to be converted to double-deck vehicle operation. Double-deck vehicles provide more capacity than a typical single-deck vehicle and are a cost-effective way of providing capacity without increasing mileage, vehicles and driver duties. This is already a committed scheme as part of the HS2 scheme.

Increasing the clearance of the bridge would provide capacity for around 900 passengers per hour through the site. Extension of these routes to the HS2 station would only require an extension of under a kilometre meaning that the cost would be cheaper than introducing new routes.

Map 10: Old Oak Common Lane rail bridge and direct links to wider area.

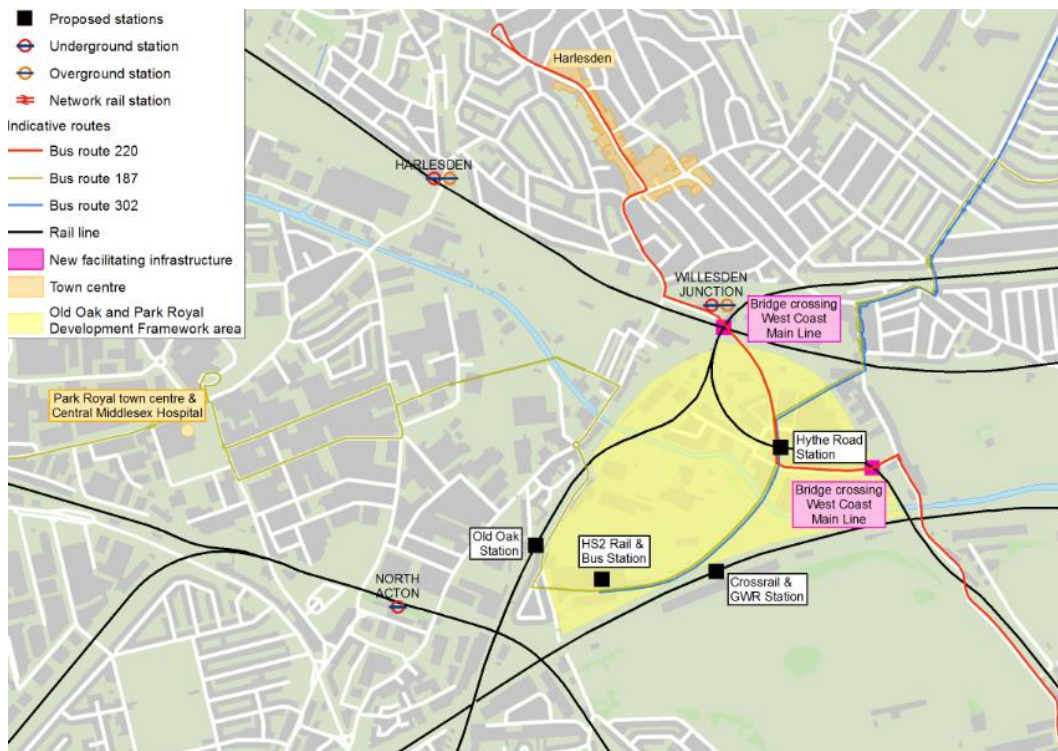


Eastern access to Scrubs Lane and Proposed Kensal Canalside Development

Suitable infrastructure linking the site to Scrubs Lane is vital for providing links to areas east of the site.

New links would be provided to All Soul's Avenue, Dollis Hill, Willesden by providing this section of highway.

New links could also be provided to the proposed Kensal Canalside opportunity area. This would require a road connection between Scrubs Lane through the site to Ladbroke Grove at Sainsbury's. Delivery of this connection is dependent on development separate to the OPDC area.



Map 11: Scrubs Lane connection would allow reroute of the 187, 220 and 302

Western access to Victoria Road

Suitable infrastructure linking to Victoria Road is also vital in providing links to areas in Park Royal, North Acton and beyond. Currently, Victoria Road is accessible via Old Oak Common Lane however this alignment is indirect and the junction between the two constrained. Bus priority would be required as the junction and approaches are expected to become more congested due to density of the development. A scheme for Victoria Road widening is being considered. It is vital that bus priority is delivered here if a new road connection between HS2 and North Acton is not delivered to provide a reliable network.

