Appendix

Station Improvements: White Hart Lane and Northumberland Park

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Tottenham Infrastructure Framework and Regeneration Strategy

Options for Enhancement of Stations at White Hart Lane and Northumberland Park

Stage B+ Report
Rev C - 15.08.13

Landolt+Brown ARUP

Introduction

This document has been prepared by Landolt + Brown architects in collaboration with Arup's masterplanning and transport consultants, to provide an options appraisal to support long-term requirements for changes to primary rail infrastructure within the North Tottenham area.

It focusses on two key locations which are central to the long term economic growth, vibrancy and integration of North Tottenham, namely White Hart Lane and Northumberland Park. White Hart Lane is the central component in the Investment Framework, building on the economic and social benefits provided by the new Spurs stadium, a wide range of new retail offers and leisure amenities that will characterise the area in years to come and make it one of London's primary destinations. Its rail connection could be considerably improved with a new station on the West Anglia route between Liverpool Street and Edmonton which copes better with greater patronage on match days and which also provides a more obvious gateway to the public transport network in the very centre of this key growth node. In addition, both stations are set to become part of the London Overground network whilst Northumberland Park station is situated on a line where £75m investment has been committed.

Northumberland Park Station is currently a small scale station predominantly serving the industrial activities to the east of the rail corridor and residents to the west. With an anticipated intensification of use to the east of the railway, this station will form a key linking piece for the communities on either side of the West Anglia lines, providing enhanced access for communities on both sides of the railway and offering the potential for dedicated and generous walking and cycle links connecting the Lee Valley with Tottenham.

In both locations, a summary appraisal of the current condition is provided, followed by an initial station options appraisal, with a preferred option identified.

It should be noted that the recommendations and analysis constrained within this study are that of Landolt + Brown and Arup and do not necessarily reflect the view of the Council or the GLA.

Extract from Arup Physical Framework Phase 1 2025

White Hart Lane Station
Context

The existing station at White Hart Lane sits at the junction of the railway viaduct running north/south through the study area and the east-west highway of White Hart Lane itself. It is located a little more than 200m to the west of Tottenham High Road.

The majority of station facilities (platforms, waiting rooms, passenger support facilities) are at viaduct level, with entrances, steps and ticketing at street level below. The brick-built station was constructed in the original phase of the Stoke Newington and Edmonton Railway in 1872 but has been modified at street level during the 20th Century. The original booking hall at street level has been de-commissioned and is now used for light industrial purposes and has no direct connection with railway operations.

Access to both platforms is provided by straight-flight stairs located on either side of the viaduct, accessed directly from White Hart Lane. Ticketing facilities are provided on the east side of the viaduct only (southbound platform) within a low level 20th Century ticket hall building. While this point of entry is visible from White Hart Lane, its poor architectural quality and single storey massing make it barely visible at street level from more than a few metres away. The stairs serving the northbound platforms exit to the west of the viaduct through a gated alleyway. Overall the quality of the environment around the station is poor and contributes little to wayfinding and orientation.

At platform level the original 4 car platforms have been extended to the south to provide capacity for 8 car trains used during peak periods and in match conditions. While busy during these peak periods, the station has low levels of patronage during the non-peak and staffing is limited to peak hours only. There are no dedicated facilities for cycle parking or for disabled drop off.

While the station is relatively close to the existing stadium and would be within walking distance of the new Spurs stadium, its location which is hidden from the High Road and not directly visible from the stadium, does not provide a clearly visible and centrally located gateway befitting of a major sport and leisure venue. Dispersal during match conditions is also hindered by the relatively narrow pavements along White Hart Lane - a more generous, direct route to the station would be of significant benefit and the provision of a higher quality gateway building would aid wayfinding and be appropriate as the new front door to one of north London's most important regeneration areas.

Three options have been tested in the following section:

1. Refurbishment of the existing station

2. A new station located at the southern end of the existing platforms

3. A new centrally located station

20th century steps provide access to the southbound platforms; the former booking hall is now in light industrial use at street level

The existing station lacks visibility at street level and cannot be seen from the High Road or Spurs stadium

Our initial analysis focused on the location of a new station at White Hart Lane. This took into account both the impact on existing communities and movement routes and how the station relates to the new Spurs stadium and its associated approach routes. The three options investigated, with a summary of pros and cons is noted below:

Option 1: Refurbishment or rebuilding in existing location:

Pros:
- The station would continue to support small scale retail and local businesses on White Hart Lane
- The station and stairs are located on the wider section of station platforms towards their northern end
- Minimal change and investment

Cons:
- Poor proximity and visual links with the new stadium
- End-loading of platform reduces match-related arrival and departure dispersal capacity
- Lack of ‘landmark’ or ‘placemaking’ potential as stair links require station buildings to be set back from street frontage.
- Single gateline not viable

Option 2: Location of station to the south (directly west of the centre-line of the Stadium)

Pros:
- Good proximity and visibility from stadium
- Potential to form new, indirect east-west connection under viaduct adjacent to station as an extension of Penhurst Road
- Good passenger dispersal and platform distribution if existing stairs retained and new stairs created further south

Cons:
- Distance from White Hart Lane and existing communities a major concern.
- Journey time increase for those living/working on the western section of White Hart Lane
- Risk of ‘dead’ station frontage at termination of station approach route on non match days
- Single point of gating only possible if existing station entrance is removed.

Option 3: Location of new station in central location:

Pros:
- Good proximity and visibility from station if main approach route is realigned (as current masterplan)
- Good proximity to White Hart Lane – local businesses would still benefit from station-related foot falls
- Potential for single station serving both existing communities and stadium – no risk of ‘dead’ frontage on non match layouts
- Good central platform loading location. Existing stairs could also be retained to ease match day loadings
- Potential to form direct east west link with extension of Penhurst Road under viaduct, feeding directly into station
- Single point of gating possible.

Cons:
- Modest increase in journey time from those living/working on western section of White Hart Lane (c75m additional walk to platforms)

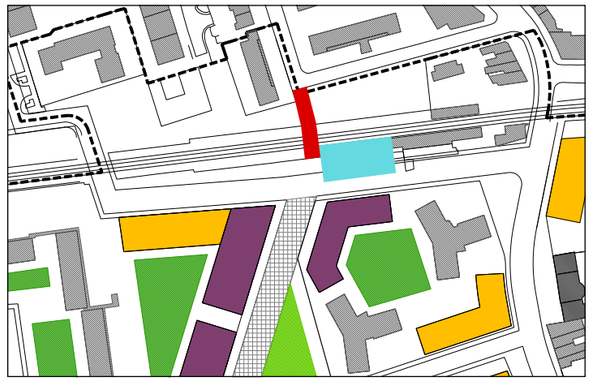
1) Station to north
2) Station to south
3) Central station

White Hart Lane Station
Initial Options Appraisal

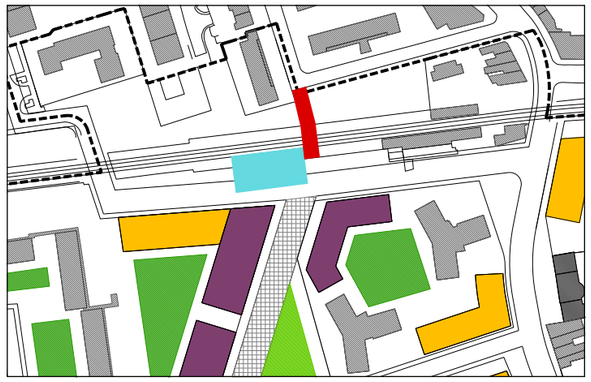
Photographic survey images illustrating the location of the 3 options investigated are illustrated right and below.

Images illustrating back of Penshurst Road

Location of Existing Station



Option 1



Option 2

Option 1

Option 2

White Hart Lane Station
Preferred Option - Option 3

The preferred solution and design principles

The relative benefits and limited dis-benefits of a centrally located station, combined with the wider Masterplan preference for a diagonal route between the Stadium and Station, led to a clear preference for the central station layout as illustrated in Option 3. A feasibility stage layout for this station has been developed which incorporates the following design principles:

- A single point of gating which allows for an entry from Penhurst Road to feed into the ticket hall, as well as points of entry from the east

- Location of ticketing and staff welfare accommodation within refurbished railway arches

- A primary point of entry on the station's south-east corner which can be approached from both Love Lane/White Hart Lane and the new public space proposed for High Road West

- A double height volume with stairs and structure pulled away from the viaduct to allow the original railway brickwork to contribute to the character of the new station

- Lift and stair access to both platforms

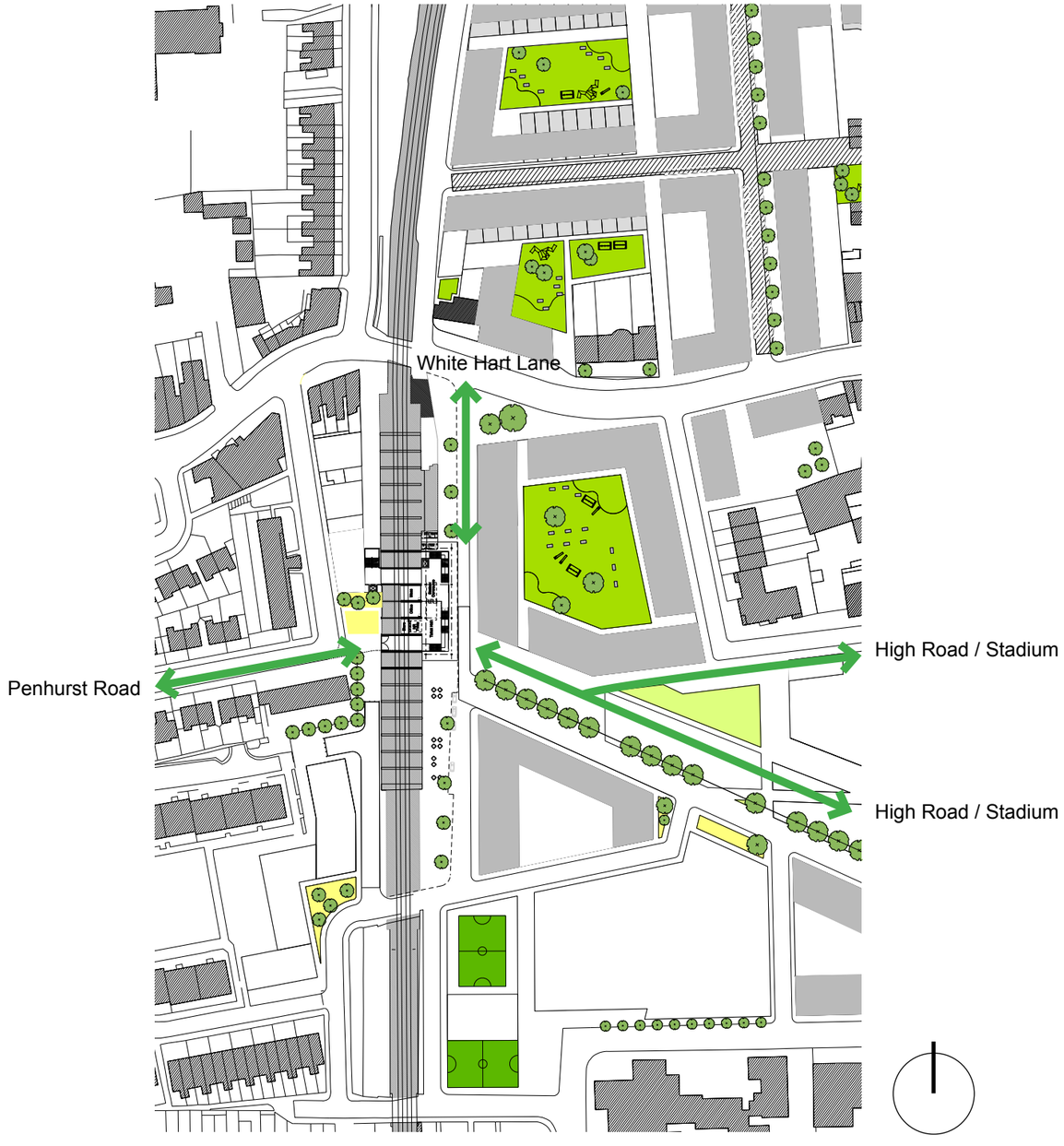
- Provision for cycle parking

- The potential for a paired stair on the eastern side of the station, allowing higher match day capacity and reduced station management on none match days