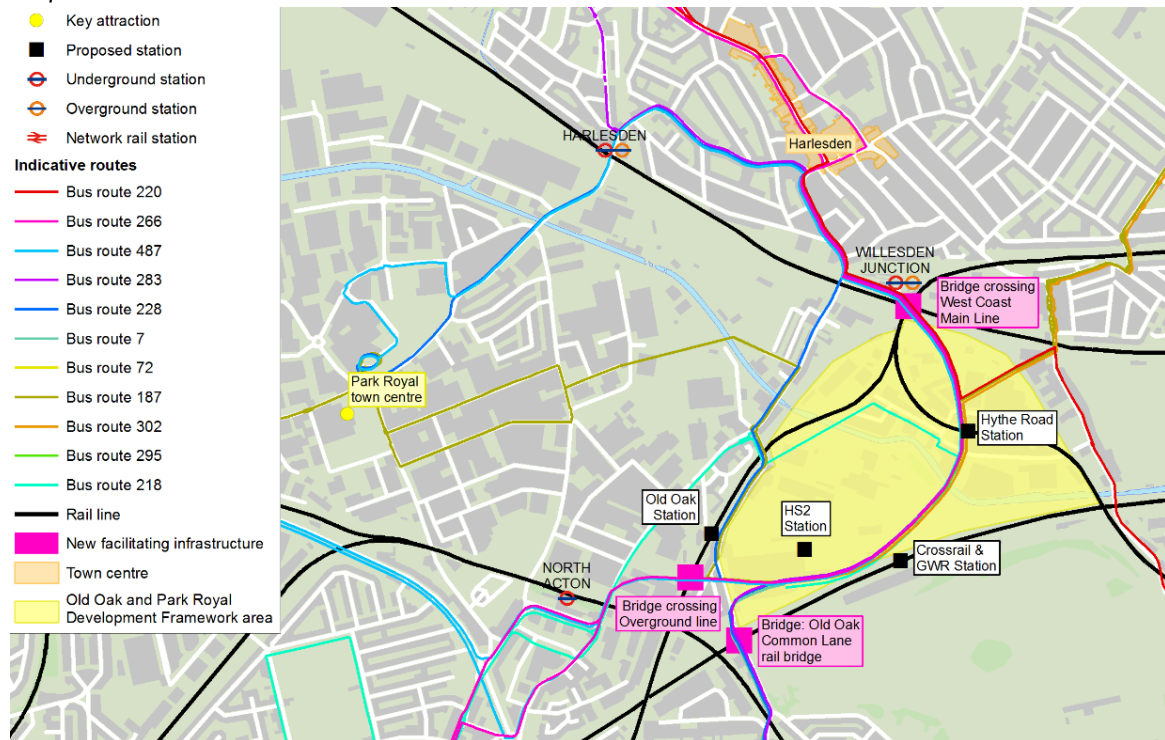
The Genesis development site falls near to Old Oak Common Lane junction with Victoria Road on the eastern side of the rail tracks. A link road is required to serve this development running between this section of Old Oak Common Lane and the proposed Old Oak High Street especially if this site is built earlier.

A further requirement to facilitate a North-South Bus Spine is a section of highway between North Acton and OOC. Linking Victoria Road to the HS2 station would connect these two attractors as well as the proposed Old Oak Station on the Richmond branch of London Overground.

Indicative Network for Old Oak Common

Through delivery of the three infrastructure requirements below plus an eastern connection to Scrubs Lane shown in map 11, the following network could be delivered.

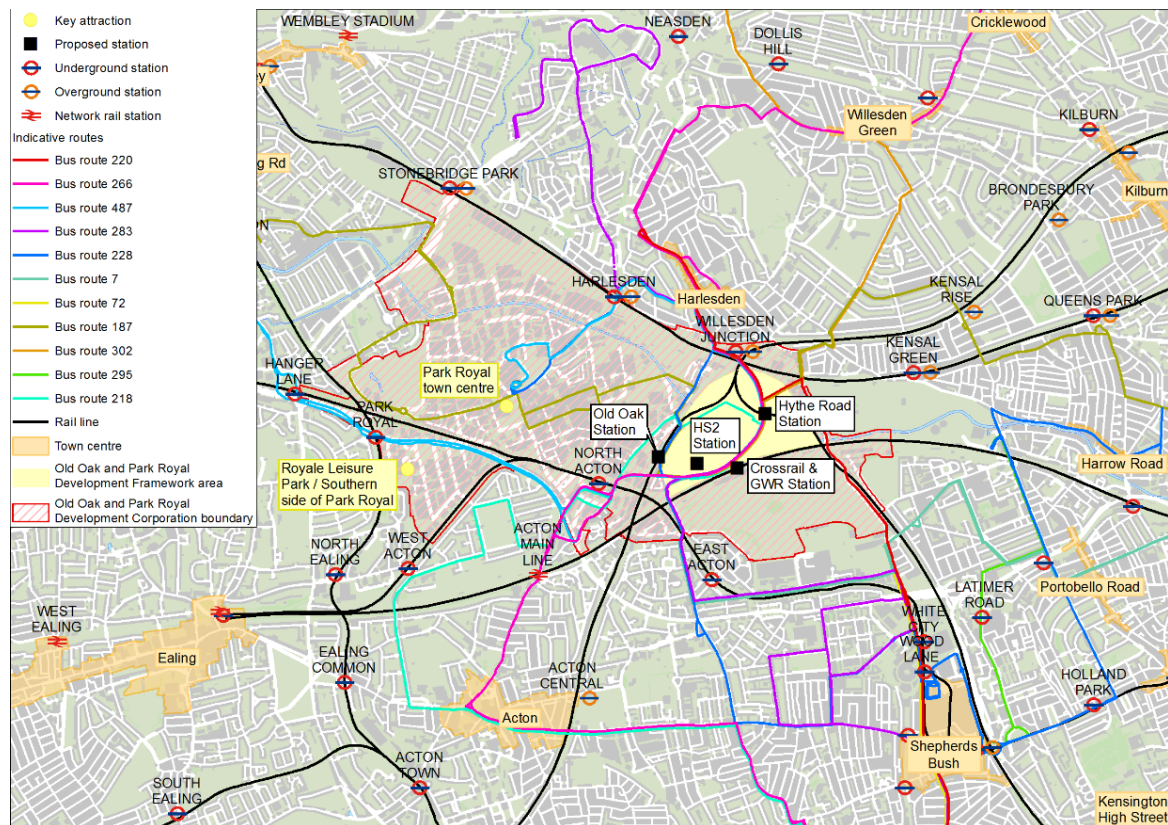
Map 12: Indicative local routes and links



Main principles behind the indicative network:

- High capacity/high frequency north-south bus spine linking OOC attractors including local town centres and key rail stations to support high density development.
- Old Oak Common HS2/GWR/Elizabeth Line Bus Station becomes a central hub for the bus network in OOC. Provides comprehensive PT coverage to the site
- New links to surrounding area including areas that are not served by rail.
- Minimises mileage and journey times for passengers. Minimises cost of running the network. Minimises conflict with other road users through straighter direct movements.

Map 13: Wider North and West London links



This would enable existing routes 7, 72, 187, 218, 220, 266, 283, 302 and 487 to serve the site and would create new links to the following locations not served directly by rail either currently or proposed in future:

- North Kensington
- Ladbrooke Grove
- Notting Hill
- Castelnau
- Roehampton
- Maida Vale
- St. John's Wood
- Barnes
- Brent Cross Cricklewood (growth area)
- Cricklewood High Road
- Willesden High Road
- Harlesden town centre
- Central Middlesex Hospital/Park Royal
- North Acton
- Acton High Street
- Alperton (housing zone)
- Sudbury
- South Harrow
- Northolt
- Neasden
- Kingsbury
- Colindale (growth area)
- Burnt Oak
- Mill Hill Broadway
- All Soul's Avenue
- East Acton
- White City Estate/Loftus Road
- Wood Lane
- Hammersmith town centre
- Fulham
- Putney High Street
- Wandsworth town centre
- Neasden
- Brent Park/St. Raphael's Estate

PARK ROYAL

There are seven routes that serve Park Royal Industrial Estate and Central Middlesex Hospital. This area is also has a small town centre with a supermarket and shops. These are routes 187, 224, 226, 228, 260, 440 and 487 run every 10-15 minutes during Monday to Saturday daytimes. There is no rail station within the centre of Park Royal, an area that is proposed for new housing and intensification.

There are a further four routes that also serve or boarder the industrial estate. Routes 218 and 266 that serve North Acton with route 266 serving the eastern side of the industrial area. Route 95 serves the southern side of Park Royal (including Royale Leisure Park) that is severed by the A40/Central Line from the rest of the industrial estate. Route 112 runs to the north-west along A406 North Circular Road.

North-South links through the middle of site are generally good. However, there is no direct road link between Park Royal and Old Oak Common. It means that two halves of this regeneration area can only be connected via two congested road junctions at North Acton and Harlesden. Without a road link with high quality bus priority, the new rail stations at Old Oak Common will not be accessible to Park Royal.