- Retention of the better quality station buildings for alternative use as commercial space at street level, while providing platform accommodation (as today) at upper level

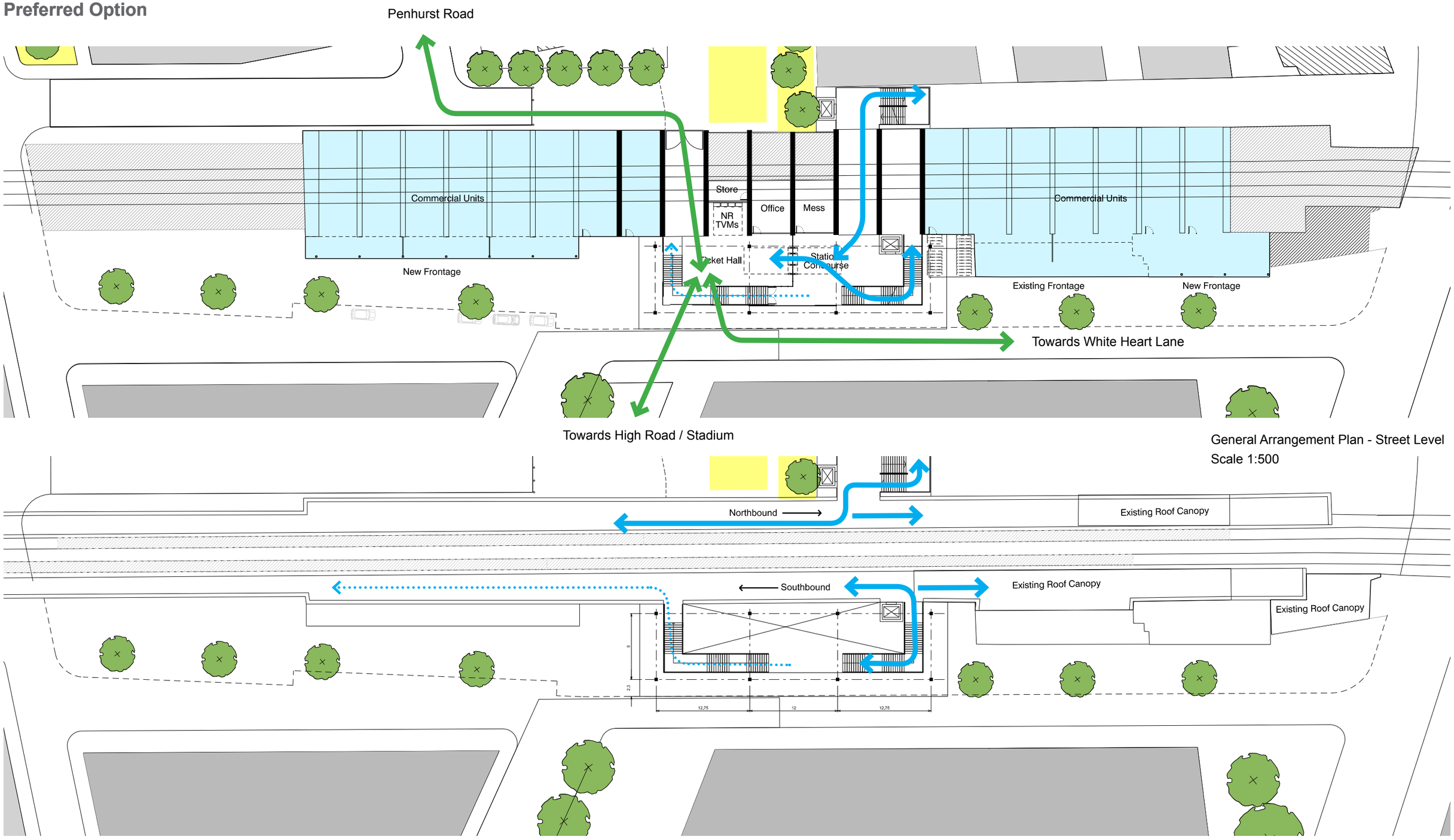
- Potential to refurbish the railway viaduct arches to the north and south of the station to promote active uses along Love Lane and to aide passive surveillance on the approaches to the station. Provision of a new frontage bay pulled approximately 3m in front of the arches would allow greater flexibility in terms of tenancy areas and could promote a richer mix of uses, with businesses able to occupy more than one bay of the viaduct if they require additional space.

RIBA Stage B+ Layouts in plan, section and elevation of the preferred solution are illustrated overleaf.



Location Plan - Preferred option in the context of High Road West master plan option 3.
Scale 1:1000

White Hart Lane Station
Preferred Option



General Arrangement Plan - Street Level
Scale 1:500

Pedestrian approach routes

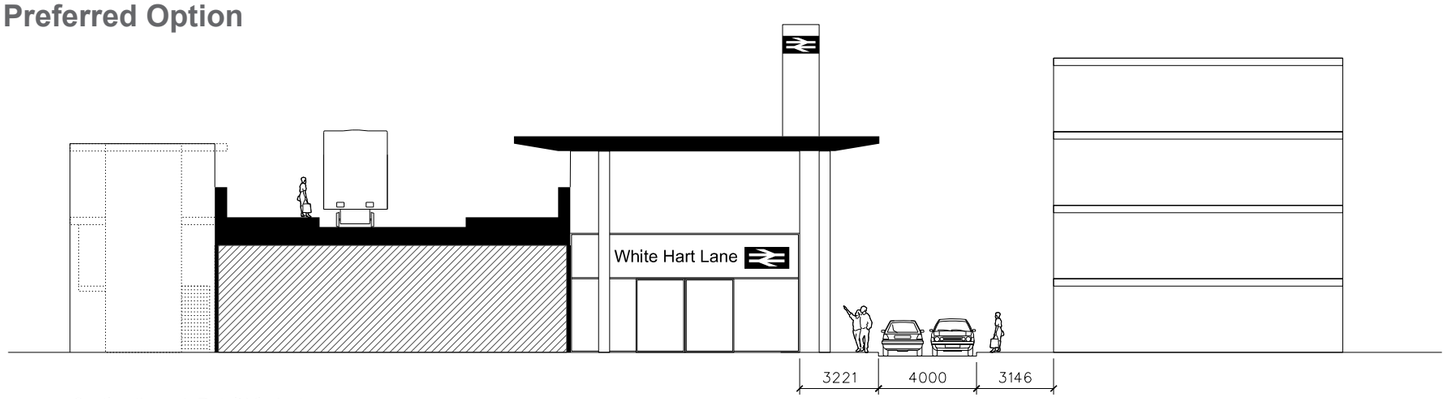
Paid side platform access

Match day / peak additional southbound platform access

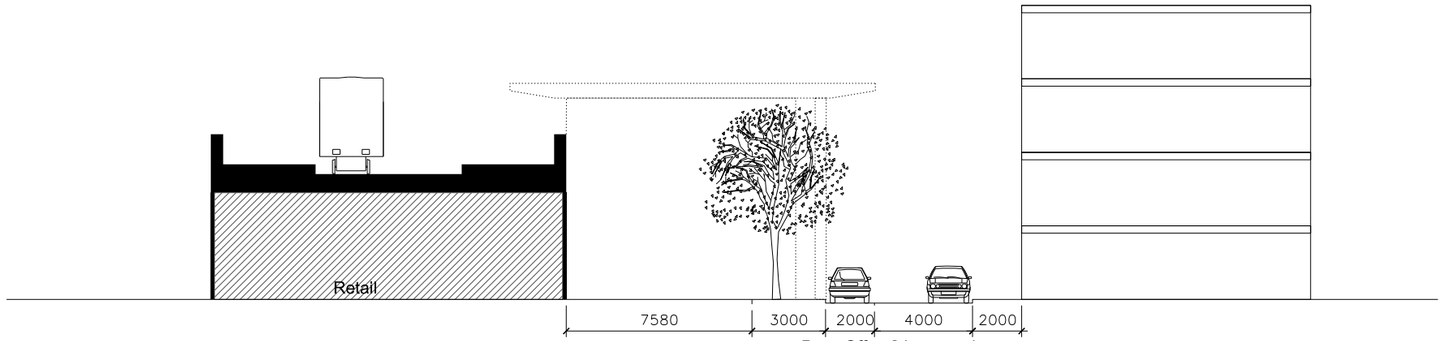
General Arrangement Plan - Platform Level
Scale 1:500

Landolt+Brown ARUP

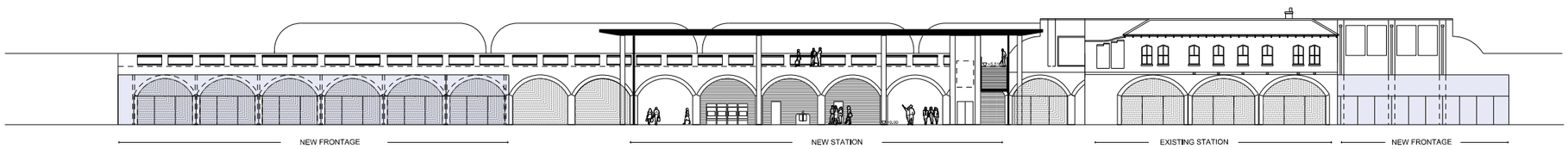
White Hart Lane Station
Preferred Option



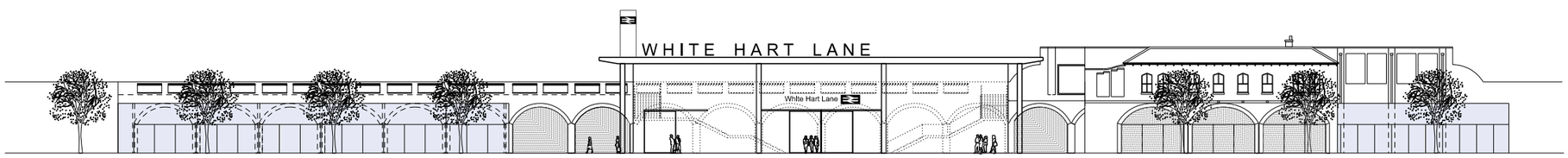
Section through Retail Viaduct
Scale 1:500



STREET SECTION
Scale 1:500



LONG SECTION THROUGH TICKET HALL
Scale 1:1000



LONG ELEVATION
Scale 1:1000

White Hart Lane Station
Preferred Option

The preferred option - potential for delivery in advance of wider estate regeneration

The preferred option illustrated on the previous pages show the recommended layout for the station in the longer term condition, if redevelopment in the High Road West area were to go ahead.

It would be possible to implement the station and viaduct enhancement in advance of more wide-ranging changes around White Hart Lane and the drawings overleaf illustrate how this might be achieved. This is most likely to take place over two stages, in response to the scale of impact on existing residential parking accommodation:

Stage One - New Station and Northern Viaduct Refurbishment:

- Construction of the new station and associated platform connections
- Redevelopment of the arches in close proximity to the station
- Refurbishment of the existing station building as retail or commercial space
- New public realm along the western side of Love Lane, linking the station to White Hart Lane

Redevelopment of the arches and existing station should encourage uses which provide an active frontage to White Hart Lane, aiding passive surveillance on the approach to the station and capitalising on the higher footfalls generated by the new station.

This stage would require acquisition of 9 garages and the dis-used yard space in front of the viaduct. The residential property at the south end of Love Lane would remain in place.

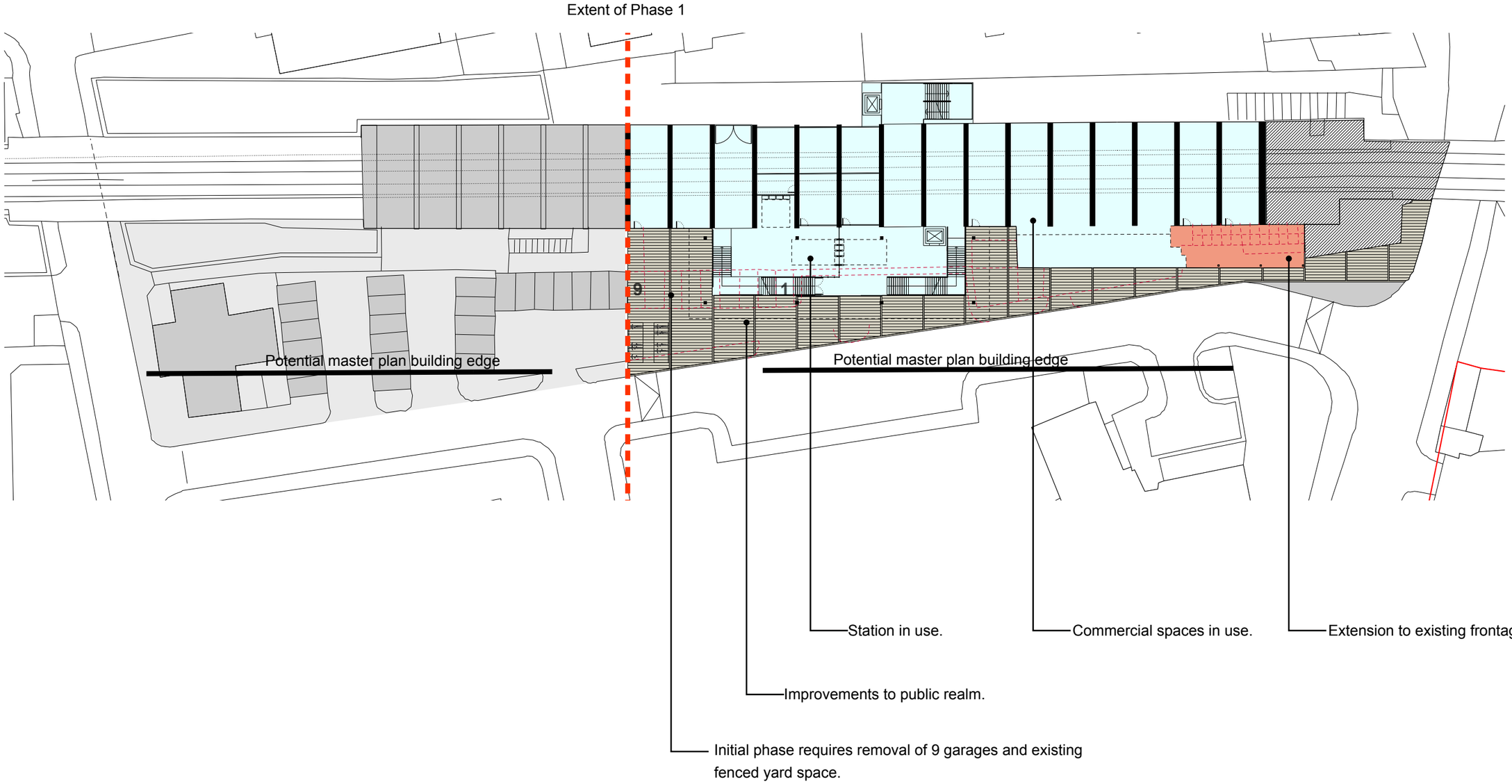
Stage Two - Development of the southern arches

- Refurbishment of the 6 southernmost viaduct arches as retail or light industrial space
- Continuation of public realm enhancements on the western side of Love Lane to meet Whitehall Street
- Acquisition of a further 18 garages

The public house at the south end of Love Lane Estate would remain in place.

These two phases are illustrated overleaf.

White Hart Lane Station
Preferred Option - Phasing Solution - Phase 1



White Hart Lane Station
Preferred Option - Phasing Solution - Phase 2

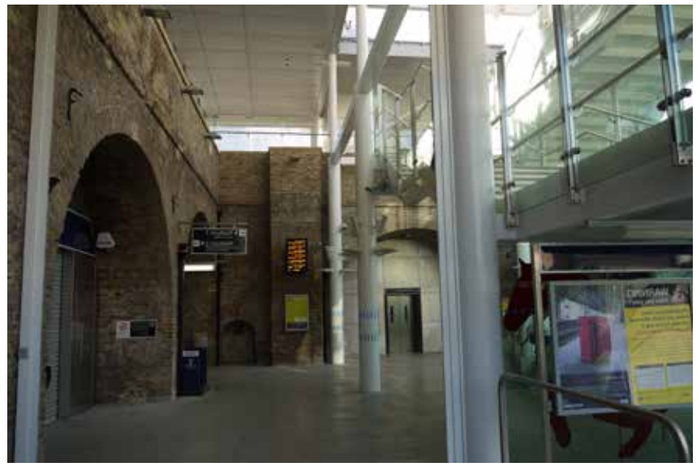
White Hart Lane Station
Precedents - Deptford Station

Precedent images of the new London Overground station at Deptford showing a similar design approach, with the viaduct forming a key element in the architecture of the new station as well as housing ticketing and staff facilities.

As envisaged at White Hart Lane, the new station at Deptford incorporates an un-gated pedestrian connection beneath the railway through one of the viaduct archways. The same approach could be formed for the new connection through to Penhurst Road.

Stairs and lifts held away from the viaduct allow the formation of a generous, double height circulation space.

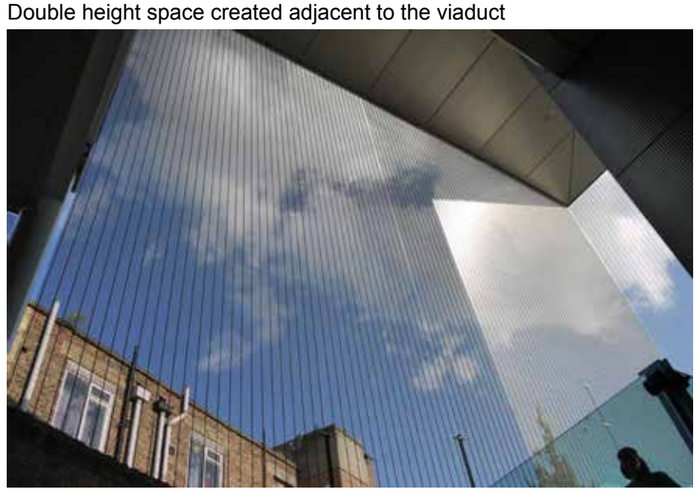
Arches used to house key station facilities



Double height space created adjacent to the viaduct

Double height space created adjacent to the viaduct

Unpaid pedestrian link beneath the viaduct



Double height space created adjacent to the viaduct

Arches used to house key station facilities

Northumberland Park Station
Context

The existing station at Northumberland Park provides access to West Anglia services between Liverpool Street and Stansted. It sits immediately adjacent to, but is not connected with the Victoria Line Northumberland Park Depot - Underground services use this route north of Tottenham Hale solely for maintenance and stabling of trains.

Known originally as Marsh Lane and constructed in 1840 as part of the Northern and Eastern Railway, the station was remodelled in the 1990's. It sits immediately adjacent to one of London's few remaining level crossings, allowing vehicles on Marsh Lane to cross the rail corridor. Expansion of the main rail corridor to deliver 3 or 4 tracking of the railway in this vicinity will necessarily sever this level road crossing.

Station facilities are located at street level, with a single, non-accessible overbridge linking the platforms. A modest, single storey brick and render station building provides ticketing facilities on the western side of the railway and includes a small set down and short term parking forecourt. A narrow pathway on the eastern side of the railway connects the overbridge to Marsh Lane. There is also a non-gated pedestrian footbridge immediately north of the level crossing which has no direct relationship with the station.

Visibility of the station is poor from both east and west approaches, with national rail totems providing the main wayfinding markers. A new residential-led development sits immediately to the west of the main station building.

Patronage today is modest, with residential properties only existing on the west side of the rail corridor. Housing is predominantly low density (other than the new development immediately next to the station) with two storey terraced housing and occasional 4 storey flatted blocks characterising the area. Land use to the east of the corridor is industrial and reliant on road access for the majority of its activities.

The primary significance of Northumberland park is two fold: First, it could form the entrance to an extension of the Victoria Line from Tottenham Hale, using the lines currently providing access to the LUL depot. Secondly it has the potential to provide the main connection to the public transport network for anticipated growth and intensification of uses to the east of the railway.

The most challenging issue relates to the level crossing; if 3 / 4 tracking is implemented north of Tottenham Hale, the road crossing in its current configuration has to be removed. Formation of a new vehicular crossing has major townscape and land acquisition implications, whereas provision of a generous cycle and pedestrian bridge over the railway can be achieved with a much lesser impact on adjacent properties. Both options are investigated overleaf.