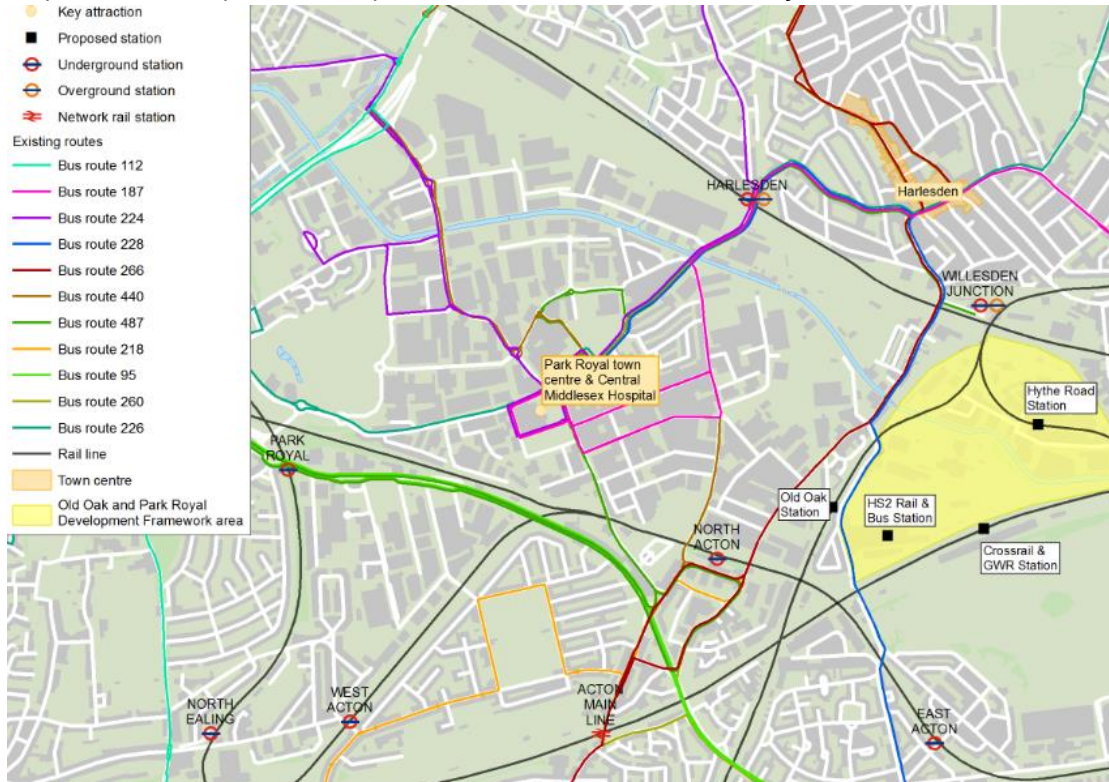
There are also two areas to the north and south of Park Royal that are severed due to major roads and the canal. While links are available to rail stations, the highway network makes connecting the rest of Park Royal to the Piccadilly Line station circuitous and unviable.

Road access is circuitous between Royale Leisure Park area and the rest of Park Royal. This journey can only be undertaken via Gypsy Corner at North Acton or Hanger Lane. There is a road link between the A40 Western Avenue and Coronation Road over the Central Line just north of Park Royal Station. There is no direct way of accessing/egressing the southern side of the A40 other than via a grade separated subway. This also includes a segregated pedestrian link to the station.

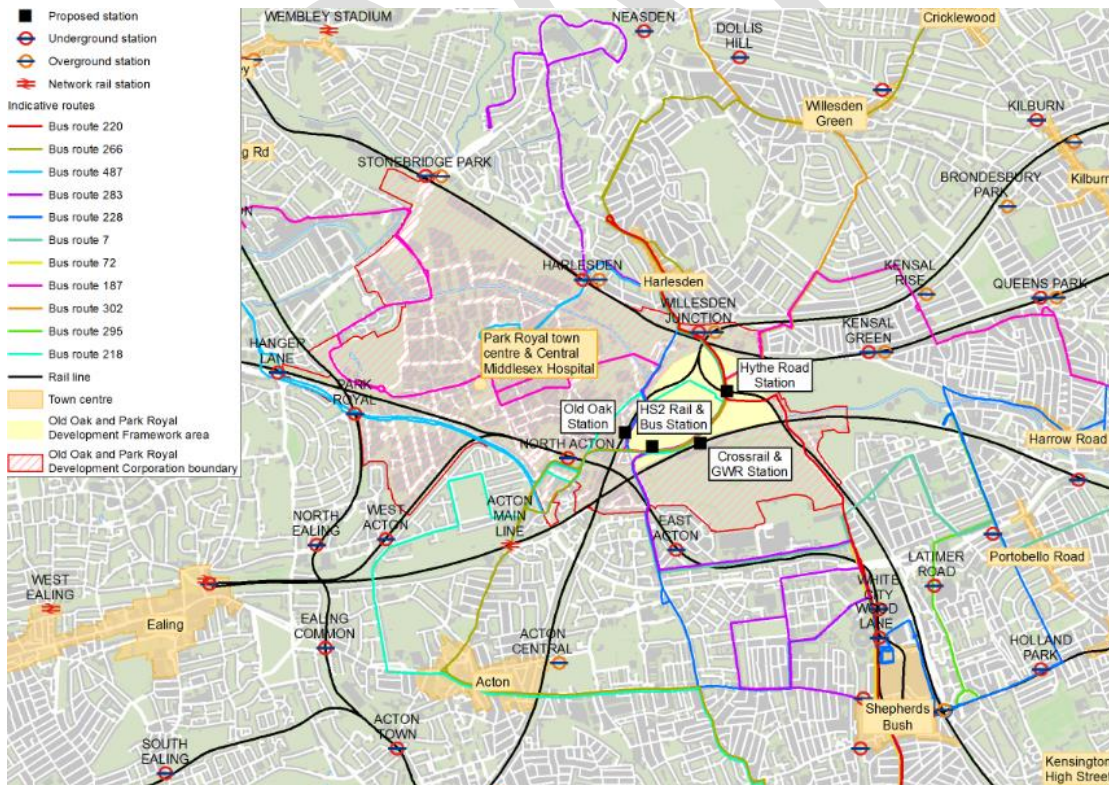
The following missing public transport links to Park Royal within 3 miles are:

- Park Royal centre – Old Oak Common proposed HS2/development sites
- Park Royal centre – Park Royal south / Park Royal Piccadilly Line Station
- Park Royal centre – Greenford and Perivale
- Kilburn

Map 14: Current public transport links in and local to Park Royal



Map 15: Current public transport links from Park Royal to surrounding areas



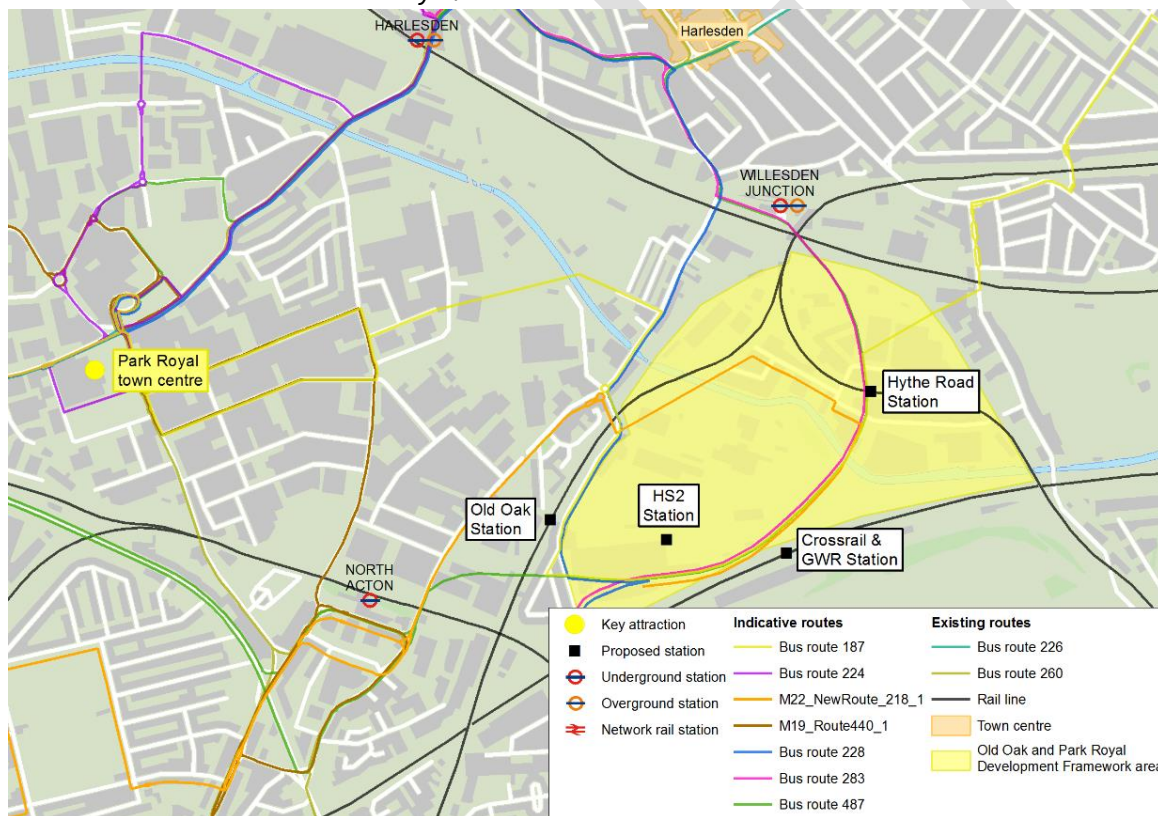
UNLOCKING PARK ROYAL THROUGH INFRASTRUCTURE

Old Oak Common – Park Royal highway link

Currently, any routing between central Park Royal and Old Oak Common needs to pass through North Acton gyratory or Harlesden. These are areas that are already congested and are predicted to get worse in future. These require circuitous routings that are indirect adding to mileage and cost.