Station Platform

Station Building

Station, level crossing and adjacent 4 storey residential

Pedestrian footbridge

Industrial buildings to east

Low rise residential to west

Northumberland Park Station
Initial Assessment

Wider Development Framework aspirations for redevelopment of land to the east of the main rail corridor will rely on Northumberland Park as the key point of connection to the rail network, with trains running either to Liverpool Street, or through interchange with the Victoria Line at Tottenham Hale. The majority of industrial sites to the east of the rail corridor are heavily reliant on vehicular rather than rail access and the low density of housing to the west of the Station both result in low levels of rail patronage in the current condition. This is reflected in the modest size and quality of the existing station and its associated bridges.

In future, however, the potential intensification of the areas on both sides of the rail corridor suggest that a larger and more visible station should be considered. Two key transport opportunities also need to be considered and are as follows:

- 3 or 4 tracking of the surface rail corridor between Tottenham and Angel Road will increase the number of tracks and frequency of trains passing through Northumberland Park. This will result in four trains per hour all day, everyday. This infrastructure upgrade will, by necessity, require removal of the level crossing which links Park Avenue Road and Garman Road across the railway.

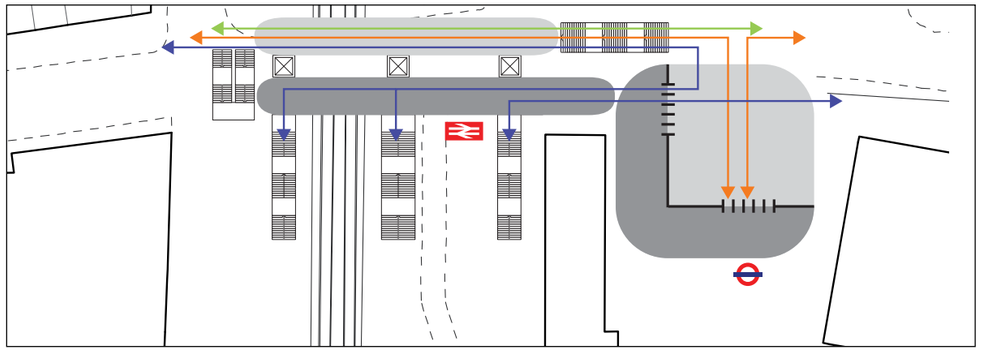
- There is potential for repurposing of the Victoria Line depot route from Tottenham Hale to Northumberland Park. If this initiative were to be taken forward, the new LUL platforms would sit on the east side of the rail corridor in land currently occupied by LUL for depot sidings and associated trainsheds.

Initial analysis to establish the preferred principles of station layout demonstrated that a twin entry station was the most suitable in terms of passenger movement and accessibility, with gates on both east and west sides of the railway.

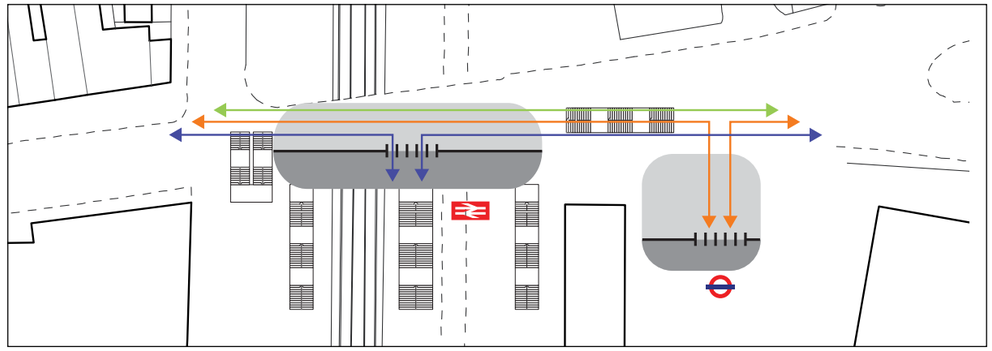
While an over-track station with a single gateline would have some benefit in terms of east of station management, this would require those arriving at or leaving on the northbound West Anglia platforms from the west, to make an additional level change (requiring passengers to move up to gating at bridge level and back down to platforms). This is not necessary today as they can move from street level directly onto the northbound platform without changing level. This major journey dis-benefit, coupled with the high cost of constructing a station above the railway, led to the preferred twin entry layout illustrated.

In all options tested we have also assumed segregation of an unpaid link across the rail corridor for pedestrians and cyclists wishing to move from Park Avenue Road to Garman Road over the railway, and a separate paid bridge connection providing lift and stair access to platforms.

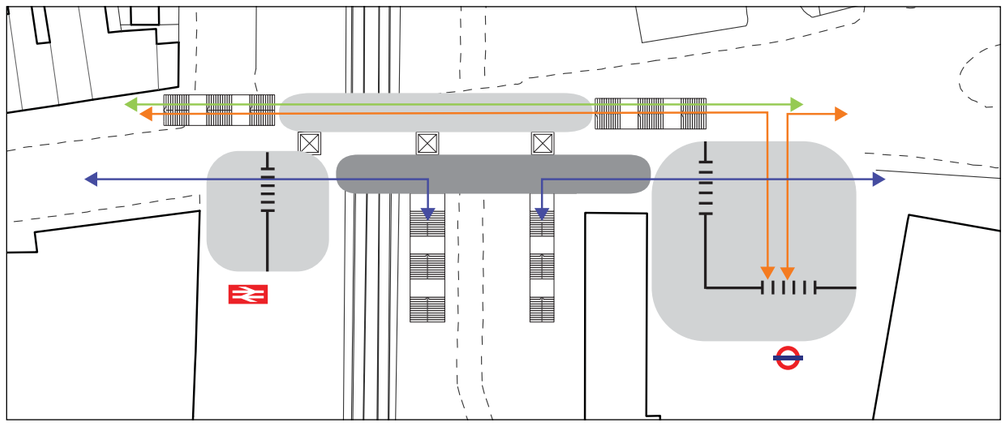
Within this general framework we have developed five generic options, illustrated overleaf.



A single eastern concourse could link with extended Victoria Line services but would require additional level changes for those approaching from the west



An over-rail station would still require additional level changes from those approaching from the west and require independent concourses for NR and LUL access.



Entrances on either side of the rail corridor would allow access to both NR and potential LUL services with the minimum number of level changes for passengers and is the preferred alternative.

Option 1. New Station, Pedestrian ramps within railway land

The key attributes of this layout are as follows:

- New station concourse structures and gatelines on both east and west sides of the railway

- An eastern concourse which allows for ticketed connection to future LUL platforms

- Single stairs on either side of the railway connecting to the main rail overbridge

- 3 lifts providing access to the bridge and to each NR platform

- A central linear stair providing access to the island platform required to extend 3 tracking to Angel Road

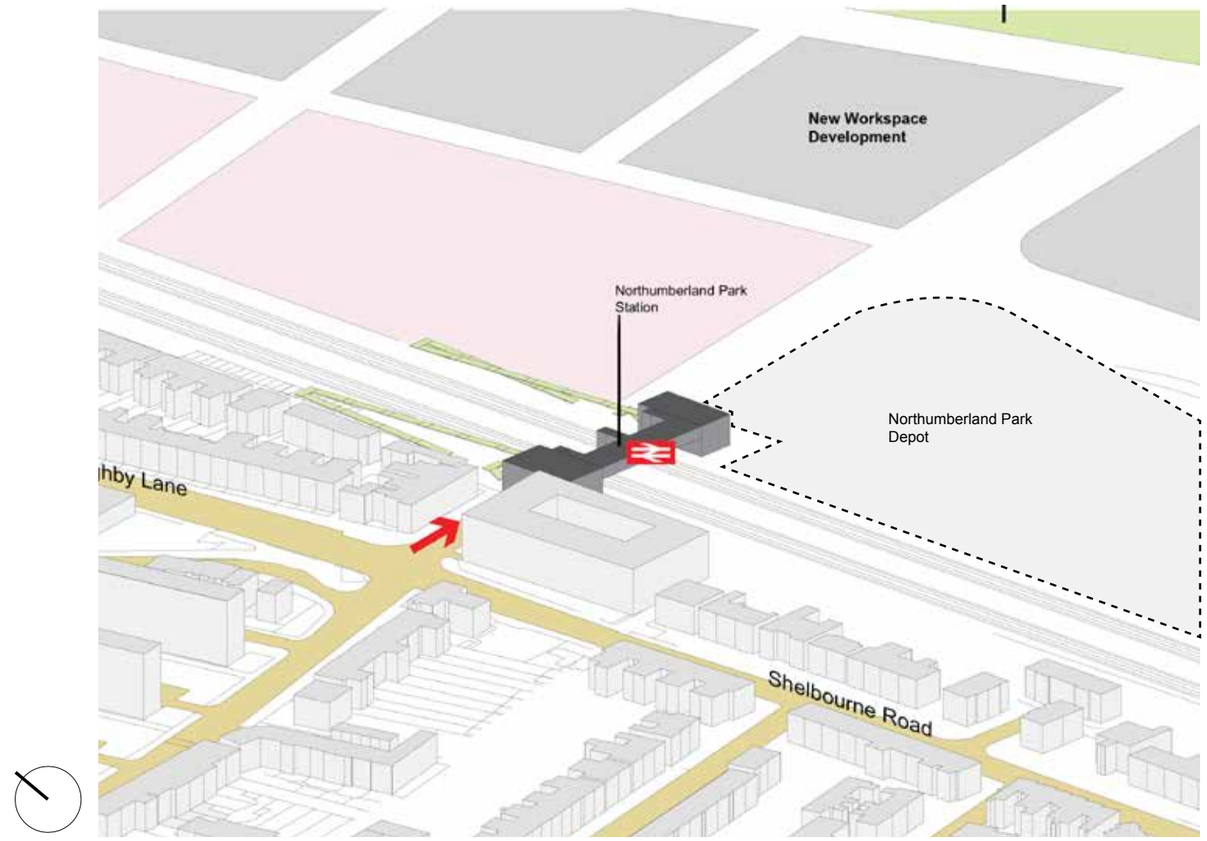
- A segregated pedestrian bridge (unpaid) on the north side of the station forming direct connections between Park Avenue Road and Garman Road

- Dogleg stairs onto the unpaid bridge immediately adjacent to the station on either side of the railway