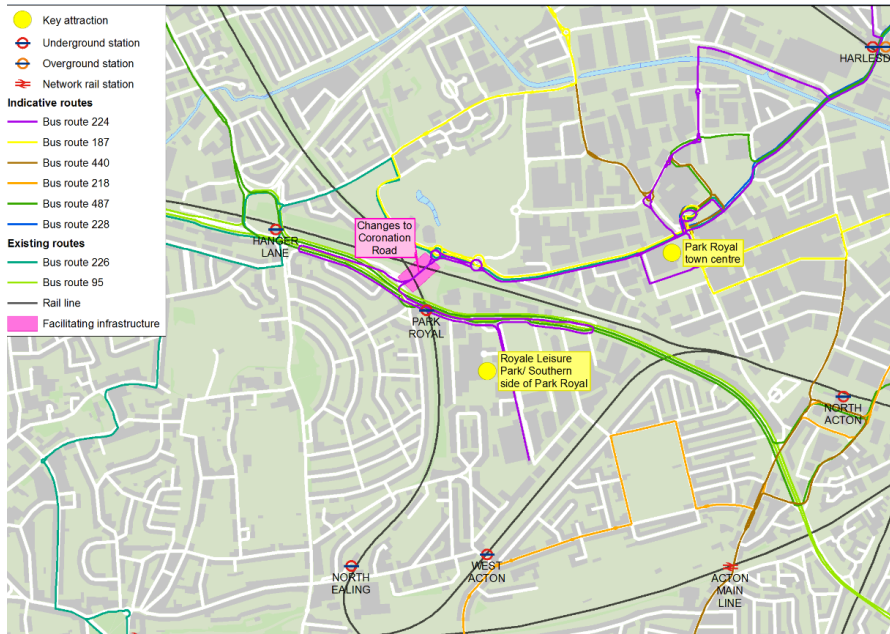
A link between North Acton Road and Old Oak Lane would remove the need for all buses to use North Acton or Harlesden to provide a direct link between Park Royal and Old Oak Common. It would also enable a much faster, direct link between each side of this regeneration area. Map 16 shows an indicative network showing route 187 linking Park Royal and Old Oak Common. Other routes could be provided if demand requires further capacity. This would link Park Royal to the extensive rail links proposed at Old Oak Common increasing its catchment. Getting from Victoria Road to the HS2 Station quickly and directly is also vital to connect the two halves of the regeneration area.

Map 16: Indicative route 187 could provide a link between OOC and Park Royal (map only shows routes that serve Park Royal)



Park Royal South link

Road access is indirect and circuitous between Royale Leisure Park area and the rest of Park Royal. This journey can only be undertaken via Gypsy Corner at North Acton, Hanger Lane or a circuitous road link between A40 and Coronation Road over the Central Line. This means that buses cannot link the southern side of Park Royal to the north restricting access to Park Royal Station on the Piccadilly Line and public transport generally in the area.



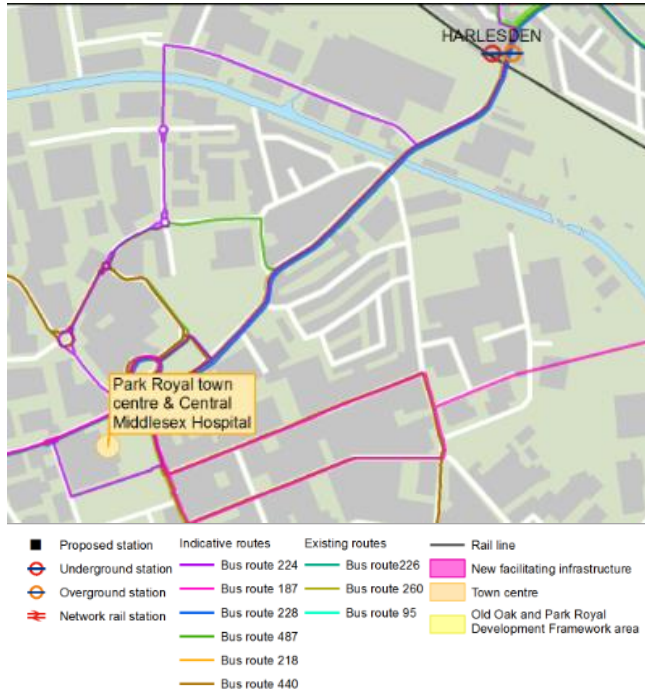
Map 17: Southern Park Royal / Royale Leisure Park

Providing this direct highway connection would allow for a route (within indicative network route 224) to link this Park Royal Station / Royale Leisure Park area with the rest of Park Royal. Any solution would need to consider impacts on the A40 and route 95. Previous proposals to rebuild Park Royal Station to include a new entrance on the north side of the A40 may also help if this idea was progressed.

Park Royal North link

Currently, there is a network hole at the northern end of Park Royal around Premier Park and Townsend Industrial Estate (shown in map 18). This area can only be accessed using East-West roads that link to Abbey Road and Acton Lane but do not connect to provide a through route. A rail line to the north and canal to the south currently prevent north-south access. A bridge linking Waxlow Road that penetrates two thirds of this network hole to the north of the canal and McNicol Drive to the south would allow for a short reroute of a bus service to link this area to Park Royal centre. Alternatively, Waxlow Road could be linked to Premier Park Road though this would require a slightly circuitous routing to serve this and Park Royal centre. The latter connect would be easier to deliver.

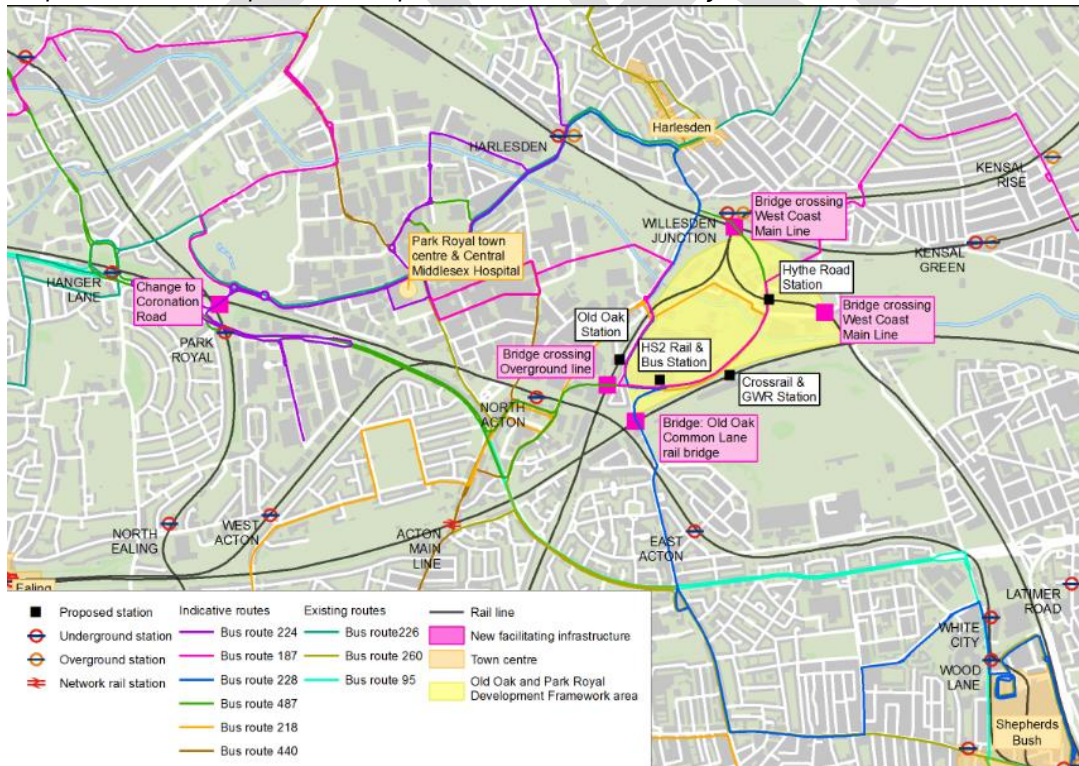
Map 18: Townsend Industrial Estate / Northern Park Royal