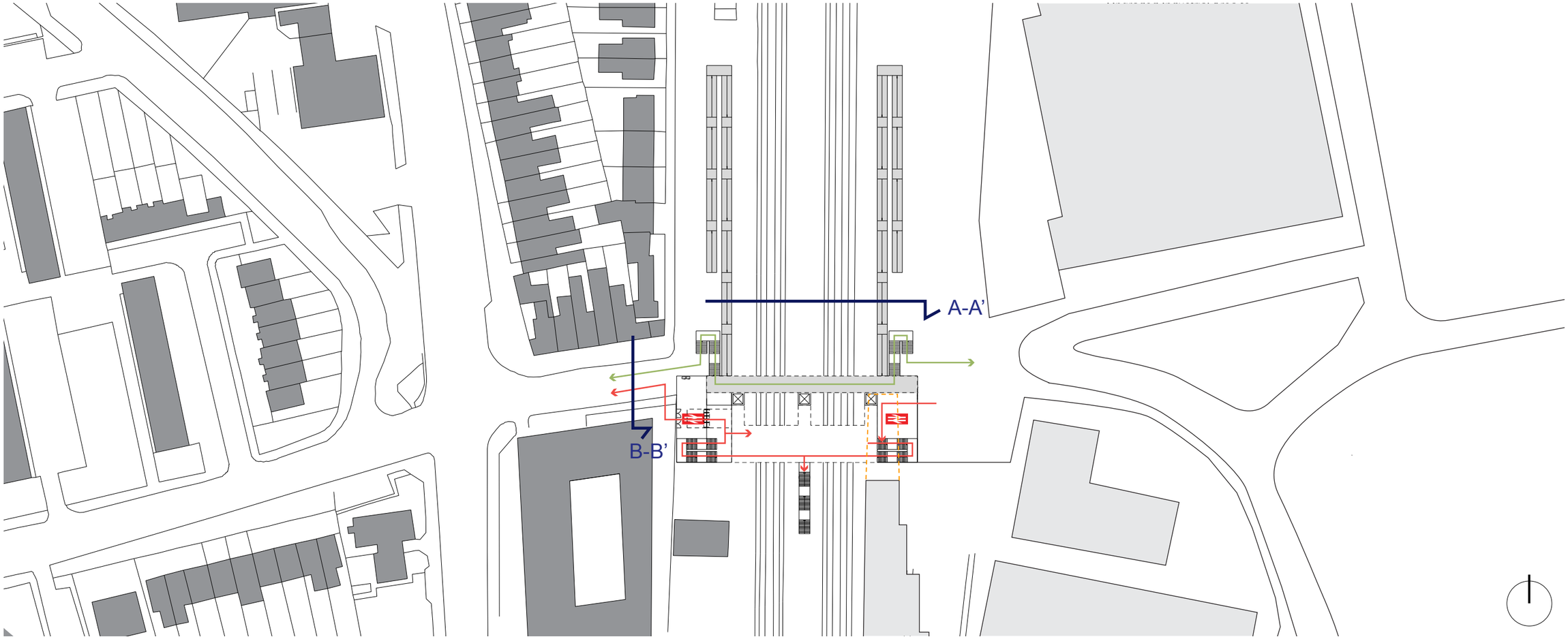
- DDA compliant ramps running north of the station, utilizing land adjacent to the tracks

- No direct impact on adjacent housing to the west of the railway

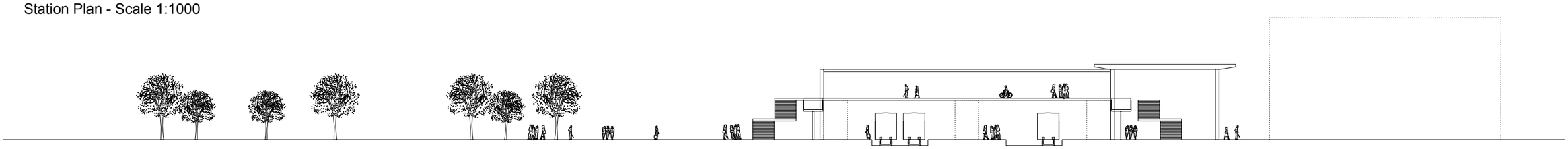
The key shortcoming of this option is the relatively modest pedestrian bridge connection across the rail corridor. Though in functional terms this will provide a step free route, in townscape and visual terms, this does little to connect land on either side of the railway. This option may be suitable to a wider masterplan solution which looks only to improve and intensify industrial activity to the east of the railway, but if new homes are to be created overlooking the Lee Valley, the suitability of this link is questionable: a more generous ‘land bridge’ with more legible landing points would be more suitable to sustain mixed use regeneration.



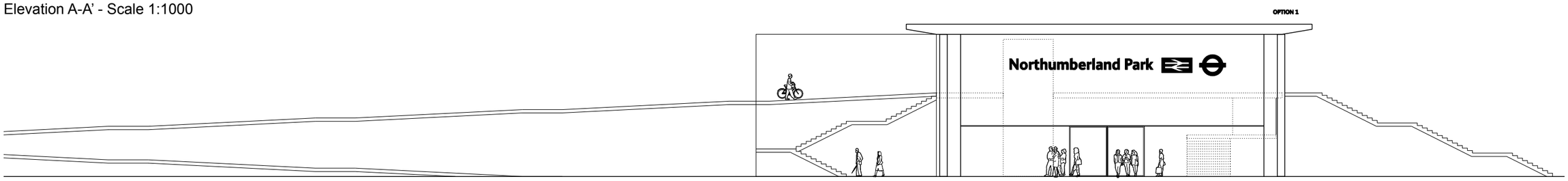
Northumberland Park Station
Options Study - Option 1



Station Plan - Scale 1:1000



Elevation A-A’ - Scale 1:1000



Elevation B-B’ - Scale 1:500

Option 2: New Station, Land Bridge across railway:

The key attributes of this layout are as follows:

- New station concourse structures and gatelines on both east and west sides of the railway

- An eastern concourse which allows for ticketed connection to future LUL platforms

- Single stairs on either side of the railway connecting to the main rail overbridge

- 3 lifts providing access to the bridge and to each NR platform

- A central linear stair providing access to the island platform required to extend 3 tracking to Angel Road

- A much wider (c15m) Land Bridge across the railway, allowing soft and hard landscape treatments to form a more intuitive and legible connection across the rail corridor

- Folded landscape treatment at either end of the new bridge, allowing ramps to form an integral part of a rising landscape (similar to Mile End Park)

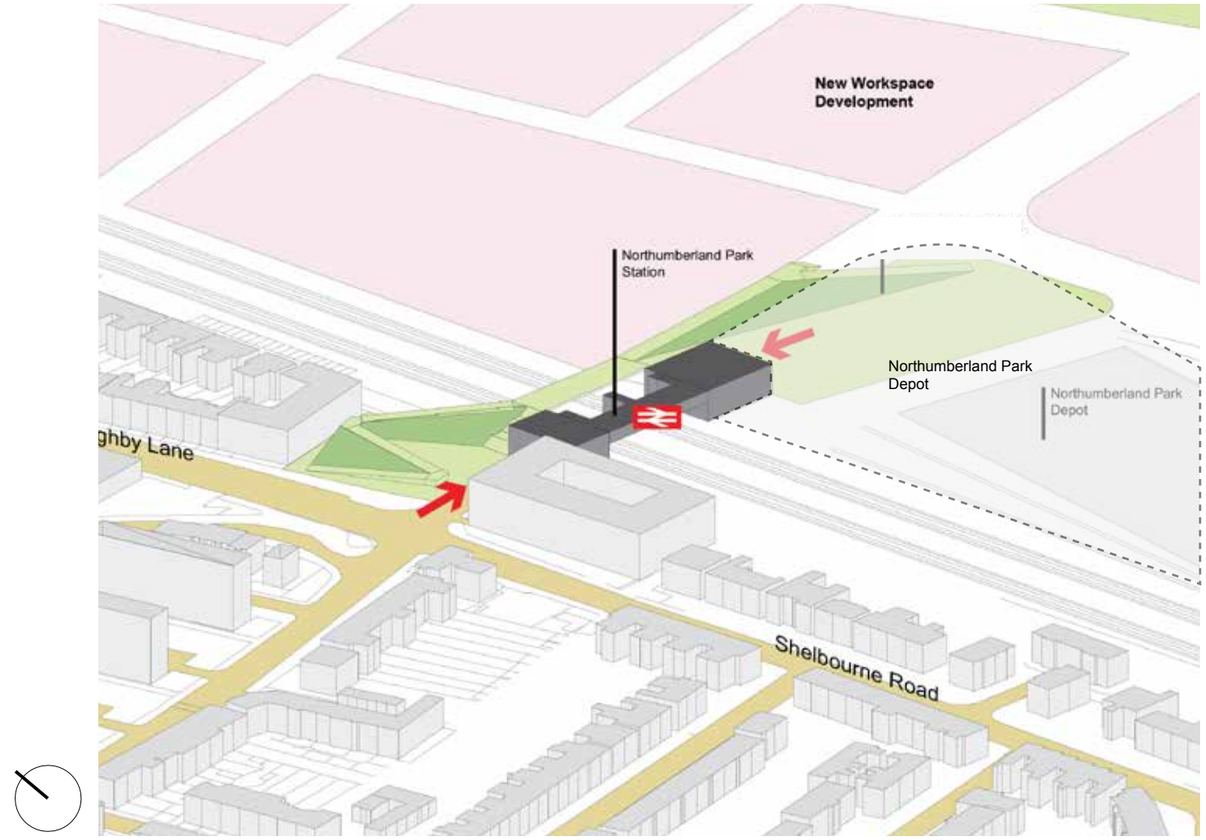
- More direct and generous linear stairs onto the pedestrian and cycle bridge

- Formation of a significant new public open space on the west side of the bridge

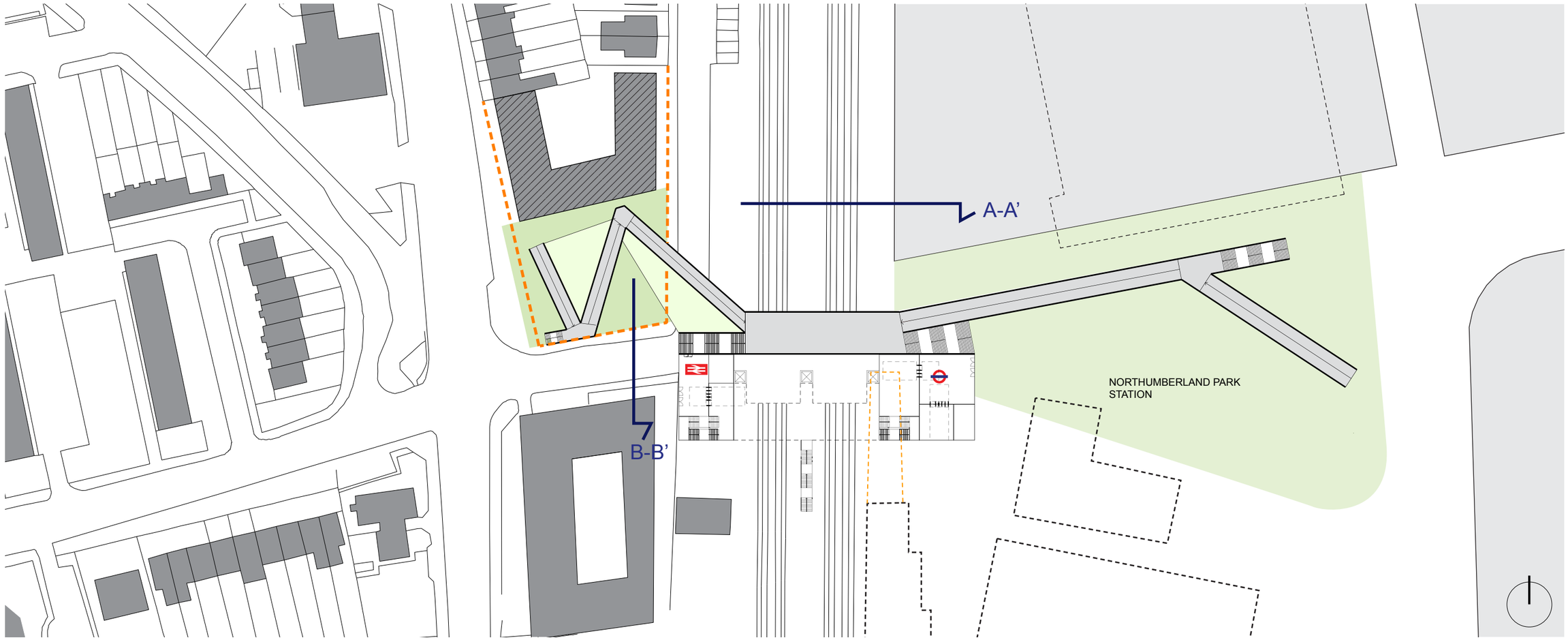
- Significant impact on housing immediately west of the new bridge – this option would require redevelopment of the existing housing on the northern section of Park Avenue Road to form the new public space and associated ramps.

This option would form a much stronger visual and physical connection between sites on either side of the rail corridor. While not suitable for vehicular use, the Land Bridge would better suit masterplan solutions which envisage housing and a richer mix of uses along the Lee Valley. The cost and greater physical implications of this alternative, particularly on existing housing stock, would need to be offset by a significant increase in connectivity and permeability.

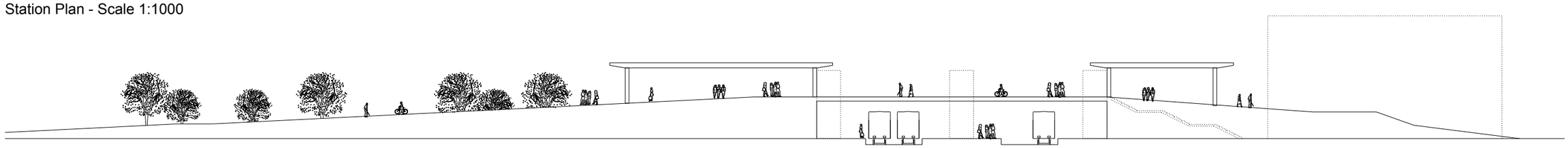
This alternative is proposed as the preferred solution within Phase 1 of the Arup Investment and Physical Development Framework. It should be noted that this recommendation is that of Landolt + Brown and Arup and does not necessarily reflect the view of the Council or the GLA. Taking this option forward would require decisions from the Council, Network Rail and other public bodies. As noted at the conclusion of this section, phased and sequential delivery of the option would reduce its impact on any existing properties.



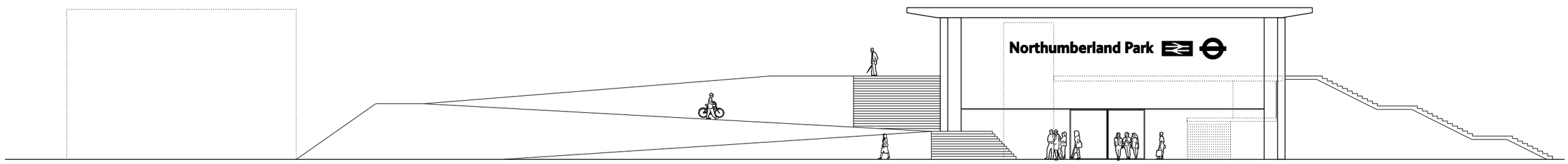
Northumberland Park Station
Options Study - Option 2



Station Plan - Scale 1:1000



Elevation A-A’ - Scale 1:1000



Elevation B-B’

Option 3: New Station, formation of an new vehicular link:

This option has been developed in order to assess the implications of a new road bridge on the existing alignment of Park Avenue Road / Garman Road.

In terms of station functionality, this layout remains essentially unaltered as Option 1 above, but excluding the pedestrian bridge, ramps and stairs.

The impact of the new bridge crossing can be summarized as follows:

- Road gradients of 1:20 – shallower gradients would be required if heavy goods vehicles and/or buses had to be accommodated

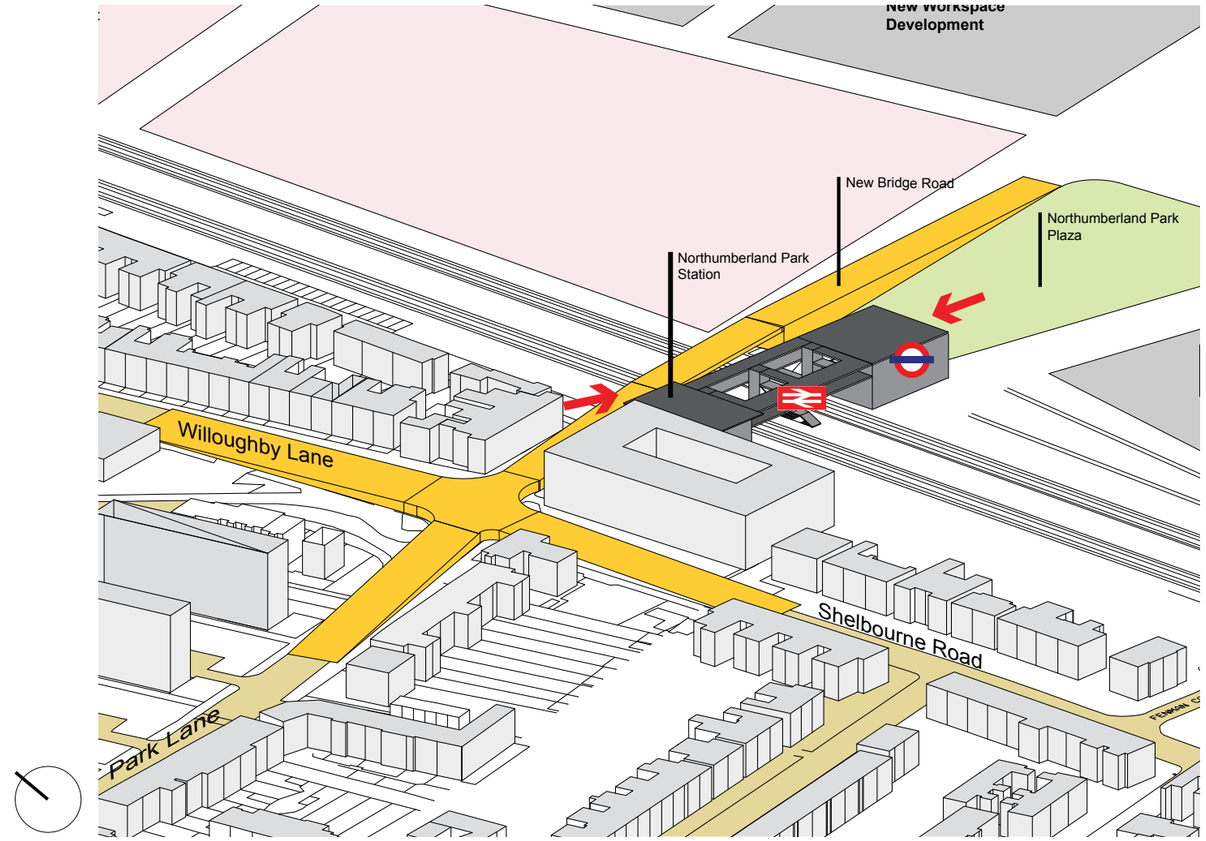
- A level, but raised junction where Park Avenue Road intersects with Northumberland Park and Willoughby Lane

- Major redevelopment of all existing housing sites adjacent to the new junction, including the recently constructed housing block on its southern side

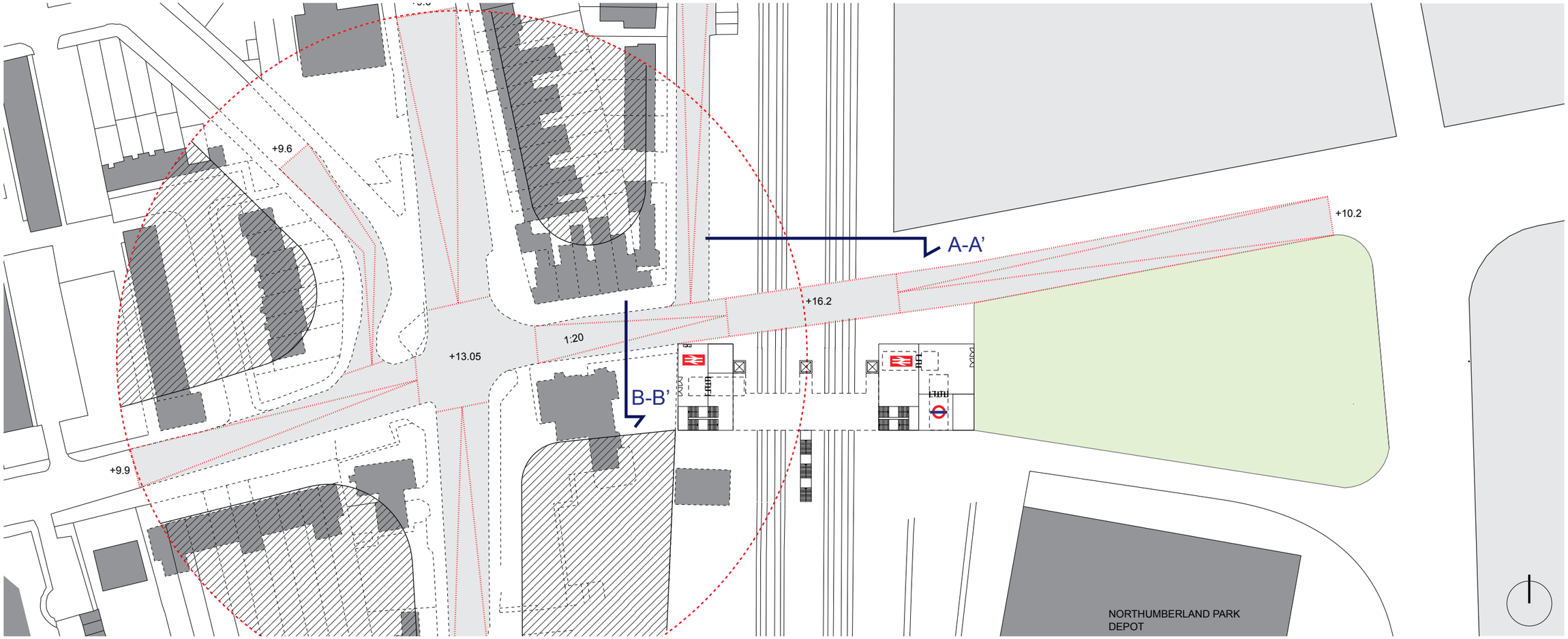
- A new road bridge immediately north of the new station, as a continuation of Park Avenue Road.

The physical implications of this new road link are clearly significant and would require major housing stock renewal. Further technical analysis of traffic movement, bus routes, highway gradients and civil engineering implications would need to be taken forward to fully test the viability and cost of this alternative.

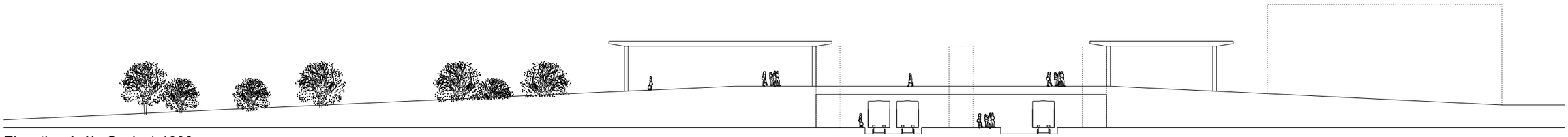
It should be noted that a crossing capable of carrying heavy traffic, notably buses and articulated vehicles, would require a more significant land take with shallower gradients.



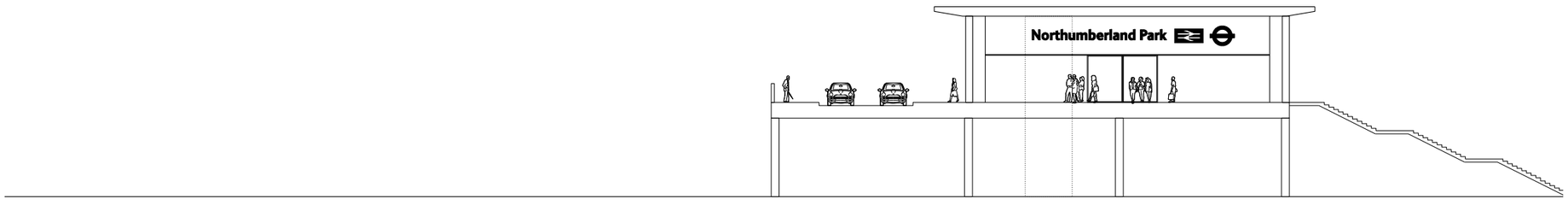
Northumberland Park Station
Options Study - Option 3



Station Plan - Scale 1:1000



Elevation A-A' - Scale 1:1000



Elevation B-B'

Option 4: New Station, formation of a new vehicular link as an extension of Northumberland Park Road

In the context of the major impact on existing housing stock in Option 3 above, this alternative looks at a more northerly crossing point for a vehicular link across the railway.

As in Option 3, the layout of the station itself remains common with Option 1, with exclusion of the pedestrian bridge.

The impact of the bridge crossing in this location can be summarized as follows:

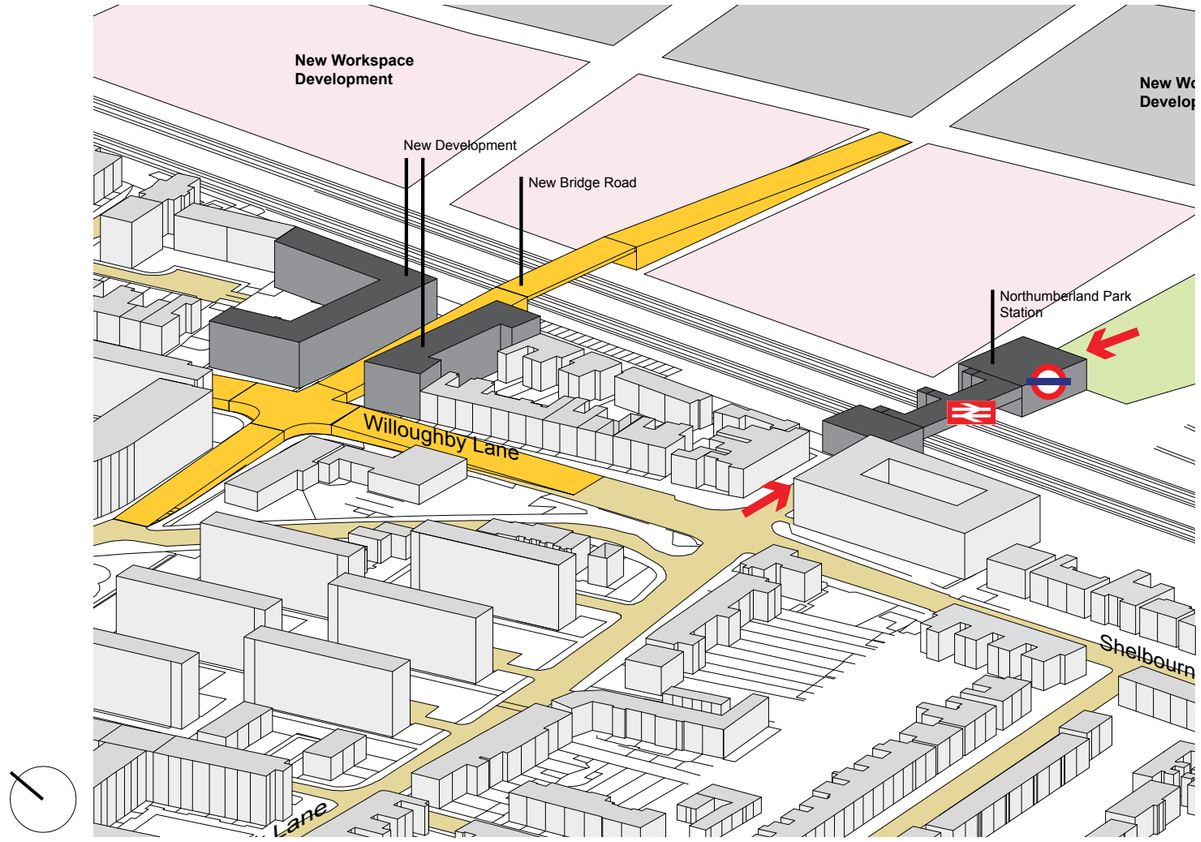
- No direct impact on the housing adjacent to the station

- Redevelopment of some housing on the east side of Willoughby Lane

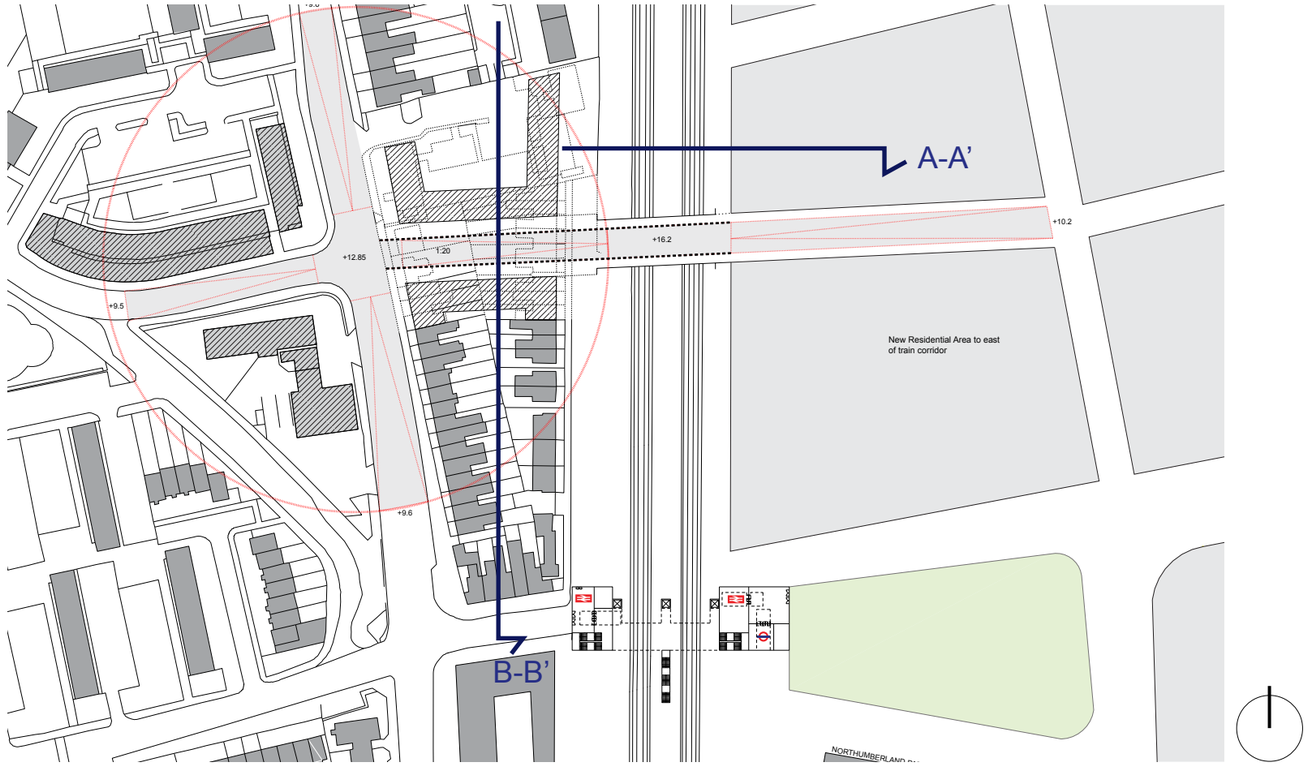
- Raised street conditions for existing housing blocks at the junction of Willoughby Lane and Northumberland Park

While the direct physical impact of this option is reduced, in terms of the need to replace existing housing, it is still significant. More detailed analysis of the impact of a crossing on retained housing at the junction of Willoughby Lane and Northumberland Park would also be necessary as an elevated road geometry in close proximity to existing housing may lead to unacceptable townscape conditions around the perimeter of existing housing sites.

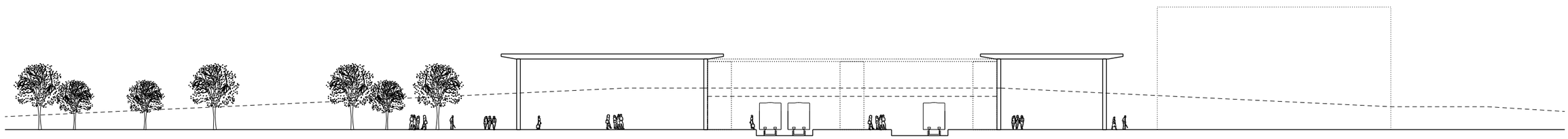
In wider transport strategy terms, this option relocates the station significantly closer to Angel Road - a more detailed analysis of catchment areas would need to be undertaken to establish the way in which this would disbenefit those living to the south of the station.



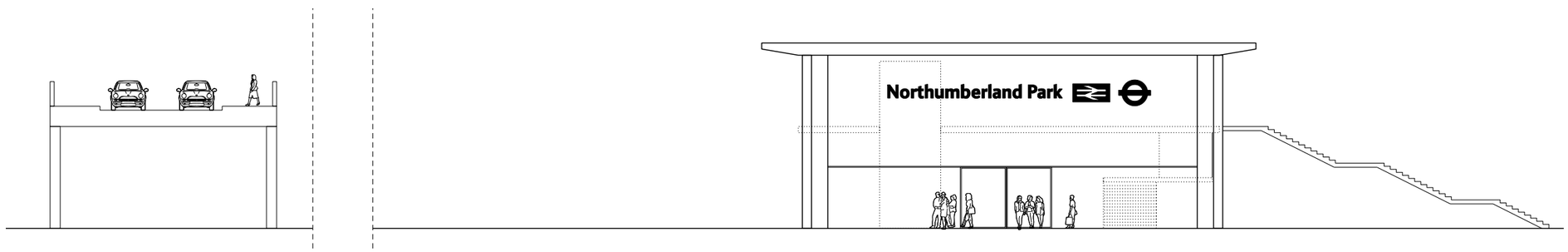
Northumberland Park Station
Options Study - Option 4a



Station Plan - Scale 1:2000



Elevation A-A’ - Scale 1:1000



Elevation B-B’

Landolt+Brown ARUP

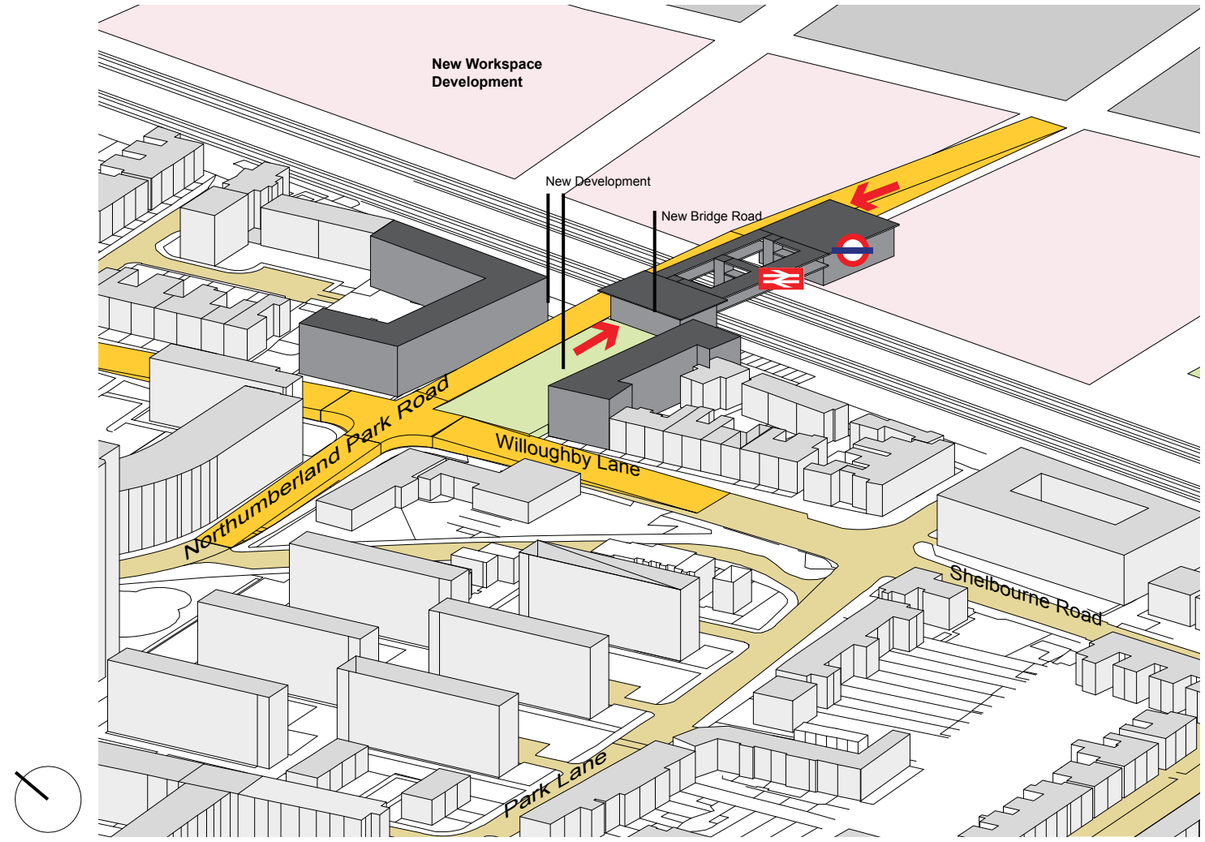
Option 4a: Formation of a new vehicular link and relocated station on Northumberland Park Road

In this final alternative, the station, as well as the main link traversing the rail corridor, is moved northwards to form an extension of Northumberland Park Road with the station on its southern side.

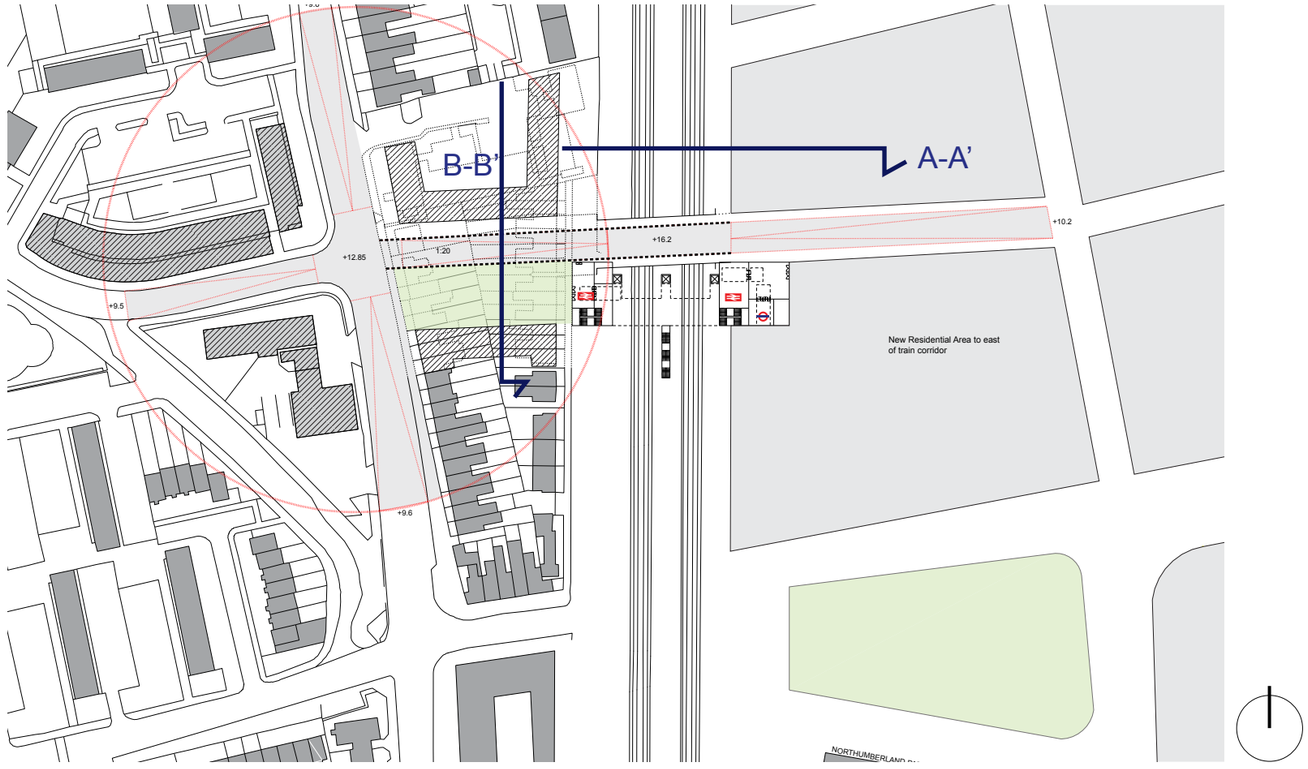
This alternative presents opportunities in the ability to plan the station within a group of (necessarily) remodelled buildings adjacent to the new road bridge and the potential to form a new station plaza on the west side of the railway as part of this remodelling.

This alternative would, by necessity, require an additional extension of the Victoria Line, if the long term intention is to extend this Underground link from Tottenham Hale. The more northerly location would also have to be examined in greater detail in terms of its proximity to Angel Road and to assess if catchment areas to the south are put at a significant disadvantage.

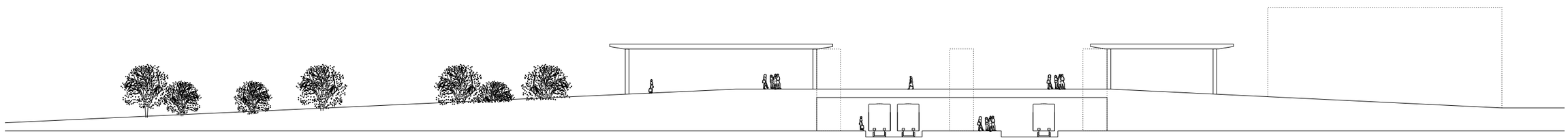
It should also be noted that the operational implications of moving the station north, in terms of track and signalling, have not been investigated further at this stage.



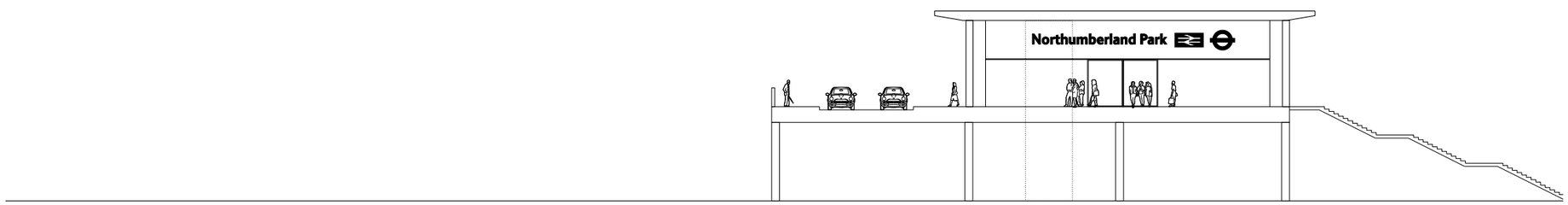
Northumberland Park Station
Options Study - Option 4a



Station Plan - Scale 1:2000



Elevation A-A' - Scale 1:1000



Elevation B-B'

ARUP