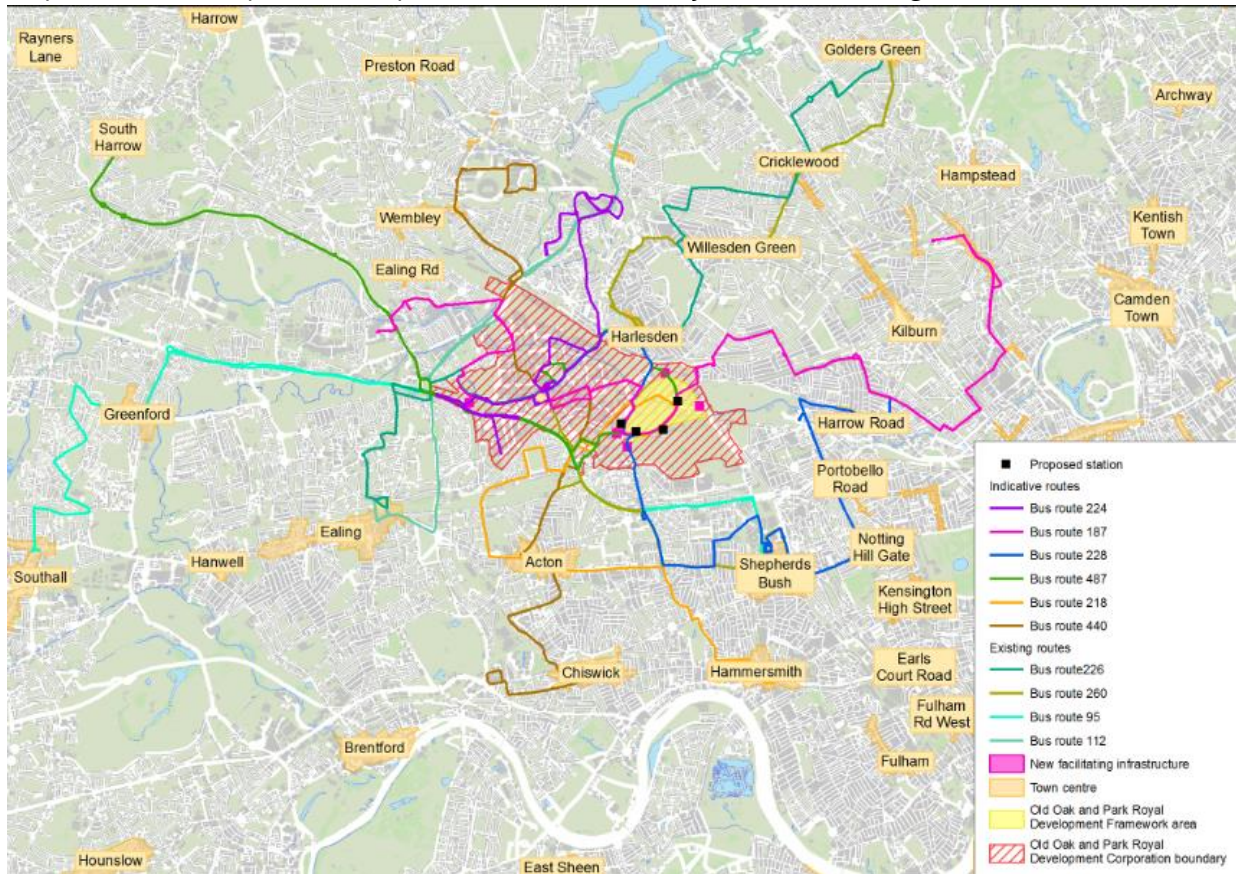
Indicative Network for Park Royal

The next two maps show how the three new infrastructure links could allow an improved public transport offer within Park Royal and also improve the catchment area of the site.

Map 19: Indicative public transport links within Park Royal



Map 20: Indicative public transport links from Park Royal to surrounding areas



This would provide the following direct public transport links from Park Royal to the surrounding area to be available:

- Acton Main Line Crossrail (contingent on route 440 extension)
- Acton town centre
- Alperton
- Brent Cross
- Brent Park
- Cricklewood
- Ealing Broadway
- East Acton
- Golders Green
- Harlesden
- Hanger Lane
- Kensal Rise
- Kilburn
- Ladbroke Grove
- Maida Vale
- North Acton
- Neasden
- Notting Hill
- Old Oak Common Lane
- Stonebridge Park
- Tokyngton
- South Harrow
- Sudbury
- Wembley
- West Hampstead
- Willesden

Next Steps

- Liaison with stakeholders and developers on requirements
- Use indicative network in strategic modelling
- Determine phasing of highway works and interim network
- Evaluation and further development of indicative network into firm service change proposals

This end state network is indicative and the length of buildout for this site will require it to be delivered in phases. It will also be reviewed periodically and amended where necessary as proposals for within the site are developed further